

KELLOGG
SWITCHBOARD AND SUPPLY COMPANY
6650 S. CICERO AVENUE — CHICAGO

*KELLOGG Switchboards, Telephones &
Supplies*
GENERAL CATALOG NO. 11
1949

A general telephone, switchboard and line supplies catalog distributed in 1949, the first catalog after WWII. This catalog was produced in bound book form.

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GENERAL CATALOG no. 11

KELLOGG

SWITCHBOARDS

TELEPHONES

SUPPLIES

C H I C A G O , U . S . A .

NO.
11

Kellogg

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KELLOGG SWITCHBOARD AND SUPPLY COMPANY
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General Catalog No. 11

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

Compiled and published in U. S. A., 1949

FOREWORD

This catalog has been prepared in three sections consisting of Kellogg apparatus, supplies, and piece parts for Kellogg apparatus.

All products of Kellogg manufacture and all supplies are presented in alphabetical order. Products are alphabetized by the name of the product. For example, desk set boxes will be found under Boxes, Desk Set, etc.

THE APPARATUS SECTION contains all coded items of Kellogg manufacture. Also included in this section are storage batteries and other power equipment and protection and cross-connecting equipment not manufactured by Kellogg. The coded components of major coded items are listed in this section under the description of the major item.

THE SUPPLY SECTION includes all supplies except storage batteries, other power equipment, and protection and cross-connecting equipment. This equipment is shown under "Power" in the Apparatus Section.

THE PIECE PART SECTION includes piece parts which are regularly supplied and which can be replaced by operating companies.

HOW TO ORDER

All orders should include *both the code number and the name* of the article or product ordered. In general, both the code number and the name are necessary to properly identify the apparatus.

Piece parts should be ordered by piece part number. Where itemized drawings are shown in the Piece Part Section the associated code number should be determined from the accompanying listing of piece part numbers.

CUSTOMER INFORMATION

Guarantee

Goods properly used are fully guaranteed for one year against any defect in material or workmanship and are subject to replacement.

Always notify a Kellogg office before making any return shipments. This will help to make the proper adjustment without delay.

Terms

All invoices to companies whose credit has been approved are payable net, within 30 days from date thereof, except those covering some items of construction material which carry a discount for cash within 10 days from date of invoice or those whose terms were specified in quotations, proposals or contracts.

We invite the opening of charge accounts. New customers who ordinarily are not rated by commercial agencies can help assure prompt service by sending in credit information such as their latest balance sheet and profit and loss statement, bank or other references, with initial orders.

Sight draft or C.O.D. orders receive the same attention as those covered by established charge accounts.

Orders

To avoid errors or delays, catalog numbers as well as the name of each article should appear on the order. Possibilities of delay are decreased when complete information is given in the order.

Telephone or telegraph orders should be confirmed by mail immediately so that if a mistake is made in transmission of the order it can be checked and corrected. However, confirming orders should be marked "Confirming" to avoid the possibility of duplication.

Changes and Cancellations

A reasonable charge is made for changes or cancellation of orders when engineering, special assembly or adjustment is involved. These charges are only sufficient to compensate for the actual loss in time or material.

Shipments

Always specify whether goods are to be shipped via freight, express or parcel post. When shipment is desired by freight specify the routing. In the absence of instructions Kellogg will select routes which will assure the best service.

Claims for Shortage, Breakage or Non-Delivery

All claims for breakage, damages and non-delivery should be made at once to the transportation company handling the shipment. Kellogg will gladly assist in presenting these claims.

Receipts from the transportation company specify that shipments are received in good condition, therefore shipments must be checked as they are received. Always have the agent of the transportation company make a notation on the bill of lading specifying any damage or shortage.

If packages or cases are in apparent good order, but contents are found to be damaged upon opening, call the freight agent or adjuster and have him mark the freight bill to show the concealed damage.

Claims for damage or non-delivery of parcel post shipments should be made to Kellogg as Kellogg insures this material and makes all adjustments.

Returning Goods

Please notify Kellogg before making any return shipments. This will help to make the proper adjustment without delay.

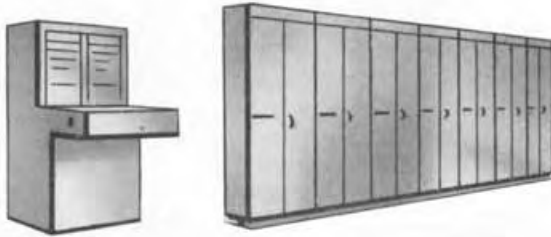
The liability of the Kellogg Company is limited in all cases to the value of the goods claimed to be defective.

Marine or Parcel Post Insurance

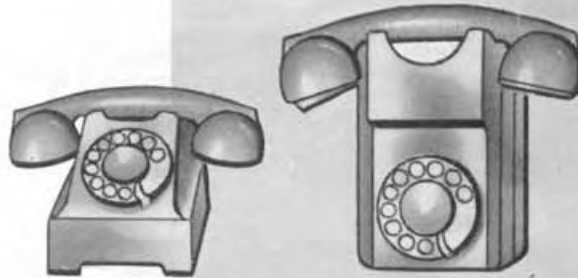
Unless otherwise directed, Kellogg will insure against non-delivery all shipments made by steamer or parcel post. A charge will be made to cover this cost.

Kellogg

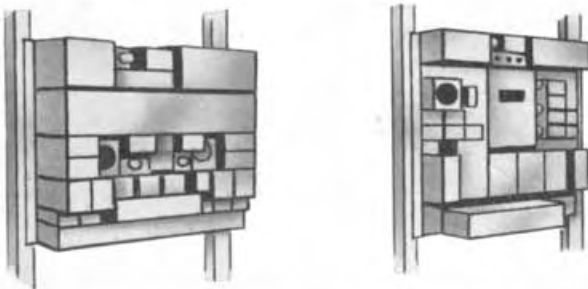
APPARATUS



SWITCHBOARDS



TELEPHONES



CARRIER & REPEATER



ARMS, TELEPHONE TRANSMITTER
No. 39 Transmitter Arm, Wall Type
Steel Telephone



This arm is used on Kellogg No. 817 type steel telephones. The transmitter back is made of punched brass and the remainder of punched steel, finished in black enamel. The arm is 1 1/2 inches long from the back of the mounting to the end of the transmitter back. Can be adjusted from 15° above to

15° below horizontal. Has concealed cord design.

No. 41 Transmitter Arm, Wall Type
Wood Telephones

The No. 41 Transmitter Arm is designed for use with Kellogg No. F-2731 and F-2870 wood telephones. The transmitter back of this arm is of punched brass and the remainder of pressed steel. The arm is finished in black enamel. The arm is 1 1/2 inches long from the back of the mounting to the end of the transmitter back and requires a 2-inch opening in the telephone woodwork to mount. Adjustable 15° above and below the horizontal. Has concealed cord design.

No. 50 Transmitter Arm



The No. 50 Transmitter Arm is standard for magneto telephones. Has concealed cord design and is adjustable 15° above and below the horizontal. The arm is 2 3/4 inches long from the back of the mounting to the end of the transmitter back. Finished in black enamel.

ARMS, SWITCHBOARD TRANSMITTER
No. 48 Switchboard Transmitter Arm



This arm is of the suspended adjustable type for use with all types of small switchboards. The construction of this arm completely eliminates the use of a cord weight and provides a wide range of positions.

The No. 48 arm is especially adaptable to installations where the operator must perform duties other than straight operating, requiring freedom of position at the board. The arm is equipped with both horizontal and vertical swivel joints, making it easy to place the transmitter in any convenient position.

Heavy brass, with a durable nickel finish, is used in the construction of this arm. The length of the arm is adjustable from 16 1/4 inches to 25 7/8 inches and the height is 2-5/16 inches. Rollers are provided for the transmitter cord to prevent wear on the conductor insulation. The arm is arranged for use with the No. 157 type transmitter.

ARMS, SWITCHBOARD TRANSMITTER
No. 28 Switchboard Transmitter Arm,
Hinged Lug Type

The arm is designed for use on desk type or small, floor type switchboards. It is made of brass tubing with durable nickel plating. The transmitter cords are concealed in the tubing, protected from wear and damage.

The length of the arm is adjustable from 16 1/4 inches to 22 3/4 inches and the height from 4-11/16 inches to 11 1/2 inches. The transmitter arm is arranged for use with the No. 121 type transmitter.

No. 54 Switchboard Transmitter Arm,
Suspended Type

The No. 54 arm is the same as the No. 48 except the arm length is adjustable from 14-5/16 inches to 20 3/4 inches. It is arranged for use with the No. 157 type transmitter.

BARS, DISTRIBUTING

These distributing bars are for use on switchboards for battery commons, ground strips, and fuse terminals. They are made of brass and are furnished with round head brass machine screws and washers. Kellogg distributing bars are available in four types: the No. 52 has tapped mounting holes for mounting with machine screws; the No. 3, No. 5, and No. 44 types have countersunk mounting holes for mounting with wood screws.



LEFT: TYPE 52



RIGHT: TYPE 3

Tapped Mounting Hole Type Bars

TYPE NO. 52

Code No.	No. Term Screws	Centers Spaced	DIMENSIONS OF BAR (INCHES)		
			Length	Width	Thickness
52	2	13/32 in.	1-3/16	1/4	1/4

Countersunk Mounting Hole Type Bars

TYPE NO. 3

Code No.	No. Term Screws	Centers Spaced	DIMENSIONS OF BAR (INCHES)		
			Length	Width	Thickness
3	2		1-3/16	1/4	1/4
4	4	1/2 in.	2 1/2	1/4	1/4

TYPE NO. 5

5	5	1/2 in.	2-9/16	3/8	1/4
10	6	1/2 in.	3-1/16	3/8	1/4
12	7	1/2 in.	3-9/16	3/8	1/4
15	9	1/2 in.	4-9/16	3/8	1/4
16	10	1/2 in.	5-1/16	3/8	1/4
18	11	1/2 in.	5-9/16	3/8	1/4
19	13	1/2 in.	6-9/16	3/8	1/4
23	16	1/2 in.	8-1/16	3/8	1/4
39	28	1/2 in.	14-1/16	3/8	1/4
43	25	1/2 in.	12-9/16	3/8	1/4

TYPE NO. 44

40	7	1 in.	6-9/16	1/2	1/4
44	2	11/16 in.	1-3/16	1/2	1/4
62	5	1 in.	4-9/16	1/2	1/4

BELLS

MAGNETO EXTENSION TYPE



The No. 37 type magneto extension bells consist of a ringer mounted in a small oak cabinet with the gongs and two binding posts mounted on the outside. The cabinet for the No. 37 type bell is 6½ inches long, 5½ inches wide, and 4½ inches high. The cabinet of the No.

115-BA bell is 6 inches long, 6 inches wide, and 3¼ inches high, mounted on a base 9 inches long, 6½ inches wide, and 5/8 inch thick. The gongs for these bells are finished in black enamel.

These bells are furnished less condensers unless specified when ordering. Order by code number.

STRAIGHT LINE TYPE

Code No.	Ringer	Frequency (Cycles)	Binding Amt.	Posts Code	Type of Ringer
37-SA	78-A	---	2	77	1000 ohm Str. Line
37-SD	78-D	---	2	77	1600 ohm Str. Line
37-SG	78-G	---	2	77	2500 ohm Str. Line

BIASED TYPE

37-BA	79-A	---	2	77	1000 ohm Str. Line
115-BA	79-A	---	2	11	1000 ohm Biased & No. 146 Condenser

HARMONIC TYPE

37-HA-1	72-A-1	33½	2	77	Harmonic
37-HA-2	72-A-2	50	2	77	Harmonic
37-HA-3	72-A-3	66½	2	77	Harmonic
37-HA-4	72-A-4	16¾	2	77	Harmonic
37-HB-1	73-A-1	30	2	77	Harmonic
37-HB-2	73-A-2	42	2	77	Harmonic
37-HB-3	73-A-3	54	2	77	Harmonic
37-HB-4	73-A-4	66	2	77	Harmonic

BELLS AND BUZZERS, NIGHT ALARM

These bells are for night alarm use in small exchanges. The bells and buzzers shown below are the same in construction except the bells are provided with a gong. The buzzers are approximately 3 inches in diameter and 1¼ inches in height. The bells have the same dimensions except that a 1¾-inch gong is mounted on top making an over-all length of 4¾ inches.

These bells and buzzers must be ordered by code number. Both bells and buzzers will operate on either A.C. or D.C. Separate connections on the terminal strips are marked for either connection.

DRY CELL TYPE

Code No.	Description	Coil Resis. (Ohms)	Voltage
1-A	Bell	4	3-V., A.C. or D.C.
10-A	Buzzer	4	3-V., A.C. or D.C.

STORAGE BATTERY TYPE

1-B	Bell	300	24-V., A.C. or D.C.
1-C	Bell	500	48-V., A.C. or D.C.
10-B	Buzzer	300	24-V., A.C. or D.C.
10-C	Buzzer	500	48-V., A.C. or D.C.
10-D	Buzzer	50	12-V., A.C. or D.C.

(The No. 10-D Buzzer is for use with intercommunication sets.)

WEATHERPROOF LOUDRINGING TYPE



The Kellogg weatherproof loudringing bell is for indoor or outdoor use with either common battery or magneto service. These bells are completely weatherproof and operate under all climatic conditions. They are especially adapted for taxi stands, coal yards, lumber yards, and all other installations where a loud-ringing bell which will stand up under all service conditions is needed.

The housing for these bells consists of a heavy cast iron base with a removable cast iron cover, all finished with an asphalt base followed by an aluminum paint to insure against corrosion. The gongs are 6 inches in diameter. Either straight line or harmonic ringers can be furnished. Over-all dimensions: width 13 inches; height 12½ inches, and depth 4½ inches. These bells must be ordered by code number.

STRAIGHT LINE TYPE

Code No.	Ringer	Ringer Freq. (Cycles)	Condenser	Type Ringer
65-SA	107-A	----	See Note	----
65-SD	107-D	----	See Note	----
65-SG	107-G	----	See Note	----

BIASED TYPE

Code No.	Ringer	Ringer Freq. (Cycles)	Condenser	Type Ringer
65-BA	107-A	----	No. 214	1000 ohm coil resistance. Biasing spring attachment.

Note: The straight line type bells are equipped with straight line ringers with coil resistances as follows: 65-SA, 1000 ohms; 65-SD, 1600 ohms, and 65-SG, 2500 ohms. A condenser is furnished only if specified. For 1 mfd. specify No. 12 condenser. For 2 mfd. specify No. 214 condenser. For other extension bells see Boxes, Desk Set.

HARMONIC TYPE

65-HA-1	105-A-1	33½	No. 12	Harmonic
65-HA-2	105-A-2	50	No. 12	Harmonic
65-HA-3	105-A-3	66½	No. 12	Harmonic
65-HA-4	105-A-4	16¾	No. 12	Harmonic
65-HB-1	106-A-1	30	No. 12	Harmonic
65-HB-2	106-A-2	42	No. 12	Harmonic
65-HB-3	106-A-3	54	No. 12	Harmonic
65-HB-4	106-A-4	66	No. 12	Harmonic
65-HC-1	119-A	20	No. 12	Harmonic
65-HC-2	119-A	60	No. 12	Harmonic
165-HA	121-A	25	No. 12	Harmonic

BINDING POSTS

**Extension Bell Type
NO. 77**

The No. 77 binding post is made of soft steel with cadmium plating. Terminal end tinned for soldering purposes. Over-all dimensions 1¼ by 7-1/16 inches. Used for No. 37 extension bells. Has No. 6-32 round head machine screws.

APPARATUS SECTION

BINDING POSTS (Cont'd)

Telephone Type



NO. 11

The No. 11 binding post is made of nickel plated brass with end tinned for soldering. Has No. 6 screw for spade tip terminals. Base dimensions 5/16 by

1 inch. Wood mounting screw is No. 5 by 1/2 inch.



NO. 59

The No. 59 binding post is similar to the No. 11 except the connection is made at right angle to the base. Made of nickel plated brass with end tinned for soldering. Size 5/16 by 3/4 inch. Wood mounting screw No. 6 by 1/2 in.



NO. 63

The No. 63 binding post is the same as the No. 59 except it has a clip to take either spike or spade tips.

Connecting Rack Type



NO. 76

This post is the same as the No. 11 except it has a clip to take either spike or pin tips as well as spade tips. Used on Nos. 12, 13, and 14 connecting racks.

BLANKS, JACK

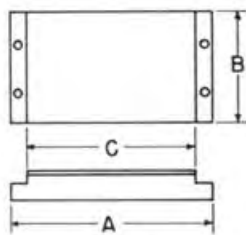


FIGURE "A"

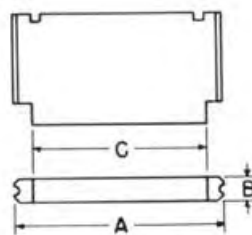


FIGURE "B"

These jack blanks are used to fill out the face of the switchboard in unequipped spaces. A few of the most commonly used blanks are listed below. For information concerning other available types, contact the Kellogg Sales Department. With the exception of the No. 9-E, all blanks listed below are made of wood with a bakelite face, dull rubbed to match the face of the switchboard. No. 9-E is made of wood with an ebonized face.

Code No.	Dimensions (Inches)			Figure
	A	B	C	
4-B	8 1/4	3/8	7-21/32	A
4-F	8 1/4	1/2	7-21/32	A
7-B	10 3/4	15/16	10 1/4	B
7-H	10 5/8	1 1/2	10 1/4	B
7-P	10 3/4	2-3/16	10 1/4	B
7-R	10 3/4	4-11/16	10 1/4	B
7-W	10 3/4	1-7/16	10 1/4	B
7-X	10 3/4	2	10 1/4	B
9-D	7-29/32	1 3/4	7-21/32	B
9-E	7-29/32	4-1/16	7-21/32	B
9-F	7-29/32	4-1/16	7-21/32	B

BOXES, DESK SET

Kellogg Desk Set Boxes have a heavy drawn steel cover with a durable black enamel finish for the common battery type and a wood cover with black finish for local battery and special types. All parts for these boxes are easily accessible and quickly replaceable with an ordinary screw driver. Connecting racks are clearly marked for convenience. Universal type terminals used.

Common Battery Two-Conductor Type



For use as an extension bell or with 2-conductor telephones. Supplied less induction coil, but space is provided for addition of a No. 99-A coil.

Code No.	Ringer	Frequency (Cycles)	Condenser	Type Ringer
F-605-BA	79-A	--	177	Biased
F-605-HA-1	72-A-1	33 1/3	177	Harmonic
F-605-HA-2	72-A-2	50	177	Harmonic
F-605-HA-3	72-A-3	66 2/3	177	Harmonic
F-605-HA-4	72-A-4	16 1/3	177	Harmonic
F-605-HB-1	73-A-1	30	177	Harmonic
F-605-HB-2	73-A-2	42	177	Harmonic
F-605-HB-3	73-A-3	54	177	Harmonic
F-605-HB-4	73-A-4	66	177	Harmonic
F-605-HC-1	74-A-1	20	177	Harmonic
F-605-HC-2	74-A-2	60	177	Harmonic
F-605-LR	---	--	177	No Ringer

Common Battery Three-Conductor Type

For common battery telephones. With steel cover. For use with 3-conductor telephones Nos. 700-A, 900-A, 9735, 925A, 9741, 1062, 1063, 1162, 1163.

Code No.	Ringer	Frequency (Cycles)	Induction Coil	Condenser	Type Ringer
F-602-BA	79-A	--	99-A	177	Biased
F-602-HA-1	72-A-1	33 1/3	99-A	177	Harmonic
F-602-HA-2	72-A-2	50	99-A	177	Harmonic
F-602-HA-3	72-A-3	66 2/3	99-A	177	Harmonic
F-602-HA-4	72-A-4	16 2/3	99-A	177	Harmonic
F-602-HB-1	73-A-1	30	99-A	177	Harmonic
F-602-HB-2	73-A-2	42	99-A	177	Harmonic
F-602-HB-3	73-A-3	54	99-A	177	Harmonic
F-602-HB-4	73-A-4	66	99-A	177	Harmonic
F-602-HC-1	74-A-1	20	99-A	177	Harmonic
F-602-HC-2	74-A-2	60	99-A	177	Harmonic
F-602-LR	---	--	99-A	177	No Ringer

BOXES, DESK SET (Cont'd)

Common Battery Four-Conductor Type



A steel cover box for use with 4-conductor telephones Nos. 900, 925, 710, 305, 9735, 9741, 1060, 1061, 1160, and 1161. Has anti-side tone induction coil.

Code No.	Ringer	Frequency (Cycles)	Induction Coil	Condenser	Type Ringer
610-BA	79-A	--	103-A	185	Biased
610-HA-1	72-A-1	33 $\frac{1}{3}$	103-A	185	Harmonic
610-HA-2	72-A-2	50	103-A	185	Harmonic
610-HA-3	72-A-3	66 $\frac{2}{3}$	103-A	185	Harmonic
610-HA-4	72-A-4	16 $\frac{2}{3}$	103-A	185	Harmonic
610-HB-1	73-A-1	30	103-A	185	Harmonic
610-HB-2	73-A-2	42	103-A	185	Harmonic
610-HB-3	73-A-3	54	103-A	185	Harmonic
610-HB-4	73-A-4	66	103-A	185	Harmonic
610-HC-1	74-A-1	20	103-A	185	Harmonic
610-HC-2	74-A-2	60	103-A	185	Harmonic
610-LR	---	--	103-A	185	No Ringer

Three-Conductor, Special Type

Code No.	Condenser	Induction Coil	Push Button	Note
F-2413	171	97-A and 98-A	58	For F-601 Telephone
F-2414	171	97-A and 98-A	--	Requires No. 1-B Foot Switch

Local Battery Three-Conductor Type



Code No.	Ringer	Generator	Condenser	Induction Coil
3328	78-A	15	--	100-A
3361	78-D	53	--	100-A
3362	78-G	53	--	100-A
3370	78-D	53	184	100-A
3371	78-G	53	184	100-A

Local Battery Four-Conductor Type

Code No.	Ringer	Generator	Condenser	Induction Coil
3515*	78-G	75	--	--
3528*	78-A	15	--	--
3561*	78-D	53	--	--
3562*	78-G	53	--	--
4362**	78-G	53	--	105-A
4415**	78-G	75	--	111-A

*Triad circuit for 1040-LR and C-LR and similar telephones.

**Anti-side tone.

BOXES, GENERATOR



Code No.	Generator
1203*	15 (3-bar)
1205*	53 (5-bar)
1206*	75 (6-bar)
4421**	53 (5-bar)

*Made of hardwood, finished in black. Used with 1040, 1041, 1050, 1140, 1141, and 1150 Magneto Master-phones.

**Used with F-2413 or F-2414 desk set boxes and F-601 telephone.

BOXES, KEY

For Switching Telephones



The Kellogg Nos. 12 and 13 key boxes are compact, attractively designed units used for switching a telephone to one of either two or three incoming lines, respectively. These boxes are made of black molded bakelite and clip to a steel back plate which is fastened to the wall with two screws.

All equipment, consisting of a standard Kellogg No. 1000 type key, connecting racks, and all wiring, is mounted on the back plate. Extra terminals provided on connecting racks may be used to terminate bell, buzzer, or other circuits which are independent of the switching key.

Lines wires are connected to the key box through an opening in the bottom of the box. Boxes may be mounted in any position.

These key boxes are 5 $\frac{1}{2}$ inches high, 3 $\frac{3}{8}$ inches wide, and 1 $\frac{1}{2}$ inches deep. Shipping weight each is one pound.

NO. 12 KEY BOX

The No. 12 key box is equipped for switching a telephone to either of two incoming lines. The key locks in two positions.

NO. 13 KEY BOX

The No. 13 key box is similar to the No. 12 except it switches a telephone to one of three lines. The key locks in all three positions. Can be used in systems having two trunks and a separate circuit for intercommunication.

NO. 24 KEY BOX WITH HOLD KEY

The No. 24 key box is used to switch a telephone between two incoming trunk lines and to hold one of those trunk lines while using the other circuit for intercommunication.

No auxiliary equipment, other than the key box is required. The key box is the regular No. 13 Kellogg key box with the addition of a No. 2-B choke coil, used to perform the holding function.

The key on this key box is a three position unit. In the normal position the circuit is arranged to answer Line 1. Operated in one direction the key switches the telephone to Line 2 and holds Line 1. Operated in the other direction the key switches the telephone to Line 2 for answering purposes.

BOXES, KEY—FOR KEY-BX SYSTEMS



18-M KEY BOX



19-M KEY BOX

THE Kellogg Key-BX key box is the basic component of the Kellogg Key-BX system, a trunk and line switching system designed to provide a maximum number of outside trunk facilities with a small number of inside intercommunicating circuits. For detailed information on the Key-BX system and associated equipment see Intercommunications Systems in this section.

The 18-M and 19-M Key-BX key boxes consist of two four-party keys, a No. 1000 type cam key, and either 10 or 20 push button keys for signalling purposes. This equipment is mounted on a strong framework with a wood base and provided with a metal cover, finished in black wrinkle enamel. A wood cover is available upon request.

Four different Key-BX key boxes are available wired for four different combinations of trunks, intercommunicating lines, and total stations.

The two basic sizes of this key box are 10 and 20 lines. The 10 line unit is standard.

This key box is designed for long life under heavy use and utilizes proved parts in its construction. The four party keys used for circuit switching are the same keys used by Kellogg in the manufacture of switchboards and have been proved strong, durable, and dependable over many years of service.

NO. 18-M KEY BOX

This key box is for use with the 6-2-10 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. Is housed in a metal cabinet.

NO. 19-M KEY BOX

This key box is for use with the 6-2-20 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 20 stations. Is housed in a metal cabinet.

NO. 20-M KEY BOX

This key box is for use with the 3-1-10 Key-BX system. It is wired for 3 trunks to a common battery manual or dial exchange,

1 intercommunication circuit, and 10 stations. Is housed in a metal cabinet.

NO. 22-M KEY BOX

This key box is for use with the 2-2-10 Key-BX system. It is wired for 2 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. Is housed in a metal cabinet.

NO. 25-M KEY BOX

This key box is for use with the 6-2-10 Key-BX system. It is wired for 6 trunks to a common battery manual or dial exchange, 2 intercommunication circuits, and 10 stations. This key box is equipped with "busy" lamps associated with each station and includes a relay and condenser for performing this function.

BOXES, KEY—FOR INTERCOMMUNICATION SYSTEMS



Code No.	Stations	Description
11	11	Without buzzer
11-B	11	With buzzer
23	23	Without buzzer
23-B	23	With buzzer

These key boxes are used as one of the components of intercommunication systems. For detailed information on these systems and associated equipment see Intercommunication Systems in this section.

Circuits of from 11 to 23 lines are possible with these key boxes. Complete flexibility is obtained with selective talking and ringing provided. The key box is compact and sturdily built of cast aluminum with a finish of black baked enamel.

A designation strip is positioned beside each button with a removable name or number card. A green button designates the ringing key, a red button indicates the home station, and all other buttons are black. Four mounting holes are provided in the base for mounting purposes. A pleasant toned buzzer is supplied with the No. 11-B and No. 23-B key boxes for signalling. The keys are all interlocked so that the operation of one key will release any other key previously depressed.

BRAID AND LEAD COVERED CABLE



Kellogg switchboard cable is manufactured from the best grades of selected raw materials by specially designed machinery and is furnished in several types and sizes. The copper conductors are either tinned or tinned and enameled, depending upon the type of cable. All conductors, except rubber covered conductors used on certain power cable, are insulated with two servings of cellulose acetate yarn followed by a cotton wrap or braid. The twisted pairs are formed into a cable, covered with several wraps of insulating paper, and impregnated with a special high grade moisture proofing wax compound. Available in round or flat types.

On braid covered cable the standard over-all covering is



braided cotton, saturated with a grey flameproof paint. For all types of cable the over-all covering is listed with other descriptive matter in the charts shown below.

A standard color code is used in Kellogg cable so each pair of conductors can be identified. With the code number of each cable is listed a reference to the color code for that cable. The color coding of any cable can thus be determined by referring to the color scheme charts.

Short lengths of cable will be shipped in boxes. Longer lengths will be shipped on suitable reels. When reels are furnished they will be charged for. Full credit will be allowed for their return, in good condition, prepaid to the Kellogg factory.

BRAID COVERED SWITCHBOARD CABLE

Round Type—No. 22 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

Code No.	Conductor Finish	Number		Diameter Inches	Color Scheme
		Twisted Pairs	Number Singles		
160-AX	Tinned Enameled	6	--	5/16	E-2
56-A	Tinned	7	--	5/16	W
114-AX	Tinned Enameled	11	--	23/64	A
65-A	Tinned	11	--	23/64	A
137-AX	Tinned Enameled	11	11	25/64	E
99-A	Tinned	11	11	25/64	E
107-AX	Tinned Enameled	21	--	15/32	D
42-A	Tinned	21	--	15/32	D
22-AX	Tinned Enameled	21	21	17/32	K
41-A	Tinned	21	21	17/32	K
161-AX	Tinned Enameled	31	--	17/32	K-2
112-A	Tinned	26	--	15/32	F
109-AX	Tinned Enameled	41	--	19/32	J
125-A	Tinned	41	--	19/32	J
29-AX	Tinned Enameled	51	--	5/8	L
63-A	Tinned	51	--	5/8	L
53-AX	Tinned Enameled	102	--	15/16	V
62-A	Tinned	102	--	53/64	V

Round Type—No. 19 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

Code No.	Conductor Finish	Twisted Pairs	No. Singles	Diameter Inches	Color Scheme
32-AX	Tinned Enameled	21	--	37/64	D
85-A	Tinned	21	--	35/64	D

Flat Type—No. 22 A.W.G.

Waxed core. Grey flameproof paint over outer braid.

49-AX	Tinned Enameled	21	--	3/8 x 33/64	D
64-A	Tinned	21	--	3/8 x 33/64	D
138-AX	Tinned Enameled	21	21	11/32 x 3/4	K
129-A	Tinned	21	21	11/32 x 3/4	K
140-AX	Tinned Enameled	21	21	5/16 x 1	K
135-A	Tinned	21	21	5/16 x 1	K
104-AX	Tinned Enameled	41	--	7/16 x 3/4	J
119-A	Tinned	41	--	7/16 x 3/4	J

Round Type—No. 22 A.W.G. Quadded Type

Grey flameproof paint over outer braid. Waxed core, tinned enameled conductors.

Code No.	No. Quads	Total No. Conductors	Diam. Inches	Color Scheme
407-AX	7	28	7/16	D-3

LEAD COVERED SWITCHBOARD CABLE

Round Type—No. 22 A.W.G.

Round type—waxed core. Tinned copper wire conductors. The construction of this cable is the same as the braid covered switchboard cable except that a lead sheath instead of a painted cotton braid covers the paper wrapping.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
148-L	13	--	15/32	B
144-L	16	--	31/64	C
121-L	21	--	33/64	D
147-L	26	--	19/32	F
146-L	51	--	3/4	L
145-L	102	--	1-1/16	V

INTERPHONE CABLE, LEAD COVERED

No. 22 A.W.G. Pairs, No. 18 A.W.G. Singles

Tinned copper wire conductors. The construction of this cable is the same as the braid covered interphone cable except that a lead sheath instead of a painted cotton braid covers the paper wrapping.

Code No.	No. 22 A.W.G. Twisted Pairs	No. 18 A.W.G. Singles	Diam. Inches	Color Scheme	Sheath Thickness Inches
163-L	8	4	13/32	C	3/64
167-L	26	4	1/2	L	3/64
168-L	32	4	17/32	L	3/64
171-L	50	4	5/8	L	1/16
174-L	100	4	3/4	V	1/16

INTERPHONE CABLE, BRAID COVERED

Round Type

No. 22 A.W.G. Pairs, No. 18 A.W.G. Singles

Grey flameproof paint over outer braid. Tinned copper wire conductors.

Code No.	No. 22 A.W.G. Twisted Pairs	No. 18 A.W.G. Singles	Diam. Inches	Color Scheme
163-A	8	4	5/16	C
167-A	26	4	13/32	L
171-A	50	4	1/2	L
174-A	100	4	5/8	V

POWER CABLE, LEAD COVERED

Ringing Equipment to Switchboard

Round type cable for leads from ringing equipment to switchboard. Made of No. 18 A.W.G. tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid. Cable made up of single conductors twisted into a cable followed by a lead sheath covering. This cable same as No. 59 and No. 105 except has lead sheath.

Code No.	No. Singles	Diam. Inches	Color Scheme
59-L	5	9/16	Y
105-L	7	19/32	M-2

POWER CABLE, NO BRAID

Ringing Circuits Through Key Cable

For carrying ringing circuits through key cable. Made of No. 22 A.W.G. tinned enameled conductors. Conductor insulation is two cellulose acetate yarn and one cotton wrap. Cable is made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
71-X	--	5	7/64	C-2
72-X	--	9	5/32	B-2
150-X	--	6	9/64	B-3

Ringing Equipment to Key Cable

For carrying power circuits from ringing equipment leads to key cable. Made of No. 20 A.W.G. tinned enameled conductors. Conductor insulation is two cellulose acetate yarn and one cotton wrap followed by a cotton braid. Cable made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
101-X	--	5	13/64	C-2
102-X	--	7	7/32	M-2
152-X	--	3	11/64	B-4

Ringing Equipment to Switchboard

For leads from ringing equipment to switchboard. Made of No. 18 A.W.G. tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid. Cable made up of single conductors twisted into a cable. No over-all braid on cable.

Code No.	No. Twisted Pairs	No. Singles	Diam. Inches	Color Scheme
59	--	5	27/64	Y
66	--	9	35/64	B-2
105	--	7	15/32	M-2

Power to Ringing Equipment

For leads from power boards to ringing equipment. Cable made of one No. 14 A.W.G. and 11 No. 18 A.W.G. single conductors twisted into a cable. No over-all braid on cable. Tinned copper wire conductors. Conductor insulation is rubber covering and cotton braid.

Code No.	No. Single Conductors	Diam. Inches	Color Scheme
122	12	9/16	O-2

CABLE COLOR SCHEME CHARTS

The color scheme charts listed below are for Kellogg switchboard, power, and interphone cable and all are based upon a standard color code. Because of this a table for a "Standard

Twenty" and "Standard Singles" may be used as a reference chart for determining the color scheme of any Kellogg cable.

STANDARD TWENTY

- | | |
|--|--------------------------|
| 1. Blue | 11. Orange-White |
| 2. Orange | 12. Orange-Green |
| 3. Green | 13. Orange-Black |
| 4. Black | 14. Orange-Slate |
| 5. Slate | 15. Green-White |
| 6. Blue-White | 16. Green-Black |
| 7. Blue-Orange | 17. Green-Slate |
| 8. Blue-Green | 18. Black-White |
| 9. Blue-Black | 19. Black-Slate |
| 10. Blue-Slate | 20. Slate-White |
| <i>Spare Pairs</i> | |
| 21. Blue-Orange-White and (White mate) | 22. Red and (White Mate) |

COLOR SCHEME "A"

One to 10 of "Standard Twenty" twisted with a white mate to form 10 twisted pairs. One spare pair No. 21.

COLOR SCHEME "B"

One to 12 of "Standard Twenty" twisted with a white mate to form 12 twisted pairs. One spare pair No. 21.

STANDARD SINGLES

- | | |
|--------------------|----------------------|
| 1. Blue-Red | 11. Orange-White-Red |
| 2. Orange-Red | 12. Orange-Green-Red |
| 3. Green-Red | 13. Orange-Black-Red |
| 4. Black-Red | 14. Orange-Slate-Red |
| 5. Slate-Red | 15. Green-White-Red |
| 6. Blue-White-Red | 16. Green-Black-Red |
| 7. Blue-Orange-Red | 17. Green-Slate-Red |
| 8. Blue-Green-Red | 18. Black-White-Red |
| 9. Blue-Black-Red | 19. Black-Slate-Red |
| 10. Blue-Slate-Red | 20. Slate-White-Red |

Spare Singles

21. Orange-Black-White

COLOR SCHEME "C"

One to 15 of "Standard Twenty" twisted with a white mate to form 15 twisted pairs. One spare pair No. 21.

COLOR SCHEME "D"

One to 20 of "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One spare pair No. 21.

CABLE COLOR SCHEME CHARTS (Cont'd)

COLOR SCHEME "E"

One to 10 of "Standard Twenty" twisted with a white mate to form 10 twisted pairs. One spare pair No. 21. One to 10 "Standard Singles" and one spare single No. 21.

COLOR SCHEME "F"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 5 of "Standard Single" twisted with a white mate to form the next 5 twisted pairs. Total 25 regular pairs. One spare pair No. 21.

COLOR SCHEME "J"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 20 of "Standard Singles" twisted with a red mate to form the second 20 pairs. Total 40 regular pairs. One spare pair No. 21.

COLOR SCHEME "K"

One to 20 of "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One spare pair No. 21. One to 20 of "Standard Singles" and one spare single No. 21.

COLOR SCHEME "L"

One to 20 of "Standard Twenty" twisted with a white mate to form the first 20 twisted pairs. One to 20 of "Standard Twenty" with a red mate to form the second 20 pairs. One to 10 of "Standard Twenty" twisted with a red-white mate to form the next 10 pairs. One spare pair No. 21.

COLOR SCHEME "V"

This scheme consists of 5 groups in each of which wires appear bearing the "Standard Twenty" colors. The five groups are distinguished by the color of the tip or mate wire. In the first, second, third, fourth, and fifth groups the mate wire is white, red, red-white, brown, and brown-white respectively forming the 100 twisted pairs. Two spare pairs Nos. 21 and 22.

COLOR SCHEME "W"

One to 7 of "Standard Twenty" twisted with a white mate to form 7 twisted pairs.

COLOR SCHEME "Y"

One to 5 of "Standard Twenty" (tracer colors).

COLOR SCHEME "B-2"

One to 9 of "Standard Twenty."

COLOR SCHEME "B-3"

One to 6 of "Standard Twenty."

COLOR SCHEME "B-4."

One to 3 of "Standard Twenty."

COLOR SCHEME "C-2"

One to 5 of "Standard Twenty."

COLOR SCHEME "D-3"

One to 7 of "Standard Twenty" with a white mate twisted with 1 to 7 of "Standard Singles" with a red mate to form 7 twisted quads.

COLOR SCHEME "E-2"

One to 5 of "Standard Twenty" twisted with a white mate to form 5 twisted pairs. One spare pair No. 21.

COLOR SCHEME "K-2"

One to 20 "Standard Twenty" twisted with a white mate to form 20 twisted pairs. One to 10 of "Standard Twenty" twisted with a red mate to form 10 twisted pairs. One spare pair No. 21.

COLOR SCHEME "M-2"

One to 7 of "Standard Twenty."

COLOR SCHEME "O-2"

One to 12 of "Standard Twenty."

CAPS, LAMP

Type No. 9



The Type 9 lamp cap fits 19/32-inch holes. The shank is 7/16-inch long and is nickel-plated. This cap generally is used for pilot and signal work.

Code No.	Color	Lens	Description
9	White Opalescent	Diamond	
9-A	Clear Red Glass	Diamond	Back of lens ground
9-B	Clear Green Glass	Diamond	Back of lens ground
9-C	Clear Glass	Diamond	
9-D	Clear Amber Glass	Diamond	Back of lens ground

Type No. 25



The No. 25 lamp cap fits 11/32-inch holes. The shanks are 5/16-inch long. These caps are used with No. 33 lamp jacks and other jacks with hard rubber face strips. The lens cap screws on and is provided with blank paper discs for numbering.

Code No.	Marking*	Color	Lens Shape	Material
25	A	White	Disc	Celluloid

*See marking diagrams on next page.

Type No. 46

The Type 46 lamp cap fits 11/32-inch holes and the shanks are 9/32-inch long. A lens protector can be screwed on the cap.

Code No.	Color	Lens Shape	Description
46	White Opalescent	Convex	Has mica disc under lens
47	Clear Red Glass	Convex	Back of lens ground

Types Nos. 74 and 75

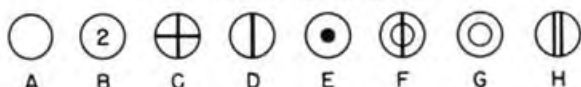


Types 74 and 75 lamp caps fit 13/16-inch holes. The shanks are 7/32-inch long and are nickel-plated. They fit Dean pilot jacks and also are used in signal work.

Code No.	Color	Lens	Description
74	White Opalescent	Diamond	
74-D	Clear Amber Glass	Diamond	Back of lens ground
75	Red Opalescent	Diamond	Back of lens ground
75-B	Clear Green Glass	Diamond	Back of lens ground

CAPS, LAMP (Cont'd)

Lamp Marking Diagrams



Type No. 79



The Type 79 lamp cap fits 5/16-inch holes and the shanks are 1/2-inch long. These caps are used with Type Nos. 35, 36, 41, and 60 lamp jacks.

Code No.	Marking	Color	Lens	Description
79	A	Wh. Opales.	Convex	
79-A	A	Cl. Red Glass	Convex	Back of lens ground
79-E	C	Wh. Opales.	Convex	
79-F	H	Wh. Opales.	Convex	
79-G	A	Cl. Grn. Glass	Convex	Back of lens ground
79-K	E	Cl. Grn. Glass	Convex	Marked with wh. enm., back of lens ground
79-L	D	Wh. Opales.	Convex		Marked with blk. enam.
79-M	D	Red Opales.	Convex	Marked with blk. enam.

Type No. 155



Type 155 lamp caps fit 7/16-inch holes. The shank is 11/32-inch long. These caps fit Automatic Electric lamp jacks No. G-30. The shank is finished in lacquered, oxidized copper.

Code No.	Color	Lens	Description
155	White Opalescent	Convex	
155-A	Clear Red Glass	Convex	Back of lens ground
155-B	Clear Green Glass	Convex	Back of lens ground
155-C	Clear Amber Glass	Diamond	Back of lens ground

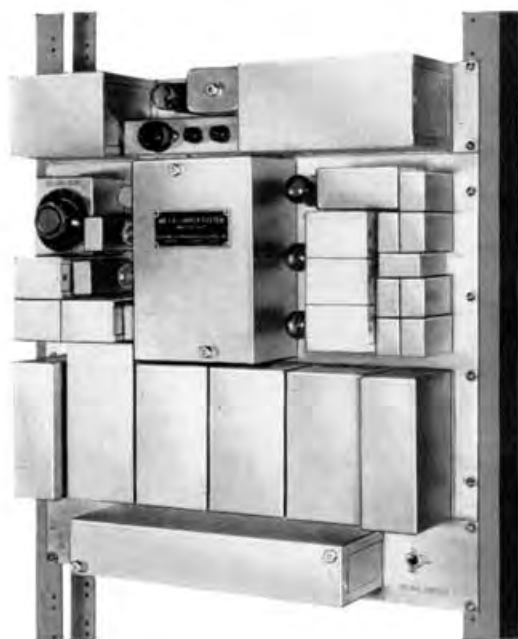
Type No. 154



The Type 154 lamp cap fits 11/32-inch holes. The lacquered brass shanks are 9/32-inch long. This cap is used with Nos. 25, 31, 32, 33, 34, 37, 43, and 44 types lamp jacks. Numbering desired must be specified when ordering No. 154-C caps.

Code No.	Marking	Color	Lens	Description
154	A	Wh. Opales.	Convex	Groove for extractor
154-A	A	Cl. Red Glass	Convex	Back of lens ground
154-B	A	Cl. Grn. Glass	Convex	Back of lens ground
154-C	B	Clear Glass	Semi-Convex	Arranged for number'g
154-D	C	Wh. Opales.			Convex	Marked with blk. enam.
154-G	A	Wh. Opales.	Flat	
154-H	D	Wh. Opales.	Convex	Marked with blk. enam.
154-J	E	Wh. Opales.	Convex	Marked with blk. enam.
154-K	F	Wh. Opales.	Convex	Marked with blk. enam.
154-L	G	Wh. Opales.	Convex	Marked with blk. enam.
154-M	H	Wh. Opales.	Convex	Marked with blk. enam.
154-N	A	Blue Opales.	Convex	
154-P	A	Cl. Red Glass	Convex	Back of lens ground, front sand blasted, shield over part of lens
154-Q	A	Cl. Grn. Glass	Convex		Same as 154-P
154-U	A	Cl. Red Glass	Semi-Convex	Back of lens ground
154-V	A	Cl. Grn. Glass			Semi-Convex	Back of lens ground
154-W	A	Cl. Grn. Glass	Convex	Back of lens ground, front sand blasted

CARRIER SYSTEMS



NO. 104 POWER SUPPLY UNIT

NO. 5A-E CARRIER UNIT

NO. 5-J SIGNAL UNIT

NO. 5A-J EAST CARRIER TERMINAL

THE Kellogg type No. 5 telephone carrier systems provide additional circuits over existing voice-frequency lines without any increase in outside plant facilities. Operation over these carrier circuits can be arranged on either a ringdown or dial basis with full supervision and without interference with existing circuits.

The type No. 5 carrier systems can be superimposed on a straight physical circuit, on either or both sides of a phantom group, or on the phantom circuit itself. In certain cases the carrier can be placed on rural subscriber loops to create additional loop facilities. It can be used on either copper or iron open-wire lines or non-loaded cable circuits.

While providing an excellent means of establishing an additional circuit in permanent installations, the flexibility and portability of this carrier equipment is such that it is ideally suited for meeting heavy seasonal traffic demands and for temporary or emergency uses.

The additional telephone circuits of any carrier system are created by lifting the voice frequency currents of each new circuit by a modulation process to frequency bands above the voice range, thus "carrying" them over the circuit without conflicting with the existing voice frequency currents. At the receiving end the carrier frequency currents are separated from the voice currents by filters and are then lowered by demodulation to recover the same voice frequency currents as were originally impressed on each new circuit.

CARRIER SYSTEMS (Cont'd)

CARRIER DESIGN

The carrier and sideband frequencies employed in the Type No. 5 Carrier System are as follows:

	DIRECTION OF TRANSMISSION	
	WEST-EAST	EAST-WEST
5A SYSTEM (1st CHANNEL)		
Carrier frequency	7150 cps	10725 cps
Sideband	4450-6850 cps	8025-10425 cps
5B SYSTEM (2nd CHANNEL)		
Carrier frequency	21450 cps	14300 cps
Sideband	18750-21150 cps	14600-17000 cps

In the Kellogg type No. 5 carrier systems each carrier frequency is an integral multiple of 3575 cycles per second. The frequencies were selected in this harmonic relation to cancel out any possible interference between bands and to provide for a simple check of the frequencies by beating one against the other by means of an oscilloscope. The equivalent voice frequency band in both channels is 300 to 2700 cycles per second.

Each carrier frequency is transmitted along with the single sideband listed above. This is in the manner of conventional radio broadcasting (except that both upper and lower sidebands are transmitted in radio).

The advantages of a carrier-transmitted system in telephony are (1) greater range of operation made possible by locating the bands farther apart; (2) the elimination of carrier synchronizing procedures since each sideband is demodulated by the same carrier that modulates it, preventing misalignment; (3) the simplicity of signaling over any distance—ringdown signalling is accomplished, for instance, merely by blocking the carrier; (4) the creation of a positive circuit-failure alarm method; (5) the ease of fault tracing and of line loss measurement without the use of an auxiliary oscillator; (6) the absence of terminal loop gain limitations; and (7) signalling method does not limit maximum range of operation.

Transmission Information

Both transmitting levels and receiving gains are adjustable at each end of the type No. 5 systems, receiving gain being selected by a variable attenuation pad with calibrated dial.

The type No. 5A carrier systems transmit at the level of 0 dbm (one milliwatt) or plus 10 dbm, as measured at the line terminals. The type No. 5B systems transmit at from 0 dbm to plus 15 dbm.

The over-all gain of the No. 5A carrier system (first channel) is 23 db in each direction. Therefore, it may be superimposed on a circuit having a line loss as great as 30 db measured at the highest frequency used, 10.7 kilocycles, in which case it will provide a talking circuit of 7 db net loss. The over-all gain of the No. 5B system (second channel) is 35 db in each direction. Thus when superimposed on a circuit having a line loss as great as 42 db measured at the highest frequency used, 21.4 kilocycles, it will also provide a talking circuit of 7 db net loss. The greater gain of the No. 5B system has been provided to offset the greater line losses at the higher frequencies in order that each system will have about the same distance capability.

The table shown in the next column gives the approximate maximum length of line over which either system will provide a standard circuit of 7 db net loss. These limits are not affected by the type of carrier signalling used.

Table 1

OPEN WIRE, PHYSICAL OR SIDE CIRCUIT

	No. 5A System Miles	No. 5B System Miles
104 mil HD copper	220	206
80 mil HD copper	160	150
104 mil copper steel, 40%	125	156
80 mil copper steel, 40%	88	115
109 mil galvanized iron, No. 12 BWG	23	22
83 mil galvanized iron, No. 14 BWG	19	18
109 mil galvanized steel, No. 12 BWG	21	20

The above figures are computed on the basis of lines with 12-inch pin spacing, DP insulators, wet weather, no large impedance discontinuities, line in good condition, and with allowance for entrance cable loss of not more than 3 db for the No. 5A or 5 db for the No. 5B system.

CABLE, PHYSICAL OR SIDE CIRCUIT

	No. 5A System Miles	No. 5B System Miles
16 ga. toll, .062 mf, carrier loaded	55	52
16 ga. toll, .062 mf, non-loaded	20	24
19 ga. toll, .062 mf, carrier loaded	35	38
19 ga. toll, .062 mf, non-loaded	11	13
19 ga. exchange, .08 mf, non-loaded	9	11
22 ga. exchange, .08 mf, non-loaded	5.4	6

The maximum range of operation for either channel is not limited in any way by terminal loop gain considerations. Excessive sidetone or actual oscillations within a carrier terminal at the higher gains are eliminated in this system by blocking the transmitted carrier frequency in the receiving section filter. Also the signalling systems in no way limit the maximum range of operation. In fact, all No. 5 carrier systems are designed to transmit signals reliably over circuits which exceed the maximum talking range of the carrier system by 5 db.

TYPES OF CARRIER SYSTEMS

Kellogg carrier equipment is designed for use in three standard circuit combinations. In addition, provisions can be made for operation over special circuits in accordance with the demands of particular applications.

Standard types of carrier systems are described below:

No. 5A-J or No. 5B-J Carrier System

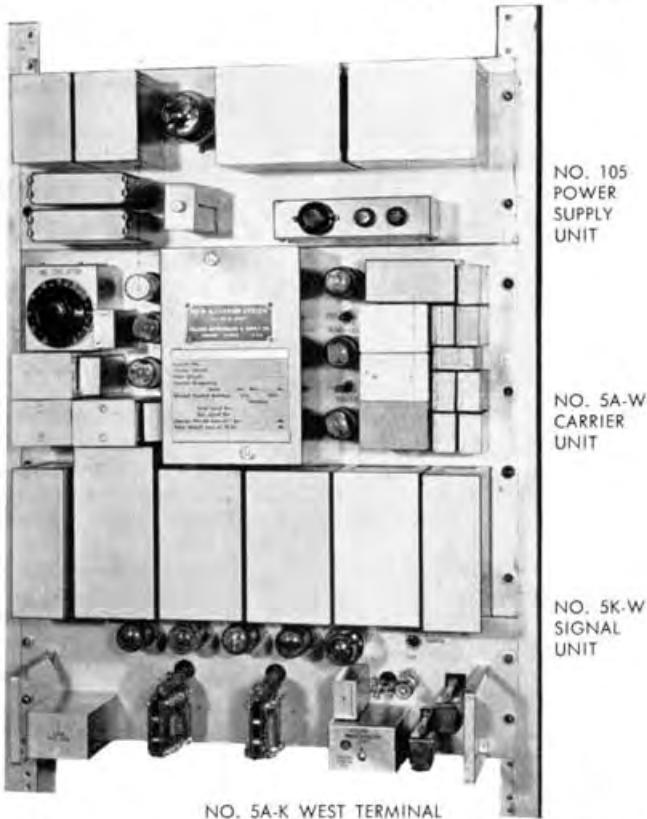
The No. 5A-J or 5B-J carrier system provides an additional ringdown trunk in which ringdown signalling is accomplished over the carrier channel. The signalling function is performed by interrupting the carrier frequency. This releases a relay in a circuit tuned to the incoming carrier frequency at the distant end and applies the local ringing supply to the carrier circuit drop. A source of ringing supply must be available at each carrier terminal. The No. 5A-J and No. 5B-J carrier systems also can be used to provide an additional circuit for magneto, code ring and multi-party rural service.

No. 5A-K or No. 5B-K Carrier System

The No. 5A-K or 5B-K carrier system provides an additional toll circuit in which composite type dial and supervisory signals are transmitted over the carrier channel. The terminals of both systems are designed for direct connection to composite dial trunks which bring out either the T, R, A, B, E, and M leads or the T, R, E, and M leads, thus eliminating the need for trunk adapter or applique circuits.

In these systems dial and supervisory signals are electronically transmitted over the carrier channel by the application of a frequency shift or FM (frequency modulation) process in much

CARRIER SYSTEMS (Cont'd)



NO. 5A-K WEST TERMINAL

the same manner as intelligence is transmitted in the FM broadcast radio systems. Since the voice transmission over the carrier channel is accomplished by AM (amplitude modulation) and the signalling by FM, it is possible to talk and signal simultaneously and independently. Also, since the signalling system is a full duplex system, it is possible to signal in both directions at the same time.

Incorporated in the 5K-() and 5L-() signal units is an auxiliary control circuit in which the absence of incoming frequency causes a relay to operate. The contacts of this relay can be used to actuate a carrier failure alarm signal.

An existing 5A-J carrier system (ringdown) can be converted to a 5A-K carrier system (carrier dialing) in a matter of minutes by simply substituting a 5K-E and a 5K-W signal unit for the two 5-J signal units.

A similar conversion of a 5B-J system can be made by substituting the 5L-E and 5L-W signal units for the two 5-J signal units.

In the 5A-K system, as in the 5A-J system, all signalling information is transmitted within the carrier frequency band allocated to the first channel, thus leaving the remainder of the frequency spectrum available for other carrier channels. Like operation is found in the second channel systems. This system of carrier dialing fulfills all the requirements of the nationwide toll dialing program.

No. 5A-CX or No. 5B-CX Carrier System

This system provides only the talking circuits. Signalling is accomplished independently of the carrier over any metallic circuit, such as a composite or simplex leg.

COMPONENTS OF KELLOGG CARRIER SYSTEMS

Each Type No. 5 carrier system consists of an east terminal and a west terminal. Each terminal consists of a carrier unit, a power supply unit, and a signal unit when required.

Shown in the chart following is all the equipment required for each terminal in the standard Kellogg carrier systems listed:

System		Component	East Terminal		West Terminal	
First Channel	Second Channel		First Channel	Second Channel	First Channel	Second Channel
5A-CX	5B-CX	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
		Signal Unit	5J	5J	5J	5J
5A-J	5B-J	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
		Signal Unit	5J	5J	5J	5J
5A-K	5B-K	Carrier Unit	5A-E	5B-E	5A-W	5B-W
		Power Supply Unit	104 or 105	105	104 or 105	105
		Signal Unit	5K-E	5L-E	5K-W	5L-W

Power Supply Units. A power supply unit is required to supply the 200 v. DC plate voltage and 6.3 v. 60-cycle, AC heater voltage for the electronic circuits in the carrier and signal units. It operates from a standard 105-125 v., 50-60 cycle, AC commercial power source. Both the No. 104 and 105 units employ a full wave rectifier and choke input circuit. They are equipped with a tap switch to compensate for a wide range of line voltages and loads. Each unit is fully fused and also contains a power failure relay having a set of contacts which may be connected to operate an external alarm device in the event of line failure or defect in the power supply unit, such as a faulty rectifier tube.

The AC ripple component of the plate voltage is less than 0.1% at full rated load.

POWER UNIT CAPACITIES

NO. 104 UNIT	NO. 105 UNIT
2 5A-CX or 1 5B-CX terminals	4 5A-CX or 3 5B-CX terminals
2 5A-J or 1 5B-J terminals	4 5A-J or 3 5B-J terminals
1 5A-K terminal	2 5A-K or 2 5B-K terminals

Accessory Equipment for Carrier Systems

NO. 28-A REPEATING COIL

The No. 28-A repeating coil is a specially designed wide frequency range transformer which will pass all frequencies from 15 to 40,000 cps. The line side of the repeating coil is a center-tapped, balanced winding that can be used to derive a simplex or phantom leg from a wire circuit over which a carrier system is operating.

CARRIER BY-PASS UNIT

A carrier by-pass unit must be employed to separate voice frequency currents from carrier currents where it is necessary to transfer a carrier circuit from one wire circuit to another wire circuit. This unit consists of two low pass line filters and a high pass filter. The low pass filters have a cut-off frequency of 3,000 cps, and the high pass filter passes only those frequencies above 4,000 cps.

With the by-pass unit, voice frequency and signalling currents can be passed through the low pass filter to an intermediate switchboard while the carrier currents are by-passed around the switchboard. The use of the carrier by-pass unit makes it possible to operate carrier circuits between two locations not connected by direct wire circuits.

BRIDGED STATION FILTER

When telephone stations are bridged on the main wire line over which a carrier system is operating it is necessary to use bridged station filters to keep carrier currents out of the bridged station and to prevent attenuation of the carrier currents in the main line. These filters may be installed on the station side of the station protection or pole mounted. When pole mounted, protection is required on both sides of the filter.

BRANCH LINE FILTER

When a branch or spur line, which serves a switchboard or many subscribers, is connected to a main line over which a carrier system is operating it is necessary to install a branch line filter to keep carrier currents out of the branch line and to prevent attenuation of carrier currents by the branch line. The filter is inserted in the main line and, in most applications, is pole mounted. Protection is required on both sides of the main line as well as on the branch line side.

CARRIER SYSTEMS (Cont'd)

EQUIPMENT RACKS

Kellogg Type No. 5 carrier equipment mounts on any standard 19-inch equipment rack with 18³/₈-inch mounting centers. Self-supporting racks are available as shown below.

Order No.	Description	Height	Width	Vertical Mfg. Space
Item 1, Drg. 42104	Standard 19" Rack with Writing Shelf	6' 6"	20 1/2"	6' 0"
Item 2, Drg. 42104	Standard 19" Rack less Writing Shelf	6' 6"	20 1/2"	6' 0"
Item 3, Drg. 42104	Writing Shelf Only	**	**	**
Drg. 42104 Special	Special 19" Rack, less Writing Shelf	*	20 1/2"	**
Drg. 46813	Small, lightweight, 19" Rack	2' 3"	19 3/4"	2' 1"

*As specified in order.

**Mounting space (vertical) is 6 inches less than specification for height.

NOTE: If it is desired to mount the carrier equipment in cabinets, specify the type and side of cabinet desired.

APPLICATION AND ORDERING INFORMATION

In planning a carrier system, the selection of the proper items of equipment and the determination of expected performance under a given set of circumstances can best be made by Kellogg.

In order to serve the customer most efficiently, the manufacturer of the carrier equipment must have accurate information relative to:

- A. Type of service desired.
- B. Characteristics of the wire lines over which the carrier system is to operate, including any apparatus connected to these lines.
- C. Availability of trunk equipment to connect the new carrier circuit to the switchboard.
- D. Availability of 19" racks or cabinets to mount the equipment.

To insure correctly engineered carrier systems, and prompt delivery of the proper equipment, the following information must accompany all orders or quotation inquiries.

A. TYPE OF SERVICE DESIRED

Which of the following types of service is the carrier system to render?

1. Ringdown Trunk.
2. Dial trunk with signalling accomplished over an available CX or SX leg.
3. Dial trunk with signalling accomplished over the carrier channel.
4. Rural line. State type of ringing to be used.
5. Special service such as control of remote radio transmitter, telemetering, etc.

B. CHARACTERISTICS AND DATA ON WIRE LINE FACILITIES

This information can be conveyed most easily by means of a sketch which shows the following data:

1. The names of the exchanges which terminate the circuits, and any intermediate locations of equipment or apparatus. Also indicate which is the east (or north) and west (or south) end of the circuit.
2. The number of pairs of conductors available between each location, and whether these conductors are arranged as physical circuits or as phantom groups.
3. Details of open wire in the circuits.
 - a. Length of open wire, and location in circuit.
 - b. Gauge and type of conductors.
Examples: 104 Copper; #10 AWG Copper-steel, 40% conductivity; #12 BB iron, etc.
 - c. Pin spacing and type of insulators, if known.
 - d. Transposition scheme of open wire lead.
 - e. Indicate exposure to power lines and voltage of power line.
4. Details of cable in the circuits.
 - a. Length and location in wire circuit.
 - b. Gauge of conductors.

- c. Distributed capacitance per mile.
- d. State whether the conductors are quadded or paired.
- e. Are the cable conductors loaded or non-loaded? If loaded, give the loading scheme.

Examples of properly described cable runs:

- 3,150 ft., 19 ga., Quadded, .062 mf Cable, Non-loaded;
- 10,500 ft., 16 ga. Non-Quadded, .062 mf cable, loaded H-88;
- 830 ft., 22 ga., Non-Quadded, .082 mf cable, Non-loaded.

5. Indicate the location, manufacturer's name, and type number of line equipment such as repeating coils, insulating transformers, and composite equipment.
6. Show the location of any telephones, switchboards or lines, bridged on the main circuit.
7. Indicate the presence of any existing carrier systems. Give manufacturer's name, type number, and carrier frequency allocations. Show the location of the east and west carrier terminals, and carrier repeaters, and the position of the system on the open wire lead by pin numbers.
8. Indicate location of any existing voice frequency telephone repeaters. Include the manufacturer's name and type number.
9. Indicate the presence of any telegraph, teletype, or facsimile equipment operating over the circuits involved.

C. TRUNK CIRCUIT REQUIREMENTS

1. In providing a new ringdown circuit for toll or rural service, the terminals of a No. 5A-J or No. 5B-J Carrier System connect directly to any ringdown type line or trunk circuit.
2. When a new dial trunk is created by the application of a No. 5A-CX or No. 5B-CX Carrier System, the carrier equipment provides only the new talking circuit. Signalling must be accomplished over an available composite or simplex leg. If no spare composite or simplex dial trunks are available, they should be ordered from the manufacturer of the switchboard.
3. In the case of a new dial trunk where it is necessary to transmit the signal impulses over the carrier channel, the No. 5A-K and No. 5B-K Systems are used. The terminals of these systems are connected directly to any composite or simplex type dial trunks which bring out either the T, R, A, B, E, and M, or the T, R, E, and M leads, without the use of trunk adapter or applique circuits. When in doubt as to whether or not a 5J-K System will work directly with an existing trunk circuit, a copy of the circuit drawing should be forwarded with the order or inquiry for carrier equipment.
4. For special carrier systems, complete information relative to the type of service desired, and the functions to be performed will be required.

D. MOUNTING RACKS FOR CARRIER EQUIPMENT

To avoid delays in delivery and installation of the carrier equipment, all orders and quotation inquiries should include a positive statement as to whether or not 19" equipment racks should be included in the order. If the customer desires non-standard height racks, it is necessary that the desired height be specified on the order.

Coils, No. 2 Heat



These coils are designed for use with the No. 16 Kellogg arrester. Coil will operate on .5 ampere in less than 210 seconds and will carry .35 ampere for 10 minutes at 68°F. Resistance varies between 3.8 and 4 ohms.

COILS, INDUCTION

Kellogg induction coils are manufactured in two major types, switchboard and telephone coils. These two groups are further divided into "anti-side tone" and "booster" types. In the listings below these groupings are indicated. In telephone coils notation is made of the application of each coil, either for local or common battery operation.

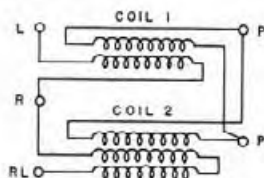
Careful craftsmanship and high-quality materials are used

throughout in the manufacture of Kellogg induction coils. Windings are of enameled wire, separated where required with an interleaving layer of paper. The coil is finished with a cotton serving and the entire coil impregnated with varnish under the vacuum method. This impregnation guards the coils against moisture and corrosion and will protect it in tropical areas against fungus and other damage.

SWITCHBOARD TYPE

Anti-Side Tone Type

NO. 72-A



An anti-side tone coil made up of two separate coils with the primary of the two coils connected in parallel.

Code No.	Winding Resistance (ohms)		Dimensions (Inches)		
	Primary	Secondary	Height	Width	Length
72-A	(1) 12.6 (2) 12.6	(1) 74.6 (2) 430	1 3/4	2 1/2	6

Booster Type

NO. 32-B



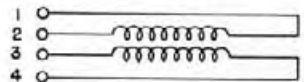
This coil is for use with an operator's circuit having a retardation type busy test. Booster type. It has four windings, the two secondaries wound in parallel forming a split secondary.

Code No.	Winding Resistance (ohms)			Dimensions (Inches)		
	Primary	Secondary	Tertiary	Height	Width	Length
32-B	30	(1) 141 (2) 141	474	1 7/8	2	6

NO. 32-E

Same as No. 32-B except winding resistances are: primary, 4 ohms; first secondary, 35 ohms; second secondary, 35 ohms, and tertiary, 400 ohms.

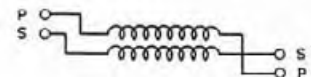
NO. 35-A



A booster type coil combined with an adjustable interrupter to change D.C. to high frequency pulsating D.C. for operation of the Kellogg No. 2 Howler.

Code No.	Winding Resistance (ohms)		Height	Dimensions (Inches)		Length
	Primary	Secondary		Width	Length	
35-A	1.5	51.5	3 1/2	2	4 3/4	

NO. 81-A

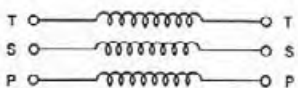


The second and third windings of this booster type coil are wound and connected in parallel. Used with battery feed coils where operators' sets on magneto boards are supplied from 24 volt battery.

Code No.	Coil Resistance (ohms)		Height	Dimensions (Inches)		Length
	Primary	Secondary		Width	Length	
81-A	4	37.5	1	1	4 1/4	

Booster Type

NO. 7-A



The No. 7-A induction coil is a booster type for use in common battery switchboards where a third or tertiary winding is designed for monitoring in connection with an operator's circuit having a relay-type busy test. It is not anti-side tone.

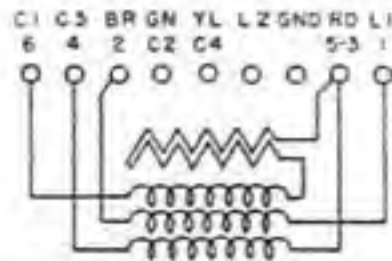
Code No.	Winding Resistance (ohms)			Height	Dimensions (Inches)		Length
	Primary	Secondary	Tertiary		Width	Length	
7-A	62	84	463	2-1/16	2-1/16	6	

COILS, INDUCTION (Cont'd)

TELEPHONE TYPE

Anti-Side Tone Type

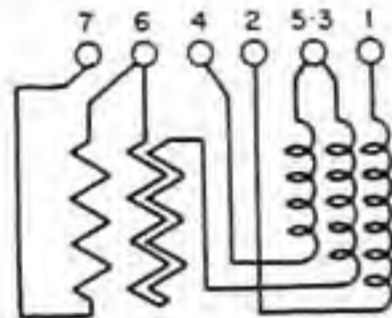
NO. 103-A



Anti-side tone type, three winding coils with 9-point connecting rack. Used in Nos. 817 and 9817 telephones and in No. 610 desk set boxes wired with the Kellogg Triad circuit.

Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
103-A	37.6	16.7	115	1 1/4	1 1/2	4 1/4

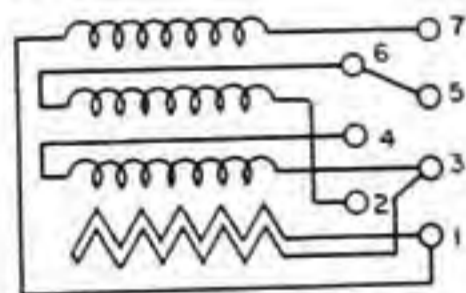
NO. 106-A



Anti-side tone type, four winding coil. Standard for Nos. 925, 9900, and 9917 common battery telephones and the No. 700 desk set boxes. For greater side tone reduction tertiary windings are connected in series.

Code No.	Winding Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
106-A	13	14	138 (1) 62 (2)	2 1/4	1	3

NO. 113-A



Anti-side tone type induction coil for use on the 1000 series Kellogg Masterphone. Plug-in type. Used for common battery signalling and talking. See illustration above.

Code No.	Primary	Coil Resistance (ohms)		Tertiary
		Secondary	Length	
113-A	15	16	(1) 273 (200) 100	

Booster Type

NO. 51-A

For common battery use in the base of desk stand for F-97 telephone. For booster circuit.

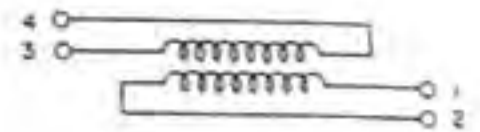


Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
51-A	33	17.5	1 7/8	1	4 1/2	

Booster Type (Cont'd)

NO. 79-A

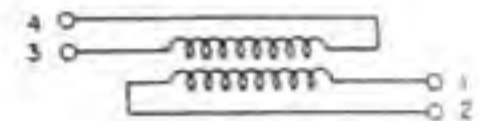
The 79-A coil is used in the booster circuit for Nos. 801 and 803 telephones and the No. 600 desk set boxes.



Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
79-A	33	17.5	1	1 3/8	4 1/2	

NO. 99-A

This coil is similar to the No. 79-A, a two winding, local battery induction coil, but is equipped with a 7-point connecting rack. It is used in Nos. 805 and 807 wall telephones and the No. 602 desk set boxes.



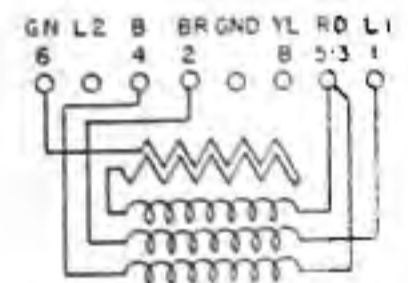
Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
99-A	25	7.8	1 1/4	1 1/2	4 1/2	

LOCAL BATTERY TELEPHONE TYPE

Anti-Side Tone Type

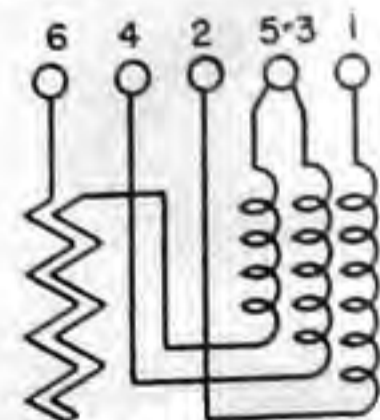
NO. 105-A

A winding local battery induction coil for use the Kellogg Triad anti-side tone circuit, equipped with 8-point connecting rack. Used in the Kellogg 4800 series wall telephones and the 5800 series magneto wall Masterphones. Similar to the No. 100-A, listed above.



Code No.	Coil Resistance (ohms)			Height	Dimensions (inches)		Length
	1	2	3		Width	Length	
105-A	1.38	10.3	610	1 1/4	1 1/2	4 1/2	

NO. 109-A



A 3-winding local battery coil with closed core. Has 5-point connecting rack. Used with Nos. 950-LR, 930-LR, and 9387 Kellogg Masterphones.

Code No.	Coil Resistance (ohms)			Height	Dimensions (inches)		Length
	1	2	3		Width	Length	
109-A	1.5	8.7	600	2 1/4	1	3	

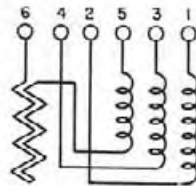
COILS, INDUCTION (Cont'd)

LOCAL BATTERY TELEPHONE TYPE

Anti-Side Tone Type (Cont'd)

NO. 111-A

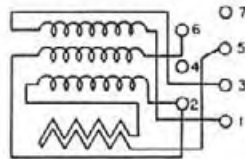
A three winding, closed core, local battery coil with separate primary and secondary circuits. For use with the Nos. 951-LR and 5844-M telephones with 4-conductor handsets. Same as No. 109-A except coils 2 and 3 are separate.



Code No.	Coil Resistance (ohms)			Dimensions (inches)		
	1	2	3	Height	Width	Length
111-A	1.5	8.7	600	2 1/4	1	3

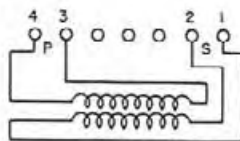
NO. 114-A

Local battery coil for use with the 1000 series Kellogg Master-phones. Used for local battery signalling—local battery talking or for common battery signalling—local battery talking. Plug-in type. Same in appearance as No. 113-A shown on page 16.



Code No.	Coil Resistance (ohms)		3
	1	2	
114-A	0.94	9.0	900

Booster Type

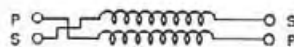


NO. 100-A

Consists of a 2-winding induction coil and 7-point connecting rack for line and cord terminals. Used as replacement for old-style Kellogg No. 3800-M series magneto wall telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
100-A	1.3	11.1	1 1/8	1-3/16	4 1/4	

NO. 108-A



Used with F-2300 series desk set boxes and with F-2731, 3000, 3001, F-2870, F-1983, and F-2921 telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
108-A	1.3	11.1	1 1/4	1	4 1/4	

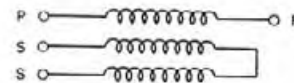
Booster Type (Cont'd)

NO. F-108-A

Same as No. 108-A except has No. 65 binding posts.

SPECIAL RAILWAY AND DISPATCHING TYPE

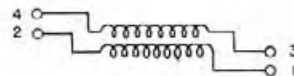
NO. 66-A



Combined interrupter and induction coil for use with railroad and telegraph telephone sets. Booster type. Used with Nos. F-2869 and 3002 telephones.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
66-A	1.6	22	2	1	3	

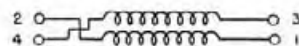
NO. 97-A



Used with the No. 98-A induction coil as a set for high impedance dispatching telephones No. F-2945 and railroad dispatching desk set boxes Nos. F-2413 and F-2414. Booster type.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
97-A	15.5	240	1 5/8	1 1/2	4 3/4	

NO. 98-A



Used with No. 97-A induction coil as a set railroad dispatching telephones and desk set boxes. Booster type. See No. 97-A above.

Code No.	Coil Resistance (ohms)		Height	Dimensions (inches)		Length
	Primary	Secondary		Width	Length	
98-A	0.3	12	1 5/8	1 3/8	4 1/4	

COILS, RELAY



Most Kellogg relay coils are wound on standard forms and each will fit the standard relay coil mountings. All 2000 series manual switchboard, 1700, 1800, and 3000 series Relaymatic, 71-7400 gang type Relaymatic, and 2100 pilot relays are manufactured on this standard form. Because of special applications, the A.C. relays, 2061 trip type relays, and the 2100 micrometer adjustment relays require special types of coils which do not mount on standard cores and mountings.

Relay coils in most general use are manufactured by the stick-winding process. Each coil is cellulose acetate filled and each layer

of winding is separated by a sheet of cellulose acetate. After winding each coil is coalesced and spool heads, of phenol fibre with a cellulose acetate facing, are firmly cemented to the coil. This type of manufacture makes the coil resistant to moisture and fungus damage and requires no impregnation.

In the listings below relay coils are separated in four types—single winding, code numbers for which are prefixed by the letter "S"; concentric winding, code number prefixed by letter "C"; tandem winding, code number prefixed by "T", and parallel winding, code number prefixed by "P". Unless otherwise specified nickel silver windings are non-inductively wound.

Special purpose coils with copper slugs on the armature end of the coil to provide a slow operate relay or with a copper sleeve over the core to provide a slow release relay are available and listed under separate headings with the respective type of coil. Special requirements for coils should be discussed with the sales division of the Kellogg Switchboard and Supply Company. Standard coils should be ordered by code number.

CONCENTRIC WOUND COILS

1/4-Inch Core

FOR GENERAL USE

First resistance value given in listing below is that for the inside winding.

Code No.	Resistance (ohms)
C-EZ	31—750
C-EP	100—12000
C-DF	875—200 Nickel Silver
C-DR	875—450 Nickel Silver

3/8-Inch Core

FOR GENERAL USE

First resistance value given in listings below is that for the inside winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
C-FC	65—20 Nic. Sil.	C-BD	775—250
C-CC*	150—750 Nic. Sil.	C-FP	1000—20 Nic. Sil.
C-AM	300—300 Nic. Sil.	C-EA	775—250
C-DU	300—1200	C-BE	1000—20 Nic. Sil.
C-DG	300—1700	C-EQ	1000—100 Nic. Sil.
C-FW	400—1000 Nic. Sil.	C-AJ	1000—500 Nic. Sil.
C-AW	500—20 Nic. Sil.	C-P†	1000—1000 Nic. Sil.
C-CR	500—200 Nic. Sil.	C-DP	1000—1000 Nic. Sil.
C-FR	500—2500 Nic. Sil.	C-EY‡	850 to 1100—850 to 1000 N.S.
C-AE	500—300 Nic. Sil.	C-FQ	1300—2000 Nic. Sil.
C-AB	500—500 Nic. Sil.		
C-B	500—3000 Nic. Sil.		

*Inductive.

†First winding is 525 ohms copper in series with 475 ohms nickel silver, inductive.

‡Effective resistance is 1700-2000 ohms when connected in series.

FOR "SLOW RELEASE" RELAYS

These coils are provided with a 1/16-inch copper sleeve over the 3/8-inch magnetic iron core for use with slow release relays. First resistance value given below is that for the inside winding. Windings are of nickel silver wire.

Code No.	Resistance (ohms)
C-Z	500—500
C-DX	500—1000
C-BZ	1000—500

CONCENTRIC WOUND COILS (Cont'd)

3/8-Inch Core (Cont'd)

FOR "SLOW OPERATE" RELAYS

This coil has a 3/8-inch diameter core and a 3/4-inch copper slug on the armature end to provide a slow operate relay. First resistance given is that of the inside winding.

Code No.	Resistance (ohms)
C-CY	125—130

PARALLEL WOUND COILS

3/8-Inch Core

FOR GENERAL USE

Code No.	Resistance
P-J	50—50
P-C	100—100
P-L*	2000—2000

*Each winding of this coil is made up of a 1230 ohm copper winding connected in series with 770 ohms nickel silver, inductive, winding for 2000 ohm total.

SINGLE WOUND COILS

1/4-Inch Core

FOR GENERAL USE

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-EQ	1.5	S-ET	140
S-HG*	3.5	S-JQ*	210
S-EB	4.5	S-FA	1175
S-EA	7.47	S-GD	2000
S-JC†	11.8	S-EP	3800
S-JG	35	S-EK	7250
S-HY*	100	S-FV	14500

*Nickel Iron core.

†16 ohm copper winding in multiple with 45 ohm nickel silver wire.

3/8-Inch Core

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-E	20	S-L	100
S-BR	25	S-N	150
S-F	30	S-P	200
S-G	40	S-EW	*(1) 50
S-H	50		†(2) 150
S-J	65	S-FP	200

*Coils in series, eff. resis. 200 ohms.

†Nickel Silver (inductive).

COILS, RELAY (Cont'd)

SINGLE WOUND COILS (Cont'd)

3/8-Inch Core (Cont'd)

FOR GENERAL USE

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-GO	(1) 350† (2) 500||	S-GG	(1) 1000§ (2) 1000||	S-GX	(1) 2000** (2) 2000
S-R*	300	S-DG	800	S-BK	1300
S-DY	(1) 550† (2) 660||	S-FG*	800	S-X	1500
S-U	390	S-FY*	1000	S-Y	2000
S-V	500	S-W*	1000	S-Z	3000
		S-AH*	(1) 450* (2) 550	S-BG	4000

† Coils in multiple, eff. resistance 205 ohms.

‡ Coils in multiple, eff. resistance 300 ohms.

§ Coils in multiple, eff. resistance 500 ohms.

* Coils in series, eff. resistance 1000 ohms.

** Coils in multiple, eff. resistance 1000 ohms.

¶ Nickel Silver.

|| Nickel Silver, Inductive.

FOR A.C. RELAYS

Code No.	Resistance (ohms)	Description
S-BZ	500	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-BX	1000	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-BY	1600	For Nos. 2017, 2018, 2052, 2057, and 2085 A.C. Relays.
S-JD	2000	Laminated core for 2103—2203 type relays.

FOR "SLOW RELEASE" RELAYS

Coils listed at left have a 3/8-inch diameter iron core with 1/16-inch thick copper sleeve. Over-all diameter is 1/2 inch. Coils at right, 3/8-inch diameter core with 1/8-inch copper sleeve. Over-all diameter is 5/8-inch.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-AJ	50	S-AQ	1000
S-AK	100	S-BM	500
S-AN	300	S-BU	1000
S-BE	400	S-DD	(1) 300* (2) 300**
S-AP	500		

* Coils in multiple, eff. resis. 150 ohms.

** Nickel Silver.

FOR "SLOW OPERATE" RELAYS

These coils have 3/8-in. diameter core. Each has a 3/4-in. copper slug on armature end.

Code No.	Resistance (ohms)
S-FN	43
S-GA	800
S-DS	1300

FOR TRIP RELAYS

For use with Nos. 2061, 2062, 2083, 2086, and 2098 trip relays only.

Code No.	Resistance (ohms)
S-GN	100
S-FS	500
S-FU	1000

FOR RINGING TONE RELAYS (WITH CONDENSER)

Code No.	Resistance (ohms)	Description
S-GB	100	Nickel Silver, with .20-.29 mfd. winding.
S-FC	540	With .01 mfd. condenser winding.
S-GT	10000	Nickel Silver, with .01 mfd. condenser winding.

RESISTANCE COILS

Wound on standard relay coil spools. Nickel silver wire insulated with enamel and one layer of silk. The coils are non-inductively wound and are all on 3/8-inch cores.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
S-DJ	50	S-CP	600
S-CE	100	S-CS	750
S-GJ	150	S-FQ	800
S-CT	200	S-CD	1000
S-CQ	250	S-CJ	2000
S-CC	300	S-CG	2500
S-CV	400	S-CH	10000
S-CB	500		

TANDEM WOUND COILS

1/4-Inch Core

FOR GENERAL USE

First resistance listed below is that for the terminal winding. Second is for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BL	35—35	T-CY*	100—100
T-BK	46—46	T-BY	125—125
T-CW	48—641	T-BX	490—48

* Nickel Iron core.

3/8-Inch Core

FOR GENERAL USE

First resistance value listed below is that for the terminal winding. Second is that for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-AE	25—25	T-AY	300—100
T-J	50—50	T-M	300—300
T-Z	75—75	T-E	500—100
T-C	100—100	T-H	500—250
T-AH	100—300	T-F	500—500
T-U	150—150	T-CO	750—750
T-G	200—200	T-Y	1000—1000
T-K	250—250	T-CD	1500—1500

FOR "SLOW RELEASE" RELAYS

These coils are wound on a 3/8-inch magnetic iron core with a 1/16-inch thick copper sleeve. Over-all diameter of sleeve is 1/2 inch. First resistance value given in listings below is for the terminal winding, second is that for the armature winding.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BS	50—50	T-AB	1000—500
T-B	500—500	T-CG	1000—1000

RESISTANCE COILS

These coils are wound on standard relay coil spools with nickel silver wire insulated with enamel and one layer of silk. The coils are non-inductively wound and are all on 3/8-inch cores.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
T-BM	20—20	T-AF	400—400
T-AV	50—50	T-CX	1000—1000
T-AS	70—70	T-BU	1500—1500
T-AT	200—200	T-CN	2000—2000
T-CZ	300—300		

COILS, REPEATING

Kellogg repeating coils are classified here in three major groups, cord circuit, line, and miscellaneous types. Each of these coils is either of the "talk and ring through" or "talk through only" types. The "talk through only" type has a low impedance and passes only

the high frequencies. The "talk and ring through" type has a high impedance and passes both low and high frequencies. All "line" type repeating coils are of the "talk and ring through" type.

Cord Circuit Type



NO. 20-A

A concentric-wound coil for "talk through only" circuits. Mounts on standard relay mountings in cross-talk proof shell.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
20-A	12.1	13.7	15.2	16.6

NO. 19-A

This is a concentric-wound coil of the "ring and talk through" type. Mounts on standard 1000-type repeating coil mountings. Has cross-talk proof shell.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
19-A	15.3	17.1	18.8	20.9

Line Type

As indicated above, all line type repeating coils are of the "ring and talk through" type.

NO. 17-F

This coil is for use with phantom circuits employing ground return only. Has two parallel and two tandem windings.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
17-F	21.5	21.5	29.5	29.5

NO. 18-A



Balanced coil for use with split phantom circuits. Consists of two parallel windings connected to two parallel windings.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
18-A	5.7	5.7	7.5	7.5

NO. 18-B

For use with phantom circuits using a ground return. Consists of two pairs of parallel windings.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
18-B	5.7	5.7	7.5	7.5

NO. 21-A

Phantom circuit type coil consisting of two pairs of parallel windings. Same as No. 24-A coil less base.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
21-A	20.6	20.6	25.5	25.5

Line Type (Cont'd)

NO. 22-A

Phantom circuit type coil consisting of two coils. One coil has two parallel windings and the other two tandem windings. Has cross-talk proof shell. For mounting on coil rack.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
22-A	20.6	20.6	25.5	25.5

NO. 23-A

Consists of one repeating coil and one No. 3-A resistance unit each on a No. 1012 mounting. Mounted on wood base. Coil has two parallel and two tandem windings.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
23-A	20.6	20.6	25.5	25.5

NO. 24-A



Phantom circuit type. Consists of four windings, two parallel and two tandem. Mounted on wood base and has cross-talk proof shell. Base size, 10³/₄ by 4 inches. Height, 3¹/₄ inches.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
24-A	20.6	20.6	25.5	25.5

NO. 27-A

This coil is the same as the No. 24-A coil except for the size of the base. Base size, 6 by 4 inches. Height, 3¹/₈ inches. Has cross-talk proof shell.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
27-A	20.6	20.6	25.5	25.5

NO. 121-A

Phantom circuit type. Has cross-talk proof shell. Mounts on 1³/₄-inch width base. Consists of two parallel and two tandem windings.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
121-A	20.6	20.6	25.5	25.5

Miscellaneous Type

NO. 19-B

A concentric wound coil used as a monitoring coil for operator's telephone circuit. Similar in construction to No. 19-A.

Code No.	Winding Resistance (ohms)			
	1	2	3	4
19-B	23	26	115	120

NO. 28-A

Used in Kellogg carrier equipment. Has high frequency cut-off at 40,000 cycles. Mounts on 1³/₄-inch mounting.

Code No.	Winding Resistance (ohms)		
	1	2	3
28-A	55.8	28.8	28.8

COILS, RESISTANCE

Non-Inductive Type

NO. 1-F

A non-inductively wound coil with windings of nickel silver wire No. 29. Resistance is 200 ohms. Height of coil 1 inch, length $1\frac{3}{4}$ inches.



NO. 5-A

Non-inductive coil wound with No. 38 nickel silver wire. Resistance is 10000 ohms. Height of coil 1 inch, length $1\frac{3}{4}$ inches.

Inductive Type

NO. 32-B

Inductively wound with No. 32 nichrome resistance wire. Resistance is 50 ohms. Height is $\frac{5}{8}$ inch by $1\frac{1}{4}$ inches.

COILS, RETARD

Retard coils are used to feed battery and to isolate or limit fluctuating or alternating currents to some particular circuits.

These coils are made over a soft iron wire core or on coils having laminated cores of silicon steel.

Attendant Station Type

The No. 21-C retard coil listed below is for use with the No. 21 attendant station. Over-all dimensions of both coils, $3\frac{3}{8}$ inches long; $1\frac{3}{8}$ -inch diameter.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
21-C	30	22-G	(1) 35 (2) 35

For Composite Telephone and Telegraph Ringing Circuits



The No. 55-A retard coil is used for composite telephone and telegraph ringing circuits as a balancing coil. Base size is $11 \times 9\frac{3}{4}$ inches. Over-all height is 6 inches.

Code No.	Resistance (ohms)
55-A	39

For Radio Interference

The No. 65-A retard coil is used to eliminate radio interference caused by telephone ringing equipment. Diameter is $2\frac{3}{8}$ inches; height, $1-3\frac{1}{16}$ inches.



Code No.	Resistance (ohms)
65-A	2.72 to 3.01

Ringing Machine Type

These retard coils are used as noise killers for pole changer equipment. Over-all dimensions: $2\frac{3}{8} \times 1-13\frac{1}{16} \times 4\frac{1}{8}$ inches.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
67-A	60.5	67-C	29.9
67-B	48.4	67-D	18.6

COILS, RETARD (Cont'd)

For Line Units

The No. 68-A retard coil is used on Nos. 401 and 402 line units. Over-all dimensions: $4\frac{1}{8} \times 2\frac{3}{8} \times 3\frac{3}{8}$ inches.

Code No.	Resistance (ohms)		
68-A	(1) 3.6	(2) 8.5	(3) 4.9

Switchboard Type

FOR C. B. OPERATOR'S TELEPHONE CIRCUIT

These coils are used for common battery operator's telephone circuit. Base size: 6 by 2 inches. Over-all height is 2 inches.



Code No.	Resistance (ohms)
8-B	200
8-C	350
8-H	165
9-D	85

For Relaymatic Ringing Circuits



The No. 41-B retard coil is used on Relaymatic ringing circuits and replaces the No. 41-A coil. Over-all dimensions: $4 \times 2\frac{3}{4} \times 3\frac{1}{2}$ inches.

Code No.	Resistance (ohms)
41-B	0.19

For Miscellaneous Applications

The coils listed below are used for miscellaneous switchboard applications. Over-all dimensions of the Nos. 22-A and 22-B listed below are $3\frac{3}{8}$ inches long and $1\frac{3}{8}$ inches in diameter. The Nos. 56-A, 56-B, and 56-C are mounted in a standard relay shell and will fit No. 2000 type mountings.



NO. 56-A

Code No.	Resistance (ohms)
22-A	(1) 75 (2) 75
22-B	(1) 100 (2) 100
56-A	(1) 57 (2) 57
56-B	(1) 200 (2) 200
56-C	(1) 3.4 (2) 3.4

Telephone Signalling Type

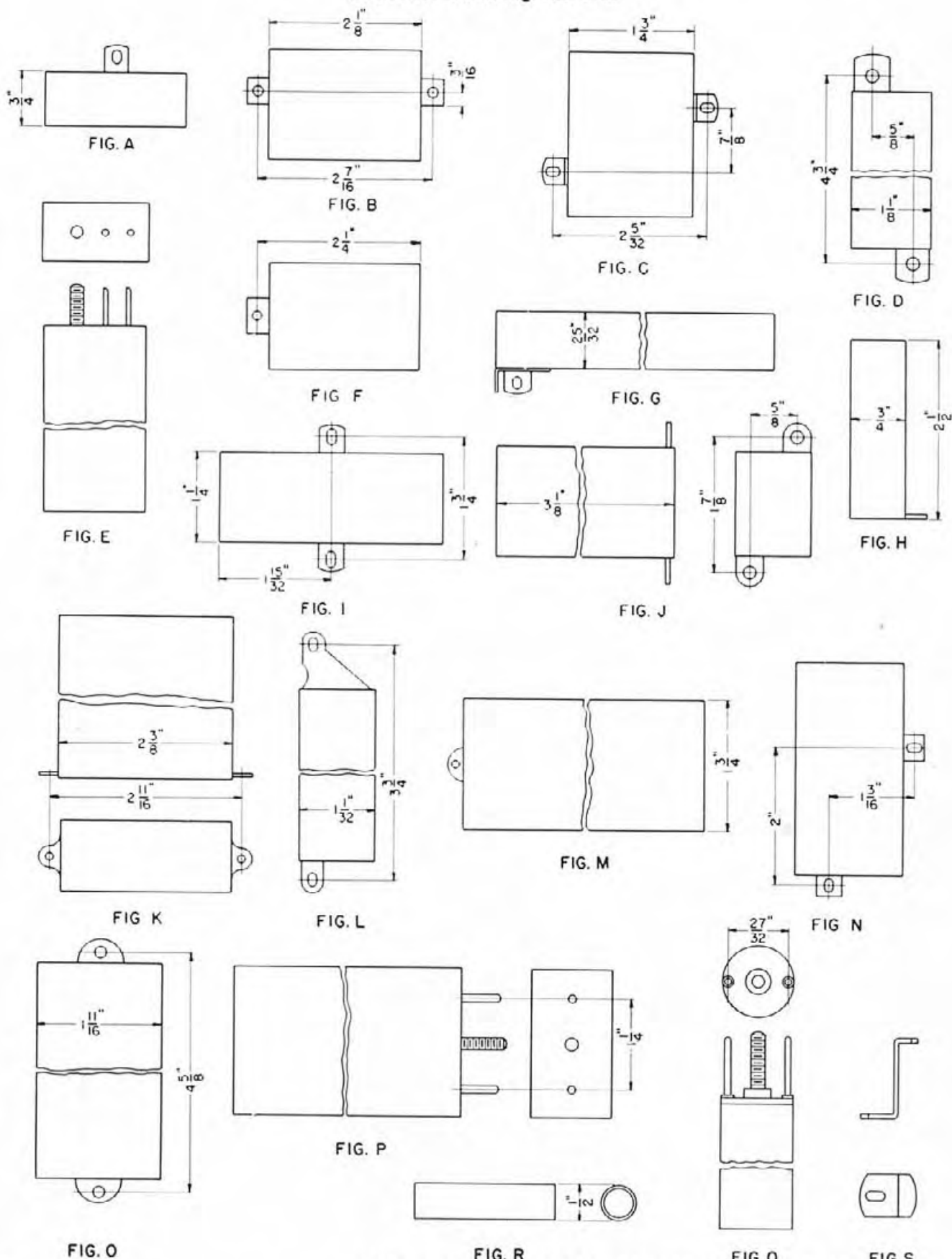


The No. 64-A retard coil listed below is used for common battery signalling, local battery talking Nos. 1020 and 1120 type Masterphones. The No. 64-B is used for simplex signal (manual or dial) local battery talking Nos. 1081 and 1181 Masterphones. No. 64-B is $1-9\frac{9}{32}$ inches square by $\frac{3}{4}$ inch thick excluding the bracket.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
64-A	80	64-B	(1) 40 (2) 40

CONDENSERS

Condenser Mounting Sketches



CONDENSERS

Condenser Mounting Sketches

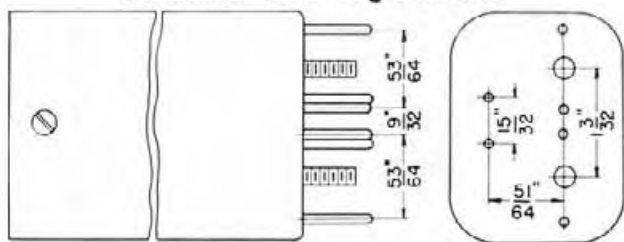


FIG. U

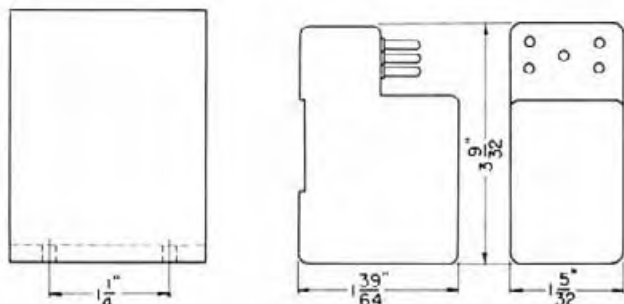


FIG. T

FIG. V

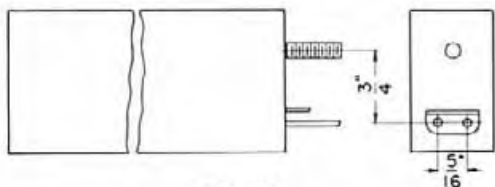


FIG. W

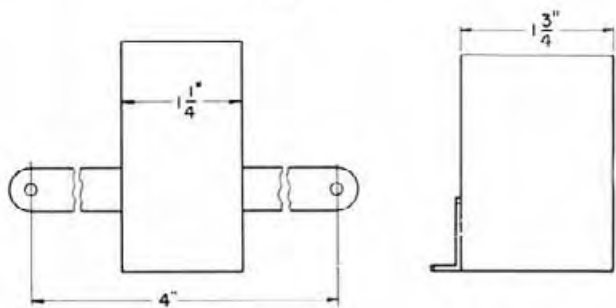


FIG. X

FIG. Z

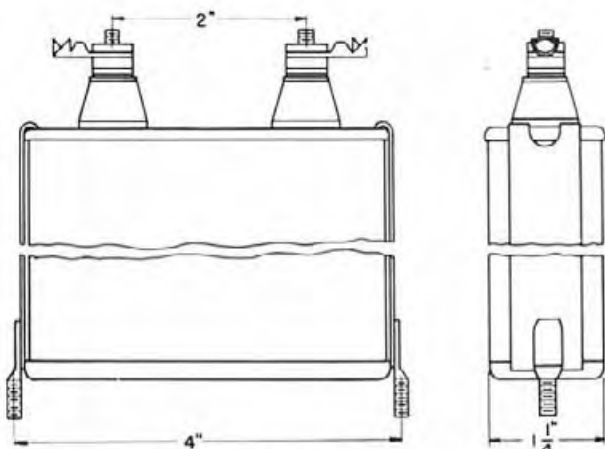


FIG. Y

Kellogg condensers are of the wax-impregnated page, aluminum foil type. The impregnating compound used is Halowax. A moisture-proofing compound is added when the condenser is assembled in the can and the can sealed to prevent the entrance of moisture.

Flash tests of twice the rated voltage for 15 seconds are made on each Kellogg condenser before it leaves the factory. Condensers should be ordered by code number.

SWITCHBOARD CONDENSERS

Single Type

NO. 37



For magneto switchboard cord circuits. This is a 1 mfd. condenser with a working voltage of 200 volts. Size: 3 x 2 3/8 x 1 inches. See mounting sketch "K."

Triple Type

NO. 239

For Nos. 1007-CC, 1007-CCX, and 2007II cordless switchboards. This is a three-unit condenser with capacities of 0.25, 0.50, and 1.0 mfd. Working voltage is 200 volts for each section. Size: 2-15/64 x 1-13/32 x 51/64 inches. See mounting sketch "E."

TELEPHONE & DESK SET BOX CONDENSERS

Single Type

NO. 28



For Nos. 2887-G, 4883, F2731, 3000, 3001, 3002, F2869 telephones and Nos. F2370, F2371, and F2376 desk set boxes. Capacity is 0.5 mfd. and the working voltage is 200 volts. Size: 2 1/2 x 1 1/4 x 3/4 inches. See mounting sketch "H."

NO. 53

For Nos. 4883, 4888, F97, and F97-B telephones, No. F97 desk stand, and transformer sets. Capacity is 2 mfd. and the working voltage 160 volts. Size: 3 x 1 1/2 x 1-1/32 inches. See mounting sketch "N."

NO. 67



For the No. 4902 telephone. Capacity is 1 mfd. and the working voltage 200 volts. Size: 3 1/8 x 1 1/2 x 1-1/32 inches. See mounting sketch "J."

NO. 171

For Nos. F2945 and 4890 telephones and Nos. F2413 and F2414 desk set boxes. Same as Western Electric Co. No. 21-AL. Capacity is 0.25 mfd. and the working voltage is 700 volts. Size: 4 3/8 x 2-1/16 x 25/32 inches. See mounting sketch "G."

NO. 172

For Nos. 4901 and 4905 telephones. Capacity is 1 mfd. and the working voltage is 200 volts. Size: 3 x 1 1/2 x 1-1/32 inches. See mounting sketch "L." Has flexible leads.

CONDENSERS (Cont'd)

TELEPHONE & DESK SET CONDENSERS



Single Type (Cont'd) NO. 174

For magneto telephones. Capacity is 2 mfd. and the working voltage is 200 volts. Size: $2\frac{1}{4} \times 1\frac{3}{4} \times 1\frac{5}{8}$ inches. See mounting sketch "Z."

NO. 184

For No. 4886 telephones. Capacity is 0.5 mfd. and the working voltage is 200 volts. Size: $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$ inches. See mounting sketch "H." Has flexible leads.

NO. 191

For No. 705 desk set boxes. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 193

For Nos. 950LR, 950CLR, and 951CLR telephones. Capacity: 1 mfd. Working voltage: 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 198

For receiver circuit of No. 9830 telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "F." Has flexible leads.

NO. 199

For No. 930CLR telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 200

For Nos. 4816, 4820, 4824, 4880, 6886, 4825, and 5800 series telephones and Nos. 3370 and 3371 desk set boxes. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{4}$ inches. See mounting sketch "H." Has flexible leads.

NO. 202

For No. 3025 telephone. Capacity: 1 mfd. Working voltage: 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "S." Has flexible leads. Requires mounting strap Pc. No. 4854.

Double Type

NO. 185

For Nos. F817 and 9817 telephones and No. F-610 desk set boxes. Capacity: (1) 1.0 mfd. (2) 2.0 mfd. Working voltage: (both sections) 160 volts. Size: $4\frac{3}{8} \times 2\text{-}1/16 \times 25/32$ inches. See mounting sketch "M." Has flexible leads.

NO. 186

For Nos. 9710, 4900, 4901-A, 4902, and 4903 telephones. Capacity: (1) 1.0 mfd. (2) 2.0 mfd. Working voltage: (both sections) 160 volts. Size: $3 \times 1\frac{1}{2} \times 1\text{-}1/32$ inches. See mounting sketch "L." Has flexible leads.

NO. 187

For Nos. 9720, 9721, 9740, and 9745 telephones. Capacity: (1) 1.0 mfd. (2) 1.5 mfd. Working voltage: (both sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "F." Has flexible leads.

NO. 189

For No. 700 desk set boxes. Capacity: (1) 1.0 mfd. (2) 1.5 mfd. Working voltage: (both sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

Triple Type

NO. 203

For No. 925 telephones. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 204

For Nos. 9900 and 9917 telephones and No. 700 desk set boxes. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 206

For general telephone use. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{3}{4} \times 1$ inches. See mounting sketch "C." Has flexible leads.

NO. 207

For desk set boxes. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $2\frac{1}{8} \times 1\frac{1}{2} \times 1\frac{1}{8}$ inches. See mounting sketch "B." Has flexible leads.

NO. 209

For No. 900 telephones. Capacity: (1) 1.0 mfd. (2) 1.0 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 210

For general telephone use. Capacity: (1) 1.0 mfd. (2) 0.5 mfd. (3) 1.5 mfd. Working voltage: (all sections) 160 volts. Size: $3\frac{1}{8} \times 1\frac{1}{4} \times 1$ inches. See mounting sketch "I." Has flexible leads.

NO. 225



For the Kellogg No. 1000 series Masterphone. Capacity: (1) 0.5 mfd. (2) 0.5 mfd. (3) 1.0 mfd. Working voltage: (all sections) 200 volts. Size: $1\text{-}39/64 \times 1\text{-}5/32 \times 3\text{-}9/32$ inches. See mounting sketch "V."

MISCELLANEOUS CONDENSERS

The condensers listed below and on next page do not have special applications but are manufactured by Kellogg for miscellaneous use in the construction of Kellogg equipment or for general use in telephone work. These condensers are listed according to their capacity, the smallest sizes listed first.

Single Type

Code No.	Capacity (mfd.)	Working Voltage	Dimensions (inches)			Mounting Sketch
			Height	Width	Thickness	
137	.01	200	$3\frac{5}{8}$	(1 inch diameter)		Q
208*	.025	400	$1\frac{1}{8}$	(1/2 inch diameter)		R
197	.25	200	$3\text{-}15/64$	$1\text{-}13/32$	$27/32$	E
238	.25	200	$3\text{-}15/64$	$1\text{-}13/32$	$27/32$	W
20	.20 to .30	400	$2\frac{3}{8}$	$1\frac{1}{4}$	$\frac{3}{4}$	S

MISCELLANEOUS CONDENSERS

Single Type (Cont'd)

Code No.	Capacity (mf.d.)	Working Voltage	Height	Dimensions (inches) Width	Thickness	Mounting Sketch
240*	.50	200	2 $\frac{3}{8}$	1 $\frac{1}{4}$	$\frac{3}{4}$	X
24	.50	400	2 $\frac{3}{8}$	(2-1/64 diameter)		T
68	.50	400	3 $\frac{1}{8}$	1 $\frac{1}{2}$	1-1/32	J
101	.50	400	3-15/64	1-13/32	27/32	E
237	.50	200	3-15/64	1-13/32	27/32	W
215	.65 to .80	400	4 $\frac{3}{8}$	2-1/16	25/32	S
192*	1.0	160	2	1 $\frac{1}{4}$	$\frac{3}{4}$	A
25	1.0	400	2 $\frac{3}{8}$	(2-1/64 diameter)		T
103	1.0	200	3	1 $\frac{1}{2}$	1-1/32	L
78	1.0	200	3	1 $\frac{1}{2}$	1-1/32	S
132	1.0	200	3-15/64	1-13/32	27/32	E
236	1.0	200	3-15/64	1-13/32	27/32	W
12	1.0	400	4 $\frac{3}{8}$	2-1/16	25/32	S
176*	1.0	200	4 $\frac{3}{8}$	2-1/16	25/32	S
177*	1.0	200	4 $\frac{3}{8}$	2-1/16	25/32	S
146	1.0	400	4 $\frac{3}{8}$	2-1/16	25/32	S
140	1.0	700	4-7/16	1 $\frac{3}{4}$	1 $\frac{5}{8}$	M
140-C†	1.0	700	4-7/16	1 $\frac{3}{4}$	1 $\frac{5}{8}$	M
241*	2.0	160	2 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{8}$	F
62	2.0	160	3	1 $\frac{1}{2}$	1-1/32	S
66	2.0	160	3 $\frac{1}{8}$	1 $\frac{1}{2}$	1-1/32	J
235	2.0	400	3-15/64	1-13/32	27/32	W
64	2.0	160	3-15/64	1-13/32	27/32	E
102	2.0 to 2.22	700	4-19/64	2 $\frac{3}{8}$	1-11/16	O
108	2.0 to 2.22	700	4-19/64	2 $\frac{3}{8}$	1-11/16	O
16	2.0	200	4 $\frac{3}{8}$	2-1/16	1 $\frac{1}{8}$	S
34	2.0	200	4 $\frac{3}{8}$	2-1/16	1 $\frac{1}{8}$	D
36	2.0	200	4 $\frac{3}{8}$	2-1/16	1 $\frac{1}{8}$	P
233	6.0	600	3-15/16	3 $\frac{3}{4}$	1 $\frac{1}{4}$	Y

*These condensers have flexible leads.

†Hermetically sealed.

Double Type

188*	(1) 1.0	160	2 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{8}$	F
	(2) 1.5	160				
128	(1) 2.0	200	4	2 $\frac{3}{8}$	1-13/16	U
	(2) 2.0	200				
213	(1) 2.0	400	4	2 $\frac{3}{8}$	1-13/16	U
	(2) 2.0	400				
234	(1) 2.0	400	4	2 $\frac{3}{8}$	1-45/64	U
	(2) 2.0	400				

*Has flexible leads.

Triple Type

229	(1) 0.5	560	4	2 $\frac{3}{8}$	1-45/64	U
	(2) 1.0	560				
	(3) 1.0	560				
212	(1) 1.0	560	4	2 $\frac{3}{8}$	1-13/16	U
	(2) 1.0					
	(3) 1.0					
231	(1) 1.0	560	4	2 $\frac{3}{8}$	1-45/64	U
	(2) 1.0	560				
	(3) 1.0	560				
230	(1) 1.0	200	4	2 $\frac{3}{8}$	1-45/64	U
	(2) 2.0	200				
	(3) 2.0	200				

CONVERSION KITS

Kellogg conversion kits are available to convert old model, out-dated equipment to usable, modern instruments. Kits are available for converting both common battery and magneto telephones to modern handset units.

For Common Battery Telephones

KIT NO. 1

For converting No. 801 wall telephones to wall Masterphone handset instruments.

This kit consists of the following parts:

- 1 No. F-27-C handset.
- 1 No. 154 hookswitch assembly.
- 1 Form 1438 designation strip.
- 1 Number plate assembly including 1 No. 42081 holder, 1 No. 56445 number plate, 1 No. 42083 protector, 1 No. 56437 dial blank and 1 No. 56000 screw.
- 1 No. 56442 clamp.
- 2 No. 56462 screws.

KIT NO. 2

For converting No. 742 wall telephones to wall Masterphone handset instruments. Consists of the same parts as used in Kit No. 1 except for the designation strip which is Form No. 1439, specially marked for No. 742 instruments.

KIT NO. 11

For converting No. 817 triad circuit steel wall telephones to No. 9817 wall Masterphone handset instruments.

This kit consists of the following parts:

- 1 No. F-27-C handset.
- 1 No. 56280 switch hook lever.
- 1 No. 62116 cover plate.

For Magneto Telephones

KIT NO. 7

For converting wall magneto telephones into wall Masterphone handset instruments. The conversion may be made without removing the telephones from the wall.

This kit consists of the following parts:

- 1 No. 40-C handset.
- 1 No. 56280 switch hook lever.
- 1 No. 71618 cover plate.

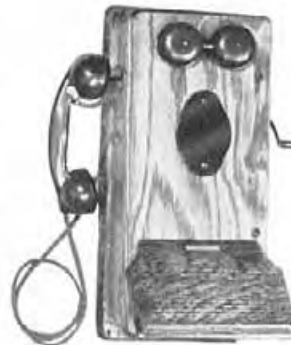


KIT NO. 8

Same as Kit No. 7 with the addition of a complete hookswitch assembly, No. 155, to replace hookswitch assembly not adapted to the Masterphone switch hook lever.

This kit consists of the following parts:

- 1 No. 40-C handset.
- 1 No. 155 hookswitch assembly.
- 1 No. 71618 cover plate.



CORDS

High quality, long lasting Kellogg switchboard and telephone cords are manufactured in two types of construction to meet all requirements of the operating company.

Braid covered conductor cords, for general use, are made under the exacting conditions of the Kellogg cord department where high precision, modern equipment turns out hundreds of cords of all types every day. Rubber covered conductor cords also are

manufactured by the Kellogg factory for installations requiring a more durable type of cord.

For extra hard usage and for installations subject to moisture and fungus damage, a special neoprene jacketed, rubber covered conductor cord can be supplied. This type cord is especially desirable in locations where heavy usage or tropical conditions demand an exceptionally durable cord.

CONSTRUCTION FEATURES OF KELLOGG CORDS

Braid Covered Conductor Type

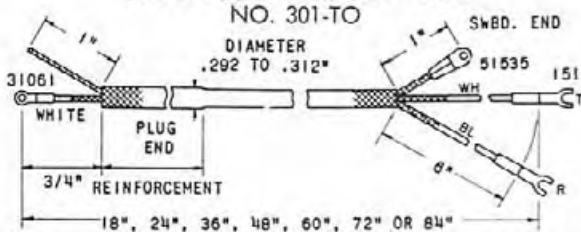
- (a) Two tinsel ribbons are wound around a cotton thread core to form a tinsel thread.
- (b) Six tinsel threads are twisted together over a cotton thread to form a flexible tinsel conductor.
- (c) The tinsel conductor is covered with two reverse servings of celanese.
- (d) Conductor assembly is then impregnated with a moisture-proofing compound.
- (e) Cotton braid is then applied.
- (f) Conductors twisted together to form the body of the cord. Fillers added to make cord round and smooth.
- (g) A tight serving is applied to hold conductors in place.
- (h) Plug end reinforced for 12 inches to fit plug and to allow for bending and handling.
- (i) Outer braiding is then applied. (Continuation of reinforcement.)

Rubber Covered Conductor Type

- (a) Two tinsel ribbons are wound around a cotton thread core to form a tinsel thread.
- (b) Six tinsel threads are twisted together over a cotton thread to form a flexible tinsel conductor.
- (c) A cotton serving is then applied over each tinsel conductor.
- (d) Conductor then given colored rubber covering.
- (e) Rubber covered conductors then laid parallel and cotton fillers used to make cord round.
- (f) Cotton binder applied to hold conductors in position.
- (g) Cord reinforced at plug end for 12 inches to fit plug and to allow for bending and handling.
- (h) Over-all braid applied.
- (i) Solderless terminals are then attached.

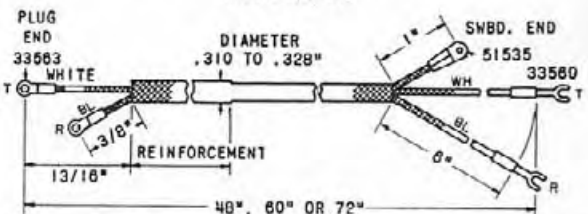
SWITCHBOARD CORDS

TWO CONDUCTOR Tinsel Type—Braid Covered

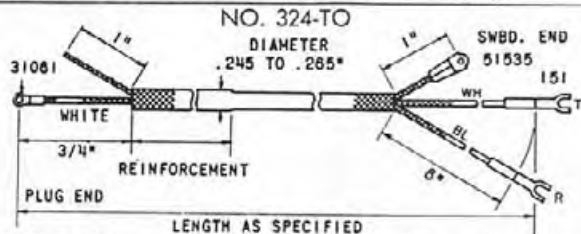


Diameter at plug end .292 to .312 inches. Fits Kellogg Nos. 3, 42, 70, 138, and 109 plugs and Leich No. 3A plug.

Tinsel Type—Braid Covered NO. 397-TO



Diameter at plug end .310 to .328 inches. Fits Western Electric No. 47 and Kellogg No. 247 plug. Replaces Western Electric Nos. 493 and S-2-A cords.



Replaces Stromberg-Carlson No. MS-22-F cord. Used with Kellogg plugs Nos. 141 and 211 and Stromberg-Carlson plugs Nos. 56 and 56-X. Also used with Garford two-conductor plugs.

Tinsel Type—Rubber Covered NO. 754

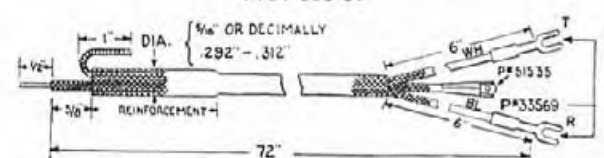


Fits Kellogg No. 42 plug. Replaces No. 301-TO for export.



Fits Stromberg-Carlson Nos. 15 and 42 plugs. Replacement for Kellogg No. 301-B cord and Stromberg-Carlson No. S-23-G. Over-all diameter at plug end is .285 to .305 inches.

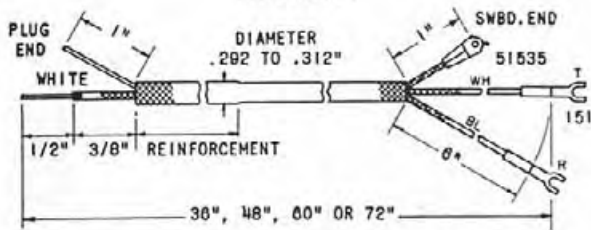
Steel and Tinsel Type—Braid Covered NO. 353-ST



Diameter at plug end is .292 to .312 inches. Fits Kellogg No. 247 and Western Electric No. 47 plugs.

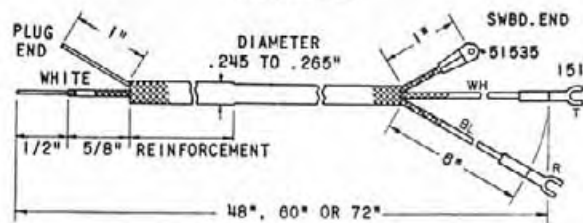
CORDS SWITCHBOARD CORDS

Steel and Tinsel Type—Braid Covered (Cont'd)
NO. 304-ST



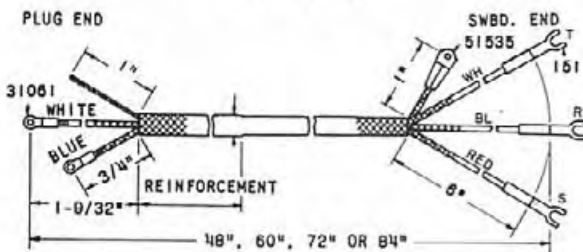
Fits Kellogg Nos. 3, 42, 70, 130, 187, and Automatic Electric No. 1188 plugs.

NO. 323-ST



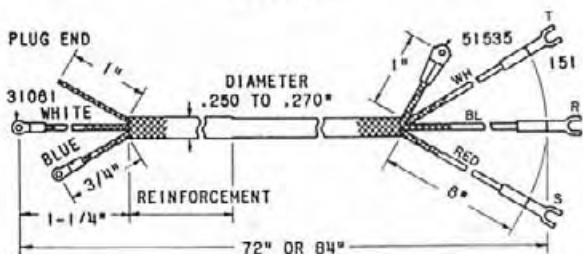
Diameter at plug end is .245 to .265 inches. Fits Kellogg No. 211 and Stromberg-Carlson Nos. 56 and 57 plugs.

THREE CONDUCTOR
Tinsel Type—Braid Covered
NO. 309-TO



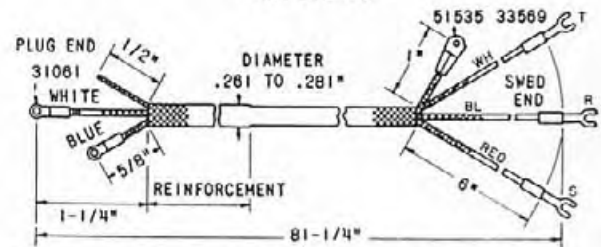
Diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 12, 13, 106, 202, 152, 137, and 233 plugs; Leich No. 202; Automatic Electric Nos. K-28, K-55, and K-56 plugs. Replaces Automatic Electric No. CD-406548-W cord.

NO. 326-TO



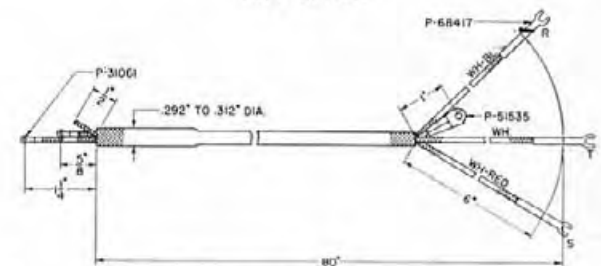
Fits Kellogg Nos. 199 and 201 plugs. Diameter at plug end is .250 to .270 inches. Replaces Automatic Electric No. CD 407572 cord.

Tinsel Type—Braid Covered (Cont'd)
NO. 390-TO



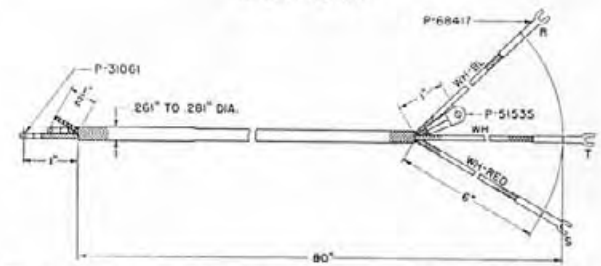
Diameter at plug end is .261 to .281 inches. Replaces Kellogg cord No. 396-TO; Stromberg-Carlson No. MS-32-K, and Western Electric No. S-2-A cords. Fits Kellogg No. 185 and Western Electric No. 109 plugs.

NO. 391-TO



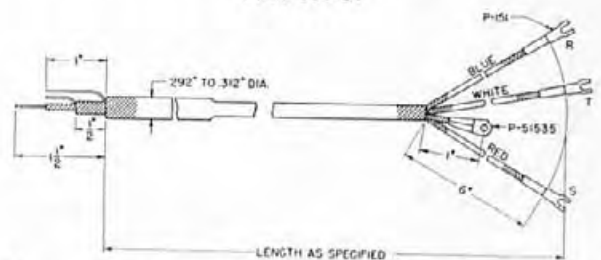
Same as No. 390-TO cord except diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 191 and 233 plugs, and Western Electric No. 110 plug. Replaces Western Electric No. S-3-B cord.

NO. 745-TO



Fits Kellogg No. 235, Western Electric No. 109, Stromberg-Carlson Nos. 53-X, 54, and 53-N plugs. Replacement for Stromberg-Carlson S-32-K cord.

Steel and Tinsel Type—Braid Covered
NO. 303-ST

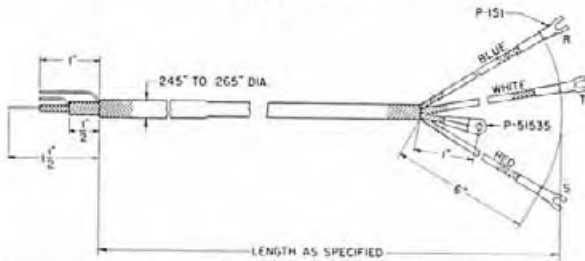


Diameter at plug end is .292 to .312 inches. Fits Kellogg Nos. 12, 13, 74, 106, 137, 152, 233, and Leich No. 202 plugs.

CORDS

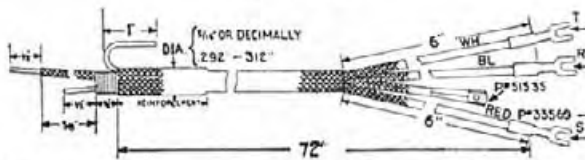
SWITCHBOARD CORDS

Steel and Tinsel Type—Braid Covered (Cont'd)
NO. 325-ST



Diameter at plug end is .245 to .265 inches. Fits Kellogg No. 201, Garford No. 54, and Stromberg-Carlson No. 55, 55-N, and 55-NX plugs.

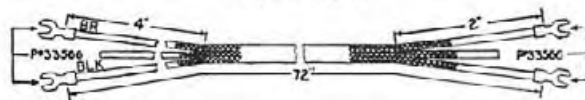
NO. 358-ST



Diameter at plug end is .292 to .312 inches. Fits Kellogg No. 191 and Western Electric No. 110 plugs.

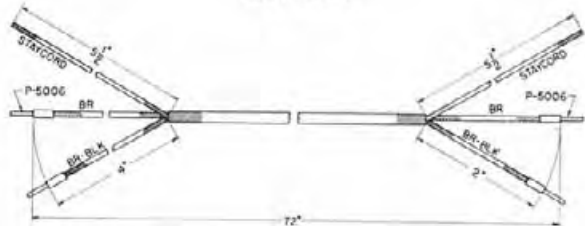
DESK STAND CORDS
TWO CONDUCTOR
Braid Covered

NO. F-665-D



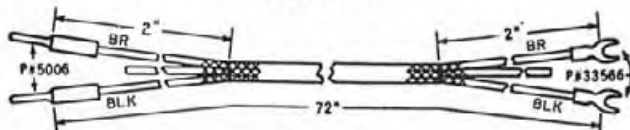
Fits Kellogg Nos. F-75, F-97, F-111, and other stands provided with terminals for flat type tips and the No. 900 and 925 type combination Masterphones. Replaces Kellogg No. F-100-D cord and Stromberg-Carlson No. D-2-C cord.

NO. 665-D



Same as No. F-665-D cord except equipped with No. 5006 spike or pin tips. Replaces Kellogg No. 100-D cord.

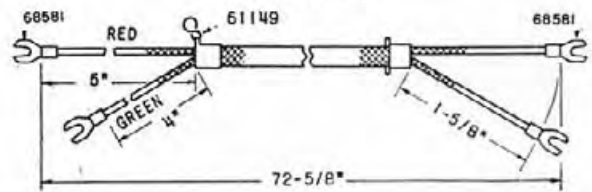
NO. 667-D



Replaces Kellogg No. 581-D cord.

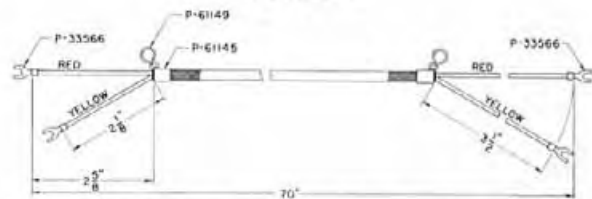
DESK STAND CORDS

Rubber Covered Conductors
NO. F-740-D



Replaces Western Electric No. D-2-D cord. Has rubber covered conductors.

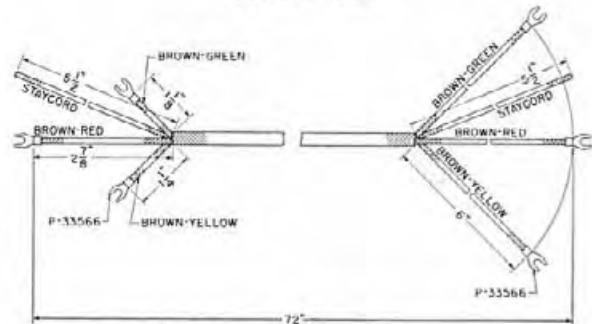
NO. 746-D



A special type desk stand cord with rubber covered conductors.

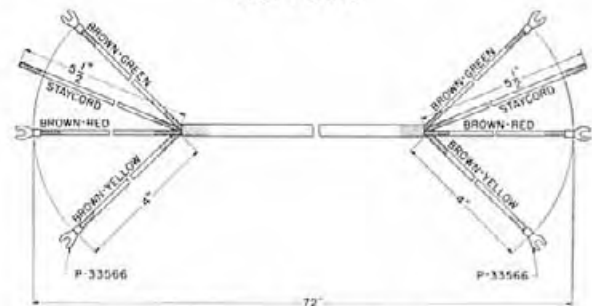
THREE CONDUCTOR
Braid Covered

NO. F-639-D



Replaces Kellogg No. F-479-D and Western Electric No. D-3-AB cords. Standard length is 72 inches. Also available in 96 and 108-inch lengths.

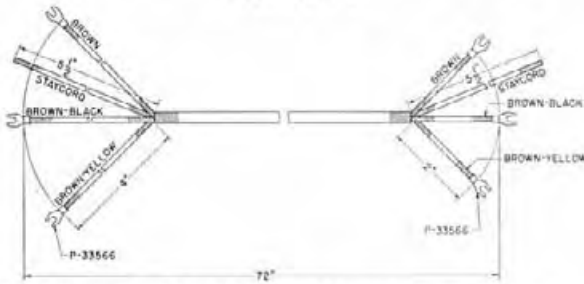
NO. F-640-D



Fits Kellogg Nos. F-115-A, F-118, F-118-B, F-135, F-138, and F-301 stands and the Nos. 900 and 925 "B" type combination Masterphones. Replaces Kellogg No. F-636-D cord.

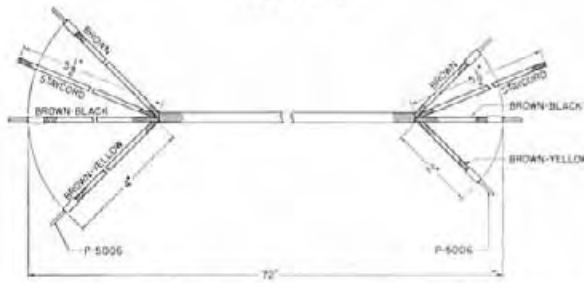
CORDS DESK STAND CORDS

Three Conductor, Braid Covered (Cont'd)
NO. F-641-D



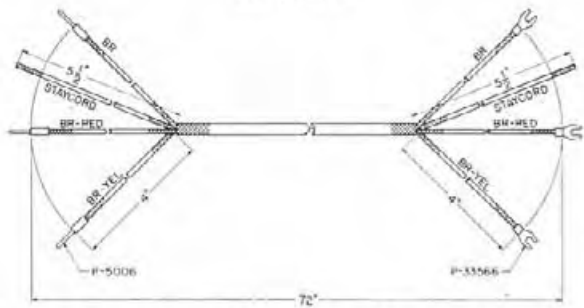
Fits Kellogg Nos. F-84, F-110, F-115, and other stands provided with terminals for flat tips. Replaces Kellogg No. F-150-D cord.

NO. 641-D



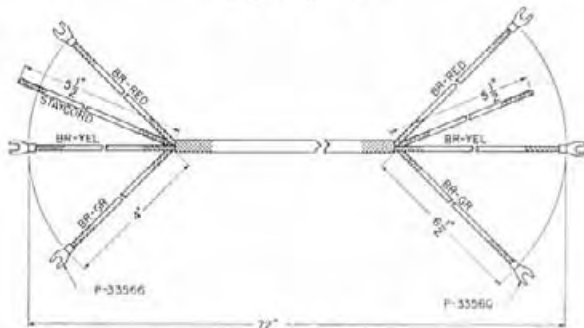
Same as No. F-641-D cord shown above except equipped with No. 5006 spike or pin tips. Replaces Kellogg No. 150-D cord.

NO. 669-D



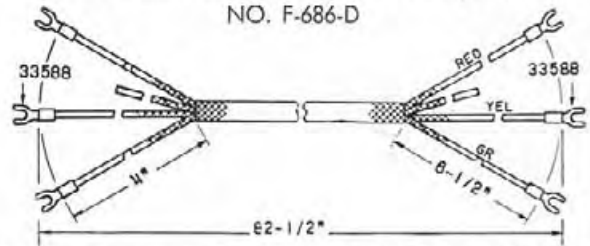
A general purpose replacement cord for old style equipment. Replaces Kellogg No. 452-D cord.

NO. F-674-D



Fits Kellogg type 700, 725, 900-A and 925-A Masterphones.

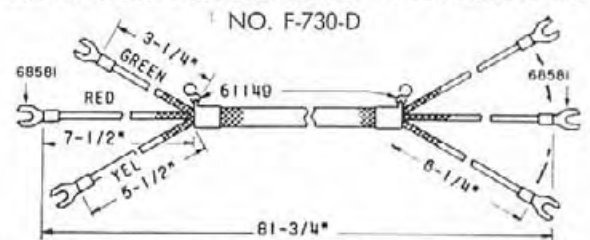
Three Conductor, Braid Covered (Cont'd)
NO. F-686-D



Replaces Stromberg-Carlson Nos. MD-3-C and MD-3-F cords. Standard length is 82 1/2 inches.

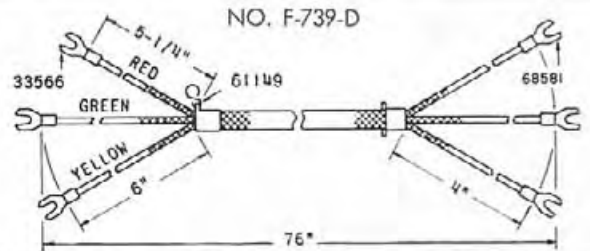
Three Conductor, Rubber Covered Conductors

NO. F-730-D



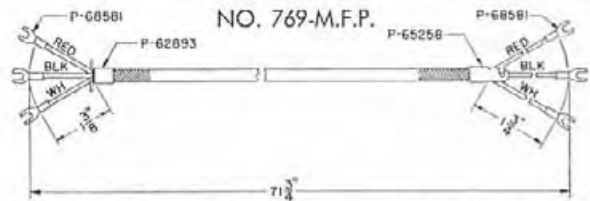
Replaces Western Electric No. D3P9 cord. Equipped with metal stay clip. Has rubber covered conductors.

NO. F-739-D



Replaces Western Electric No. D-3-AL cord. Has rubber covered conductors.

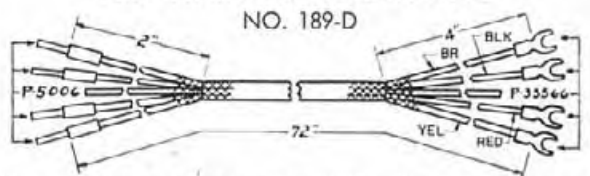
NO. 769-M.F.P.



For use with the Kellogg 1000 Masterphone. Has black over-all cotton braid. Specially impregnated and insulated for moisture and fungus proofing.

Four Conductor, Braid Covered

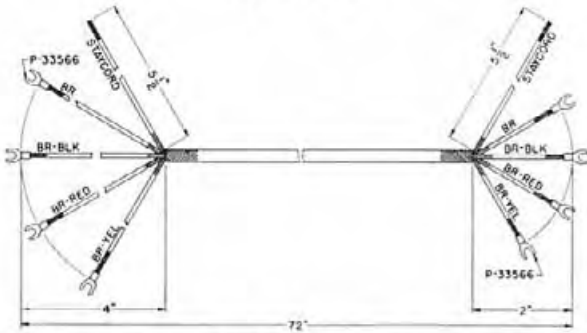
NO. 189-D



Fits most four conductor desk stands where a spike or spade terminal can be used.

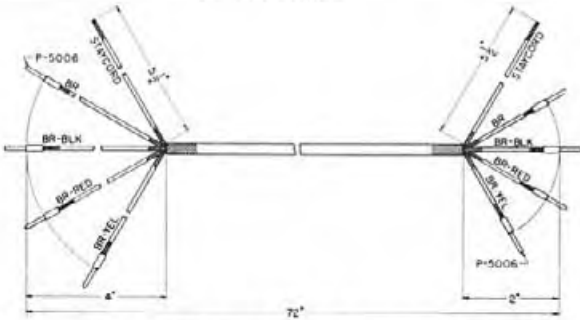
CORDS

DESK STAND CORDS
Four Conductor, Braid Covered (Cont'd)
 NO. F-666-D



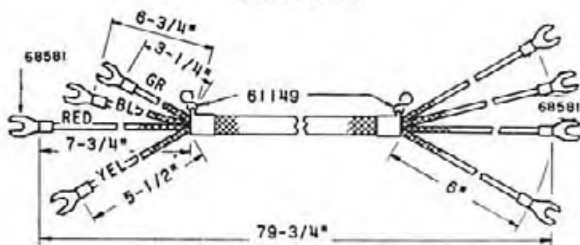
For four conductor magneto desk stands and desk set boxes provided with terminals for flat type tips. Replaces Kellogg No. F-102-D cord.

NO. 666-D



Same as No. F-666-D except has spike or pin tips No. 5006. Replaces Kellogg No. 102-D cord.

Four Conductor, Rubber Covered Conductors
 NO. F-731-D



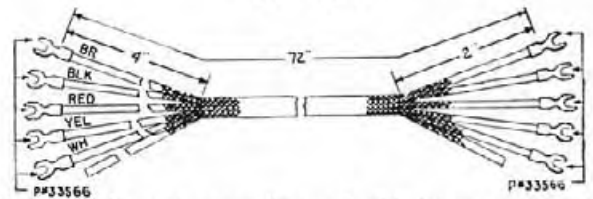
Replaces Western Electric No. D459 cord. Equipped with metal stay clip.

NO. 771-M.F.P.



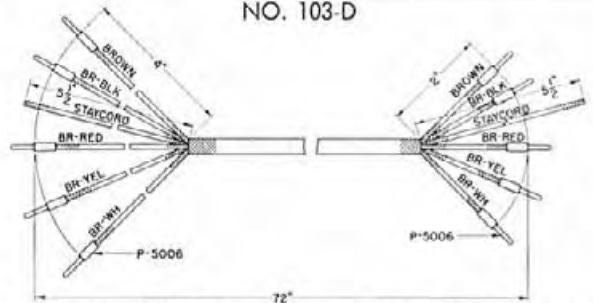
Used with the Kellogg 1000 series Masterphone. Has black over-all cotton braid. Has rubber covered conductors.

DESK STAND CORDS
Five Conductor, Braid Covered
 NO. F-103-D



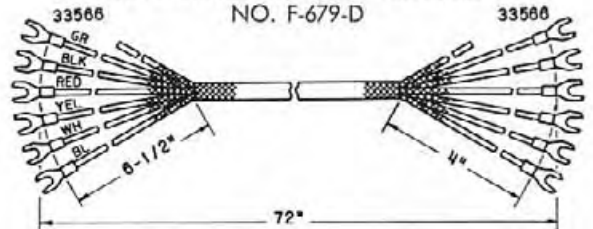
This cord is most generally used with intercommunications equipment.

NO. 103-D



Same as No. F-103-D cord except equipped with spike or pin tips No. 5006.

Six Conductor, Braid Covered
 NO. F-679-D



This cord is used on No. 701 Kellogg Masterphones.

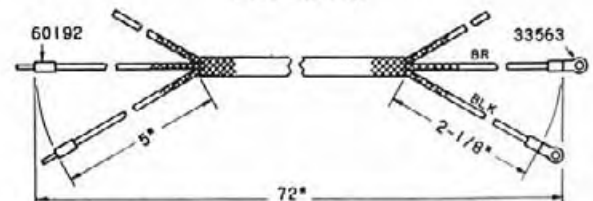
OPERATOR'S CORDS

Kellogg operator's cords are manufactured under the same conditions of quality and workmanship as are all cords and in the same manner as listed under general construction features of braid covered cords above. Standard operator's cords are listed below. Cords requiring different length or trim than those shown can be furnished to meet specific requirements.

Standard cords should be ordered by code number. When ordering special cord complete information, preferably including a sketch, should be supplied. In orders requesting duplication of cords it is advisable, if possible, to send a sample of the old cord.

FOR HEAD RECEIVERS

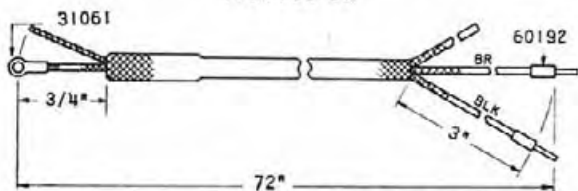
Two Conductor, Braid Covered
 NO. 466-OR



Fits Kellogg No. 139 plug and used with No. 65 type receiver. Replaces Western Electric No. 254 cord.

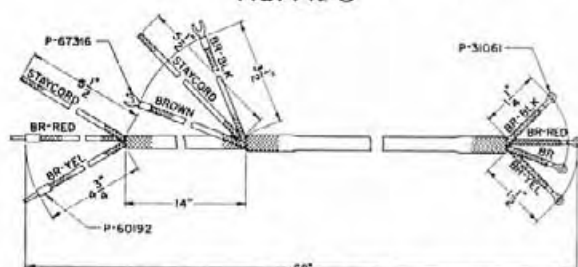
CORDS OPERATOR'S CORDS

Two Conductor, Braid Covered (Cont'd)
NO. 708-OR

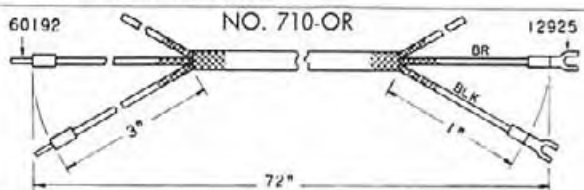


Formerly standard on Kellogg switchboards. Replaces Kellogg No. 26-OR cord and Leich No. 31 operator's receiver cord. Fits Kellogg Nos. 107 and 247 and Western Electric No. 47 plugs. Used with No. 85-A receiver.

Four Conductor, Braid Covered (Cont'd)
NO. 712-O

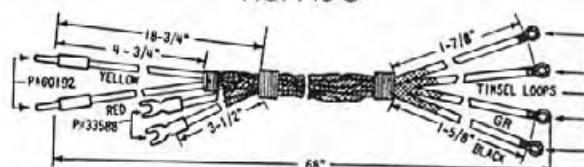


Replaces Kellogg Nos. 67-O and 239-O cords. Fits Kellogg No. 136 plug and Nos. 65-A and 85-A receivers.



Replaces Kellogg No. 110-OR cord. Standard on Kellogg boards using suspended type transmitter. Fits Kellogg No. 146 plug and Kellogg receiver No. 85-A.

NO. 713-O



Replaces Kellogg No. 439-O cord. Used with Kellogg No. 182 plug and Nos. 65-A and 85-A receivers. Replaces Automatic Electric Nos. DB-12, MC-54220 and CD-509464 and Stromberg-Carlson No. MO-4F cards. No over-all braid.

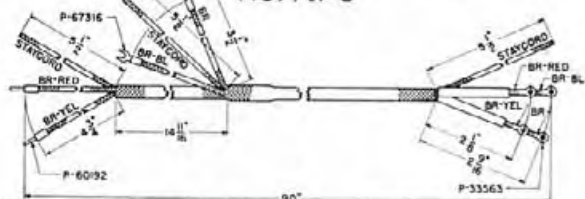
NO. 719-OR



Fits Kellogg No. 182 plug.

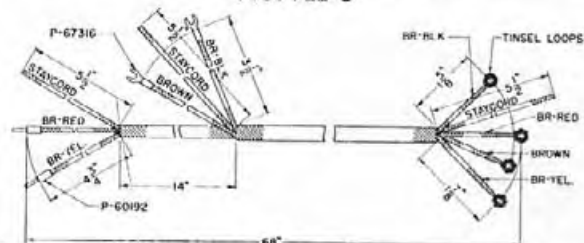
FOR HEAD AND CHEST SETS
Four Conductor, Braid Covered

NO. 709-O



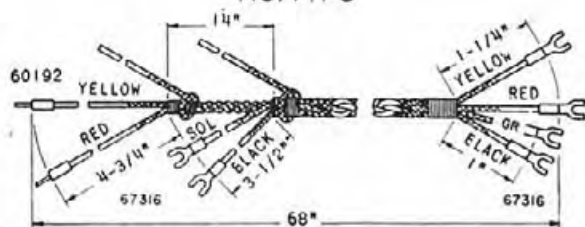
Replaces Kellogg No. 199-O cords; Western Electric No. L4B cords, and Leich No. 14-B cords. Fits Kellogg No. 139 plug and Nos. 65-A and 85-A receivers, and Western Electric Nos. 103, 112, and 137 plugs.

NO. 722-O



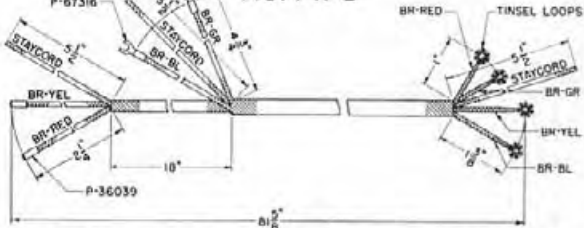
Replaces Kellogg No. 672-O cord; Automatic Electric cords Nos. DB-12, MC-54220 and CD-509464, and Stromberg-Carlson No. MO-4F cord. Fits Kellogg No. 182 plug.

NO. 711-O



Replaces Kellogg No. 111-O cord. Used with Kellogg No. 145 plug and Nos. 65-A and 85-A receivers. Cord has over-all braid of green cotton. No over-all braid.

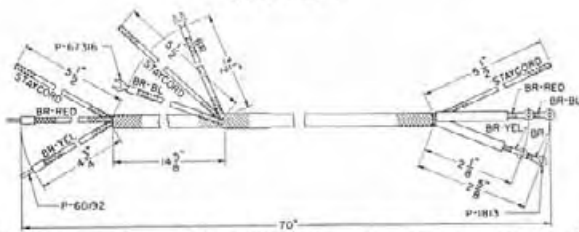
NO. 741-O



Replaces Stromberg-Carlson No. MO-4F cord. Will fit Kellogg No. 245 and Stromberg-Carlson No. 23 plugs.

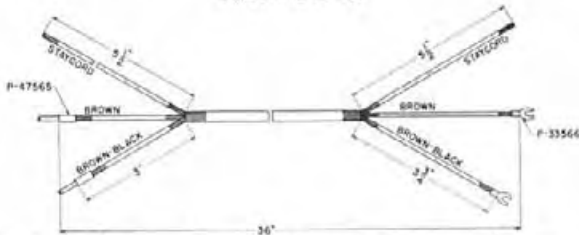
CORDS

OPERATOR'S CORDS Four Conductor, Braid Covered (Cont'd) NO. 743-O



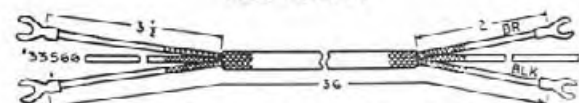
Fits Kellogg No. 139 and Western Electric No. 289-A plugs. Used with Kellogg No. 1-C and 1-L operators head and chest sets.

RECEIVER CORDS Two Conductor, Braid Covered NO. F-642-TR



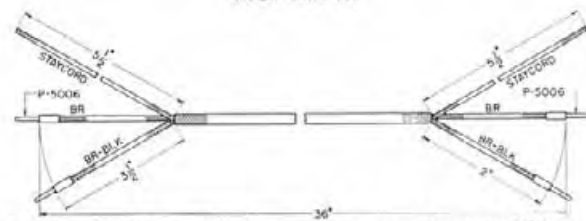
Replaces Kellogg No. 197-TR cord; Stromberg-Carlson No. MR-2-1 cord; Automatic Electric No. AR-11, CD-104436, and MC-5430 cords, and Leich No. 11-A cord.

NO. F-644-TR



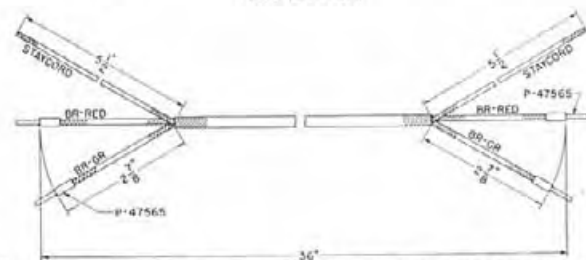
Replaces Kellogg No. F-98-TR, Leich No. 11-C, and Automatic Electric No. D-541846 cords. Fits Kellogg No. F-41-A and F-41-B receivers.

NO. 644-TR



The No. 644-TR cord is the same as the No. F-644-TR except it is equipped with spike or pin tips No. 5006. Replaces Kellogg No. 98-TR cord and Leich No. 11-B cord.

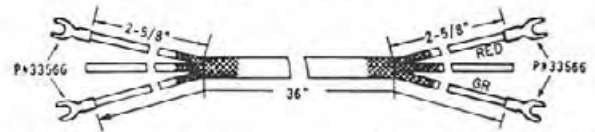
NO. 644-RA



Replaces Automatic Electric Nos. AR-31, CD-100436, MC-54201, and MC-5429 cords.

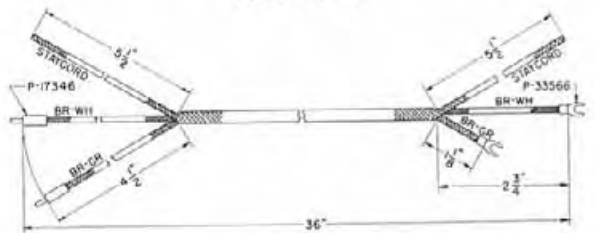
RECEIVER CORDS

Two Conductor, Braid Covered (Cont'd) NO. F-644-RA



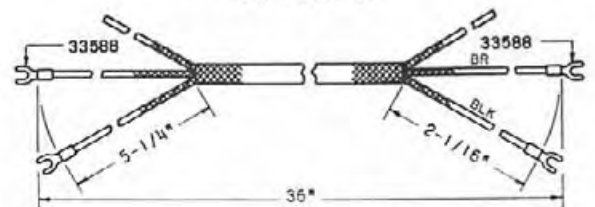
Replaces Automatic Electric Nos. AR-12, M-5431, and CD-109436 cords.

NO. 646-TR



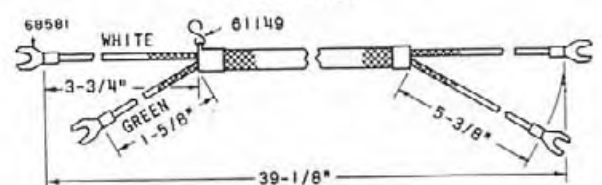
Replaces Kellogg No. 207-TR cord and Western Electric No. 549 cord. Standard for Western Electric desk stand and for the Western Electric No. 40-P transmitter arm.

NO. F-687-TR



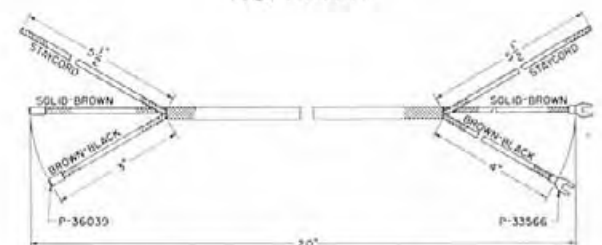
Replaces Stromberg-Carlson No. MR-2G cord.

Two Conductor, Rubber Covered Conductors NO. F-732-R



Replaces Western Electric No. R2B cord. Used with Western Electric desk stands Nos. 51-C, 51-AL, or 51-CN with No. 144 receiver. Also used with Western Electric No. 20-CC-transmitter arm. Equipped with metal stay clip.

NO. F-744-TR



Used with Kellogg weatherproof telephones Nos. 4883 and 4888. Replaces No. 682-TR cord. Fits No. 81 receiver.

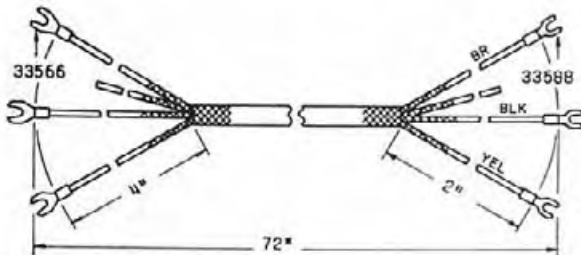
CORDS HANDSET CORDS

Standard Kellogg handset cords are listed below. Special cords to meet different requirements for length and trim can be manufactured by the Kellogg factory. When ordering special cords

complete information, preferably including a sketch, should be included with the order. Standard cords should be ordered by code number.

Three Conductor, Braid Covered

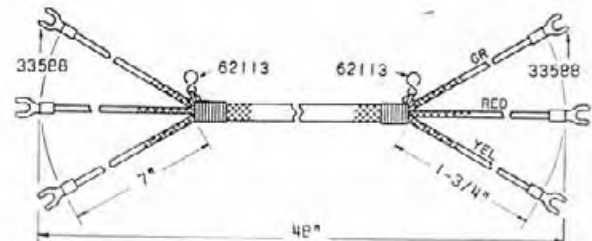
NO. F-621-G



Used with Kellogg No. 22-C handsets.

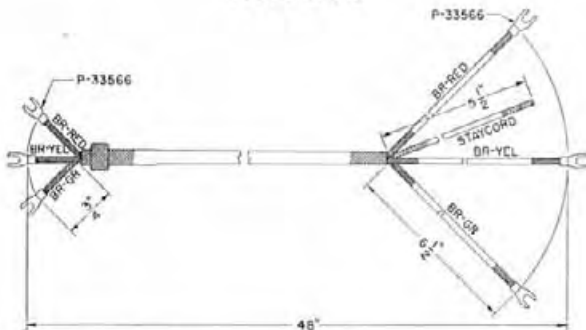
Three Conductor, Braid Covered

NO. F-738-G



Replaces Stromberg-Carlson No. MC-3-F cord.

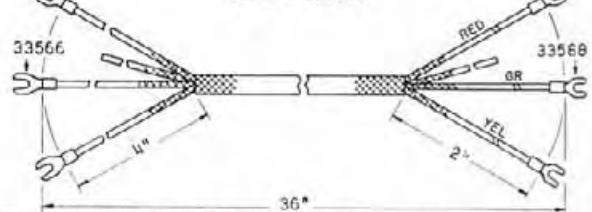
NO. F-673-G



Fits Kellogg F-27-C handset used on Kellogg Masterphones of all types. Standard length is 48 inches.

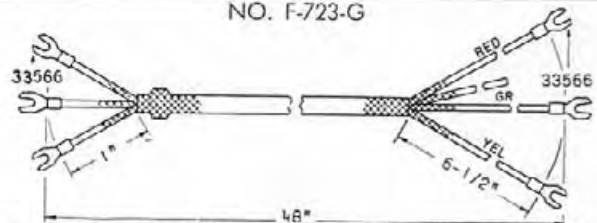
Three Conductor, Rubber Covered Conductors

NO. F-688-G



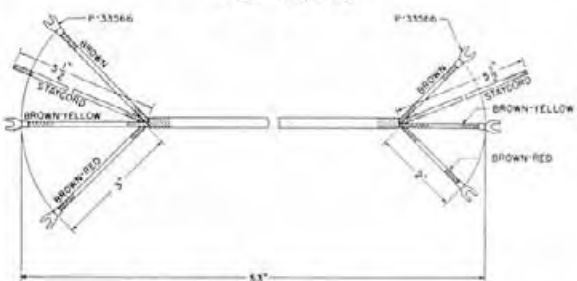
Fits Kellogg No. 32-C handset. Has rubber covered conductors.

NO. F-723-G



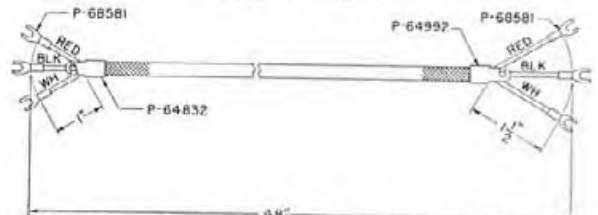
Fits Kellogg No. 27-EC handset. Has rubber covered conductors.

NO. F-690-G



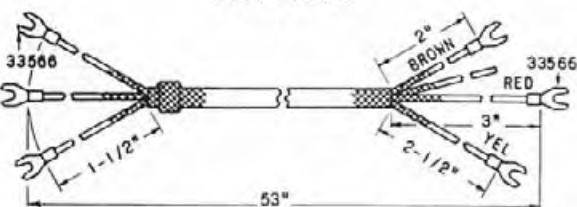
Fits Automatic Electric Monophones.

NO. 770-M.F.P.



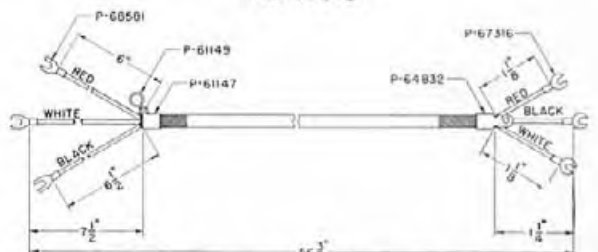
Used with the Kellogg No. 46-C handset. Rubber covered conductors with black over-all cotton braid.

NO. F-733-G



Used with Automatic Electric handset. Has black over-all cotton braid.

NO. 773-G



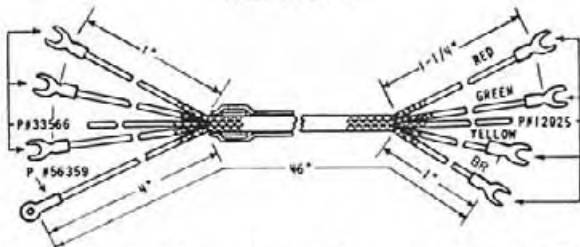
Replaces Western Electric No. H3C9 cord.

CORDS

HANDSET CORDS (Cont'd)

Four Conductor, Braid Covered

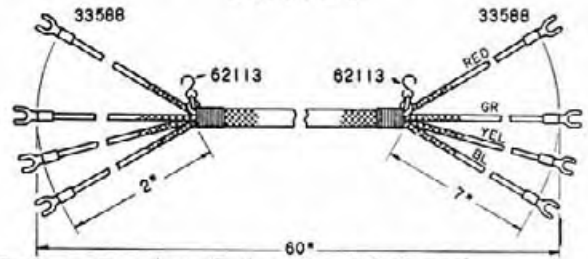
NO. F-698-G



Arranged to fit Kellogg No. 145 plug and Kellogg No. F-39-C handset.

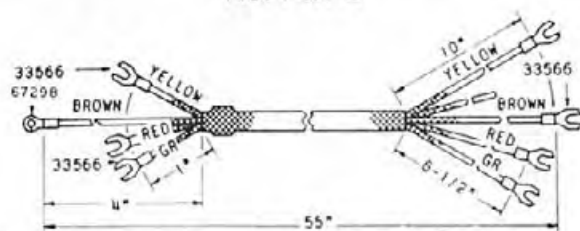
Four Conductor, Braid Covered (Cont'd)

NO. F-742-G



Replaces Stromberg-Carlson No. MC-4F cord.

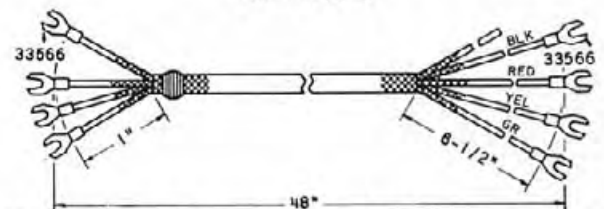
NO. F-699-G



Terminals fit receiver and transmitter binding posts in wall telephones when the conventional parts are replaced with a handset. Fits Kellogg No. F-40-C handset.

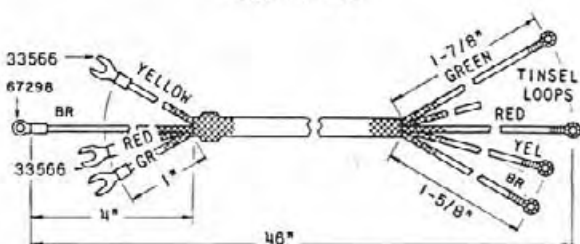
Four Conductor, Rubber Covered

NO. F-735-G



Used with the Kellogg No. 44-C and 44-L handset. Has rubber covered conductors covered with an over-all rubber jacket.

NO. F-717-G



Used with Kellogg No. F-39-C handset and No. 182 plug.

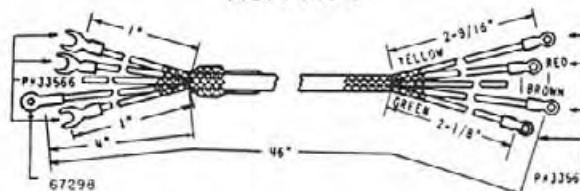
Five Conductor, Rubber Covered

NO. 774



Used on Kellogg No. 49-C handset. Has rubber covered conductors covered with an over-all rubber jacket.

NO. F-718-G

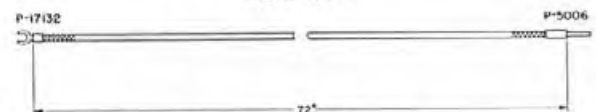


Used with Kellogg No. F-39-C handset and No. 139 plug.

TRANSMITTER CORDS

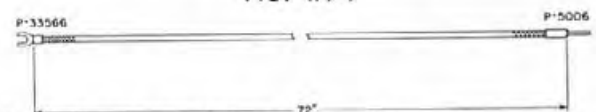
Single Conductor, Braid Covered

NO. 465-T



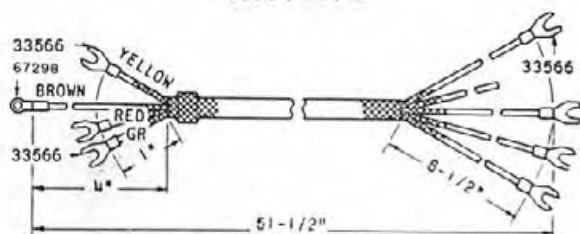
Replaces Western Electric No. 437 cord.

NO. 499-T



For Kellogg suspended type transmitter.

NO. F-734-G



Replaces No. F-455-G cord for No. 5845 telephone. Used on No. F-43-C handset.

HOW TO ORDER

In ordering cords the code number of the cord must be specified. When the length dimension of cords is shown as "Per Specification" or omitted in the listings this dimension must be specified on the order.

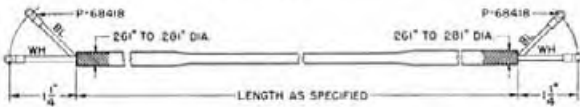
For replacement cord terminals for these cords see "Cord Terminals" on page 38.

CORDS PATCHING CORDS

Kellogg switchboard patching cords are made in a wide variety of types to meet the requirements of all telephone exchanges. These cords generally made to order to fit the exact condition of the central office equipment. They are made from one, two, or three conductor switchboard cordage of braided tinsel conductor construction. Cords can also be made up with rubber covered con-

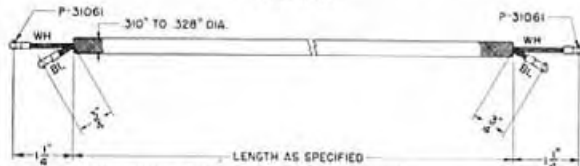
ductors. When ordering, or requesting information, on switchboard patching cords a sketch or sample of the proposed cord should be included. The code number of the plug required should also accompany the order. The most commonly used patching cords can be ordered by code number and are listed below. These cords should be ordered by code number with the desired length specified.

Two Conductor, Rubber Covered Conductors NO. 772-M.F.P.



Arranged for No. 236 plug at either end. Has white glazed cotton over-all braid.

Two Conductor, Braid Covered NO. 785



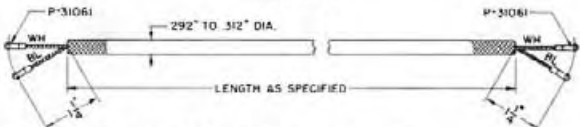
Arranged for No. 106 plug at each end.

NO. 787



Arranged for No. 42 or No. 70 plug at each end.

NO. 790

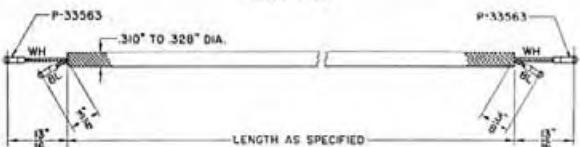


Arranged for No. 230 plug at each end.

NO. 792

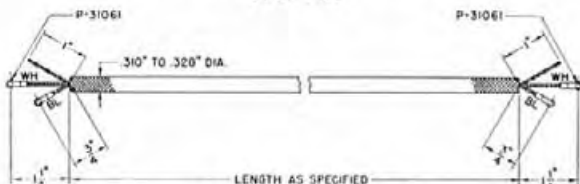
Arranged for No. 240 plug at each end. Similar to No. 793 cord shown below except for plug arrangement.

NO. 793



Arranged for No. 247 plug at each end.

Three Conductor, Braid Covered NO. 786



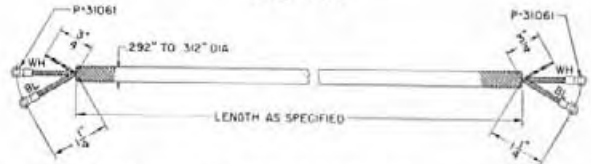
Arranged for No. 106 plug at each end.

Three Conductor, Braid Covered (Cont'd) NO. 788



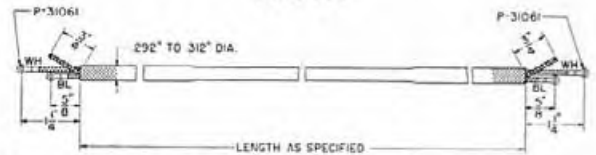
Arranged for No. 201 plug at each end.

NO. 789



Arranged for No. 230 plug at each end.

NO. 791



Arranged for No. 240 plug at each end.

NO. 794

Same as the No. 791 cord except arranged for No. 233 plug at each end.

Telephone and Switchboard Cords

The data on Kellogg telephone and switchboard cords is presented in the order shown below to simplify ordering and reference.

- | | |
|--|---|
| <p>A. Switchboard Cords.</p> <ol style="list-style-type: none"> 1. Tinsel type—two conductor. 2. Steel and tinsel type—two conductor. 3. Tinsel type—three conductor. 4. Steel and tinsel type—three conductor. <p>B. Desk Stand Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Three conductor. 3. Four conductor. 4. Five conductor. 5. Six conductor. <p>C. Operator's Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Four conductor. | <p>D. Receiver Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. <p>E. Handset Cords.</p> <ol style="list-style-type: none"> 1. Three conductor. 2. Four conductor. 3. Five conductor. <p>F. Transmitter Cords.</p> <ol style="list-style-type: none"> 1. Single conductor. <p>G. Patching Cords.</p> <ol style="list-style-type: none"> 1. Two conductor. 2. Three conductor. <p>H. Neoprene Jacketed Cords.</p> <ol style="list-style-type: none"> 1. Handset type. 2. Desk stand type. |
|--|---|

NEOPRENE JACKETED CORDS

To meet the demand for handset and desk stand cords for installations requiring long life and serviceability Kellogg is now prepared to offer the special "Telecord" neoprene jacketed, rubber covered conductor cord.

Especially designed to meet the conditions of tropical areas and for "hard service" locations, this cord will outlast the ordinary braid covered cord several times. Rubber jacketed cords long

have been used in pay stations and other locations where hard usage demands a long life cord.

The advantages of rubber jacketed cords are included in "Telecord" neoprene jacketed cords plus the additional features of smaller diameter, greater flexibility, and added resistance to abrasion, oil, and natural acids.

Construction Features of Kellogg "Telecord" Neoprene Jacketed Cords

- (a) Two tinsel ribbons are wound around a synthetic textile thread core to form a tinsel thread.
- (b) Six tinsel threads are twisted together over a textile thread to form a flexible tinsel conductor.
- (c) A cotton separator is applied over each tinsel conductor.
- (d) Conductors are then given a covering of colored rubber compound.
- (e) Conductors are then twisted together with cotton fillers to make the cord round.
- (f) Cotton binder is applied to hold conductor in position.
- (g) Over-all sheath of vulcanized neoprene applied.
- (h) Solderless terminals are then attached.

Replacements for Kellogg and Other Manufacturers' Cords

FOR KELLOGG TELEPHONES

For Kellogg No. 1000 series desk and No. 1100 series wall Masterphones using following handsets and cords:

Handset No. 46-C, No. 770 M.F.P. cord—use No. 3000 cord.
Base cords No. 769 M.F.P.—use No. 3004 cord.

For Kellogg Nos. 900 and 925 desk and Nos. 9900 and 9917 wall type Masterphones using the following handsets and cords:
Handset No. F-27-C, No. F-673-G cord—use No. 3001 cord.
Base cord No. F-640-D—use No. 3013 cord.

FOR WESTERN ELECTRIC TELEPHONES

For Nos. 250, 302, 305, and 306 desk type telephones using following handsets and cords:

Handset No. F1AW, No. H3C-9 cord—use No. 3002 cord.
Base cord No. D-3AL-9 for Nos. 302, 306 type—use No. 3006 cord.

FOR STROMBERG-CARLSON TELEPHONES

For No. 1243 desk and No. 1250 wall type telephones using following handsets and cords:

Handset No. 23, Nos. MC-3J and WC-3J cords—use No. 3002 cord.
Base cords Nos. MC-3J and WD-3J for No. 1243 desk type—use No. 3007 cord.

FOR NORTH ELECTRIC TELEPHONES

For North Electric Nos. H-400 desk and H-800 wall type telephones the No. 3002 handset cord and the No. 3006 base cord should be used.

FOR AUTOMATIC ELECTRIC TELEPHONES

For Nos. 40 desk and 50 wall type telephones using the following handsets and cords:

Handset No. 41, cord No. AH-27—use cord No. 3003.
Base cord No. AD-57 for No. 40 desk type—use No. 3007 cord.

FOR LEICH ELECTRIC TELEPHONES

For Leich Electric Nos. 601 and 605 desk or wall telephones the No. 303 handset cord and No. 3007 base cord should be used.

Table of Replacement Cords

THREE CONDUCTOR CORDS

Kellogg Cord No.	Replace With	Kellogg Cord No.	Replace With	S. C. Cord No.	Replace With
F-639-D	3015	F-641-D	3014	MC-3J	3007
F-640-D	3013			WD-3J	3007
641-D	3016			MD-3C	3012
669-D	3017			MD-3F	3012
F-673-G	3001				
F-674-D	3005				
F-686-D	3012	W.E. Co. Cord No.	Replace With	A.E. Co. Cord No.	Replace With
F-688-G	3008	H3C	3002	AH-27	3003
F-723-G	3001	D3AL	3006	AD-57	3007
F-730-D	3018				
769-M.F.P.	3004				
770-M.F.P.	3000				

FOUR CONDUCTOR CORDS

Kellogg Cord No.	Replace With	Kellogg Cord No.	Replace With
F-698-G	3011	771 M.F.P.	3020
F-731-D	3019	189-D	3022
F-734-G	3009	666-D	3023
F-735-G	3010	W.E. Co. Cord No.	Replace With
F-666-D	3021	D4U	3019
		D4N	3019
		D4S	3019

HANDSET CORDS

NO. 3000

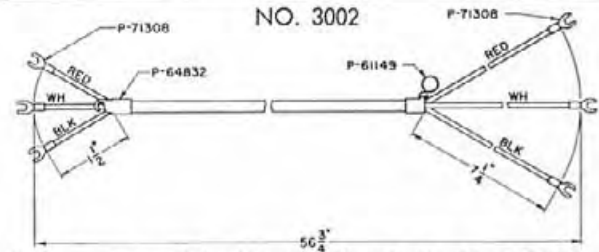
Three Conductor

Replacement cord for Kellogg No. 770-M.F.P. cord where neoprene jacketed cord is desired. Fits No. 46-C handset. This cord is similar in construction details, length of cord and conductors to the No. 770-M.F.P., a drawing of which is shown on page 31.

NO. 3001

Replacement cord for Kellogg Nos. F-673-G and F-723-G cords (shown on page 31) where neoprene jacketed cord is desired. Fits No. F-27 handset. This cord is the same in length of cord and conductors as the No. F-673-G cord, a drawing of which is shown on page 31. Conductor colors on the No. 3001 cord are black, white, and red instead of as shown on the drawing.

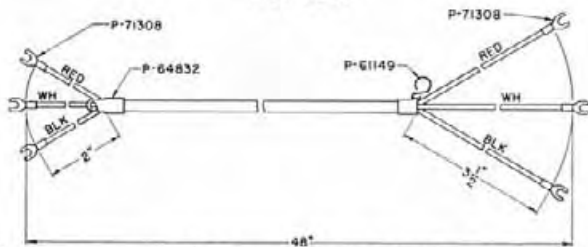
NO. 3002



Replacement cord for Western Electric Co. No. H3C, Stromberg-Carlson and North Electric Co. cords where neoprene jacketed cord is desired.

NEOPRENE JACKETED CORDS

HANDSET CORDS
Three Conductor (Cont'd)
 NO. 3003



Replacement cord for Automatic Electric Co. No. AH-27 and Leich Electric Co. cords where neoprene jacketed cord is desired.

NO. 3008

Replacement for Kellogg cord No. F-688-G (drawing shown on page 31) where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-688-G cord, a drawing of which is shown above. Conductor colors for the No. 3008 are black, white, and red.

Four Conductor
 NO. 3009

Replacement cord for Kellogg No. F-734-G cord where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-734-G cord, a drawing of which is shown on page 32. On handset end of No. 3009 cord red, white, and green conductors are each 1 1/2 inches long. The 4-inch conductor is black. On the stand end of the cord the conductors are 6 1/2 inches long.

NO. 3010

Replacement cord for Kellogg No. F-735-G cord (drawing shown on page 32) where neoprene jacketed cord is desired. This cord is similar in cord and conductor length to the No. F-735-G cord. Conductor colors are black, white, red, and green.

NO. 3011

Replacement cord for Kellogg No. F-698-G cord (drawing shown on page 32) where neoprene jacketed cord is desired. On the handset end of this cord the red, white, and green conductors are each 1 1/2 inches long, the black conductor is 4 inches long. On the plug end the black and white conductors are each 1 inch long and the red and green conductors are each 1 1/4 inch long.

DESK STAND CORDS
Three Conductor

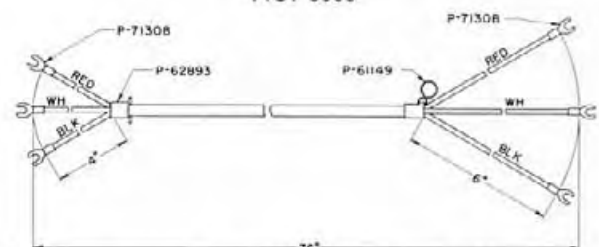
NO. 3004

Replacement cord for Kellogg No. 769-M.F.P. cord (drawing shown on page 27) where neoprene jacketed cord is desired. For Kellogg No. 1000 series Masterphones. Conductor colors are black, white, and red.

NO. 3005

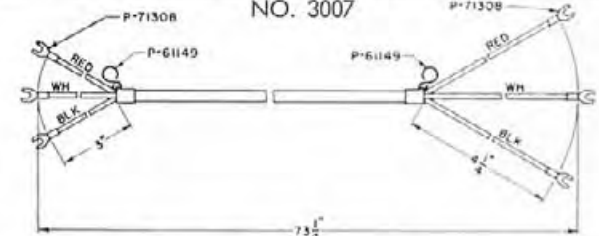
Replacement cord for Kellogg No. F-674-D cord (drawing shown on page 27) and Stromberg-Carlson cords where neoprene jacketed cords are desired. On the desk stand end of the cord the conductors, black, white, and red, are each 6 1/2 inches long. On the connector end the conductors are each 4 inches long.

DESK STAND CORDS
Three Conductor (Cont'd)
 NO. 3006



Replacement cord for Western Electric Co. No. D3AL and North Electric Co. cords where neoprene jacketed cord is desired.

NO. 3007



Replacement cord for Automatic Electric Co. No. AD-57 Leich Electric Co., and Stromberg-Carlson Co. MC-3J and WD-3J cords where neoprene jacketed cord is desired.

NO. 3012

Replacement cord for Kellogg No. F-686-D cord (drawing shown on page 27), Stromberg-Carlson Co. No. MD-3C and MD-3F cords where neoprene jacketed cord is desired. This cord is the same as the No. 3005 shown above except the over-all length is 82 1/2 inches.

NO. 3013

Replacement cord for Kellogg No. F-640-D cord (drawing shown on page 26) where neoprene jacketed cord is desired. Same as the No. 3005 cord except conductors at the stand end of the cord are 4 inches long.

NO. 3014

Replacement cord for Kellogg No. F-641-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. Same as the No. 3005 cord shown above except at the desk stand end of the cord the conductors are each 2 inches long.

NO. 3015

Replacement for Kellogg No. F-639-D cord (drawing shown on page 26) where neoprene jacketed cord is desired. Similar in length of cord and conductors to the No. F-639-D cord, a drawing of which is shown above. Conductor colors are black, white, and red.

NO. 3016

Replacement cord for Kellogg No. 641-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. This cord is the same as the No. 3014 cord except for the type of terminals used. (No. 5006 terminals used.)

NO. 3017

Replacement cord for Kellogg No. 669-D cord (drawing shown on page 27) where neoprene jacketed cord is desired. This cord is the same as the No. 3013 except for the type terminals on the stand end.

NEOPRENE JACKETED CORDS DESK STAND CORDS Three Conductor (Cont'd)

NO. 3018

Replacement cord for Kellogg No. F-730-D cord (drawing shown on page 29) where neoprene jacketed cord is desired. This cord is the same as the No. F-730-D cord, a drawing of which is shown on page 29, except conductor colors are black, white, and red.

Four Conductor

NO. 3019

Replacement cord for Kellogg No. F-731-D, Western Electric Nos. D4U, D4N, and D4S cords where neoprene jacketed cord is desired. This cord is the same as the No. F-731-D cord, a drawing of which is shown on page 30, except conductor colors are black, white, red, and green.

NO. 3020

Replacement cord for Kellogg No. 771-M.F.P. cord where neoprene jacketed cord is desired. This cord is similar to the No. 771-M.F.P. cord, a drawing of which is shown on page 30.

NO. 3021

Replacement cord for Kellogg No. F-666-D cord where neoprene jacketed cord is desired. This cord is similar in length of cord and conductors to the No. F-666-D cord, a drawing of which is shown on page 30, but conductor colors are black, white, red, and green.

NO. 3022

Replacement cord for Kellogg No. 189-D cord (drawing shown on page 29) where neoprene jacketed cord is desired. This cord is the same as the No. 3021 cord except for the type of terminals used. (No. 5006 terminal used on connector end.)

NO. 3023

Replacement cord for Kellogg No. 666-D (drawing shown on page 30) where neoprene jacketed cord is desired. This cord is the same as the No. 3021 cord except for the type of terminals used. (No. 5006 terminals are used on each end.)

Cord Fasteners



NO. 4



NO. 5



NO. 6

All are made of brass with hot tinned finish.

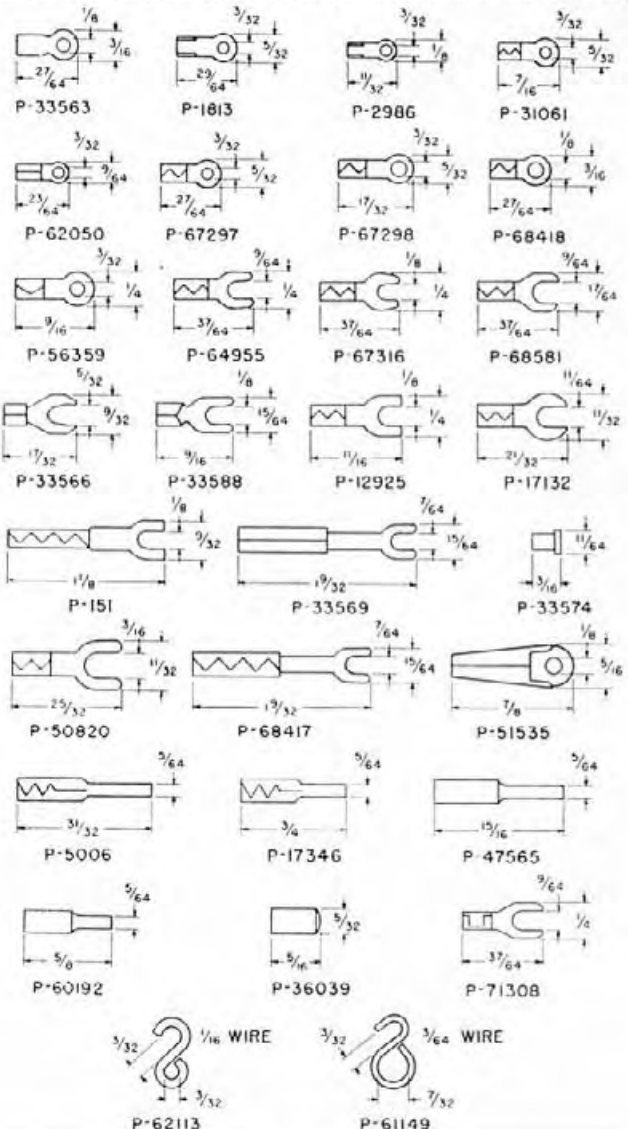
NO. 9 CORD WEIGHT



The No. 9 cord weight is the standard weight for promptly restoring switchboard cords to their proper position after use. Weight from 9 to 11 ounces, this cord weight will perform its task quickly yet will not damage the cord. The steel casing is given a rustproof treatment before being filled with lead to add weight. Dimensions: 4 inches long; 1-23/32 inches wide, and 1/2 inch thick.

CORD TERMINALS

The drawing below includes all the terminals regularly used on Kellogg equipment. Terminals should be ordered by code number. When code numbers are not known they may be determined by comparing the desired terminal with the drawing.



CUSHIONS, PLUG

These cushions fit snugly around the switchboard cord just below the plug and absorb the shock when the plug is returned to the plug seat. This cushioning protects both the plug and the cord from damage and excess wear.

Plug cushions are made of anti-oxidant rubber in sizes to fit all standard cords. Installed with the use of Kellogg Tools Nos. 101 for No. 1-A cushion, and 102 for No. 2-A cushion, small, cone-shaped brass tools which fit over the plug end providing a smooth, sloping surface over which the rubber cushion slides into position. See Tools for details on these installing tools.

Code No.	Description
1-A	11/32-in. outside diam., 1/8-in. inside diam., 1/8-in. thick
2-A	9/32-in. outside diam., 3/32-in. inside diam., 1/8-in. thick

DIALS



Kellogg dials are available with three types of number plates depending upon the application of the dial. A suffix letter "D" after the code number denotes that a standard number plate is supplied, numbered from 1 to 0. When a metropolitan dial is required

which has a number plate with both letters and numbers, a suffix letter "G" is listed after the code number. A number plate is available on the No. 10 type dial having numbers 1 to 0 with the word "Operator" faced on the plate along with the "0" digit. This number plate has a suffix "DO" after the code number.

A schematic diagram of each of the codes together with the suffix letters designating the number plates available with the respective dial codes is shown below. For tools used on dials see tools Nos. 3-86 and 92 under Tools, Switchboard.



TYPE D



TYPE DO



TYPE G

Code No. Wiring Diagram

Type No. Plate

TELEPHONE TYPE

- 10-D Fig. A
- 10-G Fig. A
- 10-DO Fig. A

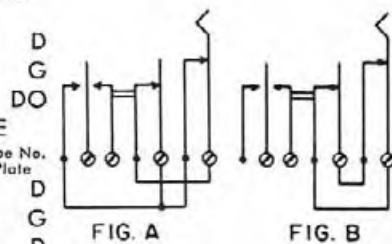


FIG. A

FIG. B

SWITCHBOARD TYPE

- Code No. Wiring Diagram
- 12-D Fig. B
- 12-G Fig. B
- 13-D Fig. B
- 13-G Fig. B

Type No. Plate

- D
- G
- DO
- D
- G

DROPS, CLEAR OUT



Kellogg drops are adjusted for positive, sensitive operation. Drops are supplied without mountings and without coils unless these parts are ordered with the drop. It is necessary to include the code number of both the mounting and the coil desired when ordering. Drop coil mountings are listed under "Mountings" and coils are listed below.

Code No.	Fits Mounting	Description
NIGHT AND CODE ALARM TYPE CONTACTS		
60	496-508-509	Regular night alarm and code night alarm contacts. Replaces No. 50.
NIGHT ALARM TYPE CONTACTS		
70	494-504-505	Regular night alarm contacts only.
	506-507-510	Replaces No. 51.

DROP COILS

These coils are designed for use with Kellogg clear out drops Nos. 60 and 70. They are wound to different resistances to meet varying line and switchboard conditions.

Code No.	Resistance (ohms)
DC	1000
DE	500
DS	2500

DROPS AND JACKS, COMBINED



The combined drop and jack is used as a line signal on rural and toll lines on manual type switchboards. The drop is sensitive and provides a clear signal for incoming calls. The drop shutter is mechanically restored when the switchboard plug is inserted to answer the call.

Coils and mountings are not furnished unless ordered. Coils of the proper resistance may be selected from the list of coils shown under "Coils, Drop and Jack." Mountings must be ordered separately and the code number and number of units to be mounted on each mounting strip specified with the order. Drops and jacks, combined, ordinarily are supplied unnumbered but number plates can be supplied if specified.

These drops and jacks, combined, will fit mountings Nos. 495, 497, 498, 499, 500, 502, 503, and 552.

TWO CONDUCTOR TYPE

Code No.	Fits Plug Code No.	Description
500	130	Regular night alarm contact on spring jack.
	247	Has break contact on tip conductor. W.E. No. 47 Replaces No. 303.
502	42	Regular night alarm contact on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on both tip and sleeve conductors. Replaces No. 103.
506	42	Regular night alarm contact on spring jack. Provides 1-local make contact. Double "cut-off" contacts (for toll line use). Has break contact on tip conductor, break and make contact on sleeve conductor. Replaces No. 113.
508	42	Regular night alarm contact on spring jack. Code night alarm contact on armature. Has break contact on tip conductor. Replaces No. 300.
509	42	Regular night alarm contacts on spring jack. Has break contact on tip conductor. Replaces No. 301.
513	42	Has 1-local break and make set of springs. Regular night alarm contacts on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on tip conductor, one break and one break and make on sleeve conductor.

DROPS AND JACKS, COMBINED (Cont'd)

THREE CONDUCTOR TYPE

Code No.	Fits Plug Code No.	Description
503	106	Regular night alarm contacts on spring jack. Has break contact on ring conductor. Replaces No. 105.
504	106	Regular night alarm contact on spring jack. Code night alarm contact on armature. Double "cut-off" contacts (for toll use). Has break contact on tip and ring conductors.
505	106	Regular night alarm contact on spring jack. Double "cut-off" contacts (for toll line use). Has break contact on both tip and ring conductors.

DROP AND JACK COILS

These coils are designed for use with all types of Kellogg combined drops and jacks. They are wound to different resistance values to meet varying line and switchboard conditions. Coils should be ordered by code number.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
DJ-A	100	DJ-E	500
DJ-C	1000	DJ-S	2500

DROP AND RINGER, COMBINED

The combined ringer and drop is used where a bell signal is required in addition to the visual drop signal. See "Mountings" for typical illustration.

The gongs on these No. 3 type ringers and drops are 1-13/32 inches in diameter, made of brass with a polished nickel plating. The drop shutter is operated by the action of the ringer armature but must be manually restored. These combined ringers and drops are available in different resistances in accordance with the listings below. Code numbers should be given when ordering.

The spring jack and mounting used with this item are not included and must be ordered separately.

Code No.	Resistance (ohms)	Code No.	Resistance (ohms)
3-A	1000	3-E	2500
3-D	1600		

EXTENSION SHAFTS, GENERATOR

SWITCHBOARD TYPE



These generator extension shafts are designed to fit the P-15911 generator crank that is standard on all Kellogg switchboard operators type generators.

Code No.	Over-all Length	Code No.	Over-all Length
9	24 inches	14	12 1/4 inches
13	19 1/2 inches	17	20 1/8 inches

ESCUTCHEONS, KEY

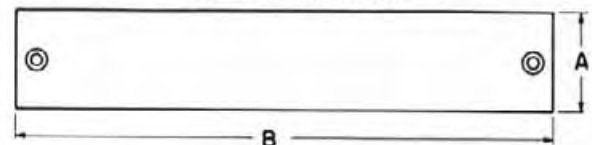
These key escutcheons are made of brass with a heavy black enamel finish. Those escutcheons listed below are those most in use and are carried in stock at the factory. The sales department will be glad to consult on any size not listed or for any special requirements. Mounting screws are not furnished unless specified with the order.

Key Blanks (Dummy Plugs)

This key blank is used on a blank position of the escutcheon for a No. 1000 type key. It is made of cold rolled steel finished in black enamel to match the key escutcheon. Four screws and nuts are supplied for assembly of the blank to the escutcheon. Size of blank is 1-1/64 inches long and 3/4 inch wide.

Code No.	Description
142	Key Blank

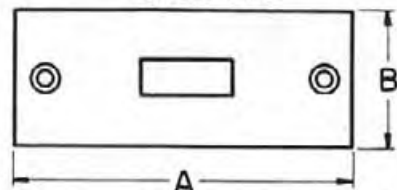
Blank Escutcheons



Code No.	Dimensions (Inches)	
	A	B
281	1/2	4
245	3/4	4
224	1	4
225	1-1/16	4
256	1-9/32	4
264	1/2	5 1/2
309	5/8	5 1/2
258	3/4	5 1/2
250	13/16	5 1/2
268	1	5 1/2
276	1-1/16	5 1/2
241	1 1/8	5 1/2
274	1-5/32	5 1/2
261	1-9/32	5 1/2
263	1/2	7-3/16
279	13/16	7-3/16
262	1	7-3/16
277	1-1/16	7-3/16
255	1 1/8	7-3/16
273	1-5/32	7-3/16

Cam Key Escutcheons

SINGLE TYPE

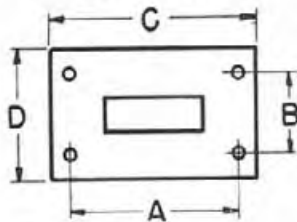


Code No.	Dimensions (Inches)	
	A	B
1053	2 1/2	3/4
1054	2 1/2	13/16
1055	2 1/2	7/8
1021	2 1/2	1
1069	4	3/4

ESCUTCHEONS, KEY

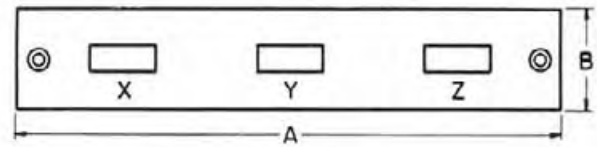
Cam Key Escutcheons (Cont'd)

SPECIAL SINGLE TYPE



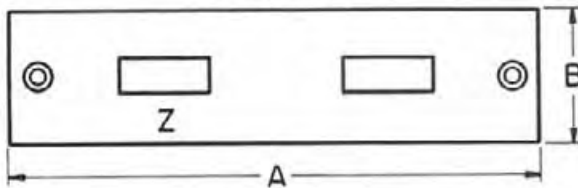
Code No.	C	Dimensions (Inches)		B	Remarks
		D	A		
1022	1 5/8	15/16	1-5/16	5/8	For Mounting 1000 Type Key to Panel

TRIPLE TYPE



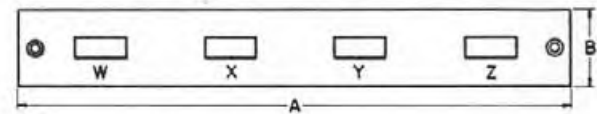
Code No.	Length Overall (Inches)	Width Overall (Inches)	Remarks
1113	5 1/2	3/4	
1040	5 1/2	3/4	Less Hole "Y"
1076	5 1/2	3/4	Less Hole "Z"
1078	5 1/2	3/4	Less Holes "Y" & "Z"
1014	5 1/2	13/16	
1074	5 1/2	1	
1041	5 1/2	1	Less Hole "Y"
1077	5 1/2	1	Less Hole "Z"
1075	5 1/2	1	Less Holes "Y" & "Z"
1080	5 1/2	1-1/16	Less Holes "Y" & "Z"
1000	5 1/2	1 1/8	
1002	5 1/2	1 1/8	Less Hole "Y"
1004	5 1/2	1 1/8	Less Hole "Z"
1001	5 1/2	1 1/8	Less Holes "Y" & "Z"
1043	5 1/2	1-3/16	Less Hole "Z"
1030	5 1/2	1-9/32	
1065	5 1/2	1-9/32	Less Hole "Z"

DOUBLE TYPE



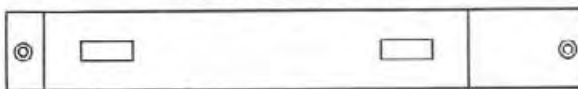
Code No.	Dimensions (Inches)		Remarks
	A	B	
1070	4	3/4	L
1015	4	13/16	
1016	4	13/16	Less Hole "Z"
1013	4	1	
1011	4	1	Less Hole "Z"
1094	4	1-1/16	
1085	4	1 1/8	
1012	4	1-3/16	
1010	4	1-3/16	Less Hole "Z"
1026	4	1-9/32	

QUADRUPLE TYPE



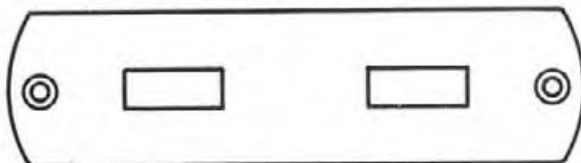
Code No.	Dimensions (Inches)		Remarks
	A	B	
1051	7-3/16	13/16	
1110	7-3/16	1	
1036	7-3/16	1	Less Hole "W"
1032	7-3/16	1	Less Holes "W" & "X"
1037	7-3/16	1	Less Holes "X", "Y" & "W"
1007	7-3/16	1 1/8	
1109	7-3/16	1 1/8	Less Holes "W" & "X"

SPECIAL DOUBLE TYPE



Code No.	Length Overall (Inches)	Width Overall (Inches)
1049	7-21/64	27/32

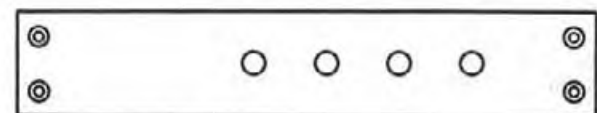
FOR MILLER TYPE KEYS



Will not mount 1000 type keys.

Code No.	Length Overall (Inches)	Width Overall (Inches)
303	3 5/8	3/4

FOR OLD STYLE FOUR PARTY KEYS (190 TYPES)

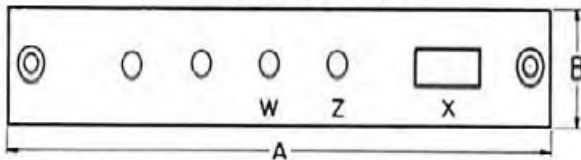


Made of polished hard rubber.

Code No.	Length Overall (Inches)	Width Overall (Inches)	Remarks
202	5 1/2	1-1/16	Includes 8 screws for mounting purposes

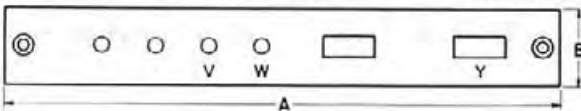
ESCUTCHEONS, KEY

Cam Key Escutcheons (Cont'd) FOR FOUR PARTY KEYS



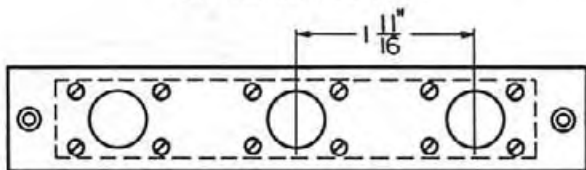
With or Without Hole for Mounting 1000 Type Cam Keys.

Code No.	Dimensions (Inches)		Remarks
	A	B	
1027	5½	¾	
1028	5½	¾	Less Hole "X"
1096	5½	7/8	
1097	5½	7/8	Less Hole "X"
1089	5½	15/16	Less Hole "X"
1039	5½	1	
1038	5½	1-1/16	
1005	5½	1 1/8	
1006	5½	1 1/8	Less Hole "X"



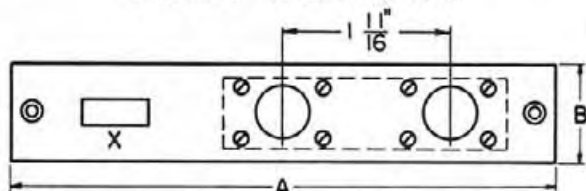
Code No.	Dimensions (Inches)		Remarks
	A	B	
1114	7-3/16	1	Less Hole "Y"
1033	7-3/16	1	
1008	7-3/16	1 1/8	
1009	7-3/16	1 1/8	Less Hole "Y"
1111	7-3/16	1 1/8	Less Holes "V" & "W" (for 2 Pty. Key)

FOR ORDER WIRE KEYS



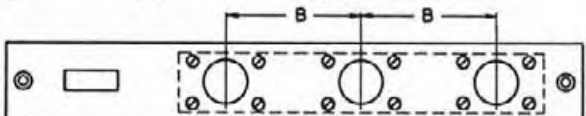
Code No.	Length Overall (Inches)	Width Overall (Inches)
1083	5½	1

FOR TWO ORDER WIRE KEYS



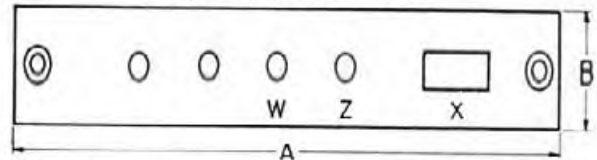
With or Without Hole for Mounting 1000 Type Cam Keys.

Code No.	Dimensions (Inches)			Description
	A	B	"B" Dim.	
1098	7-3/16	¾	1-11/16	Less Hole "X"
1101	5½	1	1-11/16	



Code No.	Length Overall (Inches)	Width Overall (Inches)	"B" Dim. (Inches)
1102	7-3/16	¾	1-11/16

Cam Key Escutcheons (Cont'd) FOR TWO PARTY KEYS



With or Without Hole for Mounting 1000 Type Cam Key.

Code No.	Dimensions (Inches)		Description
	A	B	
1050	5½	7/8	Less Holes "Z" & "W" for 319 key
1064	5½	1	Less Holes "X", "W" & "Z"

Code No.	Length Overall (Inches)	Width Overall (Inches)
1062	7-3/16	1

FILTERS, NO. 4-A NOISE

The No. 4-A noise filter is used on all Relaymatic switchboards equipped for harmonic ringing. Consists of one No. 41-B retard coil and two P-70717 condensers mounted on one P-70716 panel.

GENERATORS



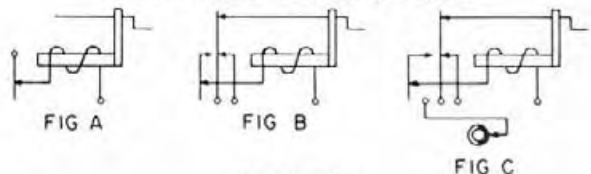
NO. 53

Kellogg generators are constructed to give long, dependable service under all conditions. The generator armatures are wound with specially insulated wire and vacuum varnish impregnated to provide the best possible protection against breakdown and to provide long

life. The magnets of these generators are made of 3½% chrome steel to insure the magnetic strength will be retained at near peak levels. Gears for these generators are accurately cut to insure quiet and smooth operation.

The 3-bar generator will ring fifty 2500 ohm bells through 1500 ohms resistance and five 2500 ohm bells through 19,000 ohms resistance. The 5-bar generator is designed for extra heavily loaded lines with an output approximately 50% greater than that of the 3-bar generator. The 6-bar generator is a special purpose generator for extra heavily loaded lines.

Switchboard Operators Type*

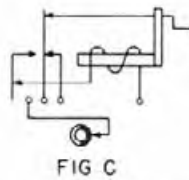
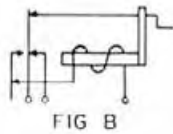


4-BAR TYPE				Overall Dimensions (Inches)		
Code No.	No. Bars	Min. Output 1500 Ohm Load	Circuit	Length	Width	Height
11	4	70 volts	Fig. A	6½	4	5¾
5-BAR TYPE				Overall Dimensions (Inches)		
63**	5	80 volts	Fig. A	6½	4	8¼
72	5	80 volts	Fig. A	6½	4	5½

*For extension shafts for these generators see Extension Shafts, Generators.

**Has inverted gear wheels.

GENERATORS (Cont'd)
Telephone Type



3-BAR TYPE

Code No.	No. Bars	Min. Output 1500 Ohm Load	Circuit	Overall Length	Dimensions (Inches) Width	Height
15*	3	65 volts	Fig. B	5½	4	5¾

5-BAR TYPE

53*	5	80 volts	Fig. B	6½	4	5¾
59**	5	80 volts	Fig. C	6¾	4	5¾
86*	5	80 volts	Fig. B	6½	4	5¾

6-BAR TYPE

75*	6	125 volts	Fig. B	7½	4	5¾
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MINIATURE TYPE

GN-38-B 3***	60 volts	Fig. B	4	2¾	3-7/64	
--------------	----------	--------	---	----	--------	--

*A. C. type.
**Pulsating and A. C. type.
***Solid field poles equivalent to 3 bars (has Alnico magnet).

HANDSETS

Kellogg handsets are manufactured in two basic types, a bakelite housing type used on all standard Kellogg telephones, and a metal housing type applicable to all installations where space is an important factor.

Both handset types have the special Kellogg Non-Positional transmitter and bi-polar type receivers using cobalt magnets. In all except the Nos. 44-C and TS-9 handsets, bakelite type units have two brass bars molded into the bakelite handle which serve as conductors to the receiver and also reinforce the handle.

Clip connections, requiring no screws or other type terminals, are used on all Kellogg handsets except the metal type. Metal type handsets are provided with screw connections on the transmitter.

These handsets are furnished with cords attached. The cord supplied with each handset is listed with the code number of the handset.

Bakelite Type Handsets

THREE CONDUCTOR—COMMON BATTERY



NO. F-27-C



NO. 46-C

Code No.	Cord Code No.	Description
F-27-C	F-673-G	For Nos. 700, 900, and 925 desk Masterphones and Nos. 5800, 9700, and 9900 type telephones.
F-35-EC	F-727-G	For Nos. 4910 and 4902 weather-proof telephones.
46-C	770-M.F.P.	Standard for 1000 ser. Masterphones.
47-C	1000	For 1000 series Masterphone, has Koiled Kord.

HANDSETS

Bakelite Type Handsets (Cont'd)

THREE CONDUCTOR—LOCAL BATTERY

Code No.	Cord Code No.	Description
F-27-L	F-673-G	Special for increased transmission of local battery sets. Same in appearance as the F-27-C Handset.
53-L	1000	For Nos. 1042-BB-K and 1142-BB-K telephones. Similar in appearance to the 46-C except has Koiled Kord.

FOUR CONDUCTOR—COMMON BATTERY

F-39-C	F-698-G	Cord fits No. 145 operator's plug.
F-40-C	F-699-G	For conversion of local battery wall telephones.
F-43-C	F-734-G	For No. 5845 telephone.

Metal Type Handsets

THREE CONDUCTOR—COMMON BATTERY



Code No.	Cord Code No.	Description
32-C	F-688-G	For Nos. 3000, 3001, and 3002 telephones.

THREE CONDUCTOR—LOCAL BATTERY

32-L	F-688-G	Special for increased transmission in local battery sets.
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Special Type Handsets



Each of these handsets has a switch built into the handle for "press to talk" or other types of operation.

THREE CONDUCTOR—COMMON BATTERY

Code No.	Cord Code No.	Description
TS-9	CC-333	For EE-8 telephone.

FOUR CONDUCTOR—COMMON BATTERY

44-C	F-735-G	For No. 3025 telephone.
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FOUR CONDUCTOR—LOCAL BATTERY

F-44-L	F-735-G	For No. 3025 telephone.
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FIVE CONDUCTOR—COMMON BATTERY

51-C	1001	For side mounting telephone. Has push button switch, Koiled Kord.
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Supplies—Pole line hardware, poles, tools, etc.—are shown in Section II of this catalog.

Piece Parts—Replacement parts for Kellogg equipment are shown in Section III of this catalog.

HEAD BANDS



Kellogg head bands are manufactured in two types, a flat steel type band with a leather cover and a round wire type with or without a fabric cover. These head bands are supplied less receivers. If receiver is desired receiver code number must be specified when ordering. For receivers used with these head bands see Receivers.

FLAT STEEL TYPE—HINGED RECEIVER

Code No.	Construction	Receivers Required	Code No. Receiver
2	Spring steel, leather cover	1	Nos. 14-46 or 80

ROUND WIRE TYPE—SWIVEL WITH YOKE

12	Round wire, no cover	1	No. 65-A
14	Round wire, no cover	1	Nos. R-14, 85, or 87
15	Round wire, fabric cover	2	Nos. R-14, 85, or 87

HEAD AND CHEST SETS, OPERATOR'S



Kellogg operator's head and chest sets use the same transmitter, receiver, and headband on each of the codes listed below. These sets differ, however, in the cord and plug used on the various codes. For detailed information on the component parts of these sets see the listings under the components elsewhere in this section.

COMMON BATTERY

Code No.	Transmitter	Receiver	Head Band	Cord	Plug
1-C	178-C	87-A	14	743-0	139
2-C	178-C	87-A	14	713-0	182
3-C	178-C	87-A	14	711-0	145

LOCAL BATTERY

Code No.	Transmitter	Receiver	Head Band	Cord	Op'r's Plug
1-L	178-L	87-A	14	743-0	139
2-L	178-L	87-A	14	713-0	182
3-L	178-L	87-A	14	711-0	145

**HOOK SWITCH STOP
(BATTERY SAVER)**



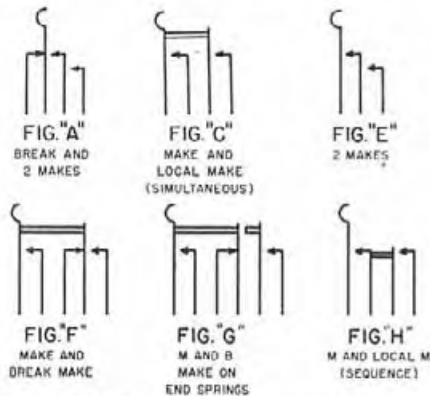
The Kellogg No. 1 hook switch stop is a battery saver lever for use on magneto party lines. The lever stops the receiver hook after it has closed the receiver contact, but before the battery contact has been closed. This permits a check on the line to see if it is busy without putting any drain on the batteries. Pressing the lever releases the receiver contact and closes the battery contact to permit conversation.

releases the receiver contact and closes the battery contact to permit conversation.

HOOK SWITCHES

Kellogg hook switches are sturdy and compact. They are divided into two main classes; for regular hand receivers and for handsets. Each of these two classes is available with different mounting details. The following charts are made up in accordance with the mounting details and lever type. Order standard hook switches by code number.

Spring combinations for hook switches are shown in the drawing below. These drawings are referred to in the listings for each hook switch by the letter assigned to the schematic spring combination drawing.



HAND RECEIVER TYPES

No. 47—Side Mounting Lug Type

The No. 47 hook switch is used on No. 1016 test set and for No. 14-A receivers. It has solder type terminals. Contact spring arrangement is one break and two makes as shown in Figure "A" above. The switch hook consists of one P-64656 and one P-5935. This hook switch is of the side mounting lug type with short lever.

Wall Side Mounting Type—With Escutcheon



These hook switches are of the wall side mounting type, with escutcheon, and short lever. They are for wood sets. All these hook switches have solder type terminals.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
99	P-46811	A	No. F-41-A	No. F-2869 telephone
103	P-46811	E	No. 41-A	Standard for local battery wood type telephones
109	P-31011	E	No. 80 Rec. No. 2 Head Band	No. F-2870 and F-2945 telephones
129	P-46811	H	No. F-41-A	No. 4800 type telephone
156	P-46811	E	No. F-41-A	No. 4885 telephone
163	P-46811	C	No. F-41-A	No. 6886 telephone

Wall Side Mounting Type—Less Escutcheon

These hook switches are of the wall side mounting type, furnished less escutcheons. They have the short lever type switch hook.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
159	P-27871	E	No. 81-A	Nos. 4883 and 4888 telephones
178	P-46811	F	No. 41-A	No. 4901-A telephone

HOOK SWITCHES
HAND RECEIVER TYPES (Cont'd)
Wall Back Mounting Type

These hook switches are of the wall back mounting type and are furnished without escutcheon. They have an extra wall bracket and are for steel sets.

Code No.	Hook Pc. No.	Spring Contacts	Receiver Type	Used On
113*	P-46811	E	No. 41-A	Common battery hotel sets
145*	P-46811	C	No. 41-A	No. F-803 type telephone
171†	P-46811	F	No. 41-A	No. F-817 type telephone

*Solder type terminals.

†Two screw type terminals and three terminals with flexible leads (soldered).

HANDSET TYPE

Wall Side Mounting Type—With Escutcheon

These hook switches are of the wall side mounting type, furnished with escutcheon and short lever for wood sets. These hook switches have screw type terminals.

Code No.	Hook Pc. No.	Spring Contacts	Used On
155	P-56280	C	No. 3800 type obsolete sets
165	P-56280	C	No. 5800 type local battery telephones

Wall Back Mounting Type

This hook switch is of the wall side mounting type, furnished less escutcheon and with extra wall bracket. It is for the No. 9817 telephone. It has switch hook No. P-56280, spring combination "F," and equipped with two screw type terminals and three terminals with flexible leads (soldered). Code No. 157.

Wall Side Mounting Type—Less Escutcheon

These hook switches are of the wall side mounting type and are furnished less escutcheons. They are of the short lever type. All are equipped with switch hook piece No. P-56280.

No. Code	Spring Contacts	Used On	Description
154	C	No. F-9700 Extension telephone	Replaces No. 98 hook switch. Has screw type terminals.
158	F	No. 9710 Extension telephone	Has two screw type terminals and three terminals with flexible leads (soldered).
164	F	Nos. 9720, 9735, 9736, 9740, 9741 telephones	Solder type terminals.
168	C	No. 9837 telephone	Same as No. 154 except terminals designation. Screw type terminals.
169	C	No. 9830 telephone	Solder type terminals.
170	F	Nos. 4900 and 4902 telephones	With spec. wires P-60077, 60078, and 60079 soldered to terminals.
174	G	No. 9721 telephone	Solder type terminals.
179	F	Nos. 9750 and 9751 telephones	Same as No. 164 but has screw terminals on outside spring.

HOWLERS

No. 2-B—Exchange Type

The No. 2-B howler is used in the exchange to signal subscribers who have left receivers off the hook by causing the receiver to howl. Consists of one No. 24 condenser, one No. 35-A induction coil, one No. 226 condenser, four No. 11 binding posts, one No. 4-J resistance coil mounted on one P-64779 wood base measuring 8½ by 6⅞ inches.

No. 5-A—Signalling Type



The No. 5-A howler is used with composite telephone lines for signalling purposes. Consists of a heavy adjustable unit, wound to 1700 ohms and mounted in an oak cabinet. Dimensions of base 5⅞ by 6 inches. Overall length, including horn, 9 inches.

INTER-COMMUNICATION SYSTEMS

Kellogg inter-communication systems are available in two types, non-attendant and attendant types.

NON-ATTENDANT, Key-BX systems are for use where the primary consideration is a maximum number of trunks to the telephone company main exchange, and one or two inter-communication circuits between individuals are incidental to the system. In this system each individual is his own attendant, and each individual in the system may answer, hold, and transfer all incoming trunk calls.

ATTENDANT type systems are for use where the primary consideration is maximum inter-communication between individuals within an organization and where one or more trunks to the telephone company main exchange are incidental to the system. In this system one individual at a centrally located attendant station is required to answer, hold, and transfer all incoming trunk calls.

NON-ATTENDANT, KEY-BX SYSTEMS

Kellogg non-attendant type inter-communication systems provide up to 20 stations and as many as 6 trunk circuits and one or two inter-communication circuits. This system is designed to provide business establishments with a specialized telephone system within the organization.

This system eliminates the necessity of floor type or cordless PBX switchboards requiring an attendant to handle outgoing, incoming, and inter-communication calls. No special attendant is required with the Key-BX system. Each individual is his own attendant and has access to all incoming and outgoing trunks, and can call any individual in the organization connected to the Key-BX system.

This equipment permits one to six trunks to a common battery manual or dial exchange; up to 20 telephone stations within the business office or building; and one or two inter-communication circuits for talking between individuals, or for conference calls between several individuals.

INTER-COMMUNICATION SYSTEMS (Cont'd)

NON ATTENDANT, KEY-BX SYSTEMS (Cont'd)



Operating Features of the Key-BX System

TRUNKS

1. Associated with each trunk is an individual push button type answer key. Trunk keys are numbered for designation purposes.
2. The trunk lamp associated with each trunk is a "line" lamp while flashing and a "busy" lamp when burning steadily.
3. A cam type hold key is provided which is arranged to hold any trunk call that has been answered.
4. For receiving incoming trunk signals an audible signal (chime or extension bell) can be furnished. This signal can be installed individual to each trunk or common to all trunks.
5. All trunk circuits multiple through all key boxes in the system.
6. Any station in the system can answer, hold, and transfer a trunk call.
7. Conference connections may be arranged by any station calling any other station and requesting them to connect with any trunk circuit which is to be used for the conference.

INTER-COMMUNICATION

1. Associated with each inter-communication circuit is an individual push button type answer key. Each key is numbered for designation purposes.
2. The inter-communication lamp is a "busy" lamp only. When the inter-communication circuit is in use this lamp burns steadily. It does not "flash" as does the trunk lamp.
3. All inter-communication circuits multiple through all key boxes in the system.
4. Conference connections may be arranged between lines by requesting each station to connect with any inter-communication circuit which is to be used for the conference.
5. A buzzer is provided in the key box for receiving incoming signals from other lines in the system.

LINES

1. Any telephone with a standard talking circuit may be used at each station.
2. Push button keys are furnished which provide selective ringing for all stations.
3. All line circuits multiple through all key boxes in the system.

Equipment for Key-BX Systems

Four types of Key-BX systems are available, differing in the total number of stations and the arrangement of the trunks and inter-communication circuits. These systems are listed below:

1. The 6-2-20 system: provides 6 trunks to a common battery manual or dial exchange, 2 inter-communication circuits and 20 stations.
2. The 6-2-10 system: provides 6 trunks to a common battery manual or dial exchange, 2 inter-communication circuits and 10 stations. Can be expanded to 20 station type.
3. The 3-1-10 system provides 3 trunks to a common battery manual or dial exchange, 1 inter-communication circuit, and 10 stations.
4. The 2-2-10 system: provides 2 trunks to a common battery manual or dial exchange, 2 inter-communication circuits, and 10 stations.

Key Boxes For the 6-2-10 system the No. 18M key box is required. For the 6-2-20 system the No. 19M key box. For the 3-1-10 system the No. 20M box. For the 2-2-10 system the No. 22M key box. Standard cabinet is metal having a black wrinkle finish. For special applications a wood cabinet can be provided. Standard wood finish is mahogany. Other, special, wood finishes can be furnished on request.

Relay Equipment Cabinet Two relay cabinets are used with these systems, the No. 25-A and 25-B. For the 6-2-10 and 6-2-20 systems the No. 25-A cabinet is required, wired for 6 trunks and 2 inter-communication circuits. For the 3-1-10 and 2-2-10 systems the No. 25-B relay cabinet is required, wired for 3 trunks and 2 inter-communication circuits.

Power Equipment The No. RFR-1027 Raytheon Rectifier can be furnished to supply the 24 volt, 0.5 ampere D.C. and A.C. power requirements of the Key-BX system from commercial power sources.

Cable For the 6-2-10 system Kellogg No. 147-L lead covered switchboard cable can be furnished. Kellogg No. 168-L, 32 pair lead covered switchboard cable can be furnished for all stations of the 6-2-20 system. For the 3-1-10 and the 2-2-10 system Kellogg No. 144-L, 16 pair lead covered cable can be furnished.

Junction Boxes Key-BX system requires No. 490-5426 junction boxes.

Audible Tone Signals An extension bell or a chime can be provided for mounting in a central location in the office or room in which the Key-BX system is in operation to call attention to an incoming trunk flashing lamp signal. Either a No. F-605-DA extension bell common to all incoming trunks or one No. N-11, 24 volt, D.C. single tone chime common to all incoming trunks can be provided. These systems can be provided with an extension bell or chime for each individual trunk if desired.

Telephones Standard Kellogg No. 1000 series Masterphones may be used with the Key-BX system. The buzzer signal provided in each key box eliminates the need for a telephone with ringer and "less ringer" type instruments are shown below. When the main exchange is common battery dial one No. D-1000-LR desk type or one No. D-1100-LR wall type Masterphone is required for each key box in the system. For dial equipment if a dial with both digits and letters is desired "with No. 10-G dial" should be specified after the code number of each telephone. For manual service the No. 1000-LR desk or No. 1100-LR wall Masterphone can be furnished.

INTER-COMMUNICATION SYSTEMS (Cont'd)

NON-ATTENDANT, KEY-BX SYSTEMS (Cont'd)

Ordering Information

Determine your requirements for Kellogg non-attendant type, Key-BX, inter-communication systems from the following chart. Kellogg will quote prices and delivery of this equipment based upon your specific requirements.

KEY-BX BOXES	No. 18M	No. 19M	No. 20M	No. 22M
Trunks to Exchange	6	6	3	2
Inter-com. circuits	2	2	1	2
Stations	10	20	10	10
RELAY CABINETS	No. 25-A	No. 25-A	No. 25-B	No. 25-B
POWER EQUIPMENT	1 No. RFR-1027 Raytheon Rectifier			
CABLE	147-L	168-L	144-L	144-L
Lead Covered	26 pr.	32 pr.	16 pr.	16 pr.
JUNCTION BOXES	No. 490-5426 Cook junction boxes			
AUDIBLE TONE SIGNALS	1 No. F-605-DA common to all trunks			
Bell Box	1 No. N-11 common to all trunks			
Single Tone Chime				
TELEPHONE INSTRUMENTS				
Desk, Manual, C.B.	No. 1000-LR			
Desk, Dial, C.B.	No. D-1000-LR			
Wall, Manual, C.B.	No. 1100-LR			
Wall, Dial, C.B.	No. D-1100-LR			

GENERAL ORDERING INFORMATION

1. Provide one Key-BX box for each equipped station in the Key-BX system.
2. Provide one relay cabinet for each installation. Specify the number of trunks and inter-communication circuits to be equipped.
3. Provide one Raytheon Rectifier for each installation.
4. Provide lead or plastic covered cable as required. Determine number of feet required for particular installation.
5. Provide junction boxes as required.
6. Provide bell box or single tone chime if desired.
7. Provide one manual desk or wall Masterphone, or one dial desk or wall Masterphone for each station in the system.

ATTENDANT TYPE SYSTEMS

Ultimate capacity of equipment in this system is either 11 or 23 stations. In the 11-station system one or two trunks can be provided to the main exchange, and in the 23-station system one to four trunks can be provided to the main exchange. Trunks to common battery manual or dial or magneto exchanges can be furnished.

Selective talking and selective ringing are standard features but special features to meet various local conditions can be provided.

Each local station in this system has only two pieces of equipment, a telephone and a key box. The key box contains a buzzer and connecting rack for terminating the cord or wires from the telephone.

Operation of Attendant-Type Systems

The number of conversations that can be carried on at any one time with this system is limited only by the number of pairs of telephones. The number of local inter-communication stations is limited only by the ultimate capacity of the key boxes. No idle equipment is required as stations can be added from time to time when needed.

Inter-Office Calls Between Stations. To make a call from one inter-communication station to another the calling party removes the receiver, presses the key button corresponding to the station desired and then presses the ringing key. This oper-

ATTENDANT TYPE SYSTEMS (Cont'd)



ates the buzzer at the called subscriber's telephone and is answered by removing the receiver in the usual manner and pressing the "home station" button. Upon completing the conversation each subscriber hangs up his receiver, restoring both telephones to normal condition.

Trunk Calls. An outgoing trunk call is made by removing the receiver in the usual way and pressing the key button associated with one of the trunk circuits. This connects the calling party direct to the main exchange. No intermediary attendant is necessary to complete connections between inter-communication stations and the main exchange.

To answer an incoming call the attendant removes the receiver, asks for the name of the party being called, and then presses the button associated with that particular station. The party being called answers the attendant in the usual way by removing the receiver and pressing the "home station" key. When informed that an incoming call is waiting on a certain trunk the called party immediately presses that trunk button. The connection is then completed and the attendant is freed for further supervision. Upon completing the conversation the called party hangs up his receiver which releases the trunk. The operator at the main exchange takes down the connection which restores the trunk circuit to its normal condition.

Attendant-type inter-communication systems are of three types:

1. With trunks to common battery manual exchanges.
2. With trunks to common battery dial exchanges.
3. With trunks to magneto exchanges.

The equipment required for a complete installation of any of these systems is given in the chart below.

Ordering Information

Determine your requirements for Kellogg attendant type inter-communication systems from the ordering chart shown on page 48. Kellogg will quote prices and delivery of this equipment based upon your specific requirements.

ORDERING CHART FOR ATTENDANT TYPE INTER-COMMUNICATION SYSTEMS

	Trunks to Common Battery Manual Exchange		Trunks to Common Battery Dial Exchange		Trunks to Magneto Exchange	
	For 11-Station Systems	For 23-Station Systems	For 11-Station Systems	For 23-Station Systems	For 11-Station Systems	For 23-Station Systems
KEY BOXES	No. 11B for each station	No. 23B for each station	No. 11B for each station	No. 23B for each station	No. 11B for each station	No. 23B for each station
POWER	Provide 12 volts of dry cells or one No. 1026 Rectifier Battery Eliminator					
CABLE	No. 148-L as required	No. 147-L as required	No. 148-L as required	No. 147-L as required	No. 148-L as required	No. 147-L as required
JUNCTION BOXES	Provide No. 490-5313 boxes for 11-station systems and No. 490-5326 boxes for 23-station systems as required.					
EXTENSION BELL	Provide one No. F-605-BA incoming signal box for each incoming trunk.					
ATTENDANT STATION TELEPHONES	Provide one No. 1005-LR or one No. 1105-LR Masterphone		Provide one No. D-1007-LR or one No. D-1107-LR Masterphone		Provide one No. 1004-LR or one No. 1104-LR Masterphone	
ATTENDANT STATIONS	One No. 20	One No. 21	One No. 22	One No. 23	One No. 4 for one trunk or one No. 5 for two trunks.	
EXTENSION STATION TELEPHONES	No. 1004-LR, 1104-LR, or 9721 as required.		No. D-1004-LR or D-1104-LR as required.		No. 1004-LR, 1104-LR, or 9721 as required.	
RETARD COILS			For 11 Stations order 1 No. 487 Mounting and for 23 Stations order 2 No. 487 Mountings.		One No. 22-G retard coil for each equipped station	

JACKS, SPRING

The frames of Kellogg spring jacks are of heavy, rigid brass construction with phenol fibre insulation. German silver is used for the springs which are tempered to withstand long and hard usage. These jacks are designed to give a minimum of wear on the springs and on plugs which are used with them.

Jacks are listed below according to the number mounted on single mounting strips and then by the type of jack—two conductor and three conductor types.

In the listings below the number of conductor and local contacts is given. In the illustration shown here Figure A is of a standard spring jack with neither local nor conductor contacts. Figure B shows a three conductor jack with two conductor con-

tacts. All conductor contacts on Kellogg spring jacks are "break" contacts.

Figure C shows a three conductor jack with local contacts. In the listings below the type of local contacts on each jack, where they appear, is indicated by "1-M," "1-B," etc., indicating one make contact, one break contact, etc.

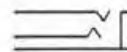


FIG. A

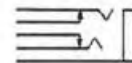


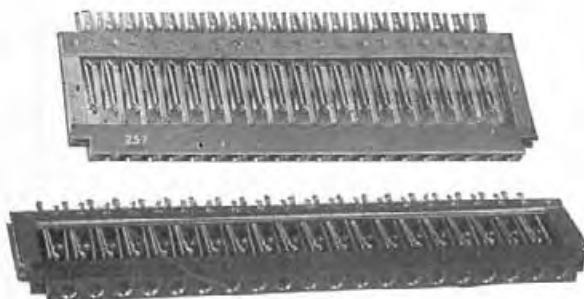
FIG. B



FIG. C

20 Per Strip on 1/2-inch Centers

THREE CONDUCTOR TYPE

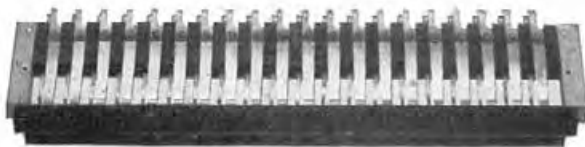


THREE CONDUCTOR TYPE (Cont'd)

Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
272	10 1/4" x 7/16"	11-5/32"	106	-	1-B	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
258	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with # 25 Lamp Jack, Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
239	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
257	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
367	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B) Drilled for party line indicators.
369	7-21/32" x 3/8"	8-9/32"	201 & 141	-	-	Lines up with # 41 Lamp Jack. (Jack Blanks 4-A or 4-B)
292	7-49/64" x 3/8"	8-41/64"	201 & 141	-	-	Lines up with # 35 Lamp Jack. Drilled for party line indicators. (Jack Blanks 4-A or 4-B)
146	10 1/4" x 1/2"	11-5/32"	# 152, 44 70, 109, 130	-	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-B or 2-D)
261	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
268	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)
270	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with # 25 Lamp Jack. (Jack Blanks 2-A or 2-C)

JACKS, SPRING

20 per Strip on 1/2-Inch Centers
TWO CONDUCTOR TYPE



Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
116	10 1/4" x 7/16"	11-5/32"	42, 55, 137, 112	-	-	Lines up with #36 Lamp Jack. (Jack Blank 2-A or 2-C)

10 Per Strip on 3/4-inch Centers
THREE CONDUCTOR TYPE



Code No.	Face Strip	Mtg. Pin Centers	Used with Plugs	Cond. Contacts	Local Contacts	Description
274	7-21/32" x 3/8"	8-9/32"	201	-	-	Lines up with #31 Lamp Jack. (Jack Blanks 4-A or 4-B)
253	7-21/32" x 3/8"	8-9/32"	201	-	-	Lines up with #31 Lamp Jack. Arranged for number plates. Otherwise same as No. 274. (Jack Blanks 4-A or 4-B)

10 per strip on 1-inch Centers
TWO CONDUCTOR TYPE

Code No.	Face Strip	Mtg. Pin Center	Used with Plugs	Cond. Contacts	Local Contacts	Description
195	10 1/4" x 7/16"	11-5/32"	42, 55 & 137	-	-	Lines up with #34 Lamp Jack. Slotted for number plate. (Jack Blanks 2-A or 2-C)

THREE CONDUCTOR TYPE



267	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
269	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
271	10 1/4" x 7/16"	11-5/32"	106	-	1-B	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
273	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-C)
259	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. Slotted for number plates. (Jack Blanks 2-A or 2-C)
355	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #34 Lamp Jack. Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
354	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #34 Lamp Jack. Drilled for party line indicators. (Jack Blanks 2-A or 2-C)
141	10 1/4" x 1/2"	11-5/32"	44, 70, 152, 109 & 130	-	-	Lines up with #34 Lamp Jack. (Jack Blanks 2-A or 2-D)
191	10 1/4" x 1/2"	11-5/32"	44, 70, 152, 109 & 130	-	1-M	Lines up with #34 Lamp Jack. (Jack Blanks 2-B or 2-D)

5 Per Strip on 2-inch Centers
THREE CONDUCTOR TYPE

Code No.	Face Strip	Mtg. Pin Centers	Used with Plugs	Cond. Contacts	Local Contacts	Description
296	10 1/4" x 7/16"	11-5/32"	106	2	-	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)
297	10 1/4" x 7/16"	11-5/32"	106	-	-	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)
318	10 1/4" x 7/16"	11-5/32"	106	-	1-M	Lines up with #37 Lamp Jack. (Jack Blanks 2-A or 2-C)

Individual Type Spring Jacks
TWO CONDUCTOR TYPE



TYPES 85 AND 277

Code No.	Mtg. Centers	Cond. Contacts	Used with Plugs	Description
85	3/8"	-	42-55-137	Mts. on 31/64" panel
277	3/8"	-	42-55-137	Mts. on 31/64" panel
298	3/8"	2	70, 109, 152, 42, 55, 56, & 112	Fits #70, 109 and 152 plugs on 7/16" panel. Fits 42, 55, 56 and 112 plug on 11/32" panel

JACKS, SPRING

Individual Type Spring Jacks
 TWO CONDUCTOR (Cont'd)



TYPE 319

Code No.	Mtg. Centers	Cond. Contacts	Used with Plugs	Description
319	5/8"	1	42, 55, 137, 56, 112, 70, & 152	Fits 42-55-137 plugs on 9/32" panel. Fits 56 & 112 plugs on 11/32" panel. Fits 70 & 152 plugs on 7/16" panel
360	5/8"	-	70, 109, 152	Mts. on 9/16" panel
363	5/8"	2	130, 247, 236	Mts. on 9/16" panel for U. S. Signal Corps (Fire Control). Equivalent to W. E. Co. Jack #220-A
364	5/8"	1	236	Mts. on #603-604 Mtg. Strip. Equivalent to W. E. Co. 218-A Jack when on 5/8" centers. Also fits W. E. Co. 241-A twin plug



TYPE 366

366	5/8"	-	247	Interchangeable with W. E. Co. 237-A Jack & W. E. #47 Plug
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THREE CONDUCTOR



Code No.	Mtg. Centers	Cond. Contacts	Local Contacts	Used with Plugs	Description
260	5/8"	-	-	106	Test Jack. Mounts on 9/16" panel
286	5/8"	-	1 B & M	106-233	Fits Kellogg #106 plug on 1/2" panel. Fits Kellogg #233 plug or W. E. Co. #110 plug on 3/8" panel. Has local Break & Make Contact
356	5/8"	1	-	106	For 23/64" panel. Mounts on #455 mtg.
361	5/8"	2	-	70-152-230	Mounts on 9/16" panel!

Operators' Type Spring Jacks
 TWO CONDUCTOR

Code No.	Face Dimensions	Used with Plug	Local Contacts	Description
24	1 7/8" diam.	107	1M	Mounts from rear of jack with machine screws. Has nickel plated finish

Operator's Type Spring Jacks
 FOUR CONDUCTOR

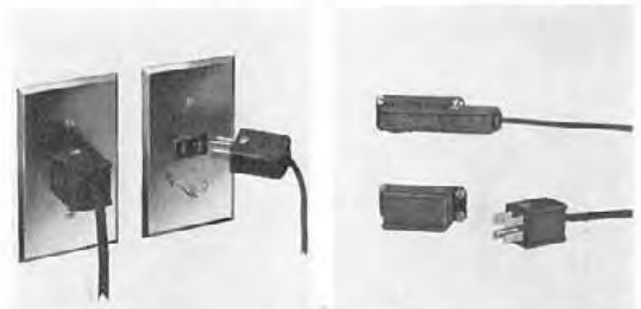


Code No.	Face Dimensions	Used with Plugs	Description
57	2" dia.	#25	For use with Operators Breast Plate Transmitter Hard Rubber frame. Mounts on 7/16" centers.
43	2 1/4" x 1/2"	#145	Black fibre frame on 7/16" centers. Includes #252 mtg.
325-A	1-13/16" x 15/32"	#182	Consists of two #260 Spring Jacks mounted on hard rubber mtg.
310	2-11/32" x 1 1/4"	#139	

Dummy Spring Jacks
 20 PER STRIP

Code No.	Face of Strip	Mtg. Pin Centers	Terminal Centers	Description
345	7-21/32" x 7/16"	8-9/32"	3/8"	Has Bakelite face
346	10 1/4" x 1/2"	11-5/32"	1/2"	Has Bakelite face

WALL OUTLET JACKS



FLUSH MOUNTING TYPE

SURFACE MOUNTING TYPE

TWO CONDUCTOR TYPE

Code No.	Face of Strip	No. of Conductors	Used with Plugs	Description
402	2 3/4" x 4 1/2"	2	302	Flush mounting type
412	1 1/4" x 1"	2	302	Surface mounting type

FOUR CONDUCTOR TYPE

404	2 3/4" x 4 1/2"	4	304	Flush mounting type
414	1 1/4" x 1"	4	304	Surface mounting type

JACKS, LAMP

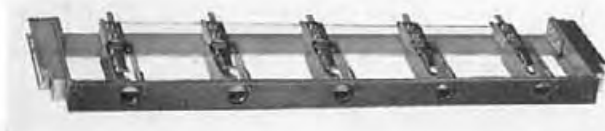
LAMP JACKS ARE SHOWN ON THE NEXT PAGE

JACKS, LAMP



INDIVIDUAL TYPE 49

INDIVIDUAL TYPE 39



STRIP TYPE 37



STRIP TYPE 25

INDIVIDUAL TYPE

Kellogg lamp jacks are designed so that the standard switchboard lamp is securely held in the proper position to furnish the maximum amount of useful illumination. The frame of the No. 39 lamp jack is made of steel with a cadmium plate finish. The No. 49 lamp jack is made of seamless brass tubing with a nickel plate finish.

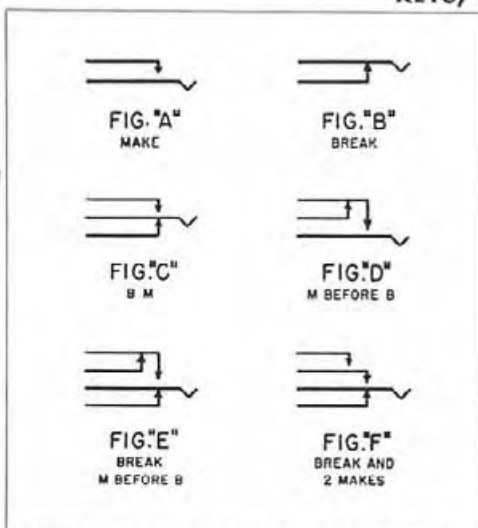
Code No.	Mounting Centers	Mounting Panel Thickness	Used With Lamp Cap
39	3/8 inches	7/8 inches	
49	9/16 inches	to 3/8 inches	No. 154

STRIP TYPE

The strip type lamp jacks have a heavy brass frame. The brass face strip is finished with a chip resistant black enamel. A brass partition strip is used on all strip type lamp jacks to prevent leakage of light to the adjacent lamp caps.

Code No.	Jacks Per Strip	Mounting Centers	Strip Size (inches)	Mtg. Pin Centers	Used With Lamp Cap	Used With Spring Jack
37	5	2 in.	10 1/4 x 1/2	11-5/32	#154	296-297-318
31	10	3/4 in.	7-21/32 x 1/2	8-9/32	#154	253
34	10	1 in.	10 1/4 x 1/2	11-5/32	#154	290
25	20	1/2 in.	10 1/4 x 1/2	11-5/32	#154	146-258
41	20	3/8 in.	7-21/32 x 7/16	8-9/32	#79	239

KEYS, 1000 TYPE CAM



Kellogg cam keys are constructed with a frame of an extruded section of brass forming a perfect "T." The contact springs are of nickel silver with precious metal contacts. The insulators are of the best grade of phenolic obtainable—a grade specially selected for its mechanical and electrical properties under all conditions. Kellogg cam keys are available in the following five types: 1) single locking; 2) single restoring; 3) locking and restoring; 4) double locking; and 5) double restoring.

A chart of the basic contact forms available is listed below. A large variety of spring combinations is available for each of the types of keys listed above. For any special applications or combinations not listed consult the Kellogg sales department.

In the following charts the various spring combinations are designated as being on the "head side" or "nut side" of the key. For reference purposes only this locates the spring combination with respect to the heads of the screw holding the spring stackups or to the opposite or "nut side" of the screws.

For tools used with 1000 type cam keys see tools Nos. 16, 4, 67 and 68 listed under "Tools" in this section. Unless specified when ordering cam keys, escutcheons are not furnished. Code numbers of both the keys and the desired escutcheon must be specified.

Single Locking Type

Dummy restoring springs are on Nut Side of all single locking keys.

Code No.	A	Spring Combination (Head Side)		D
		B	C	
1001	2	-	-	-
1003	-	4	-	-
1004	2	2	-	-
1005*	2	-	-	-
1014	-	-	-	2
1017	3	1	-	-
1028	-	-	2	-
1034	-	-	4	-
1035	1	-	2	-

Code No.	A	Spring Combination (Head Side)		D
		B	C	
1042	3	-	-	-
1069	1	1	2	-
1070	4	-	-	-
1072	4	-	-	-
1083	-	1	2	-
1102	-	-	3	-
1127*	-	2	-	-
1163	3	2	-	-
1170	-	2	4	-
1148	2	-	-	2
1191	2	1	-	2

*Meteor metal contacts.

KEYS, 1000 TYPE CAM
Single Restoring Type

The single restoring type 1000 type cam key has dummy restoring springs on the head side.

Code No.	Spring Combinations (Nut Side)		
	A	B	C
1008	-	2	2
1033	-	-	2
1068	-	-	4

Locking and Restoring Type

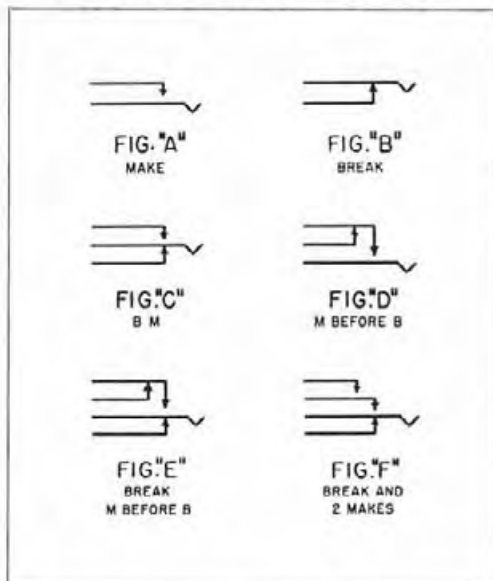
Code No.	Spring Combinations				Spring Combinations			
	Head Side (Locking)				Nut Side (Restoring)			
	A	B	C	D	A	B	C	D
1016	-	-	4	-	-	-	2	-
1021	3	-	-	-	-	-	1	1
1023	4	-	-	-	-	-	2	-
1024	1	-	2	-	1	-	2	-
1026	2	-	-	2	-	-	2	-
1027	-	-	-	2	-	-	2	-
1029	-	-	2	-	-	-	2	-
1032	1	-	2	-	-	-	2	-
1041	2	-	-	-	-	-	2	-
1043	3	-	-	-	-	-	2	-
1188	3	2	-	-	3	-	2	-
1190	-	-	2	-	-	-	1	1
1196	3	1	-	2	-	-	2	-
1197	2	-	2	-	2	-	2	-

Double Locking Type

Code No.	Spring Combinations				Spring Combinations			
	Head Side (Locking)				Nut Side (Locking)			
	A	B	C	D	A	B	C	D
1002	2	-	-	-	2	-	-	-
1010	-	2	2	-	2	-	2	-
1011	4	-	-	-	4	-	-	-
1013	-	-	4	-	-	-	4	-
1019*	-	-	2	-	-	-	2	-
1020*	2	-	-	-	2	-	-	-
1030	-	-	2	-	-	-	2	-
1036	-	-	2	-	1	-	2	-
1037	2	1	-	-	-	-	2	-
1039	-	-	-	2	-	-	-	2
1049	1	-	2	-	1	-	2	-
1051	3	1	-	-	3	1	-	-
1052	2	-	-	2	3	1	-	-
1059	-	2	-	-	-	2	-	-
1067	1	1	2	-	1	1	2	-
1074	1	-	-	2	1	-	-	2
1082	2	2	2	-	2	2	-	-
1097	3	-	-	-	2	-	-	-
1098	3	-	-	-	3	-	-	-
1105	-	-	2	2	-	-	2	-
1113	2	1	-	-	3	-	-	-
1128	2	-	-	2	-	2	2	-
1186	4	-	-	-	-	-	2	-
1187	4	-	2	-	4	-	2	-
1193	4	-	-	-	8	-	-	-

*Meteor metal contacts.

KEYS, 1000 TYPE CAM (Cont'd)



Double Restoring Type

Code No.	Spring Combinations			Spring Combinations		
	Head Side (Restoring)			Nut Side (Restoring)		
	A	B	C	A	B	C
1031	-	-	2	-	-	2
1050	1	-	2	1	-	2
1056	2	-	2	-	-	2
1064*	-	-	2	-	-	2
1124	2	-	-	2	-	-
1189	3	2	-	3	-	2
1192	2	-	2	2	-	2

*Has special indicating cam handle.

KEYS, 1000 TYPE CAM
For Releasing Party Keys

Two party releasing keys, both locking and restoring and single restoring types are listed under "A" type cam keys for four party keys.

KEYS, TO RELEASE FOUR PARTY "A" TYPE
Locking and Restoring Type

Code No.	Spring Combinations			Spring Combinations			
	Head Side (Locking)			Nut Side (Restoring)			
	A	B	C	A	B	C	
1045-A	3	-	-	-	-	-	Dummy Springs
1053-A	2	2	-	-	-	-	Dummy Springs
1062-A	2	-	2	-	-	-	Dummy Springs
1125-A	2	2	-	-	-	2	-
1162-A	3	2	-	-	-	-	Dummy Springs

NOTE: Operation of springs on Restoring Side of key releases operated four party key.

Single Restoring Type

Code No.	Spring Combinations		
	Head Side		Nut Side (Restoring)
	A	B	C
1000-A	Dummy Springs	-	Dummy Springs
1015-A	Dummy Springs	-	2

NOTE: Operation of springs on Restoring Side of key releases operated four party key.

RELEASE KEYS FOR OLD STYLE FOUR PARTY KEYS

For use with four party keys Nos. 265, 267, and 355. Each key has two extra dead terminals on end springs.

Locking and Restoring Type

Code No.	Spring Combinations					
	Head Side (Locking)			Nut Side (Restoring)		
	A	B	C	A	B	C
1044	2	-	-	-	-	2
1045	3	-	-	Dummy Springs		
1053	2	2	-	Dummy Springs		
1062	2	-	2	Dummy Springs		

NOTE: Operation of springs on Restoring Side of key releases operated four party key.

Single Restoring Type

This key has dummy springs on both head side and nut side (restoring). Restoring side of key releases operated four party key.

Code No.	Description
1000	Single Restoring Type Four Party Key

KEYS, FOUR PARTY



Kellogg four party ring keys are designed to insure positive action. Each key will remain in operated or locked position until restored by either the cam key or by operation of one of the other buttons.

The frames are constructed of heavy brass with a nickel plate finish. The contact springs are of Nickel Silver with contacts of precious metal. Insulating materials are of a grade specially selected for mechanical and electrical properties.

A chart of the basic spring combinations used on Kellogg keys is shown on page 52. Four party keys are available with "C" type spring combinations only. Other combinations shown are for the No. 1000 type cam keys used for restoring four party keys.

Escutcheons are not supplied with the key. In ordering it is necessary to specify the code number of the four party key, the cam key, and the escutcheon on which they are to be mounted in order to obtain a complete unit.

The two party keys listed below are of the same sturdy construction as the four party keys and are like the four party keys except they are equipped only with two keys.

For tools used on either four or two party keys see tools Nos. 33, 34, 4, 67, and 68 under Tools in this section.

For Release by "A" Type Cam Keys

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
355-A*	2-C	2-C
265-A*	1-C	2-C
267-A	1-C	--

*Two extra dead terminals on end springs.

KEYS, FOUR PARTY (Cont'd)

With Old Style Release Strip

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
265*	1-C	2-C
267	1-C	--
355*	2-C	2-C

*Two extra dead terminals on end springs.

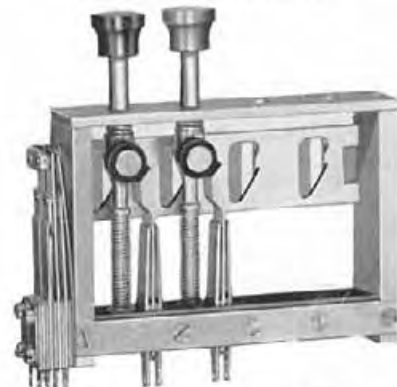
Not Released by Cam Key

LOCKING TYPE

Code No.	Sprg. Comb. (Each Key)	End Sprg. Comb.
266*	1-C	2-C
310*	1-C	--

*Two extra dead terminals on end springs.

KEYS, TWO PARTY



For Release by "A" Type Cam Keys

LOCKING TYPE

Code No.	Spring Comb. (Each Key)	End Spring Combination
358-A	1-C	2-C

NOTE: Used with any of cam keys listed with "A" type four party keys. Mounts on Nos. 1050 and 1111 escutcheons.

Not Released by Cam Key

LOCKING TYPE

Code No.	Spring Comb. (Each Key)	End Spring Combination
328	1-C	2-C

NOTE: Mounts on No. 1064 escutcheon.

KEYS, PUSH BUTTON



TYPICAL PUSH BUTTON KEY

Kellogg push button keys are available in either individual or strip types.

Tools used on push button keys are Nos. 4, 67, and 68 switch-board tools shown under "Tools" in this section.

**High Button Type
RESTORING ACTION**

Code No.	Spring Combination	Mounting Thickness
254	2C	3/4 in.
302	2C	7/8 in.

KEYS, PUSH BUTTON
High Button Type (Cont'd)

LOCKING ACTION

These keys mount on wood on 5/8-inch centers.

Code No.	Spring Combination	Mounting Thickness
269	2A	7/8 in.
300*	2A	7/8 in.
167	2C	7/8 in.
255	2C	3/4 in.
303	4C	7/8 in.

*Meteor metal contacts.

LOCKING OR RESTORING

These keys mount on panels 1/16 to 3/32-inch thick on 5/8-inch mounting centers.

Code No.	Plunger Action	Spring Combination
403	Locking	2C
404	Restoring	2C
405	Locking	2A
407	Locking	4C
410	Locking	2B

Individual Type

LOW BUTTON, RESTORING ACTION

Code No.	Spring Combination	Mounting Thickness
5	2A	7/8 in.
367	2B	7/8 in.
296	3A	7/8 in.
66	1A and 2C	7/8 in.
24	2C	7/8 in.
172	2C	
400	2A	

NOTE: Nos. 2, 367, 296, 66, and 24 push button keys mount on wood 5/8-inch centers. The No. 172 mounts on wood or metal on 1-5/16-inch centers—a 1 1/4-inch diameter metal escutcheon is part of the key. The No. 400 key mounts on panels 1/16 to 3/32-inch thick on 5/8-inch mounting centers.

Strip Type

RESTORING ACTION—EIGHT KEYS PER STRIP

Code No.	Sprg. Comb. (Each Key)	Length Overall	Width Overall	Jack Mta. Centers
301	3A	5 1/2 ins.	1/2 in.	1/2 in.
318	2A	5 1/2 ins.	1/2 in.	1/2 in.

LOCKING OR RESTORING TYPE

These key strips are similar to spring jacks in construction except equipped with plugs to provide the contact action. The Nos. 314 and 313 keys are mounted on a face strip 10 1/4 by 7/16 inches. The face strip is 10 1/4 by 1/2 inches on the Nos. 312 and 366 keys. All keys listed below have 11-5/32 inches mounting pin centers.

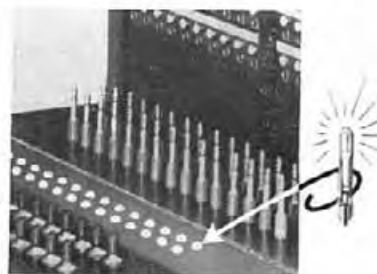
Code No.	Key Action	Keys Per Strip	Sprg. Comb. (Each Key)
314	Locking	10	1C
313	Locking	20	1C
312	Restoring	10	2A
366	Restoring	20	2A

KEY, TURN TYPE

This key mounts on panels 1/16 to 3/32-inch thick. Has locking action.

Code No.	Spring Combination	Min. Mounting Centers
411	2C	5/8 in.

LAMPS, SWITCHBOARD



Kellogg switchboard lamps fit standard lamp jacks in switchboards of all makes and are constructed to insure long life and superior performance. These lamps have tungsten filaments and are uniform in size, brilliance and current consumption.

Shown below is a listing of the lamp required for each type of switchboard and other operation.

FOR ANNUNCIATOR SYSTEMS

- 24 volt systems—use lamp No. 1224-TA.
- 48 volt systems—use lamp No. 2448-TA.

BALLAST LAMPS

- 48 Relaymatic—use lamp No. 1224-TA.

BUSY LAMPS, SWITCHBOARD

- 24 volt multiple switchboards—use lamp No. 2448-TD.
- 48 volt multiple switchboards—use lamp No. 4896-TD.

CORD LAMPS, SWITCHBOARD

- 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
- 48 volt multiple switchboards—use lamp No. 2448-TD.

INDUSTRIAL APPLICATIONS

The Nos. 6-TA, 8-TA, 12-TA, and 30-TA lamps are used in all types of industrial applications.

LINE LAMPS, SWITCHBOARD

- 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
- 48 volt multiple switchboards—use lamp No. 2448-TD.

PILOT LAMPS, SWITCHBOARD

- 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
- 48 volt multiple switchboards—use lamp No. 2448-TD.

RESISTANCE LAMPS, RINGING

For ringing circuits—use lamp No. 110-A.

TRUNK LAMPS, SWITCHBOARD

- 24 volt multiple and non-multiple switchboards—use lamp No. 1632-TD.
- 48 volt multiple switchboards—use lamp No. 2448-TD.

Industrial and Special Purpose Lamps

Code No.	Voltage	Current Consumption		Approximate Cold Resistance (ohms)
		Min. Amps.	Max. Amps.	
6-TA	6	.110	.150	7
8-TA	8	.080	.100	11
12-TA	12	.085	.115	14
30-TA	30	.090	.110	35

For 24- and 48-volt Telephone Systems

Code No.	Voltage	Current Consumption		Approx. Cold Resis. (ohms)
		Min. Amps.	Max. Amps.	
1224-TA	12	.065	.075	24
1632-TD	24	.080	.090	70
	24	.028	.036	
2448-TD	24	.035	.050	110
	24	.027	.037	
2448-TA	48	.040	.060	85
	24	.030	.040	
4896-TD	48	.042	.062	350
	48	.012	.025	

MOUNTINGS

Mountings for all types of Kellogg equipment are shown in the charts below. The most commonly used mountings in each group are listed.

For special mountings or for mountings not listed below consult the Kellogg sales department for detailed information. In some instances mounting information is given with specifications furnished with an original installation. This applies to the relay mountings for Nos. 1700—1800, 3000, 7007, 7100, 7200, 7300, and 7400 type relays which are designed for various

MOUNTINGS FOR COMBINED DROPS AND JACKS
For Mounting Nos. 100, 300, or 500 Series Drops and Jacks

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Width	Length Overall	Mtg. Centers	Length of Face	Description
552	1 3/4"	1 3/4"	1-7/16"	1 3/4"	Drilled for Code Night Alarm.

5 PER STRIP, SCREW MOUNTED

497	1 3/4"	6-9/16"	6 1/4"	5-55/64"	Replaces #257 Mtg.
499	1 3/4"	6-9/16"	6 1/4"	5-55/64"	Replaces #333 Mtg.
500	1 3/4"	6-23/32"	6 1/4"	5-55/64"	Replaces #395 Mtg. Same as #497 Mtg. except with adapters for W. E. Co. boards for flush mtg.

10 PER STRIP, SCREW MOUNTED



Mounting—Complete with drops and jacks

495	1 3/4"	10-31/32"	10-21/32"	10 1/4"	Replaces #329 Mtg.
502	1 3/4"	10-31/32"	10-21/32"	10 1/4"	Replaces #426 Mtg. Same as #495 except drilled for Code Night Alarm.

10 PER STRIP, LUG MOUNTED

498	1 7/8"	10 3/4"	11-5/32"	10 1/4"	Replaces #258 Mtg.
503	1 7/8"	10 3/4"	11-5/32"	10 1/4"	Replaces #482 Mtg. Same as #498 except drilled for Code Night Alarm.

METERS, MESSAGE REGISTER



Kellogg message register meters are standard equipment in Kellogg Masterbuilt switchboards and have many special uses where consecutive numbering records are required. They can be mounted individually or in strips. The cover is of steel with a heavy black enamel finish. Over-all dimensions are 5-11/16 inches long, 1 1/2 inches wide, and 1 3/8 inches deep.

Relaymatic installations to meet a definite requirement. In such cases equipment drawings and specifications should be referred to in ordering additional or replacement equipment.

Mountings listed here are shown in the following order: 1) for combined drops and jacks; 2) for combined ringer and drop; 3) for condensers; 4) for drops; 5) for 1000 type keys; 6) for mechanical signals; 7) for message registers; 8) for operators jacks; 9) for retard coils; 10) for relays; and 11) for spring jacks.

These meters mount on Nos. 343, 380, 446, and 1023 mounting strips.

Code No.	Volts	Coil Resistance	Description
1-A	24	300 ohms	Replaces W. E. No. 5-A
1-B	48	500 ohms	Replaces W. E. No. 5-B

MOUNTINGS FOR COMBINED RINGER AND DROP
Three per Strip, Screw Mounted



Code No.	Mtg. Centers	Dim's of Face	Description
455	10-21/32"	10 3/8" x 1 3/4"	Provides mounting space for three #3 combined Ringers & Drops and three #319 Spring Jacks.

MOUNTINGS FOR CONDENSERS
16 per Strip, Screw Mounted

Code No.	Mtg. Spaces Per Strip	Drilled for Condensers	Description
335	16	Code No. 36	2 1/8" Mtg. Centers

18 per Strip, Screw Mounted

1500	18	Code No. 64	1-9/16" Mtg. Centers
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MOUNTINGS FOR DROPS



For No. 60 Drops, Drilled for Night Alarm Screw

SCREW MOUNTED

Code No.	Mtg. Spaces Per Strip	Width	Length Overall	Mtg. Centers
508	5	1 1/4"	6-11/16"	6 1/4"
496	12	1 1/4"	13-7/16"	13"

LUG MOUNTED

509	10	1 1/4"	10 1/4"	11-5/32"
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MOUNTINGS

MOUNTINGS FOR DROPS (Cont'd)

For No. 70 Drops, Not Drilled for Night Alarm Screw

Code No.	Mtg. Spaces per Strip	Width	Length Overall	Mtg. Centers
506	1	1"	1 1/2"	1 1/4"
504	5	1"	6-11/16"	6 1/4"
510	8	1"	10-31/32"	10-21/32"
494	10	1"	10-31/32"	10-21/32"
507	12	1"	13-7/16"	13"

LUG MOUNTED

505	10	1"	10 1/4"	11-5/32"
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MOUNTINGS FOR 1000 TYPE KEYS

5 PER STRIP, LUG MOUNTED

Code No.	Mounting Centers	Length of Face	Width	Keys Mounted
403	11-5/32 in.	10 1/4 in.	1 in.	Horizontal
454	11-5/32 in.	10 1/4 in.	1 1/2 in.	Vertical

6 PER STRIP, SCREW MOUNTED

435	10-21/32 in.	11-3/32 in.	1 3/4 in.	Vertical
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10 PER STRIP, LUG MOUNTED

400	11-5/32 in.	10 1/4 in.	1 1/2 in.	Vertical
402	11-5/32 in.	10 1/4 in.	1 7/8 in.	Vertical
453	11-5/32 in.	10 1/4 in.	1 1/4 in.	Vertical

10 PER STRIP, SCREW MOUNTED

483	10-21/32 in.	11-3/32 in.	1 3/4 in.	Vertical
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MOUNTINGS FOR MECHANICAL SIGNALS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Drilled for Mech. Signal	Mtg. Centers	Length of Face	Width
472	Code #7-8	1-9/16 in.	1-15/16 in.	1 1/4 in.

5 PER STRIP, SCREW MOUNTED

450	Code #7-8	6 1/4 in.	5-55/64 in.	1 3/4 in.
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20 PER STRIP, LUG MOUNTED

200	Code #12	11-5/32 in.	10 1/4 in.	1 in.
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MOUNTINGS FOR MESSAGE REGISTER METERS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces Per Strip	Width	Length of Face	Mounting Centers	Length Overall	Description
380	1	1-3/16"	1 1/2"	2 5/8"	3 7/8"	Mounts Kellogg #1 Type or W. E. Co. #5 type meters. Wood mounting screws furnished.

(Meters shown on page 55)

15 PER STRIP, SCREW MOUNTED



1023	15	1 7/8"	26"	25 1/4"	26"	Mounts Kellogg #1 Type or W. E. Co. #5 type meters.
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MOUNTINGS FOR OPERATORS JACKS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces per Strip	Mtg. Screw Centers	Width	Length of Face	Description
452	1	2-15/16"	1-3/16"	3 1/2"	Mounts #325 Spring Jack

MOUNTINGS FOR RETARD COILS

INDIVIDUAL TYPE, SCREW MOUNTED

Code No.	Mtg. Spaces Per Strip	Length Overall	Mtg. Centers	Width	Description
319	1	1-3/16"	-	1-5/16"	Angle Mtg. Mts. 2 or 4 Term. Coils.

12 PER STRIP, SCREW MOUNTED

487	12	11"	10 1/4"	2 7/8"	6 Coils in A Row (2 Rows)
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MOUNTINGS FOR RELAYS

FOR NO. 10 TYPE RELAYS

Code No.	Mtg. Spaces Per Strip	Mtg. Centers	Length Overall	Width	Centers Spaced	Sketch Fig.	Description
357	26	22-13/16"	23 3/4"	3/4"	13/16"	"A"	
375	15	13-1/16"	13-13/16"	3/4"	13/16"	"A"	
376	20	17-15/16"	18-11/16"	3/4"	13/16"	"A"	Without overall can cover
377	30	25 1/4"	26"	3/4"	13/16"	"A"	
408	24	20 3/8"	21 1/8"	3/4"	13/16"	"A"	
473	20	17-15/16"	18-11/16"	3/4"	13/16"	"B"	

FOR NO. 72 TYPE RELAYS

279	20	25 1/4"	26"	3 3/4"	1-3/32"	2 Rows. 10 per Row	Vertical Spacing 4".
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FOR NO. 440 TYPE RELAYS

346	40	25 1/4"	26"	3 3/4"	1-3/32"	2 Rows. 20 per Row.	Vertical Spacing 4 1/2". Has Overall cover.
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STRIP TYPE MOUNTINGS



On all mountings except the 1008 one relay cover will be supplied for each equipped space (pr. of relays). Different types of covers are required for different relays. In ordering mounting strips, therefore, specify the code numbers of the relays which will be mounted so that the proper cover may be supplied. The No. 1008 has single over-all cover.

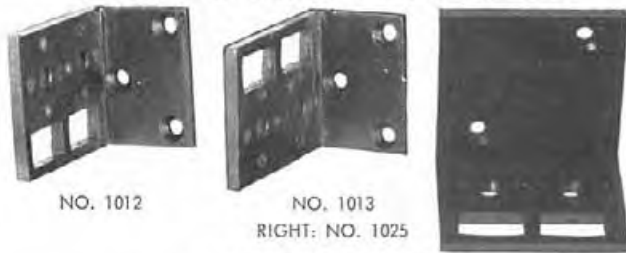
Code No.	No. of Prs. of Relays Mounted	Length Overall	Mtg. Centers	Vertical Spacing
1000	5	13-13/16"	13-1/16"	2"
1011	6	16 1/4"	15 1/2"	2"
1001	7	18-11/16"	17-15/16"	2"
1021	7	20 1/2"	19 3/4"	2"
1002	8	21 1/8"	20 3/8"	2"
1003	10	26"	25 1/4"	2"
1004	10	13-13/16"	13-1/16"	4"
1007	20	26"	25 1/4"	4"
1008	20	26"	25 1/4"	4 1/4"

MOUNTINGS FOR 7000 TYPE RELAYS

Mounts six 7000, 7001, 7002, 7003, 7004, 7005, or 7006 Relays.

Code No.	Overall Length	Mtg. Centers	Vertical Spacing	Width
806	2' 10-9/16"	2' 9-13/16"	2 1/4"	1 1/4"

MOUNTINGS FOR 2000 TYPE RELAYS



ANGLE MOUNTING

Code No.	No. of Pcs. of Relays Mounted	Overall Dim's. of Mtg. Face Height	Width	Description
1012	1	1 7/8"	2 5/8"	Mounts on right side of cab.
1013	1	1 7/8"	2 5/8"	Mounts on left side of cab.
1014	1	2-1/16"	2 5/8"	Mounts on roof of cabinet
1024	1	2-1/16"	2 5/8"	Mounts on floor of cabinet

MOUNTINGS FOR Nos. 1700, 1800, 3000, 7007, 7100, 7200, 7300, AND 7400 TYPE RELAYS

Mountings for these relays are designed for various Relay-automatic installations to meet a definite requirement. Additional mountings, when needed, should be ordered the same as the original mountings, as listed in the switchboard specification. Order for No. 1700 and 1800 type relays for special applications should include complete information regarding mounting space in order that the mountings may be designed to properly fit the allotted space.

MOUNTINGS FOR SPRING JACKS

EQUIVALENT TO W. E. CO. NOS. 184 AND 185

Code No.	Mtg. Spaces Per Strip	Drilled For Spring Jack	Width	Length of Face	Description
600	24	360-361	1 1/4"	6-15/16"	Equivalent of W.E. Co. #184 Jack Strip but mounts Kellogg Jack only. Used with plugs 70-152-230-240.
601	48	360-361	2 1/8"	6-15/16"	Equivalent of W.E. Co. #185 Jack Strip but mounts Kellogg Jack only. Used with plugs 70-152-230-240.
DUPLICATE OF W. E. CO. NOS. 184 AND 185					
603	24	362-363	1 1/4"	6-15/16"	Duplicate of W.E. Co. #184 Jack Strip. Mounts either Kellogg or W. E. Co. Jacks. Used with Kellogg Plugs 247-130-236.
604	48	362-363	2 1/8"	6-15/16"	Duplicate of W.E. Co. #185 Jack Strip. Mounts either Kellogg or W. E. Co. Jacks. Used with Kellogg Plugs 247-130-236.

PINS, INDICATOR



Indicator pins are for use on multiple jacks to indicate the equipped stations of a party line. The pins are made of iron wire properly treated to prevent rust. The concave heads are filled with colored lacquer. Pins should be ordered by code number for the color desired.

Code No.	Color	Code No.	Color
5	Red	8	Blue
6	White	15	Yellow
7	Green		

PLATES, NUMBER

For Combined Drops and Jacks

NO. 10

These number plates are standard for numbering combined drops and jacks. They are carried in stock number from 0 to 999 and are made of nickel silver having a black lacquered finish. Over-all dimensions: 3/8 by 5/16" inch. In ordering specify the numbers desired.

Key and Plug Shelf Type

NO. 4

These number plates are used for numbering the different panels of each position or section of a switchboard. They are made of ivory 1/4 inch thick and 3/4 inch in diameter. The inscription is engraved and filled with black paint. Order by code number and specify characters desired.

NO. 5

These number plates are used for numbering each cord circuit. They are 3/8 inch in diameter and 1/8 inch thick. Made of polished ivory. The numerals are engraved and filled with black paint. Order by code number and specify characters desired.

Spring Jack Type

NO. 2



This number plate is made of brass with a black enamel finish. Inscription is filled with white. Used with No. 253 spring jack. Over-all dimensions: 3/8 x 1/4 inch.

NO. 3

Same as No. 2 number plate except dimensions are 27/64 by 19/64 inch. Used with Nos. 40, 95, and 195 spring jacks.

Stile Strip Type

NO. 57



Standard stile strip number plate. Is made of polished white celluloid. The numerals are engraved and filled with black paint. Mounting screws not supplied unless specified. Order by code number and specify numerals desired. Size: 1/4 inch square.

NO. 116

Same as No. 57 listed above except made of red opaque polished celluloid.

Switchboard Type

NO. 46



Used for numbering the positions of a switchboard. Made of white polished ivory, engraved and filled with black paint. Over-all dimensions: 1 3/4 by 1 1/4 inches. Order by code number and specify the characters desired.

Transmitter Type

NO. 88

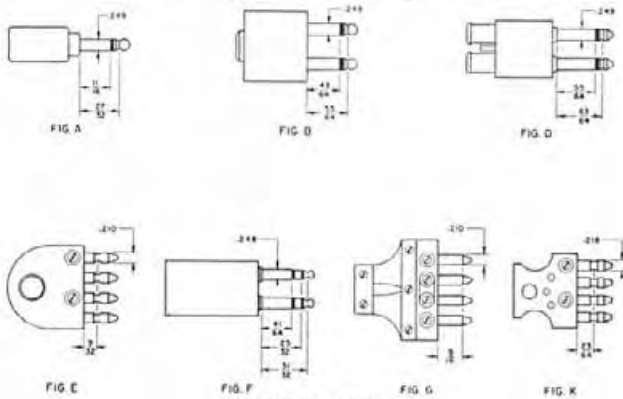
This number plate is of steel, heavily black enameled. Clear transparent celluloid is used to protect the white card which is furnished blank. Mounting screws are not supplied unless specified. Used with old style transmitters.

PLUGS

Operator's, switchboard, and wall outlet plugs are shown below. These plugs are designed and made of materials to give maximum service. The tips are made of brass and hard rubber insulation is used. All connections are protected by fibre sleeve held securely in place.

Detailed sketches are shown for each type operator's plug. For switchboard plugs a general sketch is shown. To determine length of the tip, ring, and sleeve, or tip and ring conductors on each plug, refer to the list showing A, B, and C dimensions for these plugs.

Operator's Plugs



2 CONDUCTOR

Code No.	Fits Cord	Fits Jack	Sketch Figure	Description
107	708	24	A	Replaces #75 Plug
4 CONDUCTOR				
136	712	57	B	Replaces #25 Plug
139	{ 466 709 }	310	D	Made of (2) #130 Plugs. Replaces W.E.Co. 137 & 152 Fits W.E.-99 Jack
145	{ 711 721 }	43	G	Has round cord hole
146	710	43	G	Same as #145 but has strap term. across 2 center terms. Semi-circle cord hole
182	{ 713 722 }	325-A	E	
236	772	364	F	Profiling of #247 Plug. W. E. Co. 241-A
245	741	None	K	Replaces Strom. Carlson #23 Plug

6 CONDUCTOR

240	387	{ 360 361 }	F	Made of two #152 Plugs Used for toll test panels
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Switchboard Plugs

Kellogg Switchboard Plugs are of two types: two conductor and three conductor. These two types are shown in separate charts in next column. For plug tools see tools Nos. 22, 40, 41, 46, 47, 50, 53, 54, 72, 101, 102, 105, 106, 107, under Switchboard Tools.

2 CONDUCTOR

Code No.	Dimensions Tip "A" Ring "B"	Sleeve Diam.	Fits Cord	Used With
42	7/8" 3/4"	.2495"	301, 304, 901	C.D.&J. #103, 113, 300, 301, 502, 506, 508, 509, 511, 512, 513. Spring Jacks #116, 186, 195, 215, 85, 277, 319, 378, and 381

Switchboard Plugs

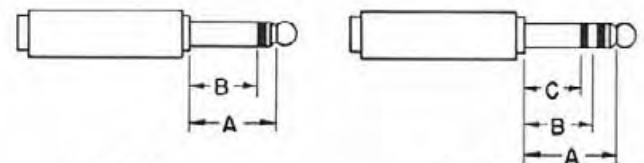


FIG. A

FIG. B

Code No.	Dimensions Tip "A" Ring "B"	Sleeve Diam.	Fits Cord	Used With
55	55/64" 35/64"	.2495"	301, 304, 901	Spring Jacks #116, 186, 195, 215, 85, 277, 319
70	31/32" 7/8"	.2495"	304, CD-138	Spring Jacks #146, 148, 141, 191, 94, 298, 319, 371, 357, 359
109	15/16" 13/16"	.2495"	301, 304	Spring Jacks #146, 148, 141, 191, 94, 298, 360, 357, 359
112	55/64" 47/64"	.2495"	301, 304	Spring Jacks #215, 298, 319, 116
130	63/64" 55/64"	.2495"	301, 304	C.D.&J. #302, 303, 510, 500. Spring Jacks 146, 148, 141, 191, 362, 363
144	1-3/16" 7/8"	.2485"	331	Replaces Swedish American Plugs
187	55/64" 23/32"	.2498"	301, 304	C.D.&J. 507. Spring Jacks #215
247	1" 27/32"	.2495"	397, CC-63, CC-64, CC-65	C.D.&J. 302, 303, 500, 510. Spring Jacks #362, 363, 366. Replaces W.E. Co. #47 Plug
255	1" 25/32"	.2495"	397	Spring Jacks #362, 363, 366

3 CONDUCTOR



Code No.	Dimensions Tip "A" Ring "B"	Sleeve Diam.	Sleeve "C"	Fits Cord
106	1 1/8" 27/32"	47/64"	.2495"	303, 309, 326; Used with C.D.&J. #105, 106, 107, 116, 504, 503, 505, 507, 514. Spring Jacks #261, 268, 270, 272, 258, 267, 269, 271, 273, 285, 324, 354, 259, 355, 296, 297, 318, 290, 284, 260, 286, 356, 377, 379, 380, 372, 384, 386, 388, 389, 383, 382
137	7/8" 21/32"	17/32"	.2495"	303, 309 Used with Spring Jacks #116, 186, 195, 85, 277, 319

PLUGS

Switchboard Plugs

3 CONDUCTOR (Cont'd)

Code No.	Dimensions			Sleeve Diam.	Fits Cord	Used With
	Tip "A"	Ring "B"	Sleeve "C"			
152	31/32"	25/32"	41/64"	.2495"	303	Spring Jacks # 309 146, 148, 141, 191, 94, 298, 319, 360, 361, 371, 359, 357
185	31/32"	23/32"	39/64"	.207"	390	Sprg. Jack #371
199	31/32"	23/32"	9/16"	.221"	325-ST	Garford & 326-TO Spring Jack
*201	15/16"	21/32"	9/16"	.2215"	325	Spring Jack 239,
*Has over-all shell.						326 257, 367, 369, 292, 274, 253, 293, 336, 254



233	1"	3/4"	41/64"	.2495"	358	Replaces W. E. Co. #110 Plug for use on 3/8" Panel
235	45/64"	43/64"	19/32"	.2495"	358	Replaces Strom. 745 Carlson 53-X & 53-N Plugs
268	31/32"	23/32"	39/64"	.2495"	CD-494	Spring Jack
					CD-508	JK-33
					CD-588	



Wall Outlet Plugs

For illustration of these plugs see Jacks, page 50.

Code No.	No. of Conductors	Description
302	2	Fits Jacks #402 and 412
304	4	Fits Jacks #404 and 414

PLUGS, DUMMY

Kellogg dummy plugs are used for designating lines in trouble, service discontinued, etc. They are available in colored celluloid or in brass finished with enamel. These plugs have flat heads for marking purposes.

For Line Jacks

BRASS TYPE—FOR 1/4-INCH DIAMETER JACK SLEEVES			CELLULOID TYPE—FOR .222-IN. DIAMETER JACK SLEEVES		
Code No.	Plug Diameter	Color	Code No.	Plug Diameter	Color
83	.249 in.	White	93	.219 in.	White
84	.249 in.	Black	94	.219 in.	Black
85	.249 in.	Red	95	.219 in.	Red
86	.249 in.	Blue	97	.219 in.	Yellow
87	.249 in.	Yellow	98	.219 in.	Green
88	.249 in.	Green			

PLUGS, DUMMY (Cont'd)

Hard Rubber Type

NO. 24

Made of polished hard rubber. The over-all plug length is 1.240 inches and the diameter is .2495 in. Used on jacks having 1/4-inch inside diameter sleeves. Generally used to plug out multiple jacks.



NO. 120

Generally used for filling blank holes in key escutcheon as when a two-party key is mounted on an escutcheon drilled for a four-party key. Head diameter is 9/16 inch.

NO. 132

Generally used to fill hole in switchboard cabinet when generator is not used. The No. 132 dummy plug fills the hole for the generator crank. Head diameter is 7/8 inch.

Drop Shutter Type

NO. 232

This dummy plug is used to hold up the drop shutter on mounting strips having unequipped spaces of drops. Made of brass with head finished in black enamel.

Trouble Sleeve Type

Trouble sleeves are made of fibre tubing and are used for designating defective cords and plugs. The tubing is split to allow for variation in plug diameters. They are furnished in two sizes.



Code No.	Description
163	For plugs .2495 inch in diameter
223	For plugs .2215 inch in diameter

Lamp and Key Hole Blank

NO. 256

Used blank space for No. 49 lamp jack. Head finished with silver hammertone finish. Used in holes 29/64 to 31/64-inch diameter.

NO. 257

Used in blank space for No. 400 type push button key. Head finished in silver hammertone finish. Used in holes 33/64 to 35/64-inch diameter. Otherwise the same as No. 256.

NO. 133-B

This dummy plug is used as a lamp hole blank in unequipped positions on the keyshelf. Made of maple with head finished in black lacquer. Head diameter, 1/2 inch; body diameter, .333 inch; over-all length, 1.295 inches.

NO. 134-B

This dummy plug is used as a plug hole blank in unequipped positions on the plugshelf. The No. 134-B is the same as the No. 133-B except the body diameter is 31/64 inch and the over-all length is 1-51/64 inches.

NO. 135-B

This dummy plug is the same as the No. 134-B except the body diameter of the plug is 27/64 inch.

NO. 231-B

This dummy plug is the same as the No. 134-B except the body diameter is 7/16 inch.

POWER EQUIPMENT

All power, protection, and cross-connecting equipment is listed in this section to facilitate ordering. Included with this equipment are storage batteries, main distributing frames, battery eliminators, rectifiers, and all types of ringing current supplies.

Wherever possible complete information necessary for ordering this equipment is given. In some instances it is neither possible nor advisable to order from catalog listings only. In these cases the Kellogg engineering department should be consulted for a detailed analysis of the particular installation and its power, or other requirements.

Storage Batteries

In selecting the proper battery for a telephone installation it is necessary to consider the requirements of the particular exchange and the ratio of cost to potential life of the battery that will meet these requirements. Generally the life of a battery is determined by two factors: type of plates, and method of charging.

There are two general types of plates—Planté and Faure. Both types have been proved in telephone work; however, longer life is generally conceded to the Planté type while the Faure type usually has lower unit capacity cost.

Planté plates are formed from lead with the active material electro-chemically deposited on ribbons or grooved strips. The Faure (or pasted) plate is formed by the mechanical pasting of

active material in the open spaces of the grid-shaped, lead antimony sheet. This construction is used by virtually all manufacturers of Faure cells.

The batteries listed below are all of the sealed jar type which completely confines the spray within the cells. This eliminates the need for special compartments, trays, or battery rooms. Open-type batteries are still available, however, for large installations. These, as well as repair parts, can be furnished on order.

Sealed glass jar type batteries are shipped complete with electrolyte, intercell connectors, and other necessary parts to insure quick and satisfactory installation. Cells are shipped charged, ready for immediate service.

EXIDE STORAGE BATTERIES



EXIDE-MANCHEX TYPE—The Exide-Manchex type is the more durable of the two types because of its rugged plate construction. The manchester positive plate consists of a lead antimony alloy grid, perforated with openings into which the pure lead buttons of active metal are forced. This alloy grid resists the "forming" action of the current during charge and discharge, and, therefore, retains its strength, shape, and dimensions throughout the entire life of the plate. Its heavy framework of interlocking rib and bar design holding the active material locked in place by the horizontal bars.

EXIDE-TYTEX TYPE—This pasted plate type will furnish greater ampere hour capacity in a given space than the Exide-Manchex type and the initial cost is lower. The active material of both positive and negative plates is pasted on both sides of the lead antimony grid or framework of interlocking rib and bar design, and locked in place by the horizontal bars. Where space is limited and cost is a consideration, where service requirements are light and operating conditions satisfactory, the results obtained from the pasted plate type may justify its selection.

A thermometer and a hydrometer syringe should be ordered with all batteries.

There are two types of Exide batteries used in telephone service: The Exide Manchex (Planté type) and the Exide Tytex (Faure). These are furnished in capacities to meet virtually every requirement. In all types listed the cell covers are sealed at the top of the jars and have spray-proof vents.

Exide-Manchex Type

TYPES DME, EME, and FME

With the exception of the three smallest sizes (DME-A), all types have burned ring seal post construction with copper inserts in the posts to improve their conductivity. All types have manchester positive and Exide Permanized negative plates, wood and slotted plastic separators.

The cells are shipped assembled, sealed, charged and filled with electrolyte, ready for service. Bolt connectors, lead plated copper intercell connectors, and lugs are furnished with two cells or more. Each cell is a unit not requiring crates. Information on racks for these cells will be furnished upon request.

SINGLE CELL UNITS

Type & Size	Ampere Hours Capacity at 8 Hour Rate to 1.75 Final Volts	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
DME-5A	40	3-1/16"	7-13/16"	12 5/8"	29
DME-7A	60	3 7/8"	7-13/16"	12 5/8"	35
DME-9A	80	4-11/16"	7-13/16"	12 5/8"	42
DME-11	100	5 1/2"	7-13/16"	12 1/2"	50
DME-13	120	6-5/16"	7-13/16"	12 1/2"	59
DME-15	140	7 1/8"	7-13/16"	12 1/2"	66
DME-17	160	7-15/16"	7-13/16"	12 1/2"	73
EME-11	200	6 1/8"	9-15/16"	15 1/4"	96
EME-13	240	6 7/8"	9-15/16"	15 1/4"	113
EME-15	280	7 3/4"	9-15/16"	15 1/4"	126
EME-17	320	8 5/8"	9-15/16"	15 1/4"	138
EME-21	400	10 3/8"	9-15/16"	15 1/4"	165
EME-25	480	12 1/8"	9-15/16"	15 1/4"	191
FME-15	560	8"	13-5/16"	19-9/16"	234
FME-17	640	8 7/8"	13-5/16"	19-9/16"	259
FME-21	800	10 5/8"	13-5/16"	19-9/16"	308
FME-25	960	12 3/8"	13-5/16"	19-9/16"	373

POWER EXIDE STORAGE BATTERIES (Cont'd)

Exide-Tytext Pasted Plate Types

TYPES DOE, EOE, and FOE

These Exide pasted plate batteries are (like the Exide-Manchex type) assembled in clear molded glass jars with the elements resting upon ribs in the bottom. With the exception of the three smallest sizes (DOE-A) all types have burned ring post construction with copper inserts in the posts to improve their conductivity. These cells are shipped assembled, sealed, charged and filled with electrolyte. Information on racks for these will be furnished on request.

Type & Size	Ampere Hours Capacity at 8 Hour Rate to 1.75 Final Volts	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
DOE-5A	50	3-1/16"	7-13/16"	12 5/8"	27
DOE-7A	75	3 3/8"	7-13/16"	12 5/8"	33
DOE-9A	100	4-11/16"	7-13/16"	12 5/8"	39
DOE-11	125	5 1/2"	7-13/16"	12 1/2"	47
DOE-13	150	6-5/16"	7-13/16"	12 1/2"	55
DOE-15	175	7 1/8"	7-13/16"	12 1/2"	61
DOE-17	200	7-15/16"	7-13/16"	12 1/2"	68
EOE-13	240	6 1/8"	9-15/16"	15 1/4"	91
EOE-15	280	6 7/8"	9-15/16"	15 1/4"	105
EOE-17	320	7 3/4"	9-15/16"	15 1/4"	116
EOE-19	360	8 3/8"	9-15/16"	15 1/4"	125
EOE-29	560	12 1/8"	9-15/16"	15 1/4"	176
FOE-17	608	8"	13-5/16"	19-9/16"	210
FOE-19	684	8 7/8"	13-5/16"	19-9/16"	229
FOE-29	1064	12 3/8"	13-5/16"	19-9/16"	336

Exide BTER, KZHGR, and LXGH

PASTED PLATE TYPE IN MULTI-UNIT GLASS CONTAINERS

The elements are made up of plates of the pasted type, assembled with both wood and Vitrex glass separators in strong multi-compartment molded glass containers. Spray proof, easy to remove vent plugs are furnished. Each unit has one cell equipped with pilot balls to give an indication of the state of charge.

The units are shipped assembled, sealed, charged and filled with electrolyte ready for service. Interunit connectors will be furnished when 2 or more units are ordered (specify whether end to end or side to side connectors are wanted). No intertier, inter-row, or intertrack connectors are included. A thermometer, a hydrometer syringe, and 2-connector bolt wrenches should be ordered with batteries.

Type and Size	Capacity in Ampere Hours at 8 Hour Rate to 1.75 Final Volts	No. of Cells Per Unit	Approximate Dimensions in Inches			LCL Shipping Weight Per Unit in Pounds
			Length	Width	Height	
3-BTER-5	14-4	3	9 1/4"	5-9/32"	8-11/16"	37
3-KZHGR-7	25	3	9 1/4"	5-9/32"	8-11/16"	41
2-LXGH-7	50	2	6 3/8"	7 1/2"	10 1/4"	40
3-LXGH-7	50	3	9-7/32"	7 1/2"	10 1/4"	58
2-LXGH-13	100	2	9 3/4"	7 1/2"	10 1/4"	68
3-LXGH-13	100	3	14-13/32"	7 1/2"	10 1/4"	102

Rubber Jar Types

TYPES EB AND FB



These are thick pasted plate batteries assembled in molded rubber jars with the elements resting on ribs in the bottom. They are designed particularly for telephone service. A special feature of this battery design is its explosion control construction. The cells are shipped assembled, sealed, charged and filled with electrolyte.

Type & Size	Ampere Hour Capacity at 8 Hour Rate to 1.75 Final Volts	Approximate Dimensions in Inches			LCL Shipping Weight in Pounds
		Length	Width	Height	
2-EB-7 Units	180	7 5/8"	10-7/16"	19 1/8"	130
3-EB-7 Units	180	11"	10-7/16"	19 1/8"	190
EB-9 Cells	240	5-3/16"	10 3/4"	19 1/8"	82
EB-11 Cells	300	6-3/16"	10 3/4"	19 1/8"	100
EB-15 Cells	420	8 1/8"	10 3/4"	19 1/8"	135
EB-19 Cells	540	10-3/16"	10 7/8"	19 1/8"	166
EB-23 Cells	660	12-3/16"	10 7/8"	19 1/8"	204
FB-15 Cells	840	8-7/16"	14 5/8"	23 3/4"	255
FB-19 Cells	1080	10-7/16"	14 5/8"	23 3/4"	313
FB-23 Cells	1320	12-7/16"	14 5/8"	23 3/4"	371
FB-29 Cells	1680	15 1/4"	14 5/8"	23 3/4"	461

Exide BTMH-2, CTMH-2, ETMH-2 and PTMH-2 EXIDE MANCHESTER TYPE

These two plate batteries are adapted to those general services where the current requirements are small. For convenience in handling and installation, these batteries are assembled in wood crates of from 4 to 8 cells in single row arrangement while 6 and 8 cell batteries can be obtained in double row arrangement. The crates of the two larger sizes, PTMH-2 and ETMH-2 are equipped with steel handles. The intercell connectors in each crate of cells are burned to the posts.

When shipped, these cells are assembled in crates, sealed, charged and filled with electrolyte ready for service.

Multi-Cell Units

Type & Size	Ampere Hours Capacity at 8 Hour Rate to 1.75 Final Volts	No. of Cells in Crate	Approximate Dimensions in Inches			LCL Shipping Weight Per Unit in Pounds
			Length	Width	Height	
BTMH-2	6	4	10-3/16"	4-15/16"	10 1/8"	30
		5	12-9/16"	4-15/16"	10 1/8"	37
		6	14 7/8"	4-15/16"	10 1/8"	44
		7	17-3/16"	4-15/16"	10 1/8"	53
		8	19-9/16"	4-15/16"	10 1/8"	61
CTMH-2	12	4	11 1/4"	7 1/2"	12 1/8"	59
		5	13 3/8"	7 1/2"	12 1/8"	73
		6	16 1/2"	7 1/2"	12 1/8"	87
		7	19-1/16"	7 1/2"	12 1/8"	102
		8	21-11/16"	7 1/2"	12 1/8"	115
PTMH-2	24	4	14-3/16"	8"	16 7/8"	95
		5	17 1/8"	8"	16 7/8"	117
		6	20-1/16"	8"	16 7/8"	140
		7	23"	8"	16 7/8"	162
		8	25-15/16"	8"	16 7/8"	184
ETMH-2	36	4	15-7/16"	10-9/16"	16 3/8"	137
		5	18-11/16"	10-9/16"	16 3/8"	168
		6	21-15/16"	10-9/16"	16 3/8"	201
		7	25-3/16"	10-9/16"	16 3/8"	233
		8	28-7/16"	10-9/16"	16 3/8"	266

POWER

GOULD STORAGE BATTERIES

Gould batteries are available in a comprehensive range of capacities in four types of cells—Plante, Flote, Kathanode, and Dreadnaught.

All Gould cells are assembled in glass jars with hard rubber covers. Plante, Kathanode and Dreadnaught are of Gould dual suspension construction. This features projections which rest on opposite top edges of the jar to support the weight of the element, and hard rubber channels resting on the lug ends of the plates of one group to support the free ends of the plates of the group of opposite polarity. Flote utilizes the supported element design, the plates resting on ribs molded into the bottom of the jar.

Gould Plante cells contain elements of Plante pure lead positive and pasted negative groups insulated with white cedar separators. The positive plates are formed from pure lead blanks by a spinning operation, and the active material is chemically formed from the pure lead plate itself. This type of Gould battery should be selected where long life and minimum maintenance are the primary considerations.

Flote batteries are assembled in "Steel Glass" jars featuring element supporting ribs in the bottom of the jar. Elements are held firmly in place by corner and side locks consisting of tapered

hard rubber wedges. The positive plates are of Flote construction, featuring heavy grids of a pattern designed to lock the active material firmly in place. These batteries have built in charge indicators which show the state of charge at a glance. This type of Gould battery should be selected where long life and high capacity are required and minimum space available.

Kathanode cells are assembled with glass-insulated positive groups and pasted negatives, with white cedar separators. Fibre glass retaining mats are held in place against the positive plate by perforated rubber envelopes, encasing the positive plate in a complete sheath of glass and rubber. This construction is recommended for partial cycle service and for float service where the battery may be subjected to abuse during charge.

Dreadnaught cells contain pasted negatives and rubber insulated pasted positives. Perforated rubber envelopes encase the positive plates, and cedar separators provide insulation and proper spacing. This Gould battery should be selected when minimum initial cost is the first consideration, and for float service where careful maintenance is practiced.

Gould Plante. These cells are shipped completely assembled and charged, supplied with inter-cell, inter-row and terminal connectors.



Gould Plante

These cells are shipped completely assembled and charged, supplied with inter-cell, inter-row and terminal connectors.

SINGLE CELL UNITS

Type	Amperes Hours Capacity 8 Hour Rate to 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DP-5	40	4-15/16"	8-1/16"	12 1/2"	32
DP-7	60	5-13/16"	8-1/16"	12 1/2"	38
DP-9	80	6-13/16"	8-1/16"	12 1/2"	45
EP-5	80	5"	10"	16 1/8"	55
EP-7	120	5 7/8"	10"	16 1/8"	70
EP-9	160	6 3/4"	10"	16 1/8"	85
EP-11	200	9 1/4"	10 1/8"	16-13/16"	120
EP-13	240	9 1/4"	10 1/8"	16-13/16"	130
EP-15	280	13 1/4"	10 1/4"	18-9/16"	155
EP-17	320	13 1/4"	10 1/4"	18-9/16"	165
EP-19	360	13 1/4"	10 1/4"	18-9/16"	175
EP-21	400	13 1/4"	10 1/4"	18-9/16"	185
FP-9	320	8 7/8"	13 7/8"	20 7/8"	205
FP-11	400	8 7/8"	13 7/8"	20 7/8"	220
FP-13	480	10 1/4"	13 3/4"	20 7/8"	245
FP-15	560	12 3/8"	14"	20 7/8"	275
FP-17	640	12 3/8"	14"	20 7/8"	300
FP-19	720	14 3/4"	14"	20 7/8"	340
FP-21	800	14 3/4"	14"	20 7/8"	355

Gould Kathanode

Shipped completely assembled, sealed and charged with all necessary accessories—ready for immediate installation and service.

SINGLE CELL UNITS

Type	Capacity in Amperes Hours 8 Hour Rate to 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DK-5	40	4-15/16"	8-1/16"	12 1/2"	29
DK-7	60	4-15/16"	8-1/16"	12 1/2"	31
DK-9	80	5-13/16"	8-1/16"	12 1/2"	36
DK-11	100	6-13/16"	8-1/16"	12 1/2"	41
DK-13	120	6-13/16"	8-1/16"	12 1/2"	44
EK-5	80	5"	10"	16 1/8"	50
EK-7	120	5"	10"	16 1/8"	56
EK-9	160	5 7/8"	10"	16 1/8"	67
EK-11	200	6 3/4"	10"	16 1/8"	78
EK-13	240	6 3/4"	10"	16 1/8"	85
EK-15	280	9 1/4"	10 1/8"	16-13/16"	123
EK-17	320	9 1/4"	10 1/8"	16-13/16"	130
EK-19	360	9 1/4"	10 1/8"	16-13/16"	133
EK-21	400	13 1/4"	10 1/4"	18-9/16"	175
EK-23	440	13 1/4"	10 1/4"	18-9/16"	180
EK-25	480	13 1/4"	10 1/4"	18-9/16"	185
EK-27	520	13 1/4"	10 1/4"	18-9/16"	190
FK-17	608	10 1/4"	13 3/4"	20 7/8"	235
FK-19	684	10 1/4"	13 3/4"	20 7/8"	245
FK-21	760	12 3/8"	14"	20 7/8"	255
FK-23	836	12 3/8"	14"	20 7/8"	265
FK-25	912	14 3/4"	14"	20 7/8"	300
FK-27	988	14 3/4"	14"	20 7/8"	310
FK-29	1064	14 3/4"	14"	20 7/8"	320
FK-31	1140	14 3/4"	14"	20 7/8"	330

**POWER
GOULD STORAGE BATTERIES**

Gould Flote

These suspended element type batteries are shipped, charged and sealed with all necessary inter-cell, inter-row and terminal connectors ready for service.

SINGLE CELL UNITS

Type	Capacity in Ampere Hours, 8-Hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DF-5	48	4½"	8-5/16"	12-7/16"	34
DF-7	72	6¾"	8-5/16"	12-7/16"	47
DF-9	96	6¾"	8-5/16"	12-7/16"	52
EF-5	96	7½"	10⅞"	16-3/16"	72
EF-7	144	7½"	10⅞"	16-3/16"	79
EF-9	192	7½"	10⅞"	16-3/16"	86
EF-11	240	10-5/16"	10⅞"	16-3/16"	120
EF-13	288	10-5/16"	10⅞"	16-3/16"	127
FF-7	288	7¾"	14½"	19¼"	127
FF-9	384	8¼"	14½"	19¼"	149
FF-11	480	9⅞"	14½"	19¼"	170
FF-13	576	10"	14½"	19¾"	202
FF-15	672	10⅞"	14½"	19¾"	223
FF-17	768	12⅞"	14½"	19¾"	270
FF-19	1056	15¼"	14½"	19¾"	345

Gould Small Glass Jar Batteries

These small glass jar batteries may be used for inter-communication systems, operators transmitter batteries, manual and dial PBX, central office No. 2 battery service, etc.

GOULD PLANTE

Single cells—assembled in multi-cell wood trays.

Type	Capacity in Ampere Hours, 8-Hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
WPE-3	9.2	2-3/16	4-5/16	8¾	6½
XPE-3	20	2½	6¾	10-13/16	15
YPE-3	28	2½	6¾	15-9/16	23

GOULD DREADNAUGHT

Single cells—assembled in multi-cell wood trays.

WSC-3	9.2	2-3/16	4-5/16	8¾	6½
XSC-3	20	2½	6¾	10-13/16	15
YSC-3	28	2½	6¾	15-9/16	23

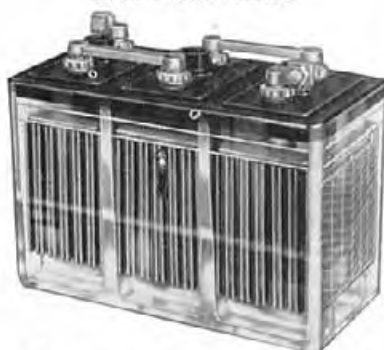
Gould Dreadnaught

Shipped completely assembled, sealed and charged—with connectors and lugs ready for immediate installation and service.

SINGLE CELL UNITS

Type	Capacity in Ampere Hours, 8-hour Rate 1.75 Volts	Dimensions			Shipping Weight
		Length	Width	Height	
DD-5	36	4-15/16"	8-1/16"	12½"	28
DD-7	54	4-15/16"	8-1/16"	12½"	31
DD-9	72	5-13/16"	8-1/16"	12½"	36
DD-11	90	6-13/16"	8-1/16"	12½"	41
DD-13	108	6-13/16"	8-1/16"	12½"	44
ED-5	80	5"	10"	16⅞"	50
ED-7	120	5"	10"	16⅞"	56
ED-9	160	5⅞"	10"	16⅞"	67
ED-11	200	6¾"	10"	16⅞"	78
ED-13	240	6¾"	10"	16⅞"	85
ED-15	280	9¼"	10⅞"	16-13/16"	123
ED-17	320	9¼"	10⅞"	16-13/16"	128
ED-19	360	9¼"	10⅞"	16-13/16"	133
ED-21	400	13¼"	10¼"	18-9/16"	175
ED-23	440	13¼"	10¼"	18-9/16"	180
ED-25	480	13¼"	10¼"	18-9/16"	185
ED-27	520	13¼"	10¼"	18-9/16"	190
FD-17	608	10¼"	13¾"	20⅞"	235
FD-19	684	10¼"	13¾"	20⅞"	245
FD-21	760	12⅞"	14"	20⅞"	255
FD-23	836	12⅞"	14"	20⅞"	265
FD-25	912	14¾"	14"	20⅞"	300
FD-27	988	14¾"	14"	20⅞"	310
FD-29	1064	14¾"	14"	20⅞"	320
FD-31	1140	14¾"	14"	20⅞"	330

**Gould Flote
MULTI-CELL UNITS**



These batteries are available in multi-cell glass jar units; two, three and four-cell containers as specified below. Smaller unit may be trayed as required.

Type	Capacity in Ampere Hours 8-Hour Rate 1.75 Volts	Number Compartments in Containers	Number Cells in Unit	Dimensions (inches)			Shipping Weight
				Length	Width	Height	
BF-52	15	2	1	3½	9	8	18
BFI-54	15	2	2	3⅞	8⅞	8	20
BF-92	30	2	1	5¼	9	8	31
BF-94	30	2	2	5¼	9	8	34
CF-52	10	1	1	2⅞	3⅞	7¼	8
CF-54	10	2	2	2-13/16	7¼	7¼	12
PF-92	20	1	1	4⅞	3⅞	7¼	13
PF-94	20	3	2	4⅞	10-7/16	7¼	26
PF-96	20	3	3	4⅞	10-7/16	7¼	29
RT-72	50	2	1	5⅞	7½	10¼	44
RT-74	50	2	2	5⅞	7½	10¼	48
RT-76	50	3	3	8⅞	7½	10¼	65
RT-78	50	4	4	10⅞	7¼	10⅞	86
RT-132	100	2	1	9-7/16	7½	10¼	63
RT-134	100	2	2	9-7/16	7½	10¼	69
RT-136	100	3	3	13-13/16	7½	10¼	97

POWER CHARGING EQUIPMENT

Storage batteries are charged, in general, by the trickle, or the automatic control method. The trickle method consists of charging the batteries continuously over a 24 hour period at a constant rate sufficient to compensate for drain and battery losses.

This automatic control method allows charging equipment to operate automatically or start when battery discharge reaches a predetermined point. The charge automatically disconnects when battery becomes fully charged.

Automatic control of the charging equipment eliminates the

possibility of starving or overcharging the battery. The control unit may be either an ampere hour meter or voltmeter relay. An automatic starting rectifier must be used with the automatic charging control circuit. The General Electric Tungar or copper oxide type of rectifiers listed below are the automatic starting type and are suitable for use with an automatic charging control circuit. The Raytheon Recticharger which has copper oxide or selenium rectifying units has its own control unit built in as a part of the rectifier circuit.

Raytheon Rectichargers



A Recticharger with a small storage battery floating across its terminals makes a complete AC to DC telephone power unit. Basically it is a dry disc copper oxide or selenium rectifier with a Raytheon control circuit which maintains a substantially constant DC voltage output at any load in the presence of wide changes in AC input voltage. Built-in filters insure quiet operation.

When the load current demand is less than the Recticharger rating, the Recticharger supplies all of the current required and, at the same time, delivers to the battery a trickle charge of the right amount to make up for internal battery losses and to prevent destructive chemical action as well as replace any load taken from the battery while the load was greater than the output of the Recticharger. If the current demand exceeds the rating, the excess is supplied by the battery. When the load drops back to a value below the Recticharger rating, the Recticharger output remains at its maximum rated value. The difference between the Recticharger rating and the load current is then supplied to the battery until it is fully charged. When this point is reached the Recticharger output is reduced to a point where it is operating the switchboard and trickle charging the battery again.

The battery acts as a reservoir of power to supply any peak DC current demand over the current rating of the Recticharger, or to furnish all the DC power in case of AC interruption.

Battery activity is reduced to a minimum, and maximum battery life is assured. The only maintenance required is the replacement of battery water lost through evaporation.

A Recticharger may be used to supplement existing constant current chargers with filters for telephone service. When this method is employed, the effect of following the load and keeping the battery fully charged is achieved.

This doubles the available power and is accomplished by installing a special relay and a Recticharger of the proper rating with the constant current charger. The output current rating of the charger should not exceed the rating of the Recticharger. If the rating is higher, the output current must be adjusted to match the Recticharger current rating.

Input. Input is 95-130 volts, 60 cycle stabilized frequency, single phase. All Rectichargers are equipped with AC input voltage, stabilizing equipment providing for operation on AC lines that may fluctuate from 95 to 130 volts.

Ratings. Normal Recticharger ratings are based on their being installed in live air and where the ambient temperature will not exceed 95° F. for appreciable periods.

Mounting. All equipment is enclosed in a steel cabinet provided with a hinged door. The cabinet is arranged for wall mounting. Brackets are available for floor or table mounting.

Cat. No.	Battery Cells	Amps. Conf.	Dimensions (inches)			Shipping Weight
			Width	Depth	Height	
1066	11/12	1.0	14½	7⅝	14⅛	62 lbs.
1073	11/12	2.0	14½	9½	14⅛	94 lbs.
1058	11/12	3.0	19	11	21	163 lbs.
1067	11/12	6.0	19	15¼	28	233 lbs.
1068	22/24	1.0	14½	9½	14⅛	93 lbs.
1076	22/24	2.0	19	11	21	173 lbs.
1069	22/24	3.0	19	15¼	28	231 lbs.
1070-B	22/24	6.0	19	15¼	28	270 lbs.

Electronically Controlled Rectichargers



The Raytheon electronically controlled Recticharger is an addition to the standard line of Raytheon Rectichargers.

In order to reduce space, an electronic amplifier containing standard tubes conservatively rated is used in conjunction with a saturable core reactor. This amplifier also provides for greater flexibility of adjustment, a greater frequency range, and a variety of input and output voltage combinations, in addition to closer tolerance of regulation.

The use of the amplifier provides several additional advantages to the older type Recticharger. These are: closer regulation over both load and line changes, interchangeable input and output voltage, and the use of either 50 or 60 cycle frequency input current. There is, also, a current limiting feature which will lower the output voltage when the current exceeds a certain adjustable point, making the unit self protecting.

Cat. No.	Battery Cells	Amps.	Dimensions (inches)			Shipping Weight
			Width	Depth	Height	
RCT-2013-A	11/12	12.0	17	15-3/16	21	232 lbs.
RCR-2016-A	11/12	24.0	17	15-3/16	28	320 lbs.
RCR-2013-B	22/24	6.0	17	15-3/16	21	232 lbs.
RCR-2016-B	22/24	12.0	17	15-3/16	28	320 lbs.

POWER CHARGING EQUIPMENT

G. E. Tungar Battery Chargers
FOR 3 TO 24 LEAD CELLS



This 12 ampere, full-wave tungar No. 6RB6B17 (or No. 6RB-6B14, see below) when used in conjunction with Cat. No. 3126680 filter reactance makes an excellent combination for "float" charging telephone batteries. Wide range of charging is obtainable with this combination (from 6 to 60 volts, 3 to 12 amperes).

In small and medium size exchanges where motor-generator sets are now in service, this combination is often used to supplement the motor-generator set especially during "low load" periods. This combination is particularly desirable for this purpose during week ends in exchanges where a charging rate of 12 amperes or less is sufficient. This enables shutting down the motor-generator set and operating during this period at the much higher efficiency obtained from the Tungar.

This Tungar employs the plug type control which simplifies balancing both sides of the outfit, as a visual indication of the settings on each side is given. An ammeter is provided on each side.

This Tungar is highly efficient and two or more units can be connected in parallel to obtain charging rates above 12 amperes. The full load efficiency is approximately 54 per cent when used in conjunction with Cat. No. 3126680 reactance. The units use two standard 6 ampere Tungar bulbs Cat. No. 189049.

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
6RB6B17	115	50-60	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	91 lbs.
6RB6B16	230	50-60	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	91 lbs.
6RB7B13	230	25-40	19 ⁷ / ₈	11 ¹ / ₂	11 ⁵ / ₈	96 lbs.
3126680	External Filter Reactance		10 ¹ / ₂	6 ¹ / ₂	7 ³ / ₄	73 lbs.

FOR 9 TO 24 LEAD CELLS

This Tungar was designed to meet the requirements of inter-communicating systems and PBX's. It can be used wherever a full-wave filtered output is required up to 3 amperes from 19 to 52 battery volts. Six sets of secondary taps brought to a terminal board located just inside the left-hand door, in conjunction with a rheostat controlled from the front panel permit a simple and easy method of adjusting the output over the entire range. A high grade D'Arsonval ammeter gives accurate indication of the charging rate. A suitable filter reactance is incorporated in the design to give quiet operation on telephone batteries.

Will give full 3.0 ampere charging rate at 52 battery volts and taper to 1.75 amperes at 65 battery volts. Full load efficiency, 48 per cent. Power-factor, 92 per cent. Uses two No. 12 x 825 bulbs.

G. E. Tungar Battery Chargers (Cont'd)
FOR 9 TO 24 LEAD CELLS (Cont'd)

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
3049455	115	60	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	88 lbs.
3049456	115	25-50	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	105 lbs.
3049457	230	60	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	88 lbs.
3049458	230	25-50	17 ¹ / ₂	12 ¹ / ₈	14 ⁷ / ₈	105 lbs.

FOR 3 TO 12 OR 18 LEAD CELLS

This Tungar is similar to Model No. 6RB6B17, the only difference being in the rated output voltage. When used in conjunction with Cat. No. 3126680 reactance it is adaptable to charging telephone batteries of 3 to 12 cells at an adjustable rate of 3 to 12 amperes. Can be used with up to 18 cells when used with the reactance. The plug type of control is used, and two ammeters are provided. It incorporates all the features of the Model No. 6RB6B17 unit.

Cat. No.	A.C. Input		Dimensions (inches)			Shipping Weight
	Volts	Cycles	Height	Width	Depth	
6RB6B14	115	50-60	19 ⁷ / ₈	11 ¹ / ₂	9 ⁵ / ₈	82 lbs.
6RB6B12	230	50-60	19 ⁷ / ₈	11 ¹ / ₂	9 ⁵ / ₈	96 lbs.

G. E. Copper Oxide Battery Chargers

The G.E. copper oxide rectifier for telephone service obtains output adjustment over an extremely wide range in very small steps. The copper oxide rectifying unit is a permanent, reliable, and safe assembly.

After the charging rate is adjusted no other attention is required. The dial mounted on the front of the cabinet gives perfectly uniform adjustment from zero to full load. Since all the adjustment is made with a transformer the efficiency of the rectifier is high. No bulbs are used with this unit.

The lower section of the black crackle finish metal cabinet is perforated to allow free circulation of air to cool the unit.

These units are for use with 115 volt, 60 cycle, AC power supply.

Model	Cells	Amperes	Dimensions (inches)			Shipping Weight
			Height	Width	Depth	
6RC49D2*	12	0.5	10 ⁷ / ₈	11 ⁷ / ₈	9 ¹ / ₄	35 lbs.
6RC98D1	12	1.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC98D2	12	2.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC98D3	12	3.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC99D3	12	4.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D2	12	5.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D1	12	6.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC95D2	12	8.0	25	20 ³ / ₈	14 ⁷ / ₈	
6RC96D7	12	12.0	31	20 ³ / ₈	14 ⁷ / ₈	
6RC98D5	24	1.0	19	13 ³ / ₈	14 ⁷ / ₈	
6RC99D4	24	2.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC99D6	24	3.0	25	13 ³ / ₈	14 ⁷ / ₈	
6RC100D1	24	4.0	31	13 ³ / ₈	14 ⁷ / ₈	
6RC96D8	24	5.0	31	20 ³ / ₈	14 ⁷ / ₈	
6RC98D9	24	6.0	31	20 ³ / ₈	14 ⁷ / ₈	

*Has transformer taps with resistance for controlling output.

POWER

Lorain Battery Chargers

The Lorain Flotrol battery charger is a completely automatic constant voltage charger which operates without moving parts. Once installed and adjusted for a specific battery, further adjustment is unnecessary. All Flotrol units are equipped with heavy duty oversized selenium rectifiers. All units compensate for changes in input voltage and output load. The output voltage is maintained within the limits of plus or minus one per cent under all normal load conditions.

Any small changes in battery voltage due to switch operation, talking, or other load requirements are instantly picked up by the Flotrol and the current for this type of operation supplied not by the battery but by the Flotrol itself. The close voltage regulation of the Flotrol permits the charger to carry the load of the exchange up to the full rating of the Flotrol. At the same time the battery is maintained at full charge without being overcharged. This insures maximum stand-by capacity in case of a power failure and at the same time greatly lengthens the years of service obtainable from a battery because the battery is not worked in normal service.

Flotrols made to deliver from 1 ampere, 24 volts up to 24 amperes, 48 volts can be supplied for single-phase operation. Larger sizes are made only for three phase operation. Three-phase chargers are made in six sizes supplying 50 to 100 amperes in the 24 volt chargers and having capacities of 25, 50, 75, and 100 amperes in the 48 volt chargers. Chargers as large as 100 amperes, 24 volts or 50 amperes, 48 volts are made for 23 inch relay rack mounting. Where it is desirable to mount this type of equipment on the floor, a special short rack can be supplied. The floor space required for this type of unit is only 15 by 24 1/2 inches, the total height being 52 inches.

FLOTROL TYPE CHARGERS



Cat. No.	Phase	Input Volts	Cycles	Output		Size (inches)
				Amps.	Volts	
24A*	1	105-125	60	1.0	24	14x8x15
75A**	1	105-125	60	3.0	24	19x8x15 3/4
150A**	1	105-125	60	6.0	24	19x8 1/4 x 24 1/2
300A**	1	105-125	60	12.0	24	19x13 1/4 x 31 1/2
600A***	1	210-250	60	24.0	24	23x15x45 1/2
1250A***	3	210-250	60	50.0	24	23x15x45 1/2
2500A***	3	210-250	60	100.0	24	23x15x45 1/2

*For wall mounting.

**For relay rack or wall mounting.

***For relay rack mounting.

Lorain Battery Chargers (Cont'd)

DUAL RANGE CHARGERS

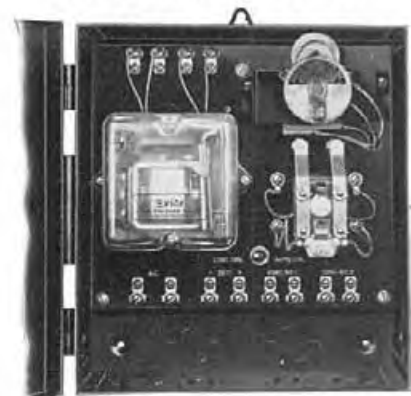
Cat. No.	Phase	Input Volts	Cycles	Output		Size (inches)
				Amps.	Volts	
150D**	1	105-125		6.0	24	19x8 1/4 x 24 1/2
		210-230		3.0	50	
300D**	1	105-210		12.0	24	19x13 1/4 x 31 1/2
		210-230		6.0	50	
75B**	1	105-125	60	1.5	50	19x8x15 3/4
150B**	1	105-125	60	3.0	50	19x8 1/4 x 24 1/2
300B**	1	105-125	60	6.0	50	19x8 1/4 x 24 1/2
600B***	1	105-125	60	12.0	50	23x15x45 1/2
1200B***	1	105-125	60	24.0	50	23x15x45 1/2
1250B***	3	210-250	60	25.0	50	23x15x45 1/2
2500B***	3	210-250	60	50.0	50	23x15x45 1/2
3750B	3	210-250	60	75.0	50	36x28x66
5000B	3	210-250	60	100.0	50	36x28x66

*For wall mounting.

**For relay rack or wall mounting.

***For relay rack mounting.

Exide ES Charge Control



This Exide Model No. ES charge control unit is used to control the charging of an automatic starting type rectifier. The control unit works equally well with either the bulb or dry disc type rectifier.

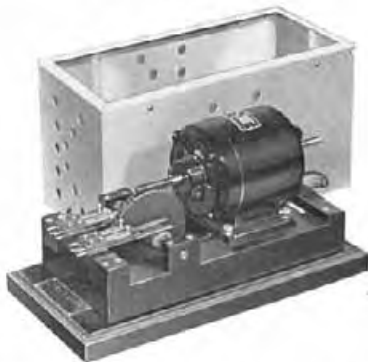
This unit consists of a small, self-starting synchronous motor driven time switch which operates from 115 volts, 60 cycle, A.C. power supply. This time switch starts the charge by operating an Exide T.V.R. voltage relay. The voltage relay winding is bridged across the battery terminals with one side of the winding connected through the contacts of the time switch which are closed 59 minutes and open 1 minute each hour. If the battery voltage is below 2.3 volts per cell at 77° F. the T.V.R. relay will remain unoperated and through its back contacts close the winding circuit of an auxiliary relay which closes A.C. through the contacts to the rectifier and starts the battery charge.

When the battery voltage rises to a predetermined point the T.V.R. relay operates. This stops the charge.

The unit is installed in a wall mounting steel cabinet 11 1/8 inches high, 10-7/16 inches wide and 4 inches deep. The cabinet has a hinged door which may be padlocked if desired. When ordering it is necessary to specify the type of charger and the number of cells as the control is built for a definite number of cells.

POWER

Interrupters



These Kellogg automatic ringing interrupters furnish automatic ringing and signalling tones. The motors for these interrupters operate from either 115 volt, 60 cycle, A.C. power supply or from the regular exchange storage battery. The interrupters can be equipped with six sets of interrupter springs and a three-tone commutator.

A tone mechanism equipped with a three-tone commutator is available when required. This will produce a high tone of 360 interruptions per second for howler service, a medium tone of 280 interruptions per second for dial and miscellaneous tones, and a low tone of 160 interruptions per second for "busy back" and "out of order" tone.

Automatic ringing is accomplished directly through cam operated interrupter spring contacts which operate a relay in the cord circuit and send the ringing current out on the line for one second and then withholds it for five seconds. The interrupter cams make 10 R.P.M. to furnish a six second cycle of ringing interruptions of one second make and five seconds break or open period.

The interrupter is complete with driving motor, mounting base and glass top, ventilated steel cover. Floor space required is 15 by 7 inches.

The two code numbers listed below, the No. 10-A and No. 10-D, are used in pair with the No. 10-A as the regular or No. 1 machine and the No. 10-D as the emergency or No. 2 machine, held in reserve for emergency service.

Code No.	Power Supply
10-A	115 volts, 60 cycle, A.C.
10-D	24 volts, D.C.

NO. 13 INTERRUPTER

The No. 13 interrupter is made up of a No. 11 and No. 12 interrupter mounted on a wood base 14¼ by 8 by 1 inch with a glass top, ventilated steel cover 12 by 7½ by 5¾ inches. The No. 11 interrupter is an automatic two-circuit ringing interrupter consisting of a 110 volt, 60 cycle synchronous motor equipped with reduction gears and extension shaft to produce 10 R.P.M. The shaft is equipped with a cam to break and make two sets of springs. The No. 12 interrupter is an automatic two-circuit ringing interrupter the same as the No. 11 except that it is designed to operate from 100 volts, 20 cycles A.C. furnished by a pole changer. The No. 12 interrupter is intended as an emergency machine to be used in case of failure of the commercial 110 volt supply.

Automatic Interrupter Switching Circuit

This circuit consists of a series of relays which automatically start the No. 2 emergency interrupter and switch all interrupter and tone circuits from the regular to the emergency machine whenever there is an interruption in the commercial A.C. supply. During this interruption the No. 2 machine operates from the office storage battery.

As soon as the A.C. circuit has been restored to service, the No. 1 regular interrupter is started and the interrupter and tone circuits automatically switched back again to the regular machine. The No. 2 machine then is stopped and held in reserve for the next power interruption.

Meter, No. 2 Frequency

The Kellogg No. 2 frequency meter is designed for checking and adjusting pole changer frequencies. This meter operates on the stroboscopic principle and its use requires no computations or other measuring devices. Readings are made directly.

The meter is portable, housed in a wood box approximately 10 inches square and 6 inches high. The net weight is 10 pounds.

This meter is designed to check any of the following frequencies: 16⅔, 20, 25, 30, 33⅓, 42, 50, 54, 60, 66, and 66⅔ cycles per second. It operates directly from 110-115 volt, 60 cycle power supply and the ringing current of the pole changers being tested.

Pole Changers

The pole changer is used to convert direct current to alternating current for telephone ringing purposes. It operates on the same principle as the ordinary door bell with weighted vibrator to regulate the frequency of vibration. The telephone exchange storage battery of 24 volts can be used to operate the vibrator, or a separate set of batteries of the correct voltage and ampere hour capacity may be used.

Pole changers are supplied with a single vibrating unit for straight line service or with four or five vibrating units of different frequencies for party line service.

Kellogg pole changers require only a minimum of maintenance. They hold their adjustment over a long period of time. There are only three vibrating springs; one is used to operate the pendulum or vibrator reed; the other two, together with the swinging vibrator, produce the desired frequency of ringing current.

To protect the pole changer contacts, a 15 or 25 watt, 120 volt mazda lamp should be installed in the live side of the ringing leads in each position of the switchboard.

SINGLE FREQUENCY TYPE

These pole changers provide A.C. only in single frequency. They are storage battery type (side swinging). Both code numbers listed below have the following parts in common: One P-69662 and two P-65789 resistors; two No. 66 and one No. 68 condensers; six No. 11 binding posts, and one No. 26 number plate. Input voltage, frequency, and code number of the transformer set supplied are given in the listing below.

Code No.	Volts (Input)	Frequency	Transformer Set
41	24	20	No. 2-A
43	24	60	No. 3-C

POWER

Pole Changers (Cont'd)

SINGLE FREQUENCY—FOR RELAYMATIC

This pole changer is used on the Relaymatic standardized power panel. It includes one P-69662 and two P-65789 resistors; two No. 64 and one No. 132 condensers; one No. 5-C transformer; two No. 65-A and one No. 41-B retard coils; relays Nos. 2106 S-JD, 1870 S-DS, and a No. S-GT coil.

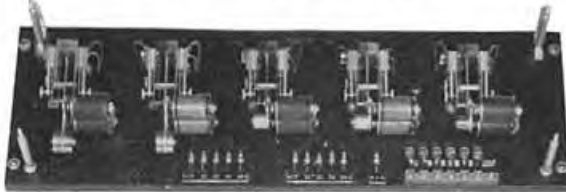
Code No.	Volts (Input)	Frequency (Cycles)
46	48	16

FOUR FREQUENCY TYPE

This pole changer provides four frequencies for the first four parties of harmonic ringing. It is designed for relay rack mounting. It includes four P-69662 resistors and a No. 29-A transformer set.

Code No.	Volts (Input)	Frequency (Cycles)			
		Position 1	Position 2	Position 4	Position 5
39	24	16 $\frac{2}{3}$	33 $\frac{1}{3}$	50	66 $\frac{2}{3}$

FIVE FREQUENCY TYPE



This pole changer provides the five frequencies of five party synchronomic ringing. Each of these pole changers includes five P-69662 resistors.

Code No.	Volts (Input)	Frequency (Cycles)					Trans. Set
		Pos. 1	Pos. 2	Pos. 3	Pos. 4	Pos. 5	
42	24	16	30	42	54	66	No. 27-B
44*	48	16	30	42	54	66	No. 30
45**	48	16	30	42	54	66	No. 31

*For relay rack mounting.
**For Relaymatic mounting.

Pole Changer Filters



The Kellogg pole changer filter is designed to reduce cross-ringing, radio interference, and ringing induction in the switchboard and outside cables.

Basically, these filters are of the band or frequency pass type and serve as blocking filters for the stray harmonic frequencies present in pole changer voltages. These harmonics are created as part of the basic frequency since the form of the pole changer frequency is, in general, a "square" wave, made up of the basic frequency and many harmonics of that basic frequency.

Pole Changer Filters (Cont'd)

In some cases the harmonics of a low ringing frequency are sufficiently high in voltage to ring other telephones on the line. By blocking these harmonics this "cross-ringing" is prevented.

Each of the filters listed below is designed to mount on a single No. 1003 relay mounting strip.

HARMONIC FREQUENCY FILTERS

Code No.	Frequency (Cycles)	Code No.	Frequency (Cycles)
1-A	33 $\frac{1}{3}$	1-D	16 $\frac{2}{3}$
1-B	50	2-B	25
1-C	66 $\frac{2}{3}$		

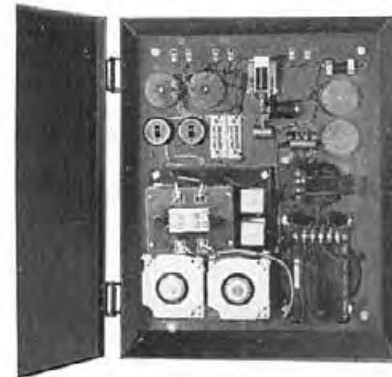
SYNCHROMOMIC FREQUENCY FILTERS

Code No.	Frequency (Cycles)	Code No.	Frequency (Cycles)
2-C	30	1-C	66
1-B	42	1-D	16
2-D	54		

STRAIGHT LINE FILTERS

Code No.	Frequency (Cycles)
2-A	20

No. 2-A Power Unit



The Kellogg No. 2-A power unit, used with a 24-volt storage battery, forms a complete power installation for PBX, magneto, or small common battery switchboards handling any number of calls up to 2,500 per day. It supplies ringing current of 105 volts, 20 cycle, and does not interfere with radio reception.

This compact unit combines in one cabinet all the necessary fuses, switches, condensers, pole changer, transformer, dry charger, and filter equipment. All of the equipment is mounted on a wood backboard inside the black enameled steel cabinet. Dimensions of mounting cabinet: 20 inches high, 16 inches wide, and 8 inches deep. Two conduit knockout holes are provided at top, one for entrance of commercial current and ringing leads to switchboard; the other for direct current leads to storage battery.

The direct current charging rate of the copper oxide charger used is variable from approximately 100 milliamperes to 1 ampere by means of slide band resistors.

Code No.	A.C. Input		Ringing		Net Weight
	Volts	Cycles	Volts	Cycles	
2-A	110-115	60	105	20	100 lbs.

POWER

Raytheon Rectifiers



Raytheon Rectifiers are used to obtain telephone D.C. power direct from an A.C. source. They are designed particularly for PBX switchboards, either dial or manual.

Rectifiers provide long, trouble-free, economical operation. Each Rectifier will operate a telephone system for 24 hours a day as long as the maximum current demand does not exceed the output rating of the Rectifier. Current ratings are

based on installations being in live air where the maximum ambient temperature does not exceed 95° F.

Rectifiers are available with change of source relays which make it possible to furnish D.C. with dry cells during an interruption of the A.C. power source.

RECTIFIERS USING DRY DISC RECTIFYING UNITS

Cat. No.	D.C. Output Volts	Output Amps.	A.C. Supply Frequency	Dimensions (inches)			Shipping Weight
				Width	Depth	Height	
1024	6	0.5	50-60	7	6¼	10½	17 lbs.
1026	12	0.5	50-60	7	6¼	10½	17 lbs.
1027	24	0.5	50-60	7	6¼	10½	34 lbs.
1028-A	6	1.0	50-60	7	6¼	10½	20 lbs.
1044-E	24	1.0	60	14½	7⅝	14⅞	84 lbs.
1044-ER*	24	1.0	60	14½	7⅝	14⅞	84 lbs.
1043	24	1.5	60	14½	7⅝	14⅞	90 lbs.
1043-R*	24	1.5	60	14½	7⅝	14⅞	90 lbs.
1040	24	3.0	60	14½	9⅝	14⅞	100 lbs.
1040-R*	24	3.0	60	14½	9⅝	14⅞	100 lbs.
1041	24	4.5	60	19	12	14⅞	142 lbs.
1042	24	6.0	60	19	12	21½	179 lbs.
1082	48	3.0	60	19	12	21½	190 lbs.
1079	48	4.0	60	19	15-3/16	28	210 lbs.

*With change of source relay. Change of source relays can be supplied on all models where not listed. Order by adding suffix letter "R" to the catalog number.

FOR OPERATORS' TRANSMITTER ON MAGNETO SWITCHBOARD



A full 4 volts is furnished by this Rectifier for the best operation of telephone operators' headset transmitters. Life-time dry disc rectifying units are used.

Operates from 115 volts, 50-60 cycles A.C. power supply. Delivers 4 volts D.C. Power consumption is 4½ watts. Will supply 1 or 2 transmitters.

If there is an A.C. power interruption, a relay automatically disconnects the Rectifier and connects a set of dry cells provided by the telephone company for this emergency. The Rectifier is automatically re-connected as soon as the A.C. power circuit is restored to service.

Cat. No.	D.C. Output Volts	Output Amps.	A.C. Supply Frequency	Dimensions (inches)			Shipping Weight
				Width	Depth	Height	
1057-R	4	0.23	50-60	7	6¼	10¼	17 lbs.

Rotary Ringing Equipment

Rotary ringing equipment provides long, trouble-free performance for all applications. The items listed here provide a complete range for all exchanges, large and small. Special ringing equipment may be obtained by submitting specifications.

MAGNETO RINGING SET NO. MG-125



This compact, two-bearing motor-generator set contains a squirrel cage motor and a magneto type generator with permanent magnet rotor. The design completely eliminates all brushes, commutators and slip rings and insures continuous operation over long periods of time without attention. Operation is quiet, causes no interference with

radio reception and has close voltage regulation. All terminals are mounted on insulating blocks recessed in the base with facilities for direct conduit connection. An insulating transformer is furnished with each set to prevent accidental demagnetization of the rotor.

The set operates on 115-volt, 60-cycle, single phase supply and delivers 80 volts, 19 cycles at 15 watts maximum output. Required floor space is 11-5/16 inches by 7½ inches for the ringing set and 5 by 5 inches for the transformer. Shipping weight is 75 pounds. Where stand-by supply is required a ringing dynamotor may be employed.

RINGING DYNAMOTOR



Ringling dynamotors operate from 24 or 48-volt battery supply and deliver 19 cycles at 115 volts, no load, and 80 volts at rated load. They are useful as standby sets for AC driven magneto ringers or as a principal source of ringing current where voltage variations are

not excessive and where space and cost are important. Where lone and interrupter equipment are required, a separately driven interrupter should be employed or a motor-generator ringing set should be used. Time limit automatic starters are provided on sets of 75 watts output and above.

Cat. No.	Watt Output	Floor Space	Shipping Weight
1	30	11½ x 8 in.	70 lbs.
2	75	18½ x 9¾ in.	175 lbs.
3	150	20 x 10½ in.	225 lbs.
4	300	24 x 14 in.	300 lbs.

POWER

ROTARY RINGING EQUIPMENT (Cont'd)

RINGING ROTARY CONVERTERS WITH FIVE CIRCUIT INTERRUPTER

These inverted rotary converters, driven by 44-52-volt battery, deliver ringing current through a transformer tapped for voltage adjustment and are also equipped with self-contained tone and interrupter. They are especially useful for large PBX or PAX installations or moderate sized exchanges. The tone commutator provides a single tone of approximately 140 I.P.S. Each of the four interrupter spring sets furnishes a one-second make followed by a five-second break period.

The rotary converters are completely enclosed by removable covers, and are provided with ball bearings and with rubber-bushed mounting holes in the feet.

Cat. No.	Input Volts	Output Volts	Floor Space	Shipping Weight
1	44-52-DC	25	13½ x 6⅞ in.	40 lbs.
			7⅞ x 4⅞ in. (trans)	15 lbs.
2	44-52-DC	50	15 x 6⅞ in.	50 lbs.
			7⅞ x 5¼ in. (trans)	25 lbs.

25-Watt Four and Five Frequency Harmonic Ringing Motor-Generator Sets



These ringing motor-generator sets supply constant frequency ringing current for harmonic party line installations and are trouble-free in operation. A speed governor is used for both AC and DC motor driven sets, holding the ringing frequencies constant.

The generator rotors consist of Alnico castings eliminating brushes and slip rings. One generator supplies four frequencies and together with the motor and accessories is mounted on a channel iron base. The generator outputs are 16⅔, 33⅓, 50 and 66⅔ cycles, 25 watts at each frequency, at voltages of 75, 100, 135 and 175 volts (at no load) respectively. When a fifth frequency (25 cycles at 100 volts) is required, it is added in the form of a separate unit, and mounted on a long base with the four-frequency set. For AC supply the fifth frequency set consists of a synchronous motor belted to a 25-watt, 25-cycle generator having an Alnico rotor. For DC supply the fifth frequency is furnished by a 25-watt, 25-cycle dynamotor equipped with a speed governor.

An insulating transformer is needed for each frequency except the fifth frequency supplied by the dynamotor.

Cat. No.	Motor	Floor Space	Weight
1	115 volt, 60 cycle, single phase	62 x 10 in.	325 lbs.
2	24 volt, DC	60 x 10 in.	325 lbs.
3	48 volt, DC	60 x 10 in.	325 lbs.
F	Fifth frequency, 25 cycles	82 x 10 in.	550 lbs.
I	Interrupter—specify circuits and timing	Same	plus 20 lbs.
T	Tone Commutator (133-400 cycles)	Same	plus 5 lbs.

FOUR AND FIVE FREQUENCY SYNCHROMONIC MOTOR-GENERATOR RINGING SETS

Each set consists of one motor belted to four or five separate generators. Four-frequency sets produce 30, 42, 54, and 66 cycles at 100, 125, 150 and 160 volts, no load, respectively. Where a fifth frequency is required it may be either 16 or 20 cycles at 100 volts.

These are available as companion sets for either AC or DC drive. DC drive motors are supplied with governors. The 25-watt sets have one generator which provides exciter current for all generator fields and one transformer, center tapped for coin collect voltages. Time limit automatic starters are furnished for the 50 and 150 watt DC driven sets. Starters are provided for 150 watt AC driven sets.

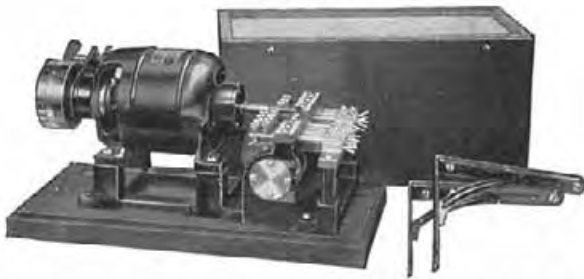
Where tone and interrupter equipment is required a separate motor driven interrupter, independently mounted, should be specified.

Cat. No.	Watts Output	Motor	Floor Space	Weight
1	25	24 volts, DC	48 x 18 x 14 ins.	500 lbs.
2	25	48 volts, DC	48 x 18 x 14 ins.	500 lbs.
3	25	115 volts, 60 cycle, Single phase	48 x 18 x 14 ins.	500 lbs.
3F*	25	115 volts, 60 cycle, Single phase	56 x 18 x 14 ins.	550 lbs.
4	50	48 volts, DC	68 x 36 ins.	1000 lbs.
5	50	115-230 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
6	50	220-440 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
6F**	50	220-440 volts, 60 cycle, Single phase	68 x 36 ins.	1000 lbs.
7	150	48 volts, DC	84½ x 28 ins.	1400 lbs.
8	150	115-230 volts, 60 cycle, Single phase	84½ x 28 ins.	1400 lbs.
9	150	220-440 volts, 60 cycle, Single phase	84½ x 28 ins.	1400 lbs.
9F†	150	220-440 volts, 60 cycle, Single phase	84½ x 28 ins.	1450 lbs.

* Same as No. 3 plus fifth frequency. Specify whether 16 or 20 cycles.

** Same as No. 6 plus fifth frequency. Specify whether 16 or 20 cycles.

† Same as No. 9 plus fifth frequency. Specify whether 16 or 20 cycles.

POWER**ROTARY RINGING EQUIPMENT (Cont'd)**
INTERRUPTERS

One of the most important functions of telephone ringing equipment is ability to provide tones for dial, busy signals, and other miscellaneous signalling purposes, interrupters for producing variously timed pulses and automatic ringing circuits providing sequential time ring for automatically coded ringing. This may be accomplished by use of a separate motor driven interrupter or may be combined directly with the ringing generators. The general description of interrupters below applies to all such interrupter equipment. The interrupter proper consists of a slow speed shaft, worm driven from an extension of the generator shaft, or a special motor shaft, and spring type contactors. The normal speed of the interrupter shaft is 10 rpm. or 6 seconds for one complete interrupter cycle. All times and frequencies given below refer to a 6-second interrupter speed. In special instances, a 5-second cycle may be provided with consequent change in indicated timings.

Specify whether low tone of 133 cycles or high tone of 400 cycles, or both, are required.

INTERRUPTERS. Interrupters are available at 40, 60, 120, or 240 I.P.M. Specify each interrupter speed required.

RINGING CIRCUITS.

Standard Ring 1. This provides 1-second ring, 5 seconds off. These are arranged to operate in sequence thus making the full power of the ringing equipment available for each circuit being signalled. Specify number of Ring 1 circuits required. Maximum of five circuits without overlapping ringing intervals.

Standard Ring 2. This provides a .4 second ring, .2 second off, .4 second ring. Specify number of Ring 2 circuits required. Maximum of five circuits without overlapping ringing intervals.

MISCELLANEOUS. Considerable variety of miscellaneous timing circuits can be provided. Each such circuit may include three springs: a common, a normally closed, and a normally open contact. Information for each circuit should include duration of contact closure, number of closures per 6-second cycle, relative time of closures to other related circuits. The minimum closure interval is 0.125 seconds and the minimum re-closure interval for the same spring is 0.5 seconds.

The separate motor-driven interrupter is available in any number of circuits from 4 to 19. Interrupters installed as part of ringing generator sets are mounted as described for each set. Where ordered as a separate motor driven interrupter, this will be furnished on a wooden base with a glass top metal cover. Interrupter combinations should be completely specified as above. Also specify whether 115-volt, 60 cycle, single phase motor is required or a 48-volt DC motor. Floor space required is 14½ x 17½ inches up to 12 circuits. Shipping weight is 50 pounds. Exact dimensions and weight will be furnished on larger interrupters on request.

SUB-CYCLE RINGING EQUIPMENT
LORAIN K-5 DECIMONIC SUB-CYCLE RINGING
CONVERTER

FRONT VIEW



REAR VIEW

The Lorain K-5 sub-cycle ringing converter was designed for use with the Kellogg decimonic type frequency selective ringer by

the combined engineering staffs of Kellogg and the Lorain Products Corporation.

This converter supplies five party selective or 10 party semi-selective ringing circuits with ringing frequencies of 20, 30, 40, 50, and 60 cycles. Exchanges having up to 7000 lines, handling up to 85,000 calls per day can be supplied from one K-5 converter.

The Kellogg 1000 series Masterphone can be supplied with ringers especially designed for operation on decimonic frequencies. These ringers have been tested and perfected for reliability of operation and ease of adjustment.

Kellogg ringers of the decimonic type also are available for replacement of ringers from other manufacturers' telephones. For detailed information on these ringers see "Ringers" in this section.

The K-5 sub-cycle converter is self-starting. This feature makes it adaptable for use on start-stop operation. The total power consumption of the K-5, however, is lower than comparable motor driven apparatus and therefore may be operated continuously without excessive power costs.

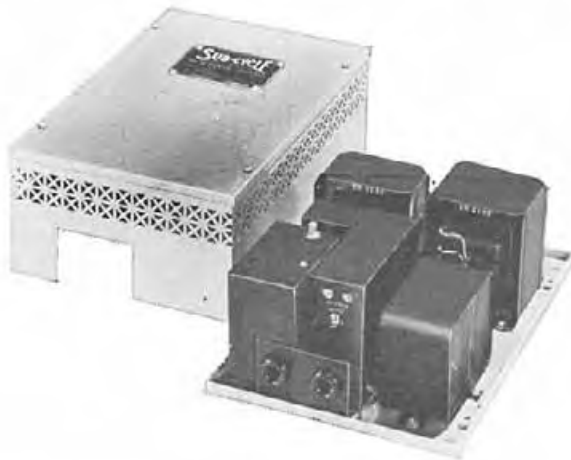
This converter operates directly from 105-125 volt, 60 cycle commercial power supply and can be used as a source of ringing power wherever the above power supply is available.

The frequencies of this converter cannot shift; the unit is supplied from a regulated source of 60 cycle power. The frequencies are directly based upon the supply frequency. They cannot shift unless the 60 cycle supply line shifts in frequency.

Because harmonics in the ringing voltage contribute to the tendency to cross-ring, the K-5 is made without reverting tone in the various frequencies (reverting tone is furnished by higher harmonics). In order to supply reverting tone, two terminals are provided to supply the tone which can be used for any frequency.

POWER
SUB-CYCLE RINGING EQUIPMENT (Cont'd)

LORAIN SUB-CYCLE RINGING CONVERTERS



MODEL S SUB-CYCLE RINGING CONVERTER

The Lorain sub-cycle ringing converter produces a powerful ringing current. These machines have no moving parts—nothing to adjust, require no routine maintenance. The output frequency is always one-third of the input frequency, regardless of fluctuations in the power supply. The converters must be ordered for the frequency supplied in the locality where it is to be used. Sub-cycles are made in different models, one for 60 cycle operation and another for 50 cycle operation. In ordering it is necessary to specify the frequency of the power supply. On 60 cycle units the output is 20 cycles; where the input is 50 cycles the output is $16\frac{2}{3}$ cycles.

MODEL S-60

This unit is for offices up to 1600 stations, produces 20 cycle ringing current from AC supply. Operates on 105-125 volts, 60 cycles AC. Output is approximately 20 watts 90 volts no load. Cabinet is finished in black wrinkle lacquer. Size: $9\frac{5}{8} \times 14\frac{1}{8} \times 5-11/16$ inches. Shipping weight: 35 pounds.

MODEL S-50

This unit is the same as the Model S-60 listed above but is for use on 50 cycle supply. Shipping weight: 40 pounds.

MODEL SGB-50

This unit is the same as the Model S-60 except for 210-250 volts, 50 cycle supply. Shipping weight: 40 pounds.

MODEL SP-60

This unit is for exchanges up to 1600 stations, produces positive and negative impulses pulsating current without moving parts for biased selective ringing, in addition to 20 cycle AC ringing current. Operates on 105-125 volts, 60 cycle AC supply. Output is 15 to 20 watts at 90 volts no load. Cabinet finished in black wrinkle lacquer. Size: $5\frac{3}{4} \times 9\frac{5}{8} \times 14\frac{1}{8}$ inches.

MODEL SP-LB-60

This unit is the same as the Model SP-60 but provides higher voltage for breaking down tubes when used in series with ringers.

MODEL BX-60

This unit is for offices up to 1600 stations. It provides 20 cycle AC ringing supply. Output is approximately 15 to 20 watts at full load is 90 volts. Similar to standard equipment used by the Bell System. Equipped with safety switch and enclosed used cut-out. Cabinet size: $5\frac{3}{4} \times 9\frac{5}{8} \times 14\frac{1}{8}$ inches. Finished in gray enamel.

MODEL CC-60

This is a heavy duty unit designed for use with exchanges having up to 4000 stations, particularly for use in cases where ringing load is abnormally heavy. Produces 20 cycle AC ringing supply. Operates from either 105-125 volts or 210-250 volts, 60 cycle supply. Output is approximately 40 to 50 watts. Either one of two output voltages available by changing a tap on converter, 130 or 90 volts. Size: $6\frac{1}{8} \times 10\frac{1}{8} \times 16\frac{3}{8}$ inches. Shipping weight: 68 pounds. Furnished in black wrinkle finish.

MODEL CC-50

This unit is the same as the Model CC-60 above except for 50 cycle supply. Same size case. Shipping weight: 75 pounds.

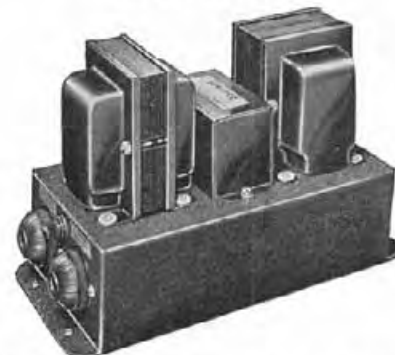
MODEL CCP-60

This unit provides pulsating ringing for 60 cycle offices.

MODEL CCP-50

This unit is the same as the CCP-60 except for 50 cycle offices. Shipping weight: 75 pounds.

MODEL M-7.5-60



This Model M-7.5-60 sub-cycle was designed to meet the need for a small, static-type ringing converter. It may be used with PBX's, inter-communicating systems, cordless boards, and in small exchanges. It has all the features of larger model sub-cycle units but is reduced in size and power. A "tone coil" producing revertive ringing tone is furnished.

Used on 105-125 volt, 60 cycle regulated lighting current, has a rated output of $7\frac{1}{2}$ watts, 20 cycles, 90 volts. Housed in metal cabinet finished in black crackle lacquer. Size: $11 \times 5 \times 6\frac{3}{4}$ inches. Shipping weight: 18 pounds.

MODEL M-7.5-50

Same as Model M-7.5-60 except for 50 cycle operation.

MODEL MGB-50

Same as Model M-7.5-60 except for 50 cycle operation on 210-250 volts.

POWER

SUB-CYCLE RINGING EQUIPMENT (Cont'd)

STEP-DOWN TRANSFORMERS FOR USE WITH SUB-CYCLE CONVERTERS

To operate Sub-Cycle converters on 210-240 volts commercial supply the use of step-down transformers is recommended.

Cat. No.	Description	For Model Nos.	Weight
T-155	220 V. to 110 V. 50 or 60 cycles	S-60, SP-60, BX-60	8 lbs.
T-203	220 V. to 110 V. 50 or 60 cycles	CC, CCP	13 lbs.

AUXILIARY TRANSFORMERS NO. T-2259

For use with Sub-Cycle Models Nos. S-60 or BX-60.

This transformer should be used for offices having superimposed ringing. The No. T-2259 transformer is connected to the output of the Sub-Cycle and provides a path for the direct current used in superimposed ringing. However, the AC voltage on the output terminals of the transformer may be varied from 90 to 130 volts. Size: $3\frac{7}{8} \times 4\frac{1}{2} \times 4\frac{1}{8}$ inches. Shipping weight: 8 pounds.

NO. T-2378

For use with Sub-Cycle Model CC. The T-2378 transformer is used where high ringing voltages are required. By means of this transformer it is possible to obtain ringing voltages of 90, 150, 175, 200, 250, or 300 volts. Under certain conditions these higher ringing voltages can be used advantageously.

Size: $6 \times 5 \times 4\frac{1}{4}$ inches. Shipping weight: 17 pounds.

STANDBY RINGER CONVERTER



This DC to AC converter has been developed to provide standby ringing capacity in case of power failure. These are made in two sizes, one for operation on 20-26 volts DC, the other to operate on 40-52 volts DC. Both supply 100-115 volts, provides approximately 20 cycle output. This unit has an automatic protection circuit built in so that over-loads will not burn out the vibrator.

The output voltage of this unit is constant even though the battery voltage may vary.

The vibrator is provided with a plug-in base and an extra vibrator can be installed in the same manner a radio tube is replaced in a socket.

In ordering specify battery voltage to be used on converter. Output is approximately 10 watts. Size: $7\frac{5}{8} \times 5\frac{1}{8} \times 12\frac{3}{4}$ inches.

POWER SWITCHBOARDS

WALL TYPE

In small exchanges the wall type power board requiring a minimum of space is usually sufficient. This saving in space is due to the simplified types of power equipment now in general use, such as sealed type batteries, trickle charging, automatic control of charging, and automatic switching circuits.

Ebony asbestos is generally used for power panels because it does not chip, buckle or warp, has high electrical resistance, and is practically unaffected by chemicals. It is free from metallic veins or other substances detrimental to the performance of power switchboards.

The power equipment mounted on this panel may include an ammeter, voltmeter, switches, fuses, sub-cycle ringing equipment, pole changers, etc.

The Kellogg engineering department should be consulted for assistance in preparing power boards and for cost estimates for boards of correct style and type to meet specific conditions.

RELAY RACK TYPE



Relay rack mounting economically provides space for necessary power equipment in convenient, efficient panels mounted on standard relay rack uprights.

This type of power board is made up of a number of ebony asbestos panels, each arranged to control a certain portion of the power apparatus. This is a flexible arrangement and can be adapted to meet almost any condition that may arise in any telephone exchange up to a point where it is necessary to use a generator for charging the exchange battery.

A relay rack power control board is usually located on the non-growing end of the relay rack and consists of the necessary panels with meters, etc., to control all the power equipment. The rack also mounts the rectifier, interrupter, pole

changers, transformer set, etc., in the same relay bay.

On the relay rack illustrated is shown various necessary apparatus for the efficient operation of a medium sized exchange. At the very top of the rack is shown the train of relays making up the automatic interrupter switching circuit. On the panel immediately below the relays a sub-cycle converter and emergency pole changer are mounted. Transformers, condensers, etc., are on the rear of the panel, behind the pole changer. The power panel is just below this apparatus and mounts the switches, ammeter, voltmeter, etc. Next is the Junior Wire Chief's Test Desk and below the desk is the Kellogg No. 13 interrupter.

POWER

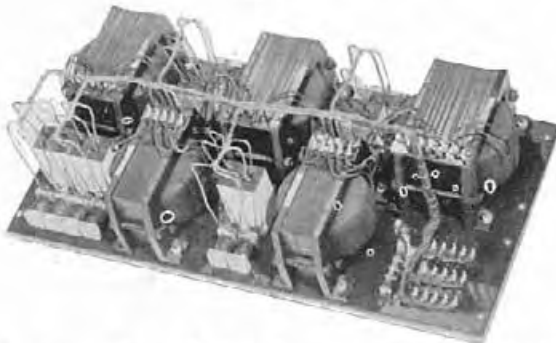
Test Sets, Pole Changer



Kellogg pole changer test sets are used to determine whether the pole changers of the exchange are operating satisfactorily. The sets are made up of harmonic ringers and condensers, with the ringers selected to match the frequency of the pole changers. The No. 1 test set is for the No. 39 pole changer, the No. 5 for the No. 42 pole changer.

Code No.	Party	Ringer	Freq. (Cycles)	Res. (ohms)	Condensers Amt.	Code
1	1	72-A-1	33 $\frac{1}{3}$	500	1	#12
2	2	72-A-3	50	500	1	#12
3	3	72-A-3	66 $\frac{2}{3}$	500	1	#12
4	4	72-A-4	16 $\frac{2}{3}$	2500	1	#12
5	1	73-A-1	30	1000	1	#37
2	2	73-A-2	42	1000	1	#37
3	3	73-A-3	54	1000	1	#37
4	4	73-A-4	66	1000	1	#37
5	72-A-4	16 $\frac{2}{3}$	2500	1	#37	

Five-Frequency Transformer Sets NO. 27-B



The Kellogg No. 27-B transformer set is equipped with five transformers arranged for harmonic ringing. The five transformers furnish 16, 30, 42, 54, and 66 cycle ringing current ranging in voltage from 110 volts for the 16 cycle frequency to 155 volts for the 66 cycle frequency. The transformers are mounted on an Ebony Electro panel, 26 inches long, 12 $\frac{3}{4}$ inches wide, and $\frac{3}{4}$ inch thick, which is arranged for relay rack mounting. The transformer panel is equipped with the necessary condensers, resistors, distributing bars, and terminals for connecting to the pole changers and switchboard. For 24 volt operation.

NO. 30

This unit is the same as the No. 27-B transformer set except designed for 48 volt operation.

NO. 31

This unit is the same as the No. 30 transformer set except it uses terminal strips instead of distributing bars and is for mounting inside a harmonic ringing Relaymatic power bay. Length of panel: 33 $\frac{1}{4}$ inches. Used with No. 45 pole changer. For 48 volt operation.

Tone Generators

These Lorain tone generators make use of the harmonics developed when a magnetic material is saturated, to generate dial tone. These generators do not have any moving parts. Taps are provided on the output to increase or decrease the tone level. Two different types of units are produced.

Models A and B provide both high and low tone, Models CK, C, and DK provide a single tone. The single tone units provide a tone of 600 cycles modulated at 120 cycles. All models provide both high and low tones which are similar in quality to tones generated by buzzer type tone generators. Model B is made for operation on 210-250 volts, 50 cycles. All other models operate on 105-125 volts, 60 cycles.

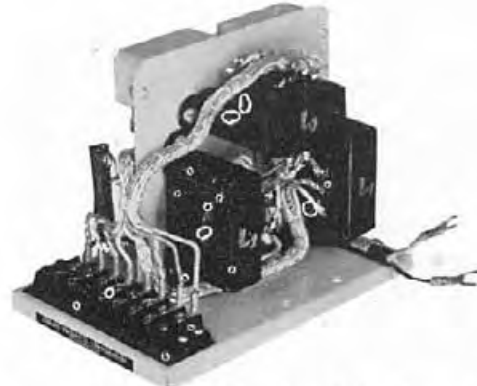
MODEL A

Provides low tone, 480 cycles modulated at 120 cycles, high tone 480 cycles with peaked wave. Size 4 $\frac{5}{8}$ x7 $\frac{5}{8}$ x14 inches. Output 100 milliwatts low tone, 65 milliwatts high tone.

MODEL B

Same as Model A except for operation on 210-250 volts, 50 cycles, 400 cycles modulated at 100 cycles, etc.

MODEL CK



Single tone 600 cycles modulated at 120 cycles, used for dial tone. Output 25 milliwatts, operates from 105-125 volt, 60 cycle supply. Size: 4 $\frac{1}{8}$ x6x4 $\frac{3}{4}$ inches, mounting holes fit Time-O-Matic mounting panel. No cover provided.

MODEL C



Output same as Model CK except mounting does not fit Time-O-Matic panel. Equipped with 6 foot cord and plug on input and provided with cover. Size: 4 $\frac{1}{8}$ x6 $\frac{3}{4}$ x5 inches.

MODEL D AND DK

Same dimensions and construction as Model C except larger coils and rated at 100 milliwatts output.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Protection and cross-connecting equipment is mounted on a main distributing frame in the central telephone office. Two types of main distributing frames are used: wall mounting for small exchanges and self-supporting floor mounting, upright racks for larger exchanges.

Three types of protector units are available for mounting on the main frame:

1. Carbon lightning arresters and heat coils.
2. Carbon lightning arresters and fuses.
3. Carbon lightning arresters, fuses, and heat coils.

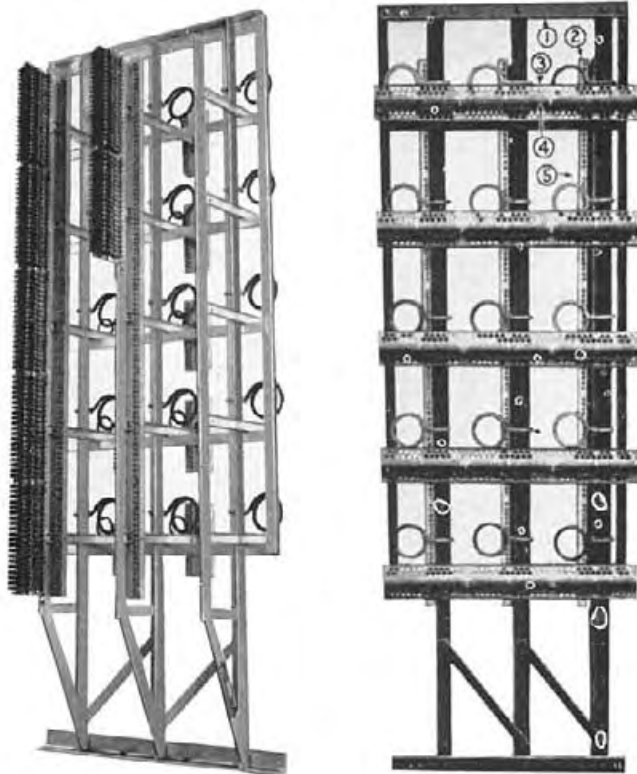
Every switchboard should be protected from lightning by some form of carbon arrester for each incoming line. Where there is

danger from electric light and power circuits a fuse or heat coil protector is used in addition to the carbon arrester.

Fanning strips mounted on the distributing frame make it possible to connect any switchboard number by means of a jumper wire to any outside line. This jumper wire provides a flexible link between the switchboard and line cables as a means of connecting or transferring any switchboard number to any cable pair. This makes it unnecessary to change the telephone number when a subscriber moves from one part of town to another.

The main distributing frame also affords a convenient means for testing both outside line and switchboard circuits and cutting them in and out of service.

Cook Type "L" Main Distributing Frames



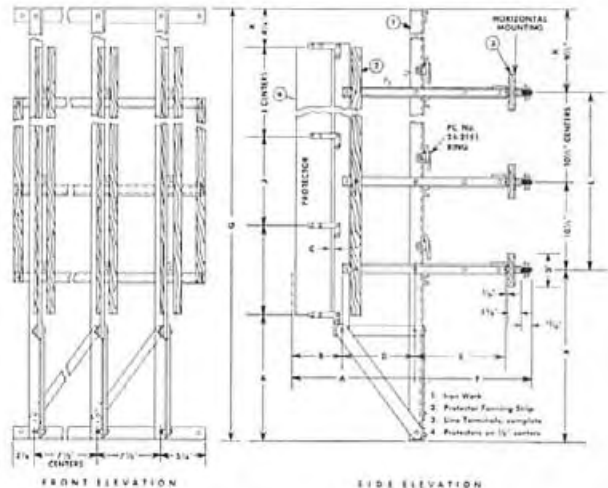
The type "L" floor type main distributing frame is constructed in sectional form, 100 or more pairs in height. Additions may be made on either the right or left side of the frame without disturbing existing equipment.

The verticals and top and bottom pieces are of angle iron and the shelf and cross-connecting pieces are of channel iron. Braces are of bar steel. The finish is gray enamel and the frame is shipped knocked-down.

Switchboard protectors built on 1/2-inch centers and standard line terminal blocks may easily be attached as required. Vertical, steel protector mounting bars and numbered maple fanning strips are mounted on the frame. A ground lug is attached to the lower end of each protector mounting bar to assure a good ground connection.

The type "L" frame is built with either a single or double floor angle. The uprights of a standard 100-pair section are 6 feet high but special uprights made to attach to the ceiling of the terminal room are available.

Cook Vertical and Horizontal Type "L" Frames



On the vertical type frame each line terminal block is mounted on an individual vertical fanning strip. On the horizontal type frame the line terminal blocks are mounted on continuous horizontal fanning strips.

Both types include the iron frame work, large jumper rings, bolts, nuts, and ground connections. Fanning strips are made of hard maple with holes equal in number to the protector capacity. Protectors are furnished as specified and line terminals, protector number plates, and fanning strips are numbered as ordered.

Vertical Type—On the vertical type frame, each line terminal block of 20 to 26 pairs of clips from two to six clips high is mounted on an individual fanning strip.

Horizontal Type—On the horizontal type frame, continuous type fanning strips run from one end of the frame to the other. The number of line terminal blocks mounted on each continuous type fanning strip depends on the width of the frame. Either No. 1000 or No. 5000 line terminals are supplied, as ordered.

The iron framework weighs approximately 24 pounds per 100 pairs.

DIMENSIONS OF TYPE "L" MAIN FRAMES

Number of Pairs of Protectors per Vertical	G*	H	J	K	L
100	6' 0"	1' 3 1/4"	10 1/2"	1' 8 1/2"	3' 6"
110	6' 10 1/2"	1' 8 1/4"	5 1/2" & 10 1/2"	1' 8 1/2"	4' 4 1/2"
150	8' 7 1/2"	1' 8 1/4"	5 1/2" & 10 1/2"	1' 8 1/2"	6' 1 1/2"
160	8' 7 1/2"	1' 3 1/4"	10 1/2"	1' 8 1/2"	6' 1 1/2"
200	10' 0"	10 3/4"	10 1/2"	1' 4"	7' 10 1/2"

*This dimension is variable with the height of the ceiling. Standard dimensions are shown.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook Vertical and Horizontal Type "L" Frames (Cont'd)

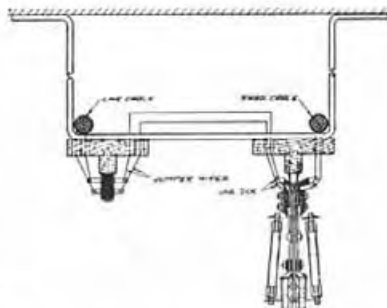
PROTECTOR AND LINE TERMINAL DIMENSIONS

Type of Protector	Size of Main Frame	Dimensions (inches)					
		A	B	C	D	E	F (2 clip)
100	100 to 400 Pairs	10 1/4	4 1/4	1/2	6	6 1/2	8 3/8
	400 to 1000 Pairs	12 3/8	4 1/4	1/2	8 3/8	10 3/8	13
	1000 Pairs and Larger	14 1/2	4 1/2	1/2	10 1/4	18 1/2	20 7/8
105	100 to 400 Pairs	14 5/8	8 5/8	1	6	6 1/2	8 7/8
	400 to 1000 Pairs	17	8 5/8	1	8 3/8	10 3/8	13
	1000 Pairs and Larger	18 7/8	8 5/8	1	10 1/4	18 1/2	20 7/8
H-36	100 to 400 Pairs	12	6	5/8	6	6 1/2	8 7/8
	400 to 1000 Pairs	14 3/8	6	5/8	8 3/8	10 3/8	13
	1000 Pairs and Larger	16 1/4	6	5/8	10 1/4	18 1/2	20 7/8

Cook L-9 Wall Type Distributing Frame



The picture above shows the frame with the protector fanning strip on which protectors are to be mounted.



The diagram above is the top view of the frame with protectors mounted.

This compact, wall type distributing frame is designed to mount No. 100, 105, or H-36 Cook central office protectors and 2-clip, 26-pair line terminals. The frame consists of two pieces of hard, kiln dried maple, one piece drilled and arranged for line terminals, the other piece drilled and milled for mounting the protectors, and two heavy mounting brackets made of bar iron.

The frame is furnished complete with line terminals. Protectors are extra and may be selected according to requirements.

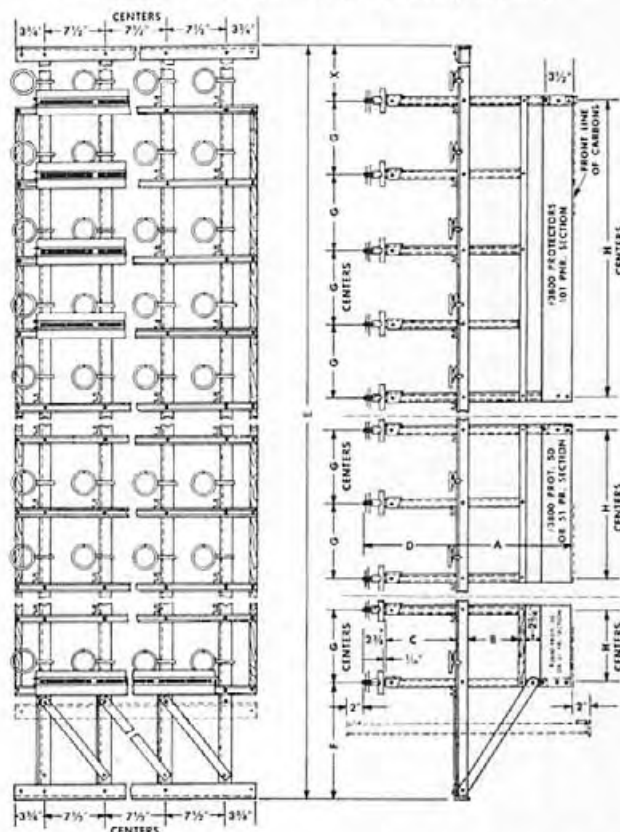
Cat. No.	No. of Pairs Protector Side	No. of Pairs Cable Side	Height Over-all (inches)	Shipping Weight
361-1050	20	26	13	10 lbs.
361-1052	40	52	23 1/2	18 lbs.
361-1054	60	78	34	32 lbs.
361-1056	80	102	44 1/2	46 lbs.
361-1058	100	130	55	60 lbs.

Main Distributing Frames

Special main distributing frames for special applications and special installations are available upon order. The Kellogg engineering department will make recommendations upon submission of the necessary information on the particular requirement.

Standard main distributing frames, not generally used and not shown, also are available. For information on these frames consult either the Kellogg engineering or sales department.

Cook No. 38 Main Distributing Frame



The No. 38 main frame is designed to mount the No. 3800 Cook protector on 3/8-inch centers. It is similar to the type "L" frame except it has no protector mounting bar. The protectors are mounted directly to the shelf channels. Additions to the frame may be made to either the left or right side.

Continuous type fanning strips are mounted horizontally. The dimensions of the frame may be varied to suit conditions.

The dimensional diagram at the left above shows the front view of the No. 38 main distributing frame. For sizes of this frame also refer to the table below.

The dimensional diagram at the right above shows the side view of the No. 38 main distributing frame. Sizes are also shown in the table below. Dimensions marked "X" are variable with the height of the ceiling of the room where the frame is to be installed. Standard dimensions are shown.

DIMENSIONS OF MAIN FRAME

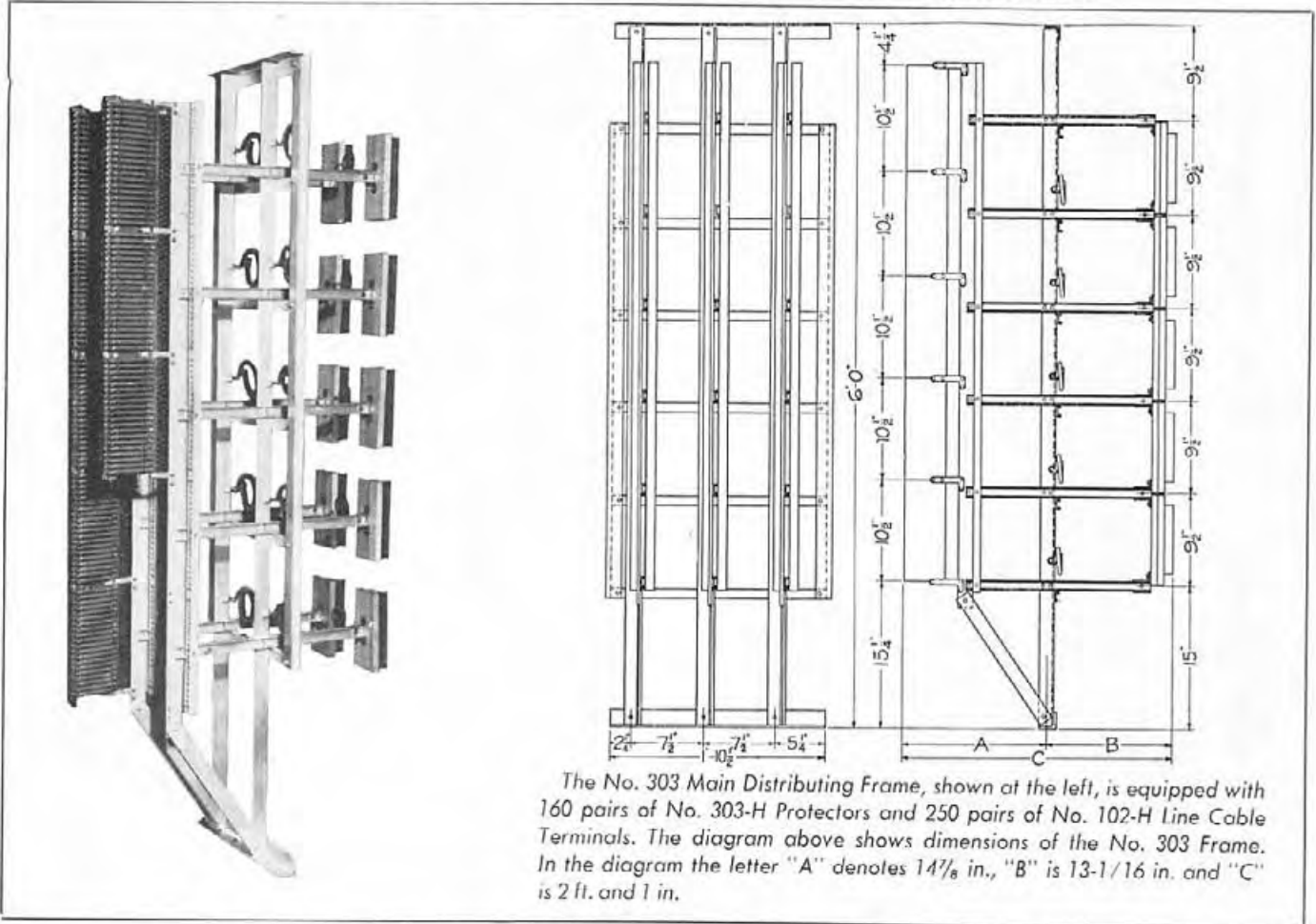
Number of Protector Pairs Per Section	Dimensions (inches)				
	E	F	G	H	X
101 Pair	72	19 3/4	9 3/4	39	13 1/4
51 Pair	X	X	10 7/8	20 1/4	X

X These dimensions are variable with the height of the ceiling. Standard dimensions are shown.

DIMENSIONS OF PROTECTORS AND TERMINALS

Type of Protector	Type of Main Frame	Dimensions (inches)			
		A	B	C	D (2-clip)
3800	100 to 400 Pair	11 1/8	4 7/8	6 1/2	2 7/8
	400 to 1000 Pair	13 1/2	7 1/4	10 5/8	13
	1000 Pair and Up	15 3/8	9 1/8	18 1/2	20 7/8

PROTECTION AND CROSS-CONNECTING EQUIPMENT



The No. 303 Main Distributing Frame, shown at the left, is equipped with 160 pairs of No. 303-H Protectors and 250 pairs of No. 102-H Line Cable Terminals. The diagram above shows dimensions of the No. 303 Frame. In the diagram the letter "A" denotes 1 7/8 in., "B" is 13 1/16 in. and "C" is 2 ft. and 1 in.

Reliable Main Distributing Frames

Reliable type 303 and 308 main distributing frames offer two arrangements in terminating outside exchange cables and switchboard cables. The outside cable can be terminated on either the line terminal or protector side. Cross connections are provided by jumper wires. The frame is strong and rigid with jumper rings provided on the main uprights. Protector fanning strip and line terminal fanning strips are provided.

Each vertical section has a capacity of 100 or more pairs of protectors mounted in banks of 20 pairs each, and 130 or more pairs of 112F line terminal blocks in 26-pair blocks. Terminal blocks may be attached in either vertical or horizontal rows as ordered.

Line terminals and protectors are numbered as specified.

All line terminals are mounted on molded bakelite fanning blocks in sections which provide continuous vertical or horizontal strips, as specified. This provides terminating space for as many pairs in a vertical position as can be accommodated in a horizontal position. If complete verticals are not filled by the equipment specified, iron work is still provided so additions may be made of standard units.

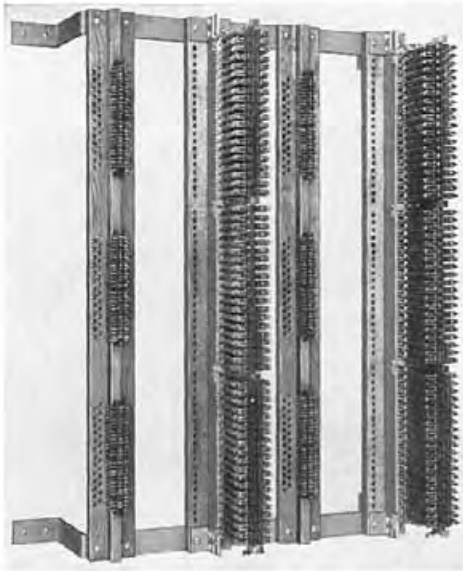
A ground strip is attached to the bottom bank of each vertical for attachment to continuous bus bar or cable for the central office ground.

CENTRAL OFFICE PROTECTORS

- | Code No. | Description |
|---|---|
| 303-F | 2 No. 106 fuses; 2 No. P495 sawtooth discharge blocks, and 2 No. P663 carbon blocks per pair. |
| 303-H | 2 No. 107 heat coil fuses; 2 No. P495 sawtooth discharge blocks, and 2 No. P663 carbon blocks per pr. |
| 308-F | 2 No. 114 fuses; 2 No. 4393 carbon and dielectric assemblies per pair. |
| 308-H | 2 No. 115 heat coil fuses and 2 No. 4393 carbon and dielectric assemblies per pair. |
| 308-A | Same as No. 308-H, plus alarm system. |
| LINE TERMINAL BLOCKS | |
| 112-F | For floor type frames. Unit mounting made with 20 to 26 terminals per row in 1 to 6 rows with fanning strip base and mounting bracket. |
| PROTECTOR FANNING STRIP | |
| 303 | For floor type frames using No. 303 protectors. Two single units per vertical. Numbered beginning with one from the top down and from left to right unless otherwise specified. |
| 308 | Same as the No. 303 except for No. 308 protectors. |
| NOTE: No. 308 switchboard protectors are supplied in 20, 22, and 25 pair units. The 20 pair unit is 8 inches long. Fuses are spaced on 3/8-inch centers. | |
| No. 303 switchboard protectors are supplied in 20, 22, and 25 pair units. The 20 pair unit is 10 1/2 inches long. The fuses are spaced on 1/2-inch centers. | |

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Reliable Wall Type Frames

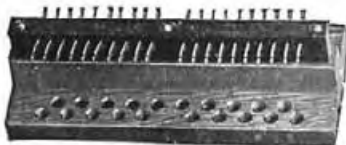


These Reliable main distributing wall frames are for use where space does not permit the installation of floor type frames. These frames use Reliable No. 303 or 308 type switchboard protectors.

Each unit consists of switchboard protector mounting bar and fanning strip in one vertical and one vertical of No. 112-F molded line terminal strips; all mounted on a substantial painted steel frame. Switchboard protectors must be ordered in addition to the unit.

Cat. No.	Protector Side	Line Terminals	Length	
			Ft.	Ins.
308-W-20	20 pair	26 pair		11
303-W-20	20 pair	26 pair	1	1½
308-W-40	40 pair	52 pair	1	7
303-W-40	40 pair	52 pair	2	
308-W-60	60 pair	78 pair	2	3
303-W-60	60 pair	78 pair	2	10½
308-W-80	80 pair	104 pair	3	1
303-W-80	80 pair	104 pair	3	11
308-W-100	100 pair	150 pair	3	7
303-W-100	100 pair	150 pair	4	7½

RELIABLE NO. 112-F LINE TERMINAL STRIPS



The Reliable No. 112-F type line terminal strips are made of high grade precision molded phenolic plastic.

Each strip consists of a fanning type base on which are mounted unit terminal strips containing 20 or 26 solder coated bronze soldering terminals. The base can be furnished with one to six rows of terminal strips. The top of the terminal block will be numbered as specified.

These sturdy units are molded with a black lustrous finish and provide excellent dielectric qualities with high surface insulation resistance.

The bases, 2¾ inches wide and 8 inches long, are supplied with interlocking steel brackets for vertical or horizontal installation on main frames, straight brackets for general use.

48-Volt Alarm System

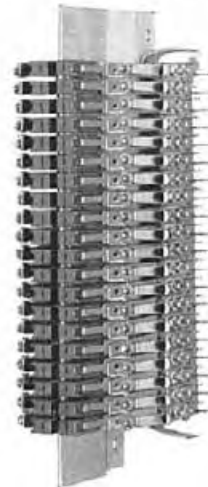
FOR RELIABLE NO. 308-HA PROTECTORS

The Reliable 48-volt alarm system for No. 308-HA protectors consists of an alarm unit for one or more verticals containing a buzzer, relay, off and on switch, and terminals for remote installation of the buzzer or other alarm device. The top protector bank of each vertical is equipped with a bracket and 48-volt signal lamp. Each bank has an alarm switch unit consisting of two precious metal contact buttons which are closed by the heat coil fuse plunger operating the switch vane. The protector alarm switch units are connected in series parallel so that any heat coil fuse may operate to cause the signal lamps and buzzer to be energized. A relay is provided to keep the buzzer circuit free of the signal lamp circuit.

The switch unit consists of a vertical hinged plated bronze vane, containing a precious metal contact button. There is one vane on each side of a 20-pair protector. The vane end contact is moved by the quick action of the heat coil fuse plunger when the fuse opens. This causes the vane to rotate from its present position so that its contact button strikes with a positive pressure and wiping action on a similar stationary precious metal contact button. The switch is opened and reset by a slight lift and turn of the vane. Reliable heat coil fuses may be operated and reset an indefinite number of times if the current does not exceed approximately 10 amperes.

The Reliable alarm system is easily wired with two battery leads to the alarm unit, while another wire is run from the alarm unit to all of the lamps located at the top of the verticals. The common protector ground wire provides a return circuit for the alarm circuit.

Cook No. 3800 Central Office Protector



This protector mounts on the No. 38 main distributing frame. Heat coils and carbon discharge blocks protect against sneak currents and high potentials. Pairs are mounted on ¾-inch centers.

Operation—This protector opens the switchboard circuit, grounds the outside line and operates an alarm signal. It is reset by relatching the operating spring over the heat coil. The coil does not have to be changed, reversed, or resoldered.

Construction—The mounting plate is cadmium plated steel, formed to secure great strength and rigidity. The ends of the mounting plate fasten directly to the shelf channels of the main frame. All springs are of nickel silver, of ample strength to give positive operation and strong, permanent contact pressure. Line connections are on one side of the protector and switchboard connections are on the other side.

Insulation—All current carrying parts are insulated with hard rubber and bakelite.

Lightning Arresters—No. 2614 sealed-gap unit dischargers are standard. They are made of two carbons, separated by an acetate dielectric and cemented into a unit. They will permanently ground under continuous discharge. They are easily installed and removed.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook No. 3800 Central Office Protector (Cont'd)



Heat Coils—The No. 3800 self-soldering, wire wound heat coils will carry .35 amperes for 3 hours, and will operate within 210 seconds on .5 ampere in an ambient temperature of 68° F. They can be reset without charging.

Temporary Disconnect—To open the circuit, a thin insulator is inserted between the outside spring and the spring holding the heat coil.



Testing—The No. 3800 test plug can be slipped over any pair of protectors, and offers means to test the outside line, the heat coils, and the switchboard circuit. When the test plug is withdrawn, the protector is left in an operating condition.

NO. 3800 PROTECTOR PARTS

Cat. No.	Description
380-60	No. 3800 Test Plug
380-30	No. 3800 Heat Coil
380-40	Unit Discharger for No. 3800 Protector (with .003 inch dielectric).
380-130	Unit Discharger for No. 3800 Protector (with .005 inch dielectric).

NO. 3800 PROTECTORS

Cat. No.	Description	Dimensions (inches)			Shipping Wt. Per 100 Pairs
		Length	Width	Depth	
380-1320	20-pair section	8 5/8	3	4 3/4	23 lbs.
380-1382	20-pair section (with third lug)				
380-1321	21-pair section	9	3	4 3/4	23 lbs.
380-1351	51-pair section	20 1/4	3	4 3/4	22 1/2 lbs.
380-1361	101-pair section	39	3	4 3/4	22 1/2 lbs.
380-1378	101-pair section				

Cook No. 100 Central Office Protector



The No. 100 central office protector utilizes heat coils and carbons. Line connections are on one side of the protector and switchboard connections on the other side. Pairs are mounted on 1/2-inch centers. Testing may be done easily without removing heat coils.

Operation—This protector opens the switchboard circuit, grounds the outside line, and operates an alarm signal. The protector is reset by simply relatching the operating spring to the heat coil. The coil does not have to be changed, reversed, or re-soldered.

Construction—heavy nickel silver holding springs insure a positive permanent pressure between the lightning arrester carbons and ground plate.

Mounting plates are metal and may be mounted on a standard frame carrying protectors on 1/2-inch centers. The circuit from the heat coil spring to the switchboard terminal is carried between the grounded mounting plates and is well shielded.

Cook No. 100 Central Office Protector (Cont'd)

Insulation—All current carrying parts are thoroughly insulated with hard rubber and bakelite.

Lightning Arresters—These consist of two grooved carbons, separated by an acetate dielectric .005 inch thick and will permanently ground under continuous discharge. Sealed gap unit discharges are furnished when specified.



Heat Coils—These No. 100 self-soldering, wire wound heat coils have approximately 3 1/2 ohms resistance, will carry .35 amperes for three hours and will operate within 210 seconds on .5 ampere in an ambient temperature of 68° F.

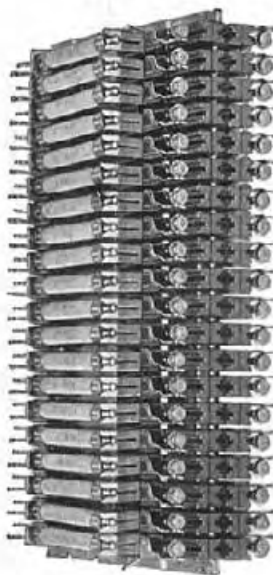
Temporary Disconnect—Before opening the circuit, insert toothpick through the slot of the carbon to keep the ground and alarm spring from making the contact when the operating spring is released.



Testing—The No. 111 test plug can be slipped over any pair of protectors and offers means to test the outside line, the heat coils, and the switchboard circuit. When test plug is withdrawn the protector is left in operating position.

Cat. No.	Description	Dimensions (inches)			Shipping Wt. Per 100 Pairs
		Length	Width	Depth	
360-1210	10-pair section	5 1/2	2	3 1/2	17 lbs.
360-1220	20-pair section	10 1/2	2	3 1/2	17 lbs.
360-70	No. 100 Heat Coil				
41-11	Acetate dielectric (.005 inch)				
370-10	No. 100 Test Plug				
41-1282	Carbons for No. 100 Protector				
41-2612	Unit Dischargers for No. 100 Protector				

Cook No. 105 Central Office Protector



The No. 105 protector is similar to the No. 100 except that it is equipped with fuses as well as heat coils and arresters.

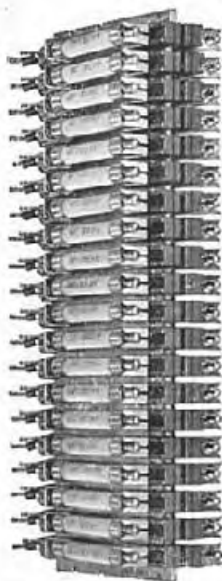
Fuse Clips—Fuses are held under positive tension in clips, but may easily be removed and replaced. Lightning arresters are held under constant pressure against ground plate by heavy springs.

Fuses—Fuses are No. 214-2200, A-22 Lavite, three ampere.

Cat. No.	Description
392-1510	No. 105 Protector, 10-pair section.
392-1520	No. 105 Protector, 20-pair section.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook H-36 Central Office Protector



This protector is designed to protect circuits where heat coils are not required.

Construction—This protector is built in 10 and 20 pair sections on metal plates. The pairs are on 1/2-inch centers.

Fuse Clips—Fuses are held under positive tension in Cook clips, but may easily be removed and replaced. The lightning arresters are held under constant pressure between heavy nickel silver springs and ground plate.

Terminals—Line terminals are on one side and switchboard terminals are on the other. Each terminal is thoroughly insulated and tinned.

Insulation—All current carrying parts are separated by rubber insulation.

Lightning Arresters—Two carbons, one grooved and one plain, separated by a .005-inch acetate dielectric, are

standard. Under the influence of a continuous arc, this protector will ground the outside line until the fuse opens the circuit. True Gap dischargers, which do not ground the line, will be supplied when specified.

Fuses—Unless otherwise specified, this protector is furnished with No. A-45 Lavite fuses that blow at 1 ampere. No. A-46 wood fuses will be furnished when specified.

Cook Type "T" Main Distributing Frame



The type "T" wall mounting main distributing frame is the unit of the Cook Trans-Mount system designed for the termination and distribution of the outside paper-wrapped lead covered cable directly to the line cable terminals. This eliminates the splicing of silk, cotton, or wool ends to the paper-wrapped cable for termination on exposed terminal blocks.

The type "T" is equipped with a moisture-proof, compact corebox, metal fanning strip with insulating bushings in fanning holes, and a white designation strip for numbering pairs. Other features are the self-soldering nozzle insuring tight cable sheath points, rubber covered rings for distributing cross-connection jumpers, solder clips for both ends of the jumpers, and strong, rigid, wall-mounting brackets.

The terminal block provided for switchboard cable has a bakelite fanning strip and a white designation strip for numbering pairs.

This frame is furnished in standard 26, 52, and 104 pair units but multiples of these sizes are available. The Cook type "H" protector with standard fuse and high-potential discharge block is installed only as required and also is standard equipment for the other apparatus in Cook's Trans-Mount system.

Cat. No.	Description	Dimensions (inches)			Shipping Weight
		Length	Width	Depth	
296-3610	10-pair section	5 1/2	1 1/2	5 1/2	21 lbs.
296-3620	20-pair section	10 1/2	1 1/2	5 1/2	21 lbs.
306-4500	No. A-45 Lavite Fuse for H-36 Protector				
307-4600	No. A-46 Wood Fuse for H-36 Protector				

Cat. No.	Capacity	Dimensions (inches)	Shipping Weight
519-2	52-pair	46 1/2 x 7 1/2 x 7	37 lbs.
519-3	104-pair	50 x 19 x 7	82 lbs.

Cook Type "H" Protector Mounts

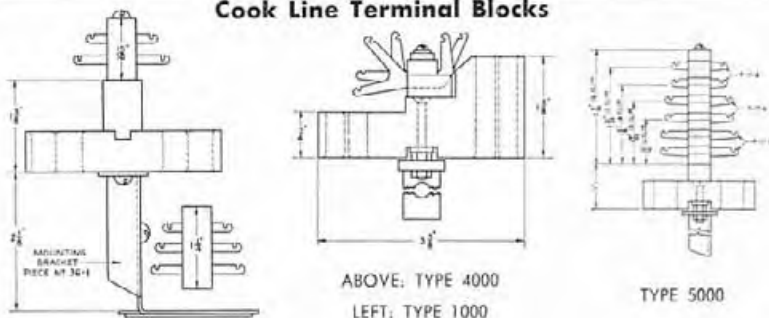


This type "H" protector unit is used in all apparatus of the Cook Trans-Mount system. Built on a bakelite base, it provides primary protection with a fuse and high-potential discharger and secondary high-potential protection after the fuse has blown.

These protector mounts are installed only as required and mount standard fuses and dischargers. Non-cor-

rosive studs and washers, phosphor bronze springs and clips, and True-Gap dischargers are standard.

Cook Line Terminal Blocks



Solder clips (from 2 to 5 clips high) are set in a rubber block mounted on a maple fanning strip. The block mounting 20 pairs is 7-7/32 inches long and 26 pairs is 7 3/8 inches long.

TYPE 4000

Three point solder clips are set in a rubber block for mounting on a continuous fanning strip. The block mounting 20 pairs is 8-15/32 inches long and 26 pairs is 8-31/32 inches long.

TYPE 5000

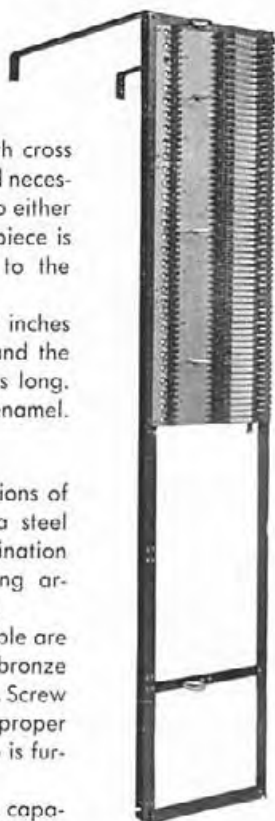
Available from 2 to 10 clips high and from 10 to 50 pairs long on mounting centers of 6 1/2 inches and longer. The rubber block mounting 20 pairs is 8-15/32 inches long and 26 pairs is 8-31/32 inches long.

PROTECTION AND CROSS-CONNECTING EQUIPMENT

Cook L-10 Main Distributing Frame

This floor type main frame is of all steel construction and is used for mounting H-51 central office protectors. It consists of two vertical upright angle iron supports with cross pieces, wall braces, jumper rings, and necessary bolts. Additions may be made to either the right or left side. The top cross piece is drilled to attach a cable bracket to the switchboard.

The vertical uprights are 6 feet, 9 inches high. The frame is 16 inches wide and the adjustable wall braces are 18 inches long. All steel parts are finished in gray enamel.



H-51 PROTECTOR

These protectors are made in sections of 10 pairs. Each section consists of a steel panel on which are mounted a combination of line terminals, fuses and lightning arresters. This protector is fire resistant.

Outside cable and switchboard cable are soldered directly to the phosphor bronze terminals set in hard rubber insulation. Screw and washer contacts are provided for proper cross connection. An extra solder clip is furnished to make a common ground.

No. A-12 composition fuses with a capacity of 1 ampere are used. Grooved carbons and .005-inch acetate dielectrics are standard. Under the influence of a continuous arc, a perma-ground is established. True Gap dischargers that do not ground the line will be supplied when specified. Arresters ground on a copper ground strip that runs the length of the mounting plate, with provisions to make the ground continuous.

Jumper rings are mounted in the center of each plate. Metal pins on the back are provided for tying up the cable. Where wires run through the metal base, fibre insulation is provided.

Cal. No.	Description
153-1260	L10 Frame
423-1910	H-51 Protectors
41-2002	Grooved Carbons for H-51 Protector
41-11	Acetate Dielectric (.005 inch) for H-51 Protector
41-1907	True Gap Dischargers for H-51 Protector
41-1200	A-12 Composition Fuses (1 amp.) for H-51 Protector

Protection Equipment

Protection equipment for station installations, both indoor and outdoor type, cable terminals, and similar equipment are shown in the Supply Section of this catalog.

Special protection equipment for special applications and special installations are available upon order. The Kellogg engineering department will make recommendations upon submission of the necessary information on the particular requirement.

RACKS, CONNECTING

Kellogg connecting racks are of one piece molded bakelite construction and are designed so that lead wires can be quickly and easily connected. They are neat and compact and are furnished with an attractively finished black enamel cover. The blocks are mounted with wood screws. Kellogg connecting racks are available in three sizes to meet a large variety of applications.

Two-Point Type

NOS. 24-A AND 25-A



These connecting racks are for connecting two wires. The No. 24-A is furnished complete with cover. Mounting screws are not supplied.

The No. 25-A is the same as the No. 24-A but furnished less cover.

Three-Point Type

NOS. 24-B AND 25-B



These connecting racks are for connecting three wires. The No. 24-B is furnished with cover. Mounting screws are not supplied.

The No. 25-B is the same as the No. 24-B but furnished less cover.

Four-Point Type

NO. 27



For connecting four wires. Furnished complete with cover and wood screws for mounting purposes.

RECEIVERS

Kellogg receivers are designed for maximum efficient operation under all types of circuit conditions. Receivers are available in three basic types: 1) for telephone use in both handset and hand-receiver types; 2) industrial types, and 3) operator's head and chest set types.

TELEPHONE TYPE—FOR HANDSETS



LEFT: NO. 89-A RECEIVER (FRONT VIEW)



RIGHT: NO. 89-A RECEIVER (REAR VIEW)

Code No.	Res. (ohms)	Used On
84-A	48	Nos. 52-L, 53-L, 56-C, 56-L, 61-L, and 62-L handsets.
89-A	48	Nos. 46-C and 47-C Masterphone handsets.
P-55919	47.4	Nos. F-27-C, F-27-L, F-27-EC, F-27-CWL, F-35-EC, F-39-C, F-40-C, F-40-L, 42-C, F-43-C, F-43-L, 44-C, F-44-L, 49-C, 54-C, 55-C, 57-C, 58-C, 59-C, & 60-C handsets.
P-44405	100	Nos. 32-C and 32-L metal handsets.
P-61575	100	No. 33-C metal handsets.
P-69602	2000	Nos. 48-C and 51-C handsets.

RECEIVERS (Cont'd)

TELEPHONE TYPE—FOR HAND-RECEIVERS

Code No.	Res. (ohms)	Used On
F-41-A	62	No. F-817 type, 4884, 4885, 4886, 4809, 4812, 4816, 4820, 4824, 4880, 6886, F-2921, F-2869, F-28, F-90-A, F-97, F-97-B, F-118, F-148, F-600, F-601, F-618, F-684, F-301, and 305 telephones and all hand-receiver type telephones.



F-41-EA	62	Same as No. F-41-A shown above except has rubber covered cord. Used on Nos. 4901, 4901-A, 4903, F-1983, and F-138 telephones and all hand-receiver type telephones.
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OPERATOR'S TYPE

Code No.	Res. (ohms)	Head Band	Fits Cord	Used On
87-A	56	No. 14	Nos. 708 to 713, inclusive	Operators' sets

RECTIFIERS



The rectifiers listed below are used to operate a D.C. relay on A.C. dialing trunk circuit applications to replace the A.C. relays formerly used. The rectifiers are of the selenium type and are provided with the proper mounting details so they will mount in either a 700-800 or 1700-1800 type relay mounting space depending upon the code.

The use of these rectifiers in conjunction with a standard relay, provides more reliable operation than the A.C. relay as formerly used on A.C. dialing trunk circuits. Order rectifiers by code number to obtain the proper mounting details.

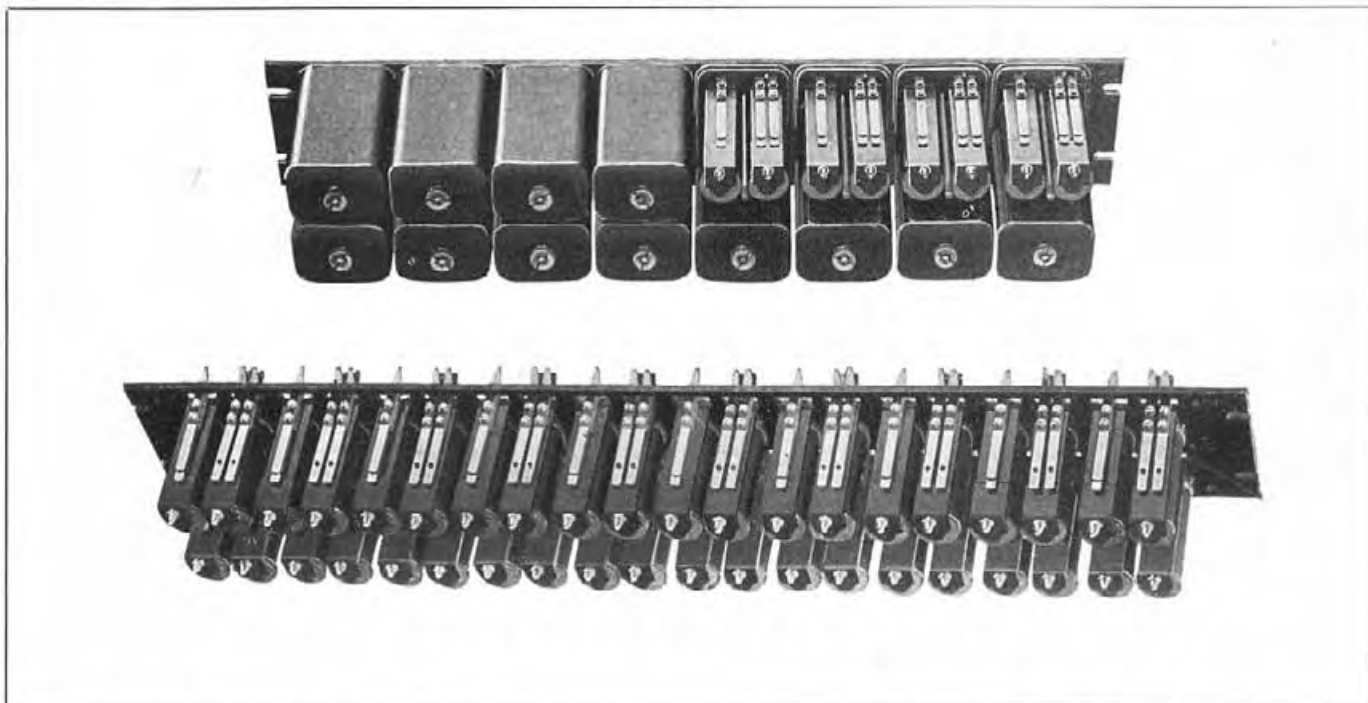
Code No.	Description
1-A	Mounts in space of 1700-1800 type relay.
1-B	Mounts in space of 700- 800 type relay.

INDUSTRIAL TYPE

Code No.	Res. (ohms)	Fits Cord	Head Band	Used On
80-A	60	Per Spec.	No. 2	For railroad service. Used on Nos. F-2945, F-2870, & F-601 telephones.
80-B	400	Per Spec.	No. 2	For dispatchers' sets.



RELAYS

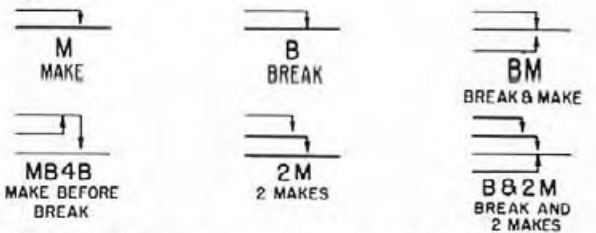
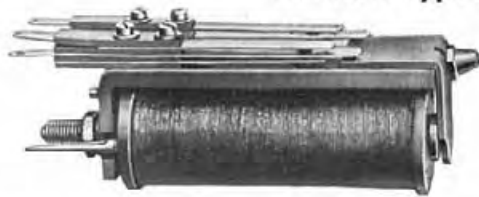
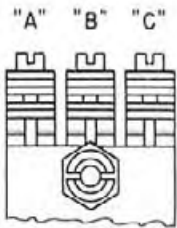


Kellogg relays are simple in design and are sturdily constructed. The angle type armature and simple adjustment assure reliable operation under the conditions which relays must meet in telephone service. Kellogg manufactures several different types of relays. Each type is listed on succeeding pages in a separate

rate chart with a brief description of the respective codes in that group.

For tools used with relays see code numbers 44, 13, 57, 43, 76, 11, 78, 1, 2, 58, 60, 75, and 79 shown under Tools in this section.

RELAYS
No. 2000 Type Relays



Kellogg No. 2000 type relays are standard for use on manual type switchboards. They are designed for mounting on No. 1000 type relay mountings. The relays generally are mounted in pairs under a steel shell supplied with the mounting strip. Coils are not supplied as part of the relays.

In ordering specify the code of the relay having the desired spring combination and also state the voltage at which the relay is to operate or the operating current value required. The Kellogg engineering department will select a coil to meet the specific requirements.

On replacement orders code numbers should be available and the complete relay can be ordered. For example, if a No. 2028 S-FY relay is ordered a No. 2028 relay and No. S-FY coil will be supplied.

Charts of the standard 2000 type relay spring combinations are shown below and on succeeding pages. The combinations are listed as they actually appear on the heel iron, reading from the bottom or heel iron surface to the top of the respective stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2000										Buzzer Relay
2001		BM				1				
2002	BM		BM			2				
2003	BM		BM			3				
2004	BM		BM			4				
2005	B		B							
2006	BM		BM	2	2					
2007	MB4B		MB4B			1				
2008	MB4B		MB4B			2				
2009	MB4B		MB4B			3				
2019	MB4B		BM			4				
2020	BM		BM	2	1					
2021	MB4B		MB4B	1	2					
2022	MB4B	BM	BM	2	2					2 Rel's. yoked at Armature Sprgs. on Right facing Arm.
2023	M	M	M	5						
2025	MB4B		BM			1	1			Used with #25 Pole Changer. Heavy Plat. Contacts.
2026	M	B	M	2	1	2				
2027	BM	M	BM	1		4				

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2028	M		M	2	2		1			
2029	B	MB4B	B	1						For Pilot Relays
2030		B			1					For Supv. Relays
2031	M	BM	M	2		3				
2032	M	BM	M	4		1				
2034	BM		C		1	1				Interrupter Relay. Special Tension Spring.
2035		B2M							1	
2036		M			1		1			
2037	M		M	2						
2038		BM				1				With screw adj. on Arm. Interrupter Rel.
2039	BM		BM			3				With screw Adj. on Arm. Tone buzzer rel. Ratchet arm. adj.
2042		Tension Spring Trouble Tone. B				1				Uses S-FL or S-DZ Rel.Coil. For Pilot Relay. Has light armature.
2043		M			1					Has light armature.
2044		BM				1				

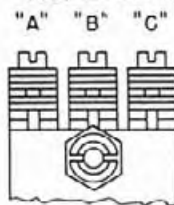
RELAYS

No. 2000 Type Relays (Cont'd)

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2045		B			1					Has dead terminal. Has light armature.
2046	BM BM	MB4B	BM BM			4	1			
2048	B		B		2					
2049		B								Has light armature.
2053										Consists of Heel Iron and Armature.
2056		M M			2					Has light armature.
2058	Dialing	M			1					Ratchet Arm. Adj. Uses S-FL or S-DZ Coil.
2059	B	B	B		3					
2063	MB4B MB4B	MB4B	BM BM			2	3			
2065	MB4B		2M				1	1		
2075	B-2M		BM						1	
2076	M MB4B		M BM		2		1	1		
2077	M M		M M		4					
2078		M B				1	1			
2079	M BM		B BM			1	1	2		
2080	M BM		M M			3		1		
2081	BM		M M			2		1		

Code No.	Contact Arrangement			No. of Sets of Following Springs						Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	TWO MAKE	BREAK & TWO MAKE	
2087	B		B M		1	2				Spec. Tension Springs & extra heavy Plat. contacts.
2088	M		M		2					Same as #2037 rel. but has extra heavy Plat contacts.
2089	MB4B		BM				1	1		
2090		M			1					For a.c. tel. only.
2091	M BM		M BM			2		2		
2093		2M							1	
2094	2M	1	2M		1				2	
2099	M BM	2M	M BM			2		2	1	
2108	MB4B MB4B	M	B B M			2	2		2	
2109	M		M M						3	
2111	MB4B MB4B	M	MB4B MB4B			1			4	
2112	BM		B B			2		1		
2113	BM		M BM			1		2		
2114		B M				1		1		
2116	2M B		B B					3		1
2118	M MB4B		MB4B			1			2	
2119	M MB4B		M MB4B			2			2	
2120	M MB4B	M	M MB4B			3			2	

No. 2060 Type Restoring Relays



This group of relays is always used with a No. 2061 trip type relay. The restoring arm relay is on the right side when facing the armature. These relays use standard relay coils. The combinations are listed as they actually appear on the heel iron reading from the bottom or heel iron surface to the top of the respective stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	
2060	BM		BM					
2064	BM		BM				4	
2066	BM		BM				2	
								No contact springs.

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

No. 2060 Type Restoring Relays (Cont'd)

Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	MAKE BEFORE BREAK	
2067		BM				1		
2068	BM		BM			3		
2074	MB4B		BM			1	1	
2082	MB4B		MB4B				2	

No. 2061 Trip Type Relays

This group of relays is always used with a restoring type relay from the group listed above. The trip is on the left side when facing the armature. This group of relays can only be used with Nos. S-FS, F-FU, S-GM, S-GN, or S-RC relay coils.

Code No.	Contact Arrangement			No. of Sets of Following Springs				Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE		
2061	B		M	1	1			
2062			M	1				
2083	BM		M	1		1		
2086			M	2				
2098	BM					1		

No. 2017 Type A.C. Relays

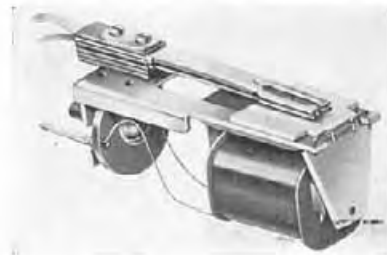


This group of alternating current relays requires special coils having the end of the core tapped. (See A.C. Relay Coils.) These relays mount on standard 1000 type mounting strips.

Code No.	Contact Arrangement			No. of Sets of Following Springs		Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	
2017		M		1		
2018		B			1	
2040	M		M	2		
2052	B		M	1	1	Composite Ring
2057			M	1		Has extra Adj. Spring.
2085	M		M	2		Tension Adj. Spring.

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

No. 2103 Type A.C. Relays



The No. 2103 type alternating current relays mount on standard 1000 type relay mountings. A laminated core is used for the coil and special coils similar to the S-JD coil. (See A.C. Relay Coils.) These relays have largely been supplanted by the use of a standard 2000 type relay and a selenium rectifier. The spring combinations are listed as they appear on the heel iron, reading from the bottom or heel iron surface to the top of the respective spring stackup.

Code No.	Contact Arrangement			No. of Sets of Following Springs			Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	
2103		B			1		These relays are for mounting on standard 1000 type mountings with 200 type relays.
2104		M		1			
2105		BM				1	
2106	BM		BM				2
2107	BM		BM				4
2203		B			1		These relays are for mounting on mtg. strips with 1700-1800 type relays.
2204		M		1			
2205		BM				1	
2206		BM				2	

No. 2100 Type Micrometer Adjustment Relays



Kellogg No. 2100 type micrometer adjustment relays allow positive and precise adjustment. The No. 2102 relay with an S-HG coil (code number for complete assembly is No. 2102, S-HG) is the standard pilot relay used on Kellogg switchboards. The No. 2102, S-HG relay replaces the No. 2043, S-HQ relay formerly used for this application. The spring stackup of these relays is always in the "B" or center position on the heel iron. With the exception of the No. 2207 relay all codes listed below mount on No. 1000 type mounting strips. The No. 2207 relay is a special pendulum relay for mounting on No. 1700-1800 type relay mounting strips.

RELAYS

No. 2100 Micrometer Adjustment Relays (Cont'd)

Code No.	Contact Arrangement			No. of Sets of Following Springs			Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK & MAKE	TWO MAKE	
2100		BM			1		Used only with S-HH or S-HG Rel. Coils. Is supplied with a cover for single relay.
2102		BM			1		Used with any 2000 type rel. coil. Replaces W.E. B-42 but not interchangeable.
2110		2M			1		Used only with S-HH or S-HG Rel. Coils. Is supplied with a cover for single relay.
2115		M		2			Used with any 2000 type rel. coil.
2207		M		1			Uses A. C. Rel. coils such as S-BX with tapped core. Mts. on 1700-1800 type rel. mtgs.

No. 3000 Type Relays

The No. 3000 type relay is used where a cover is necessary for protection against dust and dirt. The cover is of two-piece construction. The armature is of the same type as used on No. 1700-1800 type relays utilizing the spring clip to hold the armature in position and a clip type residual plate. The relay is designed for mounting on 1³/₄-inch mounting strips. The coil is not supplied as part of the relay and will be specified by the Kellogg engineering department to meet any desired specifications.

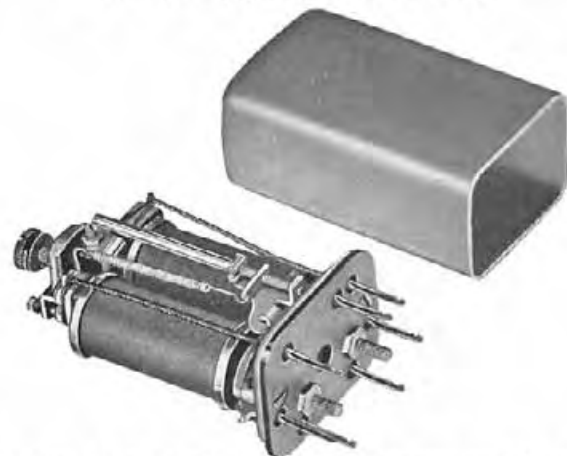
Code No.	Contact Arrangement			No. of Sets of Following Springs		
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE
3001		BM				1
3002	BM		BM			2
3027	BM	M	BM	1		4
3037	M		M	2		
3109	M		M	3		
3112	BM		B		2	1
3113	BM		M	1		2
3091	M		M			
3053	BM		BM	2		2
	No Springs					

No. 440 Type Relays

The No. 440 type relays are primarily used as line or cutoff relays on older manual exchanges depending upon the code number selected. These relays are similar to the standard No. 2000 type relays but will not mount on the same mounting strips. These relays mount on No. 346 mounting strips (see Mountings—this section). Coils are furnished as a part of the relay for the code numbers listed below. Relays should be ordered by code number.

Code No.	Contact Arrangement			No. of Sets of Following Springs		Coil Res. (Ohms)	Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK		
441-A	B		B		2	200	Used as cut-off relay.
441-B	B		B		2	500	Used as cut-off relay.
441-C	B		B		2	300	Used as cut-off relay.
442-A		M		1		1000	Used as Line Relay.

No. 546 Type Polarized Relays



The No. 546 type relay is the polarized relay used for reversing the polarity for supervision. The coils are adjustable. The relay is enclosed in a brass shell to eliminate any interference from alternating currents. Precious metal contacts are used and the relay is designed for fine adjustments as the armature is controlled by a biasing spring with a micrometer screw adjustment. These relays mount on No. 1000 type mountings. Order by code number for the resistance desired.

Code No.	Contact Arrangement	No. of Sets of Springs	Coil Res. (Ohms)	
			BREAK & MAKE	L. COIL	R. COIL
546-A	BM	1	40	40
546-B	BM	1	200	200
546-C	BM	1	1600	1600
546-D	BM	1	2500	2500
546-E	BM	1	7500	7500
546-F	BM	1	750	750
546-G	BM	1	1600	60
546-H	BM	1	100	100
546-J	BM	1	40	30,000

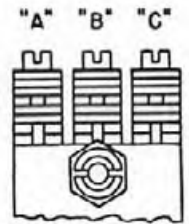
FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

No. 10 Type Relays

These relays are similar in construction to the No. 2000 type relays but are somewhat smaller in over-all dimensions. These relays mount only on mounting strips for No. 10 type relays (see Mountings in this section). These relays are not cross-talk proof as they have no shell cover.

RELAYMATIC SWITCHBOARD RELAYS



NO. 1700-1800 TYPE

The relays listed below are those used on the Kellogg Relay-matic switchboard.

Nos. 1700-1800 Type Relays

This type relay is standard for all new Relaymatic switchboards. Twin contacts of precious metal are used on all contact springs. A new "clip on" type anti-residual plate is used which eliminates the difficulty of hammering down of anti-residual pins. The new clip type can be changed easily should a thicker or thinner clip be desired.

Spring stackups are clamped under pressure in a special fixture. High tensile strength screws are used to prevent loose spring stackups.

The coil is not included as part of the relay. In ordering specify the code number of the relay having the desired spring combination and also state the voltage at which the relay is to operate. A coil will be selected by the Kellogg engineering department to meet the requirements specified. Mounting strips for these relays will be furnished on application.

The spring combinations in the following listings are shown as they actually appear on the heel iron, reading from the bottom or heel iron surface to the tip of the spring combination of the respective stackup.

Code No.	Contact Arrangement Left to Right Facing Armature			No. of Sets of Springs				Coil Res. (Ohms)	Remarks
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE		
21-A	B		B	2				250	
21-B	B		B	2				300	
21-C	B		B	2				500	
25-A		BM				1		250	
25-B		BM				1		1000	
26-A		M		1				250	
26-B		M		1				90	
26-C		M		1				600	
26-D		M		1				500	
26-E		M		1				100	
26-F		M		1				250	500 N.S. mult. with 500 C.E.
26-G		M		1				6	
26-H		M		1				500	1000 N.S. mult. with 1000 C.E.
26-J		M		1				1000	
26-K		M		1				1000	500 N.S. in series 500 C.E.
561-A	M		M	2				500	Two Dead Terminals in "B" Position.
561-B	M		M	2				300	
561-C	M		M	2				1000	
561-D	M		M	2				500	
567-A	B		B	2				300	Concentric Coil.
								1640	
567-B	B		B	2				47	Concentric Coil.
								900	
569-A		M		1				500	Four dead terms. (Pos. A & C).
569-B		M		1				300	
579-A	M		M	2				100	Concentric Coil.
								200	
579-B	M		M	2				1000	Concentric Coil.
								2000	
579-C	M		M	2				500	Concentric Coil.
								2000	
579-D	M		M	2				500	Concentric Coil.
								2000	
579-E	M		M	2				500	1000 mult. with 1000.
580-D		2M					1	500	
580-E		2M					1	1000	

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1700										
1701		M		1						
		M								
1702		M		2						
		M								
1703		M		3						
		M								
1704	M		M	4						
	M		M							
1705	M		M	5						
	M		M							
1706	M		M	6						
	M		M							
1707		M		2		1				
		M								
		BM								
1708	M		M	3		1				
	M		BM							

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RELAYS

Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1709	M M M		M BM	4		1				
1710		M B		1	1					
1711		B B			1					
1712		B B			2					
1713		B B B			3					
1714	B B B		BM B	4	1					
1715	M B B		M B B	2	4					
1716	B B B		B B B		6					
1717		M B B		1	2					
1718	M B		M BM	2	1	1				
1719	BM B		BM B		2	2				
1720		M BM		1		1				
1721		BM				1				
1722		BM BM				2				
1723	BM BM		BM			3				
1724	BM		BM			4				
1725		M BM B		1	1	1				
1726	2M B		BM BM	2	1	2				
1727	M BM		BM B	1	1	2				
1728	M BM		M BM	2		2				
1729	M M M		BM BM	3		2				
1730		BM B			1	1				
1731		2M					1			
1732		2M 2M					2			
1733		2M M		1			1			
1734	M M		2M	2			1			
1735	M 2M		2M M	3			1			
1736	M 2M		2M M	2			2			
1737	M		2M	1			2			
1738	2M		B2M				1	1		
1739		2M B				1	1			
1740		2M BM				1	1			
1741		B2M					1			
1742	B2M		B2M				2			
1743		M B2M				1	1			
1744	M M		B2M	2			1			
1745	M M M		B2M	3			1			
1746		B2M B				1	1			
1747		B2M BM				1	1			
1748		B2M M B				1	1		1	
1749	B2M		MB4B				1	1		
1750	BM		B2M			1	1			
1751	B2M		BMB4B				1	1		
1752		M BM BM				1	2			
1753		BM BM B				1	2			
1754	M M BM		BM BM	2		3				
1755		BM B B				2	1			
1756		M M B				2	1			
1757	B B		M BM	1	2	1				
1758	M M B		BM B	2	2	1				
1759	M BM B		BM BM	1	1	3				

FOR SCHEMATIC DRAWING OF CONTACT ARRANGEMENT SEE PAGE 83

RELAYS

Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1760	M M M		BM B	3	1	1				
1761	M B B		BM BM	1	2	2				
1762	M BM		BM BM	1		3				
1763	M M M		M B	4	1					
1764	M BM BM		BM BM	1		4				
1765	M BM BM		M BM BM	2		4				
1766	B B B		BM BM		3	2				
1767	M M		M B	3	1					
1768	M M M		M B	5	1					
1769	M M M		B	3	2					
1770	M B		M B	2	2					
1771		MB4B							1	
1772		MB4B MB4B							2	
1773	MB4B MB4B		MB4B						3	
1774	MB4B MB4B		MB4B MB4B						4	
1775		MB4B M		1					1	
1776		MB4B M M		2					1	
1777	M M		MB4B M	3					1	
1778	MB4B M		MB4B	1					2	
1779	MB4B M		MB4B M	2					2	
1780	MB4B M M		MB4B M	3					2	
1781	MB4B M M		MB4B M M	4					2	
1782		MB4B BM				1			1	

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1783		MB4B BM BM				2			1	
1784	MB4B BM		MB4B BM			2			2	
1785	MB4B BM		MB4B			1			2	
1786	MB4B BM BM		MB4B MB4B			2			3	
1787	MB4B BM BM		BM BM			4			1	
1788	M BM		MB4B	1		1			1	
1789	MB4B M		BM BM	1		2			1	
1790	M BM		MB4B M	2		1			1	
1791	MB4B M M		MB4B BM	2		1			2	
1792	M BM BM		MB4B BM	1		3			1	
1793	MB4B M		MB4B B	1	1				2	
1794	M B		MB4B M	2	1				1	
1795	M M B		MB4B B	2	2				1	
1796	M B		MB4B	1	1				1	
1797	BM BM B		MB4B BM			1	3		1	
1798	MB4B B		BM BM			1	2		1	
1799	M M B		MB4B 2M	2	1		1		1	
1800		MB4B 2M					1		1	
1801		MB4B B B				2			1	
1802		MB4B B				1			1	
1803	M B B		MB4B BM	1	2	1			1	
1804	M BM B		MB4B BM	1	1	2			1	

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RELAYS
Nos. 1700 - 1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1805	MB4B M M		BM B	2	1	1			1	
1806	MB4B		BMB4B						1	1
1807		BMB4B								1
1808		BMB4B M		1						1
1809		BMB4B BM				1				1
1810	M M BM		M M BM	4		2				
1811	M M M M		M M B	6	1					
1812	M M BM		M M M	5		1				
1813	M BM B		M M BM	3	1	2				
1814	M BM B		M BM B	2	2	2				
1815	BM BM BM		BM BM BM			6				
1816	M M B		MB4B M M	4	1				1	
1817	M BM BM		MB4B MB4B	1		2			2	
1818	M M M M		M M BM	6		1				
1819	M M M M		M M M M	8						
1820	M M M M		M M M	7						
1821	M M M B		M M M M	7	1					
1822	M BM B		M BM BM	2	1	3				
1823	M B		2M	1	1		1			
1824	M B B		2M BM	1	2	1	1			
1825	M BM BM		M M BM	3		3				
1826	M B B		MB4B MB4B	1	2					2
1827	MB4B M M		M BM B	3	1	1				1
1828	M M M B		M BM BM	4	1	2				
1829	MB4B M BM		M M M M	5		1				1
1830	MB4B BM		M M M M	4		1				1
1831	MB4B B B		BM BM		2	2				1
1832	2M M		M B	2	1		1			
1833	MB4B M M M		MB4B M M M	6						2
1834	MB4B M B		MB4B M B	2	2					2
1835	BM BM BM		BM BM			5				
1836	BM BM B		M BM BM	1	1	4				
1837	MB4B M BM		MB4B M BM	2		2				2
1838	M BM BM		M M M BM	4		3				
1839	M M M M M		M M M M	9						

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RELAYS

Nos. 1700-1800 Type Relaymatic Switchboard Relays

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1840	M M M M M		M M M M M	10						
1841	M M M B		M M M B	6	2					
1842	M M M B		M M M BM	6	1	1				
1843	M BM B		MB4B M BM	2	1	2			1	
1844	M M M		MB4B M M	5					1	
1845	M M M BM		M M M M	7		1				
1846	M M M M M		M BM BM	6		2				
1847	M M B		M M B	4	2					
1848	BM BM B B		MB4B B B		3	2			1	
1849	B B		B B		4					
1850	M M M M M		BM BM B	5	1	2				
1851	MB4B M BM		MB4B M M B	3	1	1			2	
1852	M M M M		MB4B M M M	7					1	
1853	M M M M		M BM BM	5		2				

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1854	M M M M		M B B B	5	3					
1855	MB4B B B		MB4B B B		4					2
1856	MB4B M BM		MB4B B B	1	2	1				2
1857		BM BM M		1		2				
1858	M M B		M B B	3	3					
1859	B B		M B	1	3					
1860	MB4B M M		BM BM	2		2				1
1861	MB4B BM B		MB4B B B		3	1				2
1862	M M BM B		M M BM B	4	2	2				
1863	M BM BM		M M BM B	3	1	3				
1864	M M M BM		BM BM BM	3		4				
1865	M M M M M		M M M B	8	1					
1866	M M M BM		BM B B B	3	3	2				
1867	M B B		BM B B	1	4	1				
1868	M		M	2						
1869	B		B		2					
1870	BM		BM			2				
1871	M M M B		MB4B BM BM	3	1	2				1

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RELAYS

**Nos. 1700-1800 Type
Relaymatic Switchboard Relays**

Code No.	Contact Arrangement			No. of Sets of Following Springs						
	POS. "A"	POS. "B"	POS. "C"	MAKE	BREAK	BREAK & MAKE	TWO MAKE	BREAK & TWO MAKE	MAKE BEFORE BREAK	BREAK & MAKE BEFORE BREAK
1872	M M M M M		BM BM BM	5		3				
1873	MB4B M M B		MB4B M B B	3	3					2
1875	M B B B		M BM B	2	4	1				
1876	BM B B B		M BM B B	1	5	2				
1878	BM BM B		M M BM B	2	2	3				
1879	MB4B B		MB4B B		2					2
1880	M M BM B		2M BM BM	2	1	3	1			
1881	BM BM BM		MB4B M BM	1		4				1
1882	2M B		3M B	5	2					
1883	M M M BM		MB4B M M M	6		1				1
1884	M BM BM		B B B	1	3	2				
1885	MB4B M M		BM BM BM	2		3				1
1886	BM BM B		M B B B	1	4	2				
1887	BM		2M			1	1			
1898	M M BM B		BM BM BM	2	1	4				
1889	M M		BM	2		1				

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No. 7007 Type Gang Relays



The Kellogg No. 7007 type gang relays are new style gang relays used on Kellogg Relaymatic switchboards. Ladder type spring separators are used and a special adjustment feature provided to hold any field maintenance work to a minimum. The spring stack-up is clamped in a pressure

fixture and held by high tensile strength screws to prevent loose stackups from occurring. Twin contacts of precious metal are used on all contact springs. Standard relay coils are used for these relays. Coils are furnished to meet specification requirements. These relays mount on No. 1700-1800 relay mounting strips per application.

Code No.	Spring Stackups Left to Right Facing Armature										Remarks
	A	B	C	D	E	F	G	H	J		
7007	4M	4M	4M	3M	3M	3M	3M	4M	4M		Screw Type Adj. Arm. Total 32 Makes
7008	4M	4M	4M	3M	3M	3M	4M	4M	4M		Screw Type Adj. Arm. Total 33 Makes
7009	4M	4M	4M	3M	3M	3M	3M	3M	4M		Screw Type Adj. Arm. Total 31 Makes
7010	4M	4M	4M	2M	2M	2M	3M	3M	4M		Screw Type Adj. Arm. Total 28 Makes 3 Breaks

No. 7100 Type Gang Unit Relays



The Kellogg No. 7100 Type Gang Unit Relays are new style gang unit relays used in the finder circuit of the Kellogg Relaymatic. The same adjustment features and method of construction have been applied to this relay as on the No. 7007 type gang relay.

Twin contacts of precious metal are used on all contact springs. Coils are not supplied as part of the relay but are furnished to meet specific requirements. These relays mount on No. 1700-1800 relay mounting strips per application.

Code No.	Spring Stackups Left to Right Facing Armature				Remarks
	A	B	C	D	
7100	4M	4M	4M	4M	Total 16 Make Contacts
7101	3M	3M	3M	3M	Total 12 Make Contacts
7102	3M	3M	3M	2M	Total 11 Makes and 1 Break on top in "D" stackup
7103	5M	5M	5M	5M	Total 20 Make Contacts

RELAYS

Nos. 7300 and 7400 Type Line and Cut-Off Relays

The Nos. 7300 and 7400 type relays are the line and cut-off relays used on Kellogg Relaymatic switchboards. Clip type residual plates are used and the armature is held in place with a special armature clip. Replacement of either armature or residual plate has been made as simple as possible. The spring stackups are clamped in a pressure fixture and held in position with high tensile strength screws to eliminate loose stackups in service. The line relay is to the left of the cut-off relay as viewed from the armature end. Coils are supplied with the codes listed below as part of the relay. These relays mount on No. 1700-1800 type relay mounting strips per application. Twin contacts of precious metal are used on all contact springs.

Code No.	Contact Arrangement				Coil Res. (Ohms)	
	Line		Cutoff		Line Side	Cutoff Side
7300	3M		2B		500	500

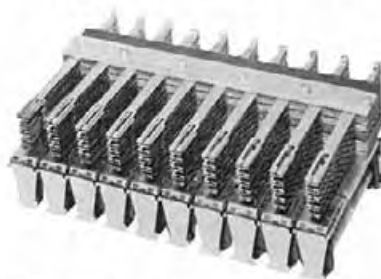
Code No.	Contact Arrangement										Total	Coil Res. (Ohms)		
	A	B	C	D	E	F	G	H	J	K		Line	Cutoff	Line Side A, C, E, G, J	Cutoff Side B, D, F, H, K
7400	3M	2B	3M	2B	3M	2B	3M	2B	3M	2B	15M	10B	500(ea. coil)	500(ea. coil)

Relays, Harmonic

Kellogg harmonic relays consist of standard harmonic ringer movements fitted with auxiliary contacts for the operation of lamp signals or other relays.

Code No.	Party	Freq. (Cycles)	Resistance (2 coils)
20570-A-1	1	20	2500 ohms
20570-A-2	2	60	500 ohms
20575-A-1	1	33½	2500 ohms
20575-A-2	2	50	500 ohms
20575-A-3	3	66½	500 ohms
20575-A-4	4	16½	500 ohms
20576-A-1	1	30	1600 ohms
20576-A-2	2	42	1600 ohms
20576-A-3	3	54	1600 ohms
20576-A-4	4	66	1600 ohms
20577-A-1	1	25	2500 ohms

No. 7200 Type Gang Unit Relays



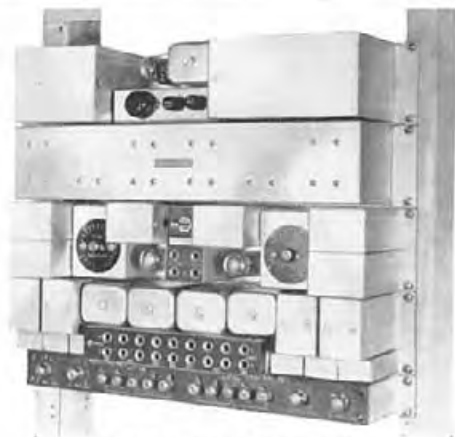
The No. 7200 type relays are new style gang unit relays used on Kellogg Relaymatic switchboards. These are special purpose relays having ten separate coils, armature and spring stackups assembled to one heel iron. Common strapping between the respective make contacts of the spring stackups allows the connection of ten lines by the operation of any one armature. Each individual armature has the same clip type residual as used on the No. 1700-1800 type relays. Coils are supplied with these relays. The spring combinations are the same. The only difference between the two is the coil windings as may be seen in the listing below. These relays mount on No. 1700-1800 type relay mounting strips per application. Twin contacts of precious metal are used on all contact springs.

Code No.	Contact Arrangement										Coil Res. (Ohms)		Remarks
	A	B	C	D	E	F	G	H	J	K	Pos. A	Pos. B, C, D, E, F, G, H, J, K	
7200	4M	4M	4M	4M	4M	4M	4M	4M	4M	4M	1200	1200 (each coil)	Total 40 Makes—10 Breaks (for 48 volts)
7201	4M	4M	4M	4M	4M	4M	4M	4M	4M	4M	500	500 (each coil)	Total 40 Makes—10 Breaks (for 24 volts)

Resistor, Variable Subset

This resistor has three windings of non-inductively wound nickel silver resistance wire, No. 32 gauge. It is used in repeaters for railroad dispatching circuits.

Code No.	Terminal No.	Resistance (ohms)
1-A	1-2	200
	2-3	400
	3-4	800



NO. 4 REPEATER EQUIPMENT

REPEATER, TELEPHONE

The Kellogg voice frequency telephone repeater is used to increase the transmission level on long or highly attenuated telephone circuits. It can be used on any circuit which will carry regular telephone transmission.

This equipment may be used as a terminal or as an intermediate repeater without circuit changes.

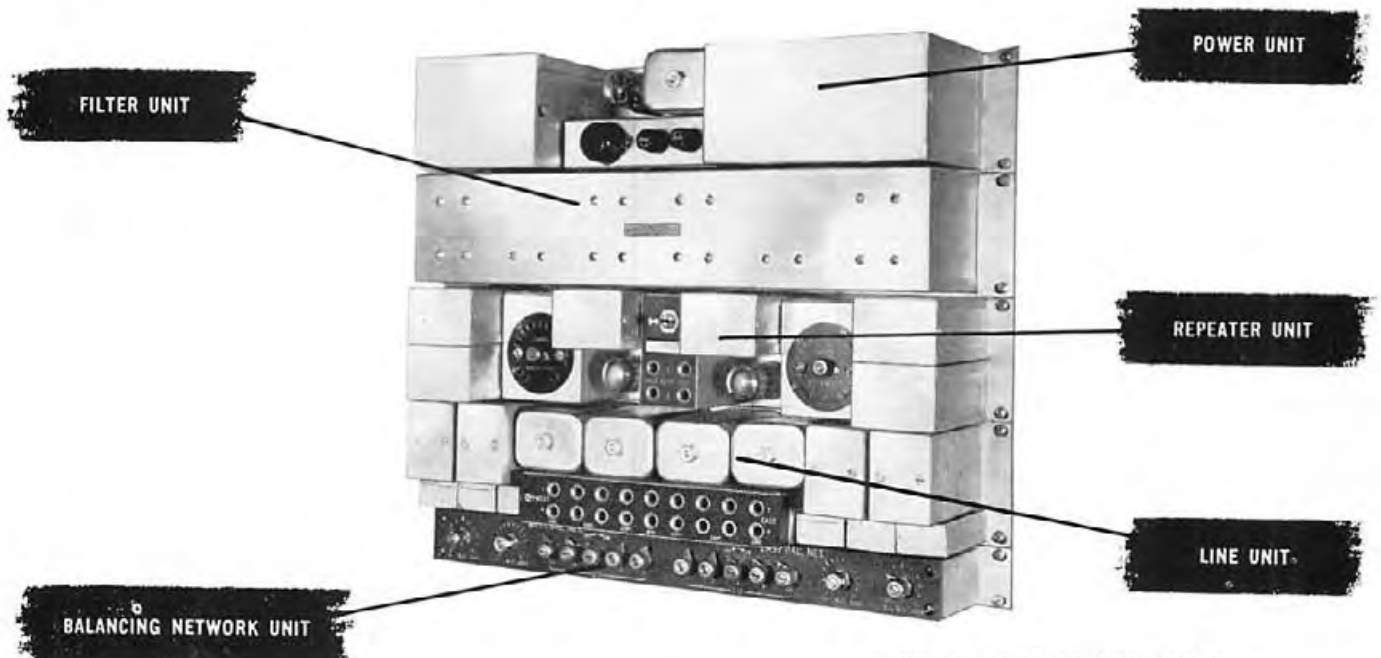
A repeater consists essentially of two vacuum tube amplifiers so arranged that voice frequency signals may be amplified in both directions in a two-wire telephone circuit without interaction between the two sides of the conversation in the circuit.

REPEATER, TELEPHONE

The Kellogg repeater consists of 1) a repeater unit for amplifying the voice level in each direction; 2) a filter unit which, by limiting the frequencies to be amplified, makes possible a greater degree of balance and consequently a greater usable gain from the repeater; 3) a balancing network unit which provides the necessary impedance balance between the line side and the network side of each hybrid coil; 4) a line unit which acts as a connecting link between the line and the repeater unit and provides a means of by-passing signalling current around the repeater unit; and 5) a power unit used only with A.C. operated repeaters to furnish plate and heater voltages for the amplifier tubes in the repeater unit.

Kellogg repeaters are assembled and wired on a unit basis to provide the flexibility necessary to satisfy the requirements of various types of lines and circuit applications. Each of the five components listed above is assembled individually on a panel suitable for mounting on a standard 19-inch relay rack or in cabinets.

After installation the Kellogg repeater can be balanced rapidly and adjusted for maximum gain through the simple adjustment of accurately calibrated dial controls on the balancing network and repeater units. The use of these calibrated dial controls eliminates strapping to control the gain of the repeater unit or the balance of the balancing network.



BALANCING NETWORK UNIT

The function of the balancing network unit is to create an artificial line whose impedance at all frequencies in the voice range approximates that of the physical line in which the repeater is installed. When this condition is satisfied the repeater is balanced and maximum gain can be obtained without singing.

The balance network unit consists of two identical networks of variable resistance units and a decade condenser unit so designed that a wide range of line impedances may be rapidly balanced by the simple adjustment of accurately calibrated dial controls. Thus should line impedances change due to unusual weather conditions balance may be easily and rapidly restored without the necessity of reducing the repeater gain to prevent singing.

REPEATER UNIT

The repeater units consist primarily of two vacuum tube amplifiers, two hybrid coils, and two gain controls. To simplify maintenance a series jack is provided in each plate circuit to permit measuring the plate current without taking the repeater out of service. This provision makes it possible to check the operation of the repeater without turning down the circuit.

Each amplifier section of the repeater unit is equipped with a dual purpose tube operated at conservative voltages as a push-pull amplifier. The amplification of the repeater in each direction is governed by a variable gain control pad accurately calibrated in one db steps indicating the actual gain of the repeater unit itself.

Three different types of repeater units can be furnished for operation on 1) 24 volt exchange battery; 2) 48 volt exchange battery; or 3) 110-120 volt 60 cycle, A.C. power source.

REPEATER UNIT SPECIFICATIONS

	CODE NO. 3A	CODE NO. 3B	CODE NO. 4
Power Supply	20-28 v. D.C. Exchange Battery	40-56 v. DC Exchange Battery	A.C. Power Unit
Type of Tube	28D7	28D7	6SL7
Maximum gain in each direction	20 db	20 db	20 db
Maximum Output level	+13 dbm*	+17 dbm*	+13 dbm*
Plate Voltage	20-28 volts	40-56 volts	200 volts
Total Plate Current	.046 amps.	.080 amps.	.008 amps.
Heater Voltage Supply	20-28 volts	40-56 volts	6.3 volts
Total Heater Current	.72 amps.	.36 amps.	.6 amps.

*0 dbm—one milliwatt in 600 ohms.

REPEATER, TELEPHONE**FILTER UNITS**

The filter unit in the repeater system is used to limit the band of frequencies which must be amplified and passed by the repeater unit, thus permitting a high degree of balance between the line and network side of the repeater hybrid coil. This balance is necessary to insure a high and uniform gain from the repeater. Two filters are provided on each filter unit—one for each direction of transmission.

No. 204-2 Filter Unit

This filter is a sharp cut-off, 300 to 2700 c.p.s., band-pass filter. It is assembled on a 1³/₄ by 19 inch panel.

The No. 204-2 filter is recommended where maximum repeater gain is required, especially where the repeater is to be installed on a circuit with heavily loaded cable lines or in circuits upon which a carrier system is superimposed.

No. 200-2 Filter Unit

The No. 200-2 filter unit is a general purpose filter suitable for use where the impedance characteristic of the line is smooth and the cut-off frequency of the line is fairly high.

LINE UNITS

The line unit is the connecting link between the line and the repeater unit and between the repeater unit and the balancing network. It provides the terminating apparatus for the line as well as the means for signalling or ringing around the repeater unit.

Each line unit is equipped with a power failure relay which by-passes the wire circuit around the repeater unit should the latter become inoperative because of a power failure or when it may be desirable to take the repeater unit out of service temporarily. This feature makes it unnecessary to turn down the circuit when a repeater unit must be removed for maintenance.

No. 400-Type Line Unit

The No. 400-type line unit is a relay by-pass line unit using relays either to by-pass the signalling current around the repeater or to apply a new source of signalling current when repeat ringing is desired. The change from by-pass signalling to repeat ringing is accomplished by changing straps on the terminal strip. When repeat ringing is used, the source of ringing power must be supplied.

The No. 400 line unit is available in four different operating voltages: No. 400-A for 24-volt operation; No. 400-B for 48 volts; No. 400-C for 200 volts, and No. 400-D for 6 volts. The A and B types operate from exchange battery, the C type from the 200 volt, dc repeater power supply and the D type from a 6 volt, dc, power supply.

No. 401-Type Line Unit

The No. 401-type line unit is a filter by-pass unit designed

to by-pass all frequencies from 3 c.p.s. to 150 c.p.s. It is used on railway dispatching circuits as well as for by-passing any signalling current within the specified frequency range. The No. 401 line unit may be used on any phantom or simplex circuit although such circuits cannot be terminated at the repeater location.

No. 402-Type Line Unit

The No. 402-type line unit is a filter by-pass unit designed to by-pass frequencies from 15 to 150 c.p.s. It is a general purpose unit which may be used on any line, metallic or phantom, simplex or composite, and is arranged to terminate both simplex and composite circuits. With these exceptions the No. 402 line unit is the same as the No. 401 unit described above.

No. 403-Type Line Unit

The No. 403-type line unit is designed for use in circuits where the signalling is accomplished by means of a simplex or composite leg.

POWER SUPPLY UNIT

The No. 104 power supply unit, required only with the No. 4 voice repeater unit, supplies the proper plate and heater voltages for the amplifier tubes in the repeater unit. It will supply from one to six No. 4 repeater units. It operates directly from the regular 105-125 volt, 60 cycle A.C. power or lighting circuit. It uses a choke-input filter.

The power unit is provided with local protection by a fuse in each side of the A.C. input supply. It is also equipped with a power failure relay wired to release the power failure relays in all associated line units. This relay may also be used to operate an alarm circuit.

APPLICATION AND ORDERING INFORMATION

In ordering Kellogg telephone repeater equipment the following information must be included with the order.

1. Operating voltage. Indicate whether the equipment is to be operated from (a) 24 volt exchange battery, (b) 48 volt battery, or (c) 105-125 volt, 60 cycle, commercial power supply.

2. Type of signalling.

a. Ringdown signalling. Specify if relay by-pass, repeat ring, or filter by-pass type line unit is desired. (If repeat ring is required a source of ringing power must be provided at the repeater location.) Specify frequency of ringing power used.

b. Composite or simplex signalling. If an intermediate repeater is desired in a compositing circuit, specify whether composite equipment is available to carry the CX legs around the repeater.

c. 3¹/₂ cps dispatcher signalling.

d. Loop dialing signalling, or C.B. subscriber's loop.

3. Circuit information. Complete details of the wire facilities involved in the circuits to be repeated must be provided as shown in paragraph "B" under Telephone Carrier Systems ordering information on page 14.

4. Equipment racks. Kellogg Telephone Repeater equipment mounts on any standard 19-inch equipment rack. If there is no 19-inch space available see page 14 under Telephone Carrier Systems for ordering information for these racks.

RINGERS

Kellogg ringers are available in: Biased, Straight Line, and Frequency Selective types for ringing applications as follows:

Biased Ringers—for common battery manual, dial, or magneto when future conversion to common battery service is

contemplated. Use for bridged or divided ringing, where desirable to prevent bell tapping, or where necessary that the ringers respond to a single polarity; also for two and four party selective, code, and other semi-selective pulsating and superimposed ringing employing Vincent Rare Gas Relay for noise reduction, or Western Electric 333-A Tube for selective ringing.

Straight Line Ringers—for magneto, bridged or divided ringing where bell tapping is not objectionable, and where maximum sensitivity to a broad range of ringing frequencies is desired.

Frequency Selective Ringers—for common battery manual, dial, bridged or divided frequency selective ringing in Harmonic, Synchronic, and Decimonic frequencies.

RINGERS


BIASED RINGERS

FOR 1000 SERIES DESK AND 1100 SERIES WALL MASTERPHONES

Code No.	Resistance (ohms)	Impedance	Gong Diam.	Type	Armature Type
120-BA	4000	High	1 3/4 in.	Small	Adjustable
120-BB	2500	Medium	1 3/4 in.	Small	Adjustable
120-BC	1000	Low	1 3/4 in.	Small	Adjustable

Note: 120-BA ringers should be used on all dial and heavily loaded manual lines. Do not mix on same line with other ringers having resistance less than 2500 ohms. Use 120-BB ringers if present ringers on line have a resistance of over 1500 ohms and under 3000 ohms. Use 120-BC ringers if present ringers on line have a resistance of over 500 ohms to 1500 ohms. For ringer adjustment tool, order No. 85 tool.

FOR EXTENSION BELLS AND C.B. DESK SET BOXES



Code No.	Resistance (ohms)	Gong Diam.	Type	Armature Type	Remarks
79-A	1000	2 1/2"	Large	Adj.	For #37 Extension Bells F605, F602, 610 Desk
79-D	1600	2 1/2"	Large	Adj.	Set Boxes, F817, 9817 Telephones
79-G	2500	2 1/2"	Large	Adj.	

STRAIGHT LINE RINGERS

FOR 1000 SERIES DESK AND 1100 SERIES WALL TELEPHONES

Code No.	Resistance (ohms)	Impedance	Gong Diam.	Type	Armature Type
123-SA	4000	High	1 3/4 in.	Small	Adjustable
123-SB	2500	Medium	1 3/4 in.	Small	Adjustable
123-SC	1000	Low	1 3/4 in.	Small	Adjustable

Note: 123-SA ringers should be used on all heavily loaded magneto lines. Do not mix on same line with other ringers having resistance less than 2500 ohms. Use 123-SB ringers if present ringers on line have a resistance of over 1500 ohms and under 3000 ohms. Use 123-SC ringers if present ringers on line have a resistance of over 500 ohms to 1500 ohms. For ringer adjustment tool, order No. 85 tool.

FOR 4800 AND 5800 SERIES WALL TELEPHONES, EXTENSION BELLS AND LOCAL BATTERY DESK SET BOXES

Code No.	Resistance (ohms)	Gong Diam.	Type	Armature Type	Remarks
78-A	1000	2 1/2 in.	Lge.	Non-Adj.	For #37 Extension Bells, F2300, 3300, 3400, 3500 Desk Set Boxes, & 4800 5800 Telephones
78-D	1600	2 1/2 in.	Lge.	Non-Adj.	
78-G	2500	2 1/2 in.	Lge.	Non-Adj.	

FOR LOUDRINGING EXTENSION BELLS

Code No.	Resistance (ohms)	Gong Diam.	Type	Armature Type	Remarks
107-A	1000	*	Large	Adjus.	for #65 Extension Bells
107-D	1600	*	Large	Adjus.	
107-G	2500	*	Large	Adjus.	

*Six-inch diameter ringers are mounted on extension bell frame and not supplied with ringer.

FOR 3000-3001 PORTABLE TELEPHONES

109-G	2500	1 3/8 in.	Large	Non-Adj.	
FOR 1016 TEST SET					
18-C	1600	1 3/4 in.	Large	Adjustable	
FOR NO. 6886					
55-G	2500	3 in.	Large	Non-Adjus.	

FREQUENCY SELECTIVE RINGERS

FOR 1000 SERIES DESK, 1100 SERIES WALL MASTERPHONES
For Harmonic, Synchronomic, Decimonic Ringing Applications

Kellogg No. 124 Ringer



This is a standard low impedance ringer furnished in 1000 series desk and 1100 series wall Masterphones. For bridged selective ringing five to ten telephones equipped with the 124 ringer can be used on a line. However, the use of ten bridged telephones using 124 ringers on long rural lines is not recommended. For divided selective ringing applications ten telephones equipped with this ringer can be used on a line.

Kellogg No. 122 Ringer



This is a high impedance ringer which can be furnished in 1000 series desk and 1100 series wall Masterphones if requested on your order. For bridged ringing applications ten telephones equipped with the 122 ringer can be used on a line. For divided ringing applications twenty telephones equipped with this ringer can be used on a line.

FOR WESTERN ELECTRIC & STROMBERG CARLSON TELEPHONES

Kellogg W-125 Ringer—This is the same style ringer as the Kellogg No. 124 type but specially designed for installation in Western Electric No. 302 desk telephones. Can be furnished in all frequencies.

Kellogg S-125 Ringer—Same style as the 124 type but for use in Stromberg Carlson No. 1243 desk and No. 1250 wall telephones. Available in all frequencies.

Above ringers are available in the following frequencies. In ordering, specify code number of ringer and designate frequency desired. Example—124-HB1—30 cycle.

HARMONIC FREQUENCIES

Code No.	Frequency (cycles)	Resistance (ohms)
HA-1	33 1/3	1000
HA-2	50	1000
HA-3	66 2/3	1000
HA-4	166 2/3	2500
HA-5	25	2500

SYNCHROMONIC FREQUENCIES

HB-1	30	2500
HB-2	42	1000
HB-3	54	1000
HB-4	66	1000
HB-5	16	2500

DECIMONIC FREQUENCIES

HC-1	20	2500
HC-2	60	1000
HC-3	30	2500
HC-4	40	1000
HC-5	50	1000

RINGERS

RINGERS FOR USE WITH NO. 65 EXTENSION BELL

Six-inch diameter gongs for this ringer are mounted on an extension bell frame. This ringer is a large type with adjustable armature.

Code No.	Frequency (cycles)	Resistance (ohms)
105-A-1	33 1/3	500
105-A-2	50	500
105-A-3	66 2/3	500
105-A-4	16 2/3	2500
106-A-1	30	1000
106-A-2	42	1000
106-A-3	54	1000
106-A-4	66	1000
121-A	25	2500



105 TYPE RINGER



72 TYPE RINGER

RINGERS FOR NOS. F-817 AND F-9817 TELEPHONES AND NOS. 602, 605, 610 DESK SET BOXES

Code No.	Frequency (cycles)	Resistance (ohms)	Gong Diam.	Type	Armature Type
72-A-1	33 1/3	500	2 1/2 in.	Large	Adjustable
72-A-2	50	500	2 1/2 in.	Large	Adjustable
72-A-3	66 2/3	500	2 1/2 in.	Large	Adjustable
72-A-4	16 2/3	2500	2 1/2 in.	Large	Adjustable
73-A-1	30	1000	2 1/2 in.	Large	Adjustable
73-A-2	42	1000	2 1/2 in.	Large	Adjustable
73-A-3	54	1000	2 1/2 in.	Large	Adjustable
73-A-4	66	1000	2 1/2 in.	Large	Adjustable
74-A-1	20	2500	2 1/2 in.	Large	Adjustable
74-A-2	60	500	2 1/2 in.	Large	Adjustable
101-A	25	2500	2 1/2 in.	Large	Adjustable

SEATS, PLUG

Plug seats in strip types cannot be accurately drilled unless they are fitted to the plug shelf and drillings made with the old plug holes as a guide. Strips are shipped undrilled and, if desired, necessary tools for drilling are furnished. For tools used for drilling plug seats see tool kits Nos. 65 and 66.

NO. 9 INDIVIDUAL TYPE

The No. 9 plug seat consists of two parts, a leather washer and a red fibre seat which may be fastened to the plug shelf by two wood screws which are furnished. The leather washer is 5/32 inch thick and has an outside diameter of 11/16 inch. The dimensions of the 1/8 inch red fibre strip are 1 by 3/4 inch. The cord hold is .368 inch in diameter.



STRIP TYPE

Code No.	Length	Width	Thickness	Material
14	12 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
15	19 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
22	20 3/8 in.	2 1/8 in.	1/8 in.	Red fibre
25	21 3/8 in.	2 1/8 in.	1/8 in.	Red fibre

NOTE: Order No. 65 tool kit for drilling plug seats for Nos. 42 and 106 plugs. Order No. 66 tool kit for drilling plug seats for No. 201 plugs.

SIGNALS, MECHANICAL



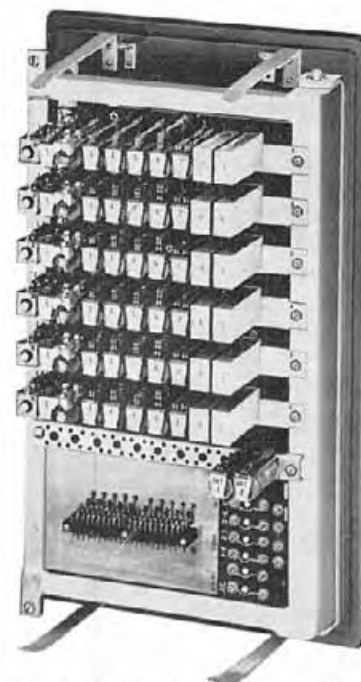
Kellogg mechanical signals are of the same rugged construction as Kellogg drops. The most commonly used types are shown below with the respective resistance value of each code.

The No. 7 type signal has gridiron type shutter. Equipped with night alarm. This signal is used for attendant station busy signal.

The No. 12 type signal has target shutter. Used for busy test on toll boards.

Code No.	Coil Res. (ohms)	Mounting Centers
7-A	500	1 in.
7-B	50	1 in.
7-C	200	1 in.
12-A	160	1/2 in.
12-B	100	1/2 in.
12-C	1600	1/2 in.
12-D	2750	1/2 in.

STATIONS, RELAY EQUIPMENT CABINET FOR KEY-BX SYSTEMS



Designed for wall mounting in any convenient location. Provided with side swinging relay gate for mounting trunk relays, condensers, battery feed coils and other apparatus associated with Key-BX system. Dimensions are as follows: width, 16 inches; height, 28 inches; depth, 9 1/4 inches. Trunk relays and associated apparatus for each trunk are all mounted and wired in the factory on individual trunk mounting plates. "Plug-in" type trunks permit quick installation and maintenance of trunk circuits. Trunk relays have twin

contacts of precious metal on all springs. The switching equipment is protected from dust and dirt with a slip-on wood cabinet cover finished in olive green.

Code No.	Description
25-A	For Key-BX systems. Wired for 6 trunks and 2 intercommunication circuits.
25-B	For Key-BX systems. Wired for 3 trunks and 2 intercommunications circuits.

STATIONS, ATTENDANT



Kellogg attendant stations are for use with intercommunication systems. The Nos. 20 and 22 attendant stations are of the 11 station type, providing for 2 trunks and 9 local stations. By eliminating the trunks all 11 key units can be used for local intercommunication use.

The Nos. 21 and 23 attendant stations are of the 23 station type, providing for 4 trunks and 19 local stations. By eliminating

the trunks all 23 key units can be used for local intercommunication.

The attendant stations listed above have a black enamel finished steel cover. The Nos. 4, 5, 24, and 25 attendant stations are housed in attractively finished wooden covers. The features of these types are listed below.

The standard operating voltage for all these systems, except the No. 25, is 12 volts. The No. 25 operating voltage is 24 volts. Modification of these voltages can be made for operation on other voltages if desired.

For more complete information on attendant stations see "Intercommunication Systems" pages 43 through 46 in this section.

Code No.	Description
4	One trunk to magneto exchange.
5	Two trunks to magneto exchange.
20	11 station capacity or 2 trunks to common battery manual exchange and 9 local stations.
21	23 station capacity or 4 trunks to common battery manual exchange and 19 local stations.
22	11 station capacity or 4 trunks to common battery dial exchange and 9 local stations.
23	23 station capacity or 4 trunks to common battery dial exchange and 19 local stations.
24	1 trunk Relaymatic intercommunication to common battery (manual or dial) main exchange.

STRIPS, TERMINAL WITH SCREW CONNECTORS



The connectors are made of steel, hot tin plated, and are mounted on a hard maple strip, finished with shellac.

Code No.	No. of Lines	No. of Connectors	Length of Strip
41	5	10	7½ in.
43	25	50	32½ in.

STRIPS, TERMINAL WITH SOLDER CONNECTORS



Code No.	No. of Connectors	No. of Connectors per Row	No. of Rows High	Over-all Length of Strip
32	20	10	2	6⅞ in.
31	30	10	3	6⅞ in.
49	40	10	4	6⅞ in.

STRIPS, DESIGNATION

Kellogg designation strip holders are made of brass with a heavy black enamel finish. White paper inserts are used under a clear celluloid cover. Type No. 7 strips shown below are 17/32-inch wide and can be furnished in the lengths listed. Mounting screws are not furnished unless specified. No. 4 flat head wood screws (P-5964) should be specified if screws are desired.

TYPE NO. 7—UNMOUNTED



Code No.	Over-all Length	No. Mtg. Screws
10	10¼ in.	3
15	10 in.	3
16	9½ in.	3
17	5½ in.	2
26	15½ in.	5
28	8-3/16 in.	3
30	17 in.	4
33	11½ in.	5

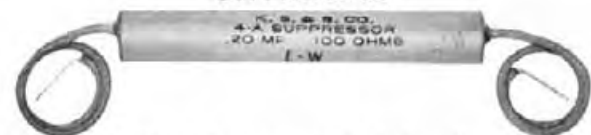
TYPE NO. 13—MOUNTED



Type No. 13 designation strips are similar to type No. 7 in general construction except they are mounted on jack panels for mounting on switchboard stile strip.

Code No.	Mounting Centers	Width of Panel	Dimensions
13	11-5/32 in.	½ in.	10 x 7/16 in.
20	11-5/32 in.	7/16 in.	10 x 7/16 in.
23	8-9/32 in.	¾ in.	7-9/16 x 23/64 in.
31	8-9/32 in.	½ in.	7-9/16 x 7/16 in.

SUPPRESSORS



The Kellogg No. 4-A suppressor is designed as a spark suppressor for Relaymatic switchboards. Its function is to prevent burning of contacts on dialing relays and similar applications. A flash test voltage of 500 volts, DC, is given every suppressor.

Code No.	Capacity (Mfd.)	Working Voltage	Size
4-A	.20 - .25	250 volts	3¼ x ½ in. diam.

MAGNETO MASTERBUILT SWITCHBOARDS



The Magneto switchboard is ideally suited for the small exchange having many long rural subscribers' loops and where operating conditions require an installation which is simple in operation and maintenance.

Three major features are part of every magneto switchboard. (1) "Magneto" is the simplest form of telephony; (2) local battery transmission, at its best, is the best transmission so far de-

vised by telephone engineers; (3) magneto equipment will operate over distances and conditions of outside plant which prevent the use of any other type of switchboard.

The magneto switchboard must be such that it will give satisfactory service to patrons. Its maintenance expense must be extremely low. Replacements must be negligible. The apparatus itself must be so simple that it can be handled perfectly by persons of very limited training and experience. Every Kellogg magneto switchboard is designed and engineered to meet these requirements. The quality of material, design, and workmanship of Kellogg switchboards assures complete satisfaction on the part of the subscriber and the operating company.

SELECTING A MAGNETO SWITCHBOARD

The selection of the proper magneto switchboard depends upon the number of subscribers to be served, the type of line construction, the length of the lines, the number of telephones on each line, and the probability of station growth. These facts permit the selection of the proper size switchboard with a sufficient number of drops and jacks and cord circuit capacity to adequately care for the needs of the community.

The complete line of Kellogg magneto switchboards includes a board for every need, from a 10-line wall switchboard to a 200-line floor type board.

Construction Features



FRAMEWORK. The framework of the Masterbuilt magneto switchboard is of all steel construction, fabricated into one complete interlocking unit. Rivets and spot welding fasten each piece permanently in position. This construction not only provides ample strength to support the equipment and cabinet woodwork but adds permanence to the installation.

Cam keys have colored handles—miscellaneous keys are red and white and contrast with black mountings.

Each plug space in the Masterbuilt magneto switchboard has a plug well bushing to take up plug seat wear and prevent the wearing of holes around the plug seats. These bushings are replaceable.



SHELVES AND PANELS. The keyshelf and face equipment are made of black phenol fibre. This material is used because of its permanent lustre and its unusual wearing qualities. It contrasts with the equipment and sets off the cords, plugs, keys, drops and lamps. The keyshelf is hinged with a full length piano hinge and can be raised to provide easy access to the key equipment.

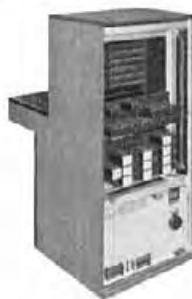


SWINGING GATE. All card circuit repeating coils and condensers, and in the case of lamp supervision switchboards, all supervisory relays, are mounted on a swinging gate at the back of the switchboard. Below this steel gate is a maple panel which mounts the operator's telephone circuit and night alarm equipment, terminals for ringing current, battery supply, telephone switching circuits; and

in the case of lamp supervision switchboards, the fuses. This panel is conveniently located for easy access. Swinging the gate open exposes the line equipment, cords, and both sides of the gate for inspection and cleaning.



FACE EQUIPMENT. The face equipment of the Masterbuilt magneto switchboard has been arranged for simplicity and ease of operation. The black bakelite background prevents fatiguing glare. Jack thimbles are of bright nickel for visibility. Plugs have red or black fibre sleeves for quick identification and are positioned and spaced for maximum convenience.



CABINET. The cabinet of the Masterbuilt Magneto switchboard is made of medium golden oak side panels and top. The cabinet has been modernized with old style trim and overlapping sides eliminated to present a smooth beveled top and flush sides. The kickboard is completely covered with a solid color battleship linoleum panel.

MAGNETO MASTERBUILT SWITCHBOARDS



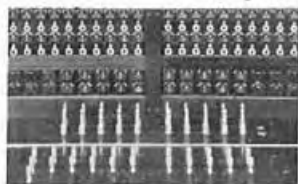
DROPS AND JACKS. The Kellogg drop and jack is designed to insure positive operation. The armature

which operates the latch is at the back end of the coil. This permits the use of a longer latch rod, with more positive action because the armature can be set closer and be pulled up easier by weaker currents. A slight movement of the armature will cause full movement of the latch. The latch, as it is constructed, not only releases the shutter but kicks it down at the same time. Because of this feature the operation of these drops is positive, even on heavily loaded lines where the ringing current is weak.

Jacks with the necessary spring assemblies, are mounted on a rigid frame. The jack thimbles into which the plugs are inserted are designed to insure long life and to protect the plugs from excessive wear. When necessary, jack thimbles may be easily and inexpensively replaced.

SUPERVISION. Two types of supervision are available on Kellogg Masterbuilt magneto switchboards—drop and lamp types.

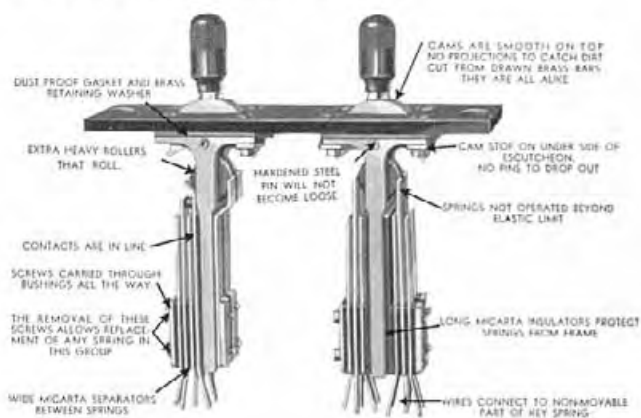
Drop Supervision



Kellogg drop supervision magneto switchboards employ the same type drop for supervision as is used for each line. These drops are mounted on the face of the board. When the subscriber rings off the shut-

ter falls. The "kick" of the Kellogg latch gives added assurance of operation.

Two types of drop supervision are available. The double drop type provides non-ring-through supervision in which the subscriber ringing off signals only the operator and not the party with whom he was connected. Single drop supervision permits ringing through.



KEYS. The keys used in the Masterbuilt magneto switchboard are strong and simple in construction, designed to withstand years of hard service. The contact springs are of nickel silver, long, heavy, evenly shaped and accurately tempered. Contacts are of precious metal to insure positive, low-resistance circuits. Springs are rigidly mounted in a heavy "T" shaped brass frame, protecting the key against misalignment or damage.

Lamp Supervision



On lamp supervision switchboards a lamp immediately lights, when the subscriber "rings off," and continues to glow until the operator takes down the connection. In lamp supervision there are no moving parts on the keyshelf; the only maintenance required is the occasional replacement of the lamps.

LINE AND CORD CAPACITY

Cabinet Code No.	DROP SUPERVISION				Cabinet Code No.	LAMP SUPERVISION			
	Maximum Lines	Capacity Cords	Wired for			Maximum Lines	Capacity Cords	Wired for	
50	50	10	50	10	150-EL	150	15	100	15
150-E	150	15	100	15	150-FL	150	15	150	15
150-F	150	15	150	15	200-EL	200	15	100	15
200-E	200	15	100	15	200-FL	200	15	150	15
200-F	200	15	150	15	200-GL	200	15	200	15
200-G	200	15	200	15					

CORD CIRCUITS

DROP SUPERVISION

DR Double Drop—Same as type LR except drop instead of lamp supervision.

DRK Double Drop—Same as type LRK except drop instead of lamp supervision.

D Double Drop—Same as type L except drop instead of lamp supervision.

SR Single Drop—Includes repeating coil and is not non-ringing through.

S Single Drop—Same as type SR less repeating coil.

LAMP SUPERVISION

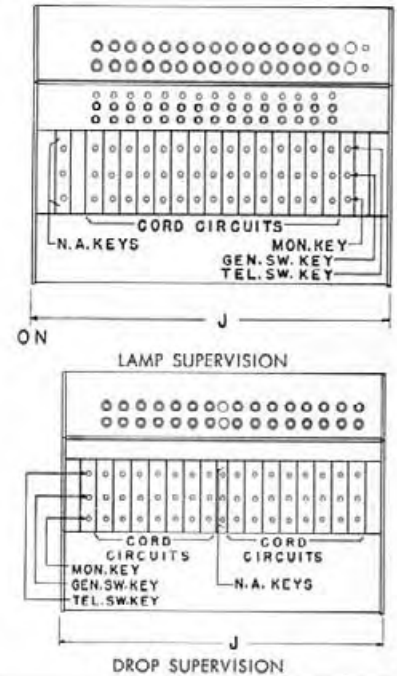
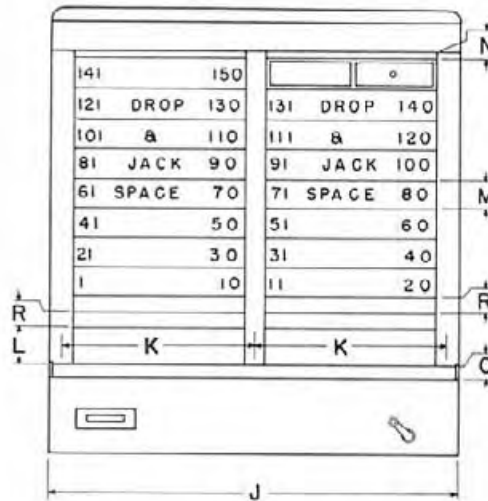
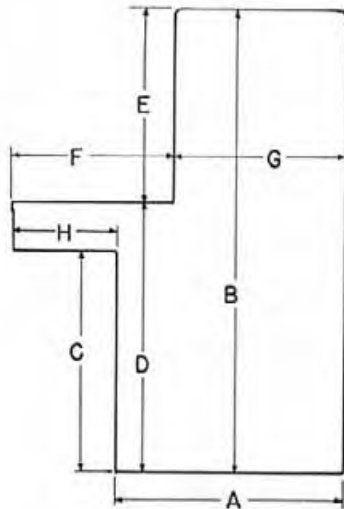
LR Double Lamp—Includes repeating coil and should be used for inter-connecting metallic and grounded lines. Permits either the calling or answering party to signal the operator for a recall without ringing the other party.

LRK Double Lamp—Same as type LR but also equipped with repeating coil cut-out key. Used for through toll connections on metallic toll lines.

L Double Lamp—Same as LR less repeating coil. Used with either all metallic or all grounded lines.

MAGNETO MASTERBUILT SWITCHBOARDS

Cabinet Dimensions



CODE NO.	DIMENSIONS (All dimensions are in inches)																													
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	R															
50	22 $\frac{3}{4}$	46-9/16	24 $\frac{3}{4}$	30	16-9/16	18	16 $\frac{3}{4}$	11 $\frac{7}{8}$	23-15/16	11-5/32	1-29/32	1 $\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	1															
150-E 150-EL 150-F 150-FL	24 $\frac{3}{4}$	50-9/16	24 $\frac{3}{4}$	30	20-9/16	18	18 $\frac{3}{4}$	11 $\frac{7}{8}$	23-15/16	11-5/32	1-29/32	1 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$	1															
200-E 200-EL 200-F 200-FL 200-G 200-GL																26 $\frac{1}{4}$	58-5/16	27 $\frac{3}{4}$	33	25-5/16	18	20 $\frac{1}{4}$	11 $\frac{7}{8}$	23-15/16	11-5/32	1-29/32	1 $\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	1

Equipment

CABINET—Three sizes are available. See table for dimensions.

OPERATOR'S SET—Suspended or breastplate type non-positional transmitter, and featherweight, watchcase type, head band receiver.

LINE DROPS—Code and regular alarm—resistance as specified.

DROPS AND CORDS—May be equipped as desired, up to ultimate capacity.

GENERATOR—5-bar, hand generator, wired to a switching key for switching to power generator.

CABLE—12 feet of line cable furnished, extended from top or bottom of switchboard cabinet and from the right or left hand side.

NIGHT ALARM—With bell and control key. An additional alarm with buzzer and key is furnished when line drops are equipped with armature contacts for indicating code rings on party lines.

WALL TYPE MAGNETO SWITCHBOARDS

The Kellogg wall type magneto switchboard is ideally suited for the installation where only a few telephone lines are to be connected together. These switchboards are small and compact and can be installed in almost any convenient location. Three sizes are available, a 10, a 15, and a 30-line unit.

It is usually best to select a switchboard that has sufficient extra capacity to allow for future growth. All of

these switchboards are completely wired at the factory for the maximum equipment, but, with the exception of the Type 9-B, they can be furnished with just enough equipment to handle present requirements. As more lines are needed it is easy to install the additional equipment. When ordering or requesting information on these switchboards it is important that information on the number of lines the switchboard is required to handle at present be included.

WALL TYPE MAGNETO SWITCHBOARDS

Type 9-B—10 Lines



This 10-line switchboard is the smallest of the Kellogg wall types. Its operation is just as positive and just as dependable as the largest magneto switchboard and is recommended for use where requirements do not exceed 10 lines. It can be used for either grounded or metallic lines.

EQUIPMENT AND CONSTRUCTION. The line wires connect to binding posts on the top of the cabinet and terminate on combined drops and jacks in the face of the switchboard. The binding posts are specially arranged with air gap lightning arresters. Two pairs of connecting cords provide for

two complete conversations at the same time between different lines; and in addition, the operator can also answer calls on other lines. A listening-in jack, associated with each pair of cords, enables the operator to supervise the connection without interference. A drop shutter falls when any connected subscriber rings off or makes a recall.

NIGHT ALARM. A night alarm buzzer and a switch come with this switchboard and can be mounted wherever convenient. They connect to two binding posts located on the side of the cabinet and operate from two dry cell batteries connected in series. When the switch is closed the buzzer operates every time a drop on the board falls.

Code ringing night alarm can be furnished extra. This feature, on party lines using code ringing, permits the attendant to go about other duties and still be able to distinguish between calls for the operator and calls for someone else on the same line.

OPERATOR'S SET. Any standard magneto telephone with hand generator and a ringer can be used for the operator's set, and connects to the switchboard through a cord attached to a switchboard plug. A suitable operator's set can be furnished with the switchboard when specified. Shipping weight is approximately 25 pounds.

Type 48—15 Lines

This switchboard is designed specially for rural switching centers where the operator is not always close to the switchboard and a loud signal is desired. A double gong bell is wired across each line and operates similar to a telephone bell. These bells are located in the face of the switchboard, and through their code rings, the operator can tell at a distance whether a party line subscriber is signalling the operator or a subscriber on the same line.

CAPACITY. This switchboard has a capacity for 15 lines and 4 connecting cord circuits. Each line terminates on a combined drop-jack-bell unit and is arranged for either grounded or metallic systems. The board can be partially equipped for 3, 6, 9, 12, or 15 lines as desired and additional drop-jack-bell units can be installed up to full capacity at any time more lines are needed.

Type 48—15 Lines (Cont'd)



OPERATOR'S SET. An all-bakelite Masterphone handset is furnished for the operator. It contains a capsule type non-positional transmitter unit and a self contained capsule type receiver. This handset is supported on a standard Kellogg hookswitch and is wired to an operator's answering cord and plug.

EQUIPMENT AND CONSTRUCTION. All of the plugs are conveniently located on an oak plug shelf in front of the face panel. A hand generator is mounted inside with the crank extending from the right of the cabinet. Also located inside is a night alarm bell, and

a button type night alarm control key is mounted in the front of the cabinet in line with the cord circuit jacks. This board comes completely wired with the line wires brought out to binding posts on the back to which is connected an 8-foot cable. Shipping weight is approximately 125 pounds.

HOW TO ORDER

When ordering or requesting information on the Type 48 switchboard the following information should be furnished:

1. Number of lines to be equipped at present.
2. Resistance of drop coils.
3. Whether the 8 feet of line cable supplied is sufficient.

Type 30—30 Lines

This switchboard fits most cases where a wall board is required because it can handle up to its full capacity of 30 lines. This allows for sufficient expansion for those systems where less than 30 lines are now used.

CAPACITY. Ten drops and jacks are mounted in a row and space is available for three of these rows or a total of 30 lines. There is capacity



for 6 cord circuits. It can be equipped with as few as 10 drops and jacks and 4 cord circuits, depending upon the number of lines needed and the amount of traffic handled at present. Additional equipment can be added as more lines are required.

OPERATOR'S SET. This switchboard comes equipped with an all-bakelite Masterphone handset, containing capsule type, non-positional transmitter and receiver units, supported by a hookswitch mounted on the cabinet.

HAND GENERATOR. A heavy duty hand generator is located inside the cabinet with the generator crank extending from the right side. If power ringing is to be used a generator switching key can be furnished to switch from the power ringing machine to the hand generator in an emergency.

WALL TYPE MAGNETO SWITCHBOARDS

Type 30—30 Lines (Cont'd)

CORD CIRCUITS. The cord circuits are of the single supervision type, equipped with a "clear out" drop and combined ringing and listening key. The supervisory drops and keys are located on the face of the board. The first pair of cords may be equipped with a repeating coil for connections between metallic and grounded lines.

NIGHT ALARM. The night alarm bell is mounted inside the cabinet and is furnished with a control key to turn it on or off. The bell will ring as long as the drop signal is down.

If desired any strip of line drops can be equipped with a code alarm. This circuit has a buzzer and control key and is entirely separate from the night alarm. The code operates in unison with the ring from the subscriber's telephone so the operator can distinguish between a station-to-station call on any one line or a call for the operator.

This switchboard is designed for use with either metallic or grounded lines. Shipping weight is 65 pounds.

HOW TO ORDER

When ordering or requesting information on the No. 30 switchboard the following information should be furnished:

1. Number of lines to be equipped at present.
2. Number to be equipped with code alarm.
3. Number of cord circuits to be equipped at present: should the first pair be equipped with repeating coil?
4. Should the 8-foot line cable which comes with the switchboard extend from the top or the bottom of the cabinet? Whether the 8 feet of line cable furnished is a sufficient amount.

MASTERBUILT JUNIOR SWITCHBOARDS

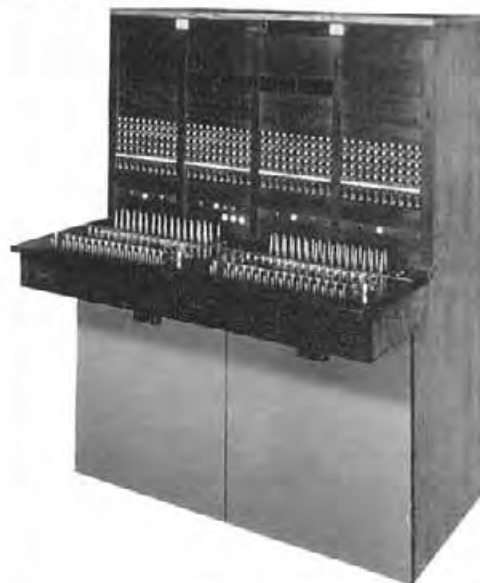


SINGLE POSITION

The Masterbuilt Junior switchboard is of the non-multiple type, equipped with universal cord and line circuits designed to provide either common battery or magneto service or a combination of the two. These switchboards are available in single position units up to 200 lines and in two position units with capacities up to 400 lines.

The Masterbuilt Junior is adapted to the installation where the anticipated growth will not require a multiple type switchboard. It provides modern manual service and the initial cost is only slightly more than for magneto equipment. Both magneto and common battery subscribers may be served with one switchboard and as subscribers are changed from magneto to common battery service the transfer is made by switching only two wires on the line relay.

The universal line and cord circuits of these switchboards permit both magneto and common battery subscriber service without special equipment. This feature makes it possible to convert subscriber service from magneto to common battery on a one-line-at-a-time basis, thus avoiding large purchases of telephone instruments at one time.



TWO POSITION

Each Masterbuilt Junior position has a capacity of 200 local lines, either magneto or common battery, and 40 drop signal or 30 lamp signal magneto rural or toll lines, 15 universal cord circuits with either manual or machine ringing and any type of party line service. The sections are complete individual units. Two sections may be placed together which provides double the capacity of one section. This also may be accomplished by using a two-position cabinet switchboard.

The cord circuits may be equipped with either manual or machine ringing and with any type of party line service desired. Pilot lamps, fuse alarm, cord and wire chief's tests, generator switching key, operator's telephone switching key, and night alarm key are all standard equipment. Code alarm and hand generator will be furnished when specified.

Operating Features

COMMON BATTERY OPERATION. Lamp lights when subscriber removes telephone from hookswitch.

MAGNETO OPERATION. Hand generator at subscriber's telephone provides means of signalling operator.

MASTERBUILT JUNIOR SWITCHBOARDS

Operating Features (Cont'd)

FULL UNIVERSAL LINE CIRCUITS. These circuits handle all types of local lines, magneto or common battery. To convert from local battery to common battery change just two connections on the line relay. No additional switchboard wiring or equipment is required to change to common battery.

RURAL OR TOLL LINE CIRCUITS. These are magneto, with either drop or lamp signal.

FULL UNIVERSAL CORD CIRCUITS. Adapt instantly to the line in which the plug is inserted, regardless of whether it is common battery or magneto. Nine different circuits are available to meet specific operating conditions.

PILOT CIRCUITS. Line pilots and supervisory pilots are provided for both common battery and magneto lines.

PARTY LINE RINGING. Code, two-party divided, or five-party harmonic ringing may be furnished as specified.

MANUAL RINGING OR MACHINE RINGING. Machine ringing is recommended for common battery lines because of great saving of operator's time. Revertive ringing tone is recommended with machine ringing only. The switchboard may be wired for machine ringing and the actual equipment added later to meet future needs. Single party, two-party divided, or five frequency harmonic ringing may be furnished as desired.

REVERTIVE RINGING TONE. Revertive ringing tone is audible to the calling subscriber when the called subscriber is being rung on a common battery line. Available when machine ringing is specified.

POSITIVE NIGHT ALARM. Controlled by a night alarm key.

CODE ALARM. Repeats code rings on rural or toll lines. It is used when the operator leaves the board. When code calls are made the operator does not need to answer. Subsequent calls will not be prevented from coming through. (This feature is optional.)

FUSE ALARM. The fuse alarm sounds whenever a switchboard circuit fuse "blows."

LINE JACKS. Masterbuilt Junior switchboards have only ten jacks per strip. This permits the operator to handle the plugs easily and efficiently. Congestion is eliminated, the operator's view is not obstructed and wear on cords is lessened.

POSITIVE LAMP SUPERVISION. Individual supervisory lamps with pilots to attract the operator's attention insure prompt recalls. On common battery connections supervisory signals automatically appear when the receiver is placed on the hook. On magneto connections it is necessary for the subscriber to ring off after placing the receiver on the hook.

REPEATING COILS. Repeating coils are necessary to provide the best universal cord circuits and are recommended under all conditions.

CAPACITY. The ultimate capacity per position is 200 local lines and 40 magneto lines. Two-position switchboards have an ultimate capacity of 400 non-multiple local lines and 80 magneto lines.

Construction Features

FRAMEWORK. The framework of the Junior Masterbuilt is of rigid, all-steel construction. Rivets and spot-welding fasten each piece firmly in place.

FACE EQUIPMENT. The face equipment of the Junior Masterbuilt has been arranged for simplicity and ease of operation. The black bakelite background prevents fatiguing glare. Jack thimbles are of bright nickel for visibility. Plugs have red or black fibre sleeves for quick identification and are positioned and spaced for maximum convenience. Cam keys have colored handles—miscellaneous keys are red and white and contrast with black mountings.

Each plug space in the Masterbuilt Junior switchboard has a plug well bushing to take up plug seat wear and prevent the wearing of holes around the plug seats. These bushings are replaceable.

SHELVES AND PANELS. The keyshelf and face equipment are made of black bakelite. This material is used because of its permanent lustric and its unusual wearing qualities. It contrasts with the equipment and sets off the cords, plugs, keys, jacks, and lamps. The keyshelf is hinged with a full length piano hinge and can be raised to provide easy access to the key equipment.

SWINGING GATE. All repeating coils, condensers, relays, etc., are mounted on the swinging gate of the Masterbuilt Junior. A maple panel which mounts night alarm equipment, terminals for ringing current, battery supply, fuses, and telephone switching circuits is located at the back of the switchboard. This panel is conveniently located for easy access. Swinging the gate open exposes the line equipment, cords, line, trunk terminal blocks, and both sides of gate for inspection and cleaning.

CABINET. The cabinet of the Masterbuilt Junior switchboard is made of medium golden oak side panels and top. The cabinet has been modernized with old style trim and overlapping sides eliminated to present a smooth beveled top and flush sides. The kickboard is completely covered with a solid color battleship linoleum panel.



MASTERBUILT JUNIOR SWITCHBOARDS

How to Order

In ordering or requesting information on the Masterbuilt Junior the following information should be included:

1. Number of universal lines to be equipped. Any number of these universal lines may be wired for common battery operation as specified.
2. Number of rural lines to be equipped and whether they are to be equipped with drop and jack or lamp signals.

3. Number of cord circuits to be equipped. State whether manual or machine ringing is to be furnished and type of party line service. If ringing machine is to be furnished specify type.

4. If power equipment is to be furnished specify voltage and frequency of commercial current available.

5. Specify length of cable runs from switchboard to main distributing frame.

Equipment

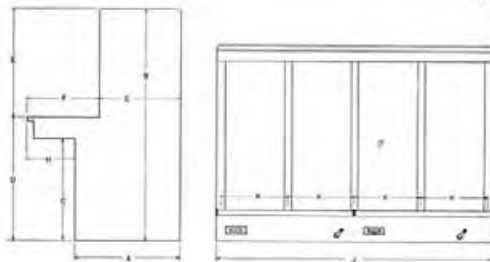
OPERATOR'S SET. Suspended or breastplate type operator's sets are available.

CABLE. Cable to the switchboard is terminated on terminal blocks provided at the back of the switchboard. Cable must be ordered separately.

GENERATOR. Switchboard may be furnished with or without 5-bar hand generator.

BLUE PRINTS. Two complete sets of blue prints covering all circuits used in the Masterbuilt Junior are furnished with each installation.

Cabinet Dimensions



The side view of a Masterbuilt Junior Switchboard is shown at the left. On the right is the front view of the Masterbuilt Junior face plate. The drawing shown is of the two position board.

All dimensions are in inches.

A	B	C	D	E
26 1/4	58-5/16	27 3/4	30	25-5/16
F	G	H	J	K
18	20 1/4	11 1/8	*23-15/16	11-5/32
			**47	

*One position **Two position

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)



Multiple-type Masterbuilt Switchboards are available in sizes to meet requirements of any exchange of from 300 lines to thousands of lines. They are soundly engineered, built by skilled craftsmen and made of the highest quality material throughout.

The Masterbuilt Switchboard is especially designed to include operating features which will provide the basic elements of good telephone service desired by subscribers. These features include 1) a quick answer; 2) a fast connection; 3) a satisfactory conversation; 4) instantaneous disconnect; and 5) a prompt recall.

Masterbuilt switchboards do not demand large investment in

surplus idle equipment. In planning for future needs, either small or large, Masterbuilt users can be sure that their switchboards will have the flexibility to meet those needs economically and efficiently.

The positional equipment of any section or operator's position in a Masterbuilt switchboard may be removed and reinstalled where needed. All of the operator's equipment and cord equipment is installed in the keyshelf and relay gate in one demountable unit. This feature enables any Masterbuilt position, whether local, toll, or universal to be converted over night.

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)

A steel framework is the foundation of every Masterbuilt switchboard. This framework is one fabricated unit, complete and interlocking from end to end. Framework for the Masterbuilt switchboard is shipped separately from the electrical equipment to take advantage of lower freight rates. In assembling the framework on the job bolts and machine screws are used, no riveting or welding is required.

Service Features of Masterbuilt Switchboards

MULTIPLE LINE LAMP CALL DISTRIBUTION

Multiple line lamp call distribution consists of the association of a line lamp with each multiple appearance on switchboards up to 1600 lines and as many appearances as may be necessary on larger installations. In this way every call is made available to every operator so it is unnecessary for the subscriber to wait on one or two particular operators to answer his signal. Switchboard operation is placed on a competitive basis between operators and their performance may be graded in terms of actual calls handled. This feature not only tends to shorten answering time, but it materially reduces traffic expense. Multiple line lamp makes each operator's position a complete unit in itself.

KEYLESS LISTENING

Keyless listening automatically connects the operator to the calling party upon the insertion of the answering cord, without the necessity of operating manual listening key. This feature saves time for the operator who is spared the manual work of key operation, and for the subscriber, whose call is answered more promptly.

After the operator has answered a call, she can only free her telephone circuit of that call by inserting the calling plug and starting the machine ringing. Therefore it is impossible for her to accidentally abandon a calling subscriber without completing the desired connection.

This feature also prevents "overlapping" which consists of an operator inserting two or more answering plugs at one time and answering the call on the second plug as soon as she completes the first connection. This abuse results in delaying the second call unnecessarily when it might have been completed by an idle operator.

DARK KEYSHELF

Dark keyshelf is that feature which consists of all keyshelf supervisory lamps remaining unlighted after the ringing has been started and until one or the other of the parties hangs up his receiver. The answering supervisory lamp is lighted only when the calling party desires to disconnect or recall. The calling supervisory lamp is lighted when the calling plug is first inserted and serves as a guard lamp until the automatic ringing has been started. As soon as the ringing is started, the calling supervisory lamp is extinguished and does not light again until the called subscriber restores his receiver to the switchhook, or, if the called subscriber fails to answer, the calling subscriber abandons the call. With this method of supervision any lighted supervisory lamp means that the dark lamp of the cord pair needs attention. There are no flashing signals to irritate the operator nor is perfect supervision dependent upon the operator's understanding the differentiation between the full or partial illumination of the lamps.

Installation of Masterbuilt switchboards is made easy by the "knock-down" method of shipment which means smaller parcels, easier and cheaper handling, and no hoists or special openings in central office telephone buildings.

The positional units are factory wired. The cord equipment is completely wired, assembled, and tested at the factory. Assembling and wiring relay gates on the job is eliminated.

NON-INTERFERENCE

Non-interference is that feature which prevents two operators from answering the same call. This feature is specially recommended for large exchanges to prevent the confusion arising from more than one operator trying to handle any one call.

AUTOMATIC ANSWERED-CALL PEG COUNT

Automatic answered-call peg count automatically registers every call the operator answers. This provides the chief operator or supervisor with an accurate measure of the traffic handled by hours, days, or months. It furnishes the most satisfactory information from which schedules and payrolls may be computed. As mentioned above, it forms an accurate rating for operative performance.

SECRET SERVICE

Secret service is that feature, associated with automatic listening, which prevents the operators from listening on a completed connection. As soon as the calling cord is inserted and the machine ringing started, the operator is automatically excluded from the circuit. Machine ringing and dark keyshelf definitely take care of all supervision, and the operator has no further duty except to take down the cords when supervisory lights appear.

AUDIBLE MULTIPLE BUSY TEST

Audible multiple busy test provides an audible indication to the operator that the line to which she wishes to complete a connection is busy. This test consists of a slight click in the operator's receiver when the tip of the calling plug touches the thimble of a busy jack. With non-interference features, however, the operator, as well as the calling party, is automatically excluded from the busy line even though the operator may actually insert the calling plug.

MACHINE RINGING

Machine ringing provides an intermittent, automatic ringing of the called subscriber's bell. This ringing continues until the called subscriber answers or the calling party abandons the call and hangs up his receiver. If the switchboard is arranged for individual lines only, the automatic ringing may be keyless, so that it is only necessary for the operator to insert the calling plug into the line of the party called for, whereupon the ringing circuit starts immediately. However, with party line systems it is necessary for the operator to start the ringing, after the calling plug has been inserted, by depressing the ringing button which selects the code, or frequency, to be rung and automatically sets the machine ringing mechanism in motion.

Machine ringing will reduce the cord holding time in any exchange now equipped with manual ringing. The reduction in cord holding time means fewer cords and fewer operator positions are necessary. Reducing the holding time on the calling and called subscribers circuits materially reduces the number of busy reports and unavoidable second calls.

MASTERBUILT SWITCHBOARDS (MULTIPLE TYPE)**Service Features of Masterbuilt Switchboards (Cont'd)****REVERTIVE RINGING TONE**

Revertive ringing tone is that feature which provides to the calling party a tone each time the bell of the called party is rung. This tone indicates to the calling party that the operator has performed every possible function in connection with the call and the desired conversation is then dependent only on the answering of the telephone by the party called. This feature entirely does away with reports that the operator refuses to ring, and relieves the operator of all necessity for re-ringing on established connections.

INSTANTANEOUS DISCONNECT

Instantaneous disconnect entirely disassociates the cord circuit from the subscriber's line circuit the instant he restores his receiver to the switchhook. This connection applied not only to the talking conductors of the cord but also to the busy test so that after the completion of a call or the abandonment of an uncompleted call the line of either party or both parties is immediately available for either an outgoing or an incoming call.

This feature materially reduces the cord holding time since the cord may immediately be used for another connection. The disconnect indication on the supervisory lamps is complete and unmistakable; however, in the event that the operator has other idle cords, it is not necessary for her to take down a disconnected cord pair immediately because the cords, if left in the subscribers line jack, can in no way interfere with the subscribers service. This feature results in a saving of operators time and subsequent calls. The number of busy tests is reduced by making both subscribers lines immediately available for incoming service.

Instantaneous disconnect may be furnished on both cords or on the answering cord only. Traffic studies show that the majority of recalls come from the party who originates the first call. For

this reason some traffic authorities believe that disconnect on the answering cord is sufficient. However, in some cases it has been proved that the savings in the number of busy tests and consequent second calls was more than enough to justify the installation of instantaneous disconnect on the calling cord as well.

LINE LAMP RECALL

Line lamp recall is that feature associated with instantaneous disconnect which permits a subscriber's recall to appear in the line lamp instead of on the cord supervisory lamp as would be the case without instantaneous disconnect in the cord circuits. The recall appearing in the line lamps is just as available to every operator as was the original call, and the subscriber receives the same prompt answer on all classes of calls.

BUSY LINE LOCK-OUT

Busy line lock-out positively prevents a second call from being completed to a busy line so long as ringing or a conversation is in progress. With this feature, the operator gets the audible multiple busy test on a busy line, but even though she may plug into the jack, the cord is half open and the operator cannot start the machine ringing nor release her telephone set from the calling party until she withdraws the incorrectly inserted plug and reports the line as "busy." Under this condition the calling supervisory lamp remains burning as a visible indication of her error until rectified.

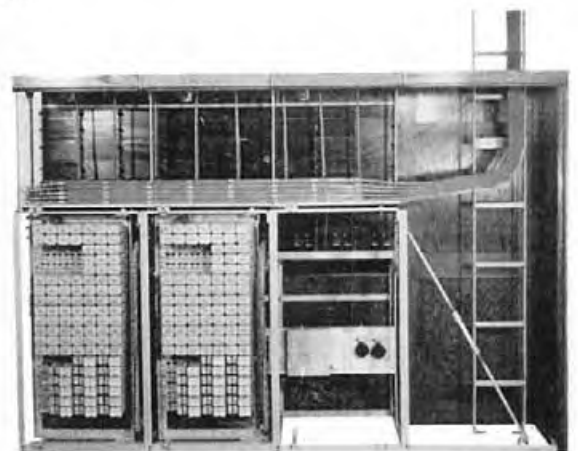
This feature may be considered as the last step in perfecting secret service. "Busy Line Lock-Out" prevents a third party from being connected into an established connection and prevents a second operator from listening in on any multiple appearance of a busy line. This feature also prevents careless operators from ringing on established connections in case a busy test is disregarded.

Construction Features**RIGID STEEL FRAME**

The complete switchboard is built upon the spot where it is to stand. The installer handles one piece of framework at a time, interlocking and bolting together the members. No riveting is necessary.

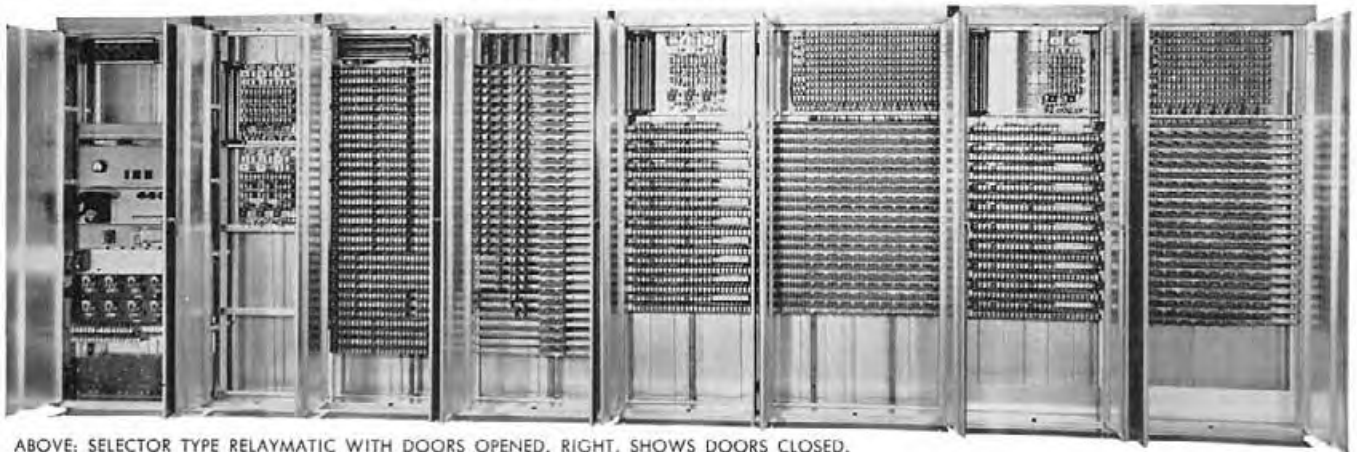
**CORD EQUIPMENT**

The cord equipment shipped completely, wired, assembled, and tested. The only work for the installer is to slide the key shelf, connecting rack and cord rack into place, hang the gate, connect the power and hang and connect the cords to the operator's jack.

**CONSTRUCTION AND ASSEMBLY**

The swinging gate carries cord circuit relays, condensers, repeaters and coils. Merely swing open the gate and the line equipment, cords, and both sides of the gate are accessible. Nothing obstructs the wiring.

RELAYMATIC SWITCHBOARDS



ABOVE: SELECTOR TYPE RELAYMATIC WITH DOORS OPENED. RIGHT, SHOWS DOORS CLOSED.

The Kellogg Relaymatic switchboard is an automatic switching unit providing attended or unattended service for central offices, private branch exchanges, and inter-communication systems. It provides all the operational features of manual operation, utilizing line circuits, connecting circuits, and auxiliary circuits, without operator supervision.

All switching functions of the Relaymatic are performed by relays—no cams, shafts, plungers, or other mechanical moving parts are required. No complicated mechanical maintenance is necessary with the Relaymatic.

The relays of the Relaymatic are of the highest quality. Precious metal is used on all spring contacts, assuring quiet operation and increased dialing range. Twin contacts are used in all Relaymatic relays, providing a broad margin of safety because the extra contact eliminates almost all contact failures.



Operating Features of the Relaymatic

- Local line circuits are all of the metallic type.
- Line adapters are used for grounded lines.
- Any line circuit can be converted into a trunk by the addition of a trunk repeater.
- A station dialing the trunk number is automatically connected to an idle trunk.
- Incoming trunk or long-distance calls get first use of links.
- Trunks from toll board are arranged for operator verification.
- Calls are assigned to links in rotation. This distributes the load equally among all links.
- Links are automatically freed from any line which may be in trouble due to incorrect dialing, receiver off the hook, shorts, grounds, wet cables, etc.
- All local calls are dialed in the same manner, using the directory number, including revertive calls on the same line.
- Links on revertive calls are instantly released when the called party answers.
- A dial tone tells the subscriber when to begin dialing.
- Dial start supervision is given toll operation.
- Busy tone indicates that a called line is in use.
- Flash busy of 60 I.P.M. for line busy and of 120 I.P.M. for all paths busy is provided.
- Revertive ringing tone is heard by the calling subscriber at each ringing interval.
- A time cut-off feature, if desired, limits conversations to a predetermined talking period.
- Maximum transmission is assured.
- Adequate transmitter battery is supplied to the subscriber's line on all types of connections.
- The calling subscriber releases all equipment instantly by restoring his receiver on "don't answer" calls.
- All connections are secret and cannot be intruded upon by subscribers on other lines.
- Each answered call is automatically counted.
- All connections are made through relay spring contacts.
- All relays are of the angle armature type having springs equipped with contacts of precious metal.
- Relay armatures and spring contacts are at the front of the relay for easy cleaning and inspection.
- Relay springs are of the sufficient length and proper gauge to give ample tension and cleaning action without causing unnecessary wear or pitting.
- Precious metal is used exclusively on all relay contacts. No base metal contacts or wipers are used.
- Circuits and relays are designed throughout to give positive operation with minimum current consumption.

Classes of Service

The line circuits of the Relaymatic may be assigned for common battery local and rural, trunk, or pay station service. Local lines provide single-party or multi-party service up to 10-party selective or 20-party semi-selective ringing per line. Adapters are available for grounded rural lines.

Wiring

The circuits of the Relaymatic units are all wired, connected, and tested at the factory. All lines are wired to terminal strips at the top of the bays to facilitate cabling to the main distributing frame and protection equipment.

RELAYMATIC SWITCHBOARDS

Trunks to Manual Exchanges

The Relaymatic may be arranged to operate with any type of trunk line. The trunk lines may be provided singly or in groups, with not more than 10 trunks equipped in each group of broadspan or groups of more than 10 in selector type. When more than one trunk is equipped in a group they are arranged for progressive allotment so an idle trunk is automatically selected when the number assigned to the group is dialed. A busy signal indicates that all trunks are busy.

Trunk lines, as required, for connecting Broadspan type switchboards to other exchanges may be obtained by adding trunk repeaters to certain local lines. The repeater provides supervision and signalling features required for trunk operation and the type of repeater depends upon the kind of outside plant to be used.

Main Distributing Frame

Any standard main distributing frame may be used in connection with a Relaymatic. Protectors having carbons and heat coils are usually recommended. Wall type frames can be used

in small exchange buildings where it is desired to conserve floor space.

Auxiliary Equipment

A machine type automatic ringing interrupter is used to provide clear and distinct codes and tones. The same type interrupter with different interruptions is used on harmonic ringing. This machine also is arranged for timing calls and furnishes the out-of-order, dial, and busy tones.

The dial tone generator produces a pleasing tone without radio interference.

The busy back tone is obtained from the tone generator with interruptions provided by the interrupter.

The ringing current is derived from standard pole changer equipment or from another suitable ringing machine.

The tone generators, timer, and ringing equipment may or may not operate only while there is a call in progress in the exchange.

Revertive ringing tone is taken from the ringing supply through a suitable filter.

RELAYMATIC SWITCHBOARD EQUIPMENT

The Kellogg Relaymatic switchboard is available in two types. The "Broadspan" type switchboard has a maximum line capacity of 200 lines including trunks and uses only finder and connector circuits. The "Selector" type switchboard is available in any size up to many thousand lines and uses selector circuits in addition to finder and connector circuits.

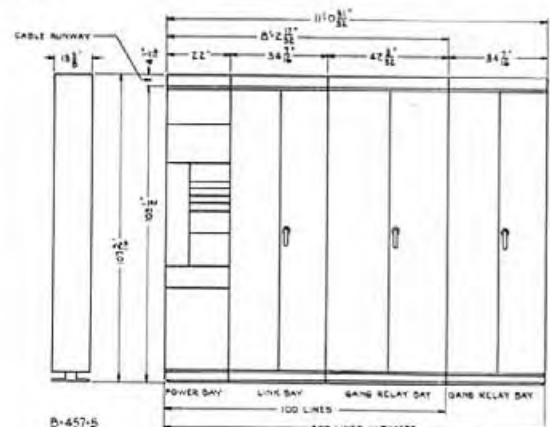
Broadspan Type Relaymatic



30-LINE, 6 LINK RELAYMATIC WITH POWER BAY, SEPARATE FROM BROADSPAN.



BROADSPAN RELAYMATIC FRAMEWORK FOR 100-LINE, 12 LINKS, 6 TRUNKS AND POWER BAY



DRAWING SHOWING DIMENSIONS OF BROADSPAN RELAYMATIC, 200 LINES CAPACITY—17 LINKS ULTIMATE.

Standard Broadspan Relaymatic has a 200-line ultimate capacity. Any number of lines less than the maximum (in groups of 10) may be equipped, with provision made for expansion as future growth demands.

30-LINE, 6 LINK RELAYMATIC—WITH POWER BAY

This switchboard has an ultimate capacity of 30 lines and 6 links. Any line may be converted into a trunk.

The line and connecting equipment is mounted in one bay, occupying a space 34-7/16 inches wide, 13 inches deep, and 81 inches high. This Relaymatic may be equipped with any number of lines in groups of 10 and links up to the ultimate capacity. The power equipment may be located in a 22-inch cabinet attached to the relay bay or in a separate floor or wall rack if desired.

Exchanges requiring more than 200 lines are served by Relaymatic switchboards having relay type selectors to complete connections between the "hundreds" and "thousands" groups. All apparatus used in these larger switchboards is of Kellogg standard design, and, with the exception of the selectors, is fundamentally the same as that used in Relaymatics of lesser capacity. With selectors, these larger Relaymatic switchboards are available for any size installation. See next page.

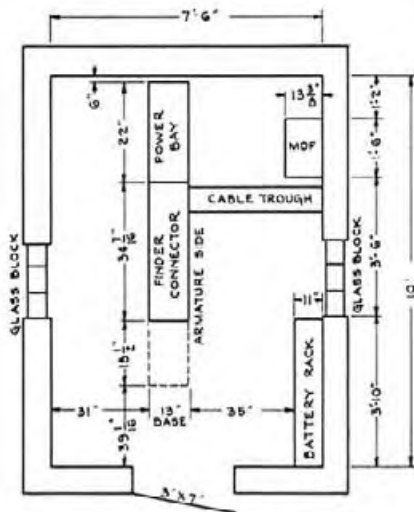
200-LINE CAPACITY

The ultimate capacity of this Relaymatic is 200 lines with 12, 15, or 17 links as desired. It may be equipped with as many lines and links as are immediately required. Any line in the 7, 8, 9, and 0 group of the first hundred group may be converted into trunks as needed.

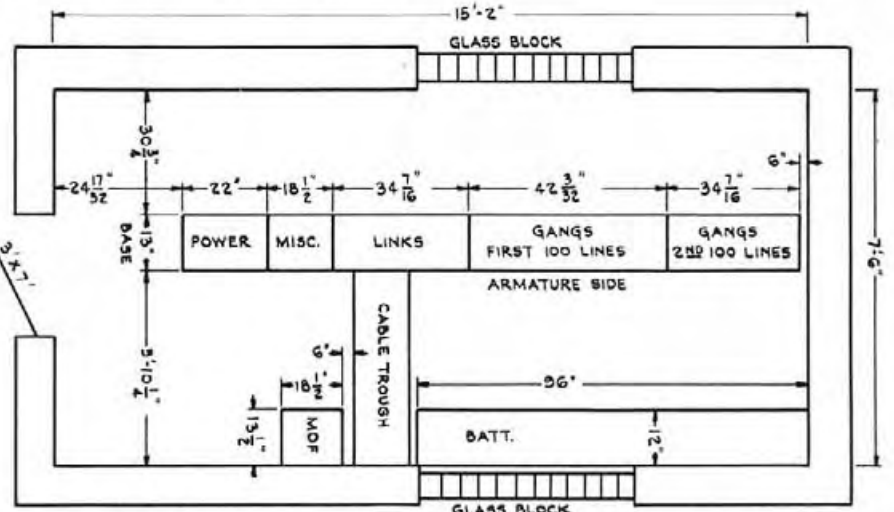
The dimensions of the 200-line capacity Relaymatic depend upon the arrangement of the equipment specified, the number of links required, and other engineering factors. A variety of cabinet sizes is available.

RELAYMATIC SWITCHBOARDS

Typical Broadspan System Floor Plans

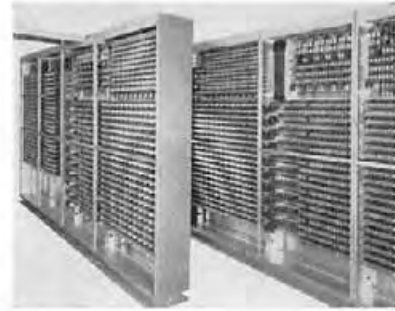
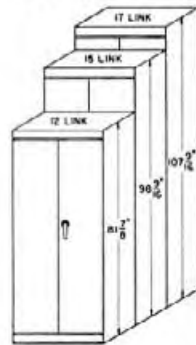
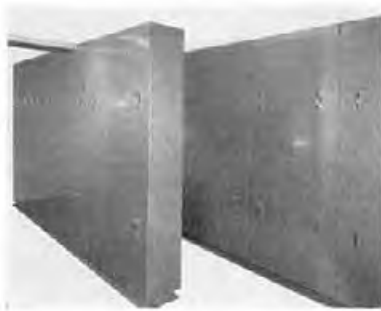


30-LINE, 6 LINKS, 3 TRUNKS ULTIMATE . . . WITH SPACE FOR ADDITIONAL BAY FOR CX SETS, ETC.



200-LINE ULTIMATE . . . CODE RINGING. 6 TRUNKS WITH ADDITIONAL MISCELLANEOUS BAY.

Selector Type Relaymatic



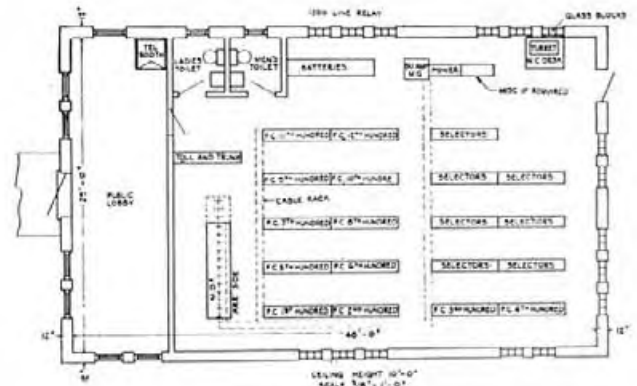
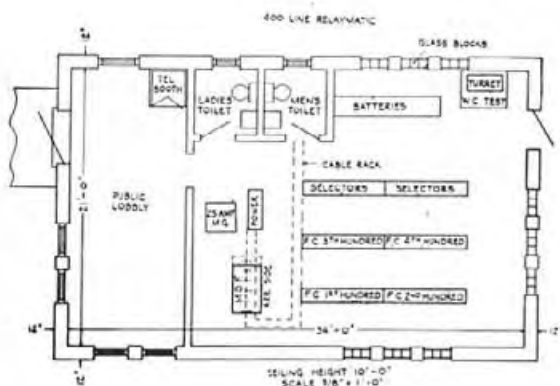
The number of lines and the number of trunks to toll and other exchanges determine the use of the selector type Relaymatic. Illustrated below are the three sizes of frames employed to give the required trunking capacities.

The 81-inch line bay has a capacity of 100 line equipments, 12 finders, and 12 connectors. The selector bay will accommodate 30 selectors. These bays have 2 lift-out type doors, front and rear. The 98-inch line bay has a capacity of 100 line equip-

ments, 15 finders, and 15 connectors. The selector bay has a capacity of 36 selectors.

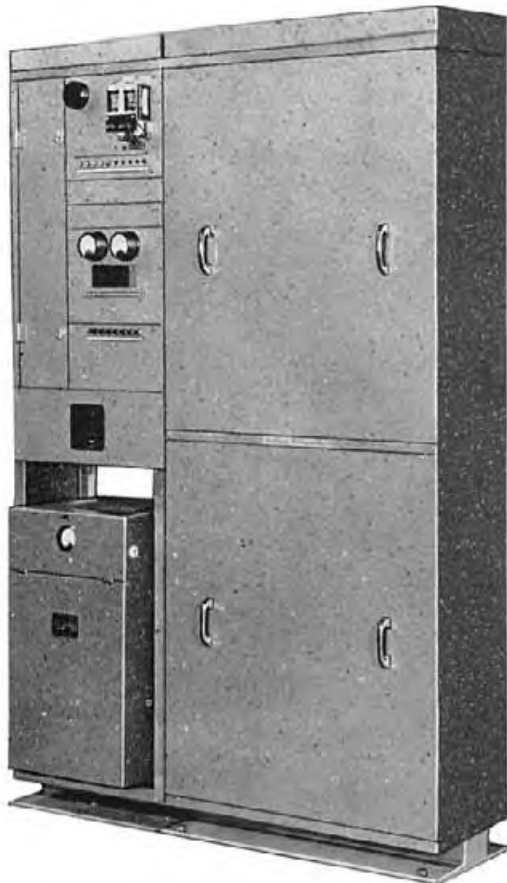
The 108-inch line bay has a capacity of 100 line equipments, 17 finders, and 17 connectors. The selector bay has a capacity of 40 selectors.

The 98 and 108-inch frames have two side-swinging doors, front and rear.



RELAYMATIC PABX

PRIVATE AUTOMATIC BRANCH EXCHANGE SWITCHBOARD —WITH TRUNKS



The Kellogg Relaymatic PABX can be adapted to provide any type of PABX or inter-communication service, or any combination of the two.

Standard Relaymatic PABX equipment is arranged to provide inter-connection between the PABX stations with unrestricted direct access to the main exchange trunks. If desired, certain predetermined stations, in specific ten-line groups, can be restricted from using the trunk circuits.

Auxiliary features available with these switchboards include code call and signal equipment, watchman's recording and supervising circuits, and various type of conference circuits.

Incoming trunk calls may be supervised at either a turret or floor type switchboard, depending upon the size of the installation. Trunk calls from restricted stations may be routed through this switchboard for interception. Standard attendant stations include switching arrangements for connecting predetermined stations for direct service to the main exchange when the attendant is off duty.

NON-ATTENDANT TYPE

Where an attendant is not desired to distribute incoming trunk calls or to supervise outgoing calls, Relaymatic PABX equipment with an annunciator unit is available to provide intercommunication service and trunking to either a manual or a dial main exchange. An annunciator unit is used to signal all incoming calls. Such calls can be answered from any station and can be transferred to any other station. All stations have access to all trunks and through supervision is provided to the main exchange.

MASTERBUILT PBX SWITCHBOARDS



Kellogg Masterbuilt PBX switchboards are available in two types, each offering the maximum in dependability and flexibility of operation. The "K" type switchboard is designed for universal service and is adaptable for use in many different types of installation. The "J" type switchboard is designed to meet special demands of given installations, providing special service features and types of operation.

"K" Type PBX Switchboard

The type "K" is an all-purpose PBX switchboard. It furnishes whatever services are required by the subscriber and is so designed that it can connect to any type of central office equipment. It employs the same cord and trunk circuits whether for manual or dial operation. When connected to a common battery manual or dial central office this PBX provides in a jack-ended trunk all the advantages of through battery feed.

The supervision of this switchboard is under control of the PBX telephone, not the PBX operator, and all trunks, cords, and subscriber's lines are immediately available for other use as soon as each party hangs up, eliminating "false busies" and false ringing.

When connected to a dial exchange the PBX provides both through and attendant dialing. The central office connectors and the PBX trunks are released as soon as the calling PBX subscriber hangs up. The toll operator also gets standard supervision on connections to PBX stations.

MASTERBUILT PBX SWITCHBOARDS

Operating Features of "K" Type PBX Switchboards Operates with Common Battery Manual or Dial or Magneto Exchanges

Jack-ended trunk circuits and cord circuits will operate with either a manual or dial main exchange. Two relays and a dial are added for dial operation, no wiring changes are required. A simple line adapter is required for each trunk in the central office when the PBX is connected to a magneto main exchange.

THROUGH BATTERY FEED ON JACK-ENDED TRUNKS. This feature insures excellent transmission on both toll and local connections.

THROUGH TRUNK SUPERVISION. The toll operator receives a disconnect when the PBX station hangs up, insuring correct timing on toll calls. PBX stations may also place sequence calls to main exchange without the assistance of the PBX operator. Local main exchange operator receives double-lamp disconnect signals on connections from completed trunks. False rings and extra waiting are eliminated.

TRUNK RE-RING. As soon as the PBX station hangs up, the trunk circuit is available for incoming calls, whether or not the connection at the PBX has been removed.

THROUGH OR ATTENDANT DIALING. When the PBX is served by a dial main exchange PBX stations equipped with dial can dial their own numbers without assistance of the PBX attendant.

TRUNK SEIZURE BUSY SIGNAL. When the trunk at the main exchange (C.B. manual or dial) is seized it becomes "busy" at the PBX immediately, even though the line lamp is not yet lighted.

BALANCED BATTERY FEED. Connections between any two PBX stations are made with individual high impedance, bridged type battery feed relays for each line, permitting double lamp supervision.

AUTOMATIC TRUNK HOLDING. Trunk calls are held automatically until PBX station answers and hangs up—it is not possible to lose the trunk connection at the main exchange while the attendant is handling the call.

LOW CURRENT CONSUMPTION. All circuits consume the minimum amount of current. A battery cut-off key further prevents current drain when the board is unattended.

POSITIVE SUPERVISION. Positive lamp supervision is provided for all types of connections.

SINGLE NIGHT CONNECTIONS. Regular cord circuits can be connected to night trunk jacks with the "through" key operated—one PBX station may be connected to each PBX trunk for two-way main exchange service while PBX is unattended.

MULTIPLE NIGHT CONNECTIONS. Spider patching cords make it possible to connect up to five stations with each trunk for two-way service to main exchange when PBX is unattended. Battery cut-off key removes possibility of battery drain during this period.

Capacities of Type "K" PBX Switchboards

Code No.	Lines	Line Relays	Trunks	Cords
K-50	50	up to 50	10	10
K-100	100	up to 100	10	15
K-200	200	up to 200	10	15

Each cabinet is wired to full capacity and may be equipped as desired.

Equipment

Each type "K" PBX board is furnished with the following common equipment: one battery cut-off key, one hand generator with switching key, one night alarm and control key, one dial (if required), and one operator's telephone set.

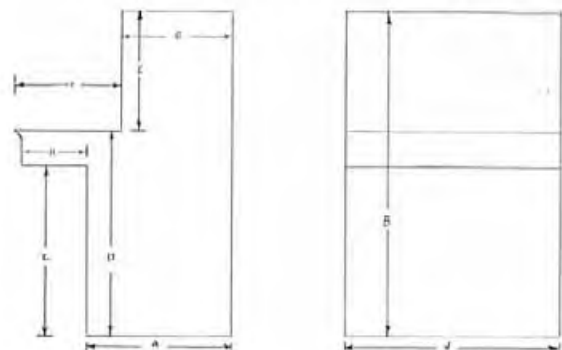
The operator's telephone set may consist of: a suspended transmitter and lightweight headband receiver; a bakelite Master-telephone handset which mounts on the side of the cabinet; or a breastplate with transmitter and lightweight headband receiver.

Cabinet Finishes

The following cabinet finishes are furnished as standard: medium dark oak or birch-walnut (medium).

The following special cabinet finishes are available: birch-mahogany (light); birch-mahogany (dark); oak (light); other special finishes as desired.

Cabinet Dimensions and Weights



All dimensions are in inches

Code	A	B	C	D	E	F	G	H	J
K-50	22 3/4	46-9/16	24 3/4	30	16-9/16	18	16 3/4	11 7/8	23-15/16
1055-1									
K-100	22 3/4	46-9/16	24 3/4	30	16-9/16	18	16 3/4	11 7/8	23-15/16
1055-1									
K-200	26 1/4	58-5/16	27 3/4	33	25-5/16	18	20 1/4	11 7/8	23-15/16

Ordering Information

In ordering the type "K" Masterbuilt PBK the following information should be provided:

Code number of the size switchboard desired, the cabinet finish, the number of lines to be equipped with and without relays.

Whether the board should be equipped with designation strips.

Number of cord circuits.

Number of trunk circuits.

Type of operator's set.

With or without dial and mounting.

Number of patching cords to connect one trunk to local lines (number of local lines).

Lines number from bottom up, left to right across the face of the board. Patching cords can be furnished to connect one trunk to either 2, 3, 4, or 5 PBX lines as desired.

MASTERBUILT PBX SWITCHBOARDS

"J" TYPE PBX Switchboard



The Kellogg "J" type PBX switchboard offers all standard PBX switchboard operating features in addition to providing special trunk and cord circuit arrangements as desired. Any type of trunk circuit, for common battery dial or manual or for magneto service, can be provided.

This switchboard is housed in the same type cabinet and has the same construction features as the "K" type switchboard covered on pages 111 and 112.

Standard Operating Features of the "J" PBX Switchboard

TRUNK RE-RING. When a conversation is completed on a trunk connection another trunk call may come in on the same trunk even though the PBX operator has not removed the plug from the jack of the trunk for the first connection.

BALANCED BATTERY FEED. Connections between any two PBX stations or between a PBX station and a trunk are completed through the balanced windings of "battery feed" relay coils.

LOW CURRENT CONSUMPTION. All circuits are designed to consume a minimum amount of current. A battery cut-off key is provided to eliminate current drain when the switchboard is unattended.

POSITIVE SUPERVISION. On all "local-to-local" or "local-to-trunk" connections positive supervision is provided.

SINGLE NIGHT CONNECTIONS. Single night connections are made by using a "patching cord" with a plug on each end to connect the night jack of the trunk with the line jack of the desired line.

MULTIPLE NIGHT CONNECTIONS. Multiple night connections are obtained by means of "spider" cords with a plug on each of the several ends. One plug is inserted in the trunk night jack and one plug in each line jack of the stations when it is desired

to furnish night service or when the PBX is unattended. It is recommended that the number of stations per trunk be limited to five for this service.

TRUNK SEIZURE BUSY SIGNAL. When the trunk at the main exchange (C.B. manual or dial) is seized it becomes busy at the PBX immediately, even though the line lamp is not yet lighted.



STEEL FRAMEWORK. Welded steel framework forms the foundation of Kellogg Masterbuilt PBX switchboards, rigid and sturdy, this steel structure supports all the weight of the equipment and cabinet woodwork.

The keyshelf provides high visibility for the convenience of the operators. Bakelite is used for keyshelf and face equipment because

of its lustre and permanence and because it sets off the cords, plugs, keys and lamps.

The keyshelf, hinged with a full length piano hinge, can be raised to provide free and easy access to the key equipment.

Capacities of "J" Type PBX Switchboards

Code No.	Lines	Line Relays	Trunks	Cord Circuits
1055-JM	50	50	10	10
1055-JMR	50	50	8	10
1055-JCBR	50	50	10	10
1055-JA	50	50	10	10
1110-JM	100	100	10	15
1110-JMR	100	100	7	15
1110-JCBR	100	100	10	15
1110-JA	100	100	10	15
1210-JM*	200	100	10	15
1210-JMR*	200	100	10	15
1210-JCBR*	200	100	10	15
1210-JA*	200	100	10	15

*Cord circuits can be increased to 17 and trunks to 15 on special order. Trunks on JMR model are limited to 10.

NOTE: The above switchboards are available with four different types of trunks which are indicated by the code number suffix and which are explained below:

JM trunks—for service to magneto exchange.

JMR trunks—for service to magneto exchange with re-ring feature.

JCBR trunks—for service to common battery manual exchange with re-ring feature.

JA trunks—for service to dial exchange with re-ring feature.

MASTERBUILT CORDLESS PBX SWITCHBOARDS



Kellogg Masterbuilt cordless PBX switchboards can be operated in connection with either a common battery manual, dial, or magneto main exchange, or one or more at the same time, without modification of circuits.

These switchboards are compact and modern in appearance. Cabinets can be furnished as standard in either oak or walnut, or special in any wood or finish.

All equipment in these switchboards is easily accessible. The cabinet can be lifted off as one piece, giving full access to relays, condensers, fuse panel, and connecting rack, mounted on a steel frame chassis which is fastened to the base board. The face panel is hinged at the bottom with a full length piano hinge and can be dropped forward to expose all keys and lamps.

Operating Features of Cordless PBX Switchboards

OPERATES WITH C.B. MANUAL OR DIAL OR MAGNETO EXCHANGES. The trunk and connecting circuits are arranged for operation with all types of main exchanges. (When connected to a magneto main exchange a line adapter is required for each trunk in the central office.)

THROUGH BATTERY FEED ON TRUNKS. The circuits are arranged to provide talking battery to the PBX stations from the main exchange.

THROUGH OR ATTENDANT DIALING. These switchboards provide for through dialing from PBX stations or for attendant dialing for manual telephones when this service is desired.

BALANCED BATTERY FEED. Connections between any two PBX stations are made with a high impedance bridged type battery feed coil permitting lamp supervision.

TRUNK HOLDING. Trunk calls are held with trunk answering keys with the disconnect lamp serving as a holding signal.

LOW CURRENT CONSUMPTION. All circuits are designed to consume a minimum amount of current. A battery cut-off key is provided to conserve current when the switchboard is unattended.

POSITIVE SUPERVISION. Positive supervision is provided for answering, calling, and disconnect supervision.

NIGHT CONNECTIONS. Night connections are made to stations as desired with connecting circuits and battery cut-off key.

THROUGH TRUNK SUPERVISION. The through battery feed trunks provide through supervision to the main exchange from the PBX station, permitting prompt recall or disconnect at the main exchange.

Cordless Switchboard Trunk Circuits

Four types of trunk circuits are available with cordless PBX switchboards.

CXF type. Designed to operate in connection with a common battery, manual type central office with through battery feed on trunk connections.

CX type. Designed to operate in connection with a common battery, manual type central office with local battery feed on trunk connections.

AX type. Designed to operate in connection with a dial or manual type central office with through battery feed on trunk connections.

MX type. Designed to operate in connection with a magneto type central office.

Capacities of Cordless PBX Switchboards

	NO. 1007-CC	Wired	Equipped
Lines (less relays)		12	10
Trunks to Main Exchange (AX type)		3	2
Connecting Circuits		5	5
Cabinet Finish: Oak or Walnut			

	NO. 1007-CCX		
Lines (with relays)		12	12
Trunks to Main Exchange (AX type)		5	5
Connecting Circuits		5	5
Cabinet Finish: Walnut (Oak on special order)			

	NO. 2007-II		
Lines (less relays)		20	15
Trunks to Main Exchange (AX type)		5	3
Connecting Circuits		5	5
Cabinet Finish: Oak or Walnut			

NOTE: Other capacities are available; however, those switchboards listed above are available for more prompt delivery than special switchboards.

Operator's Set

All Kellogg cordless PBX switchboards are supplied with a 1000 series Masterphone with dial or dial blank, as specified, for the operator.

Code No.	CABINET DIMENSIONS AND WEIGHTS			Shipping Weight
	Height	Length	Depth	
1007-CC	12 in.	23 in.	12 in.	120 lbs.
1007-CCX	12 in.	24-13/16 in.	12 in.	135 lbs.
2007-II	12 in.	30 in.	12 in.	140 lbs.

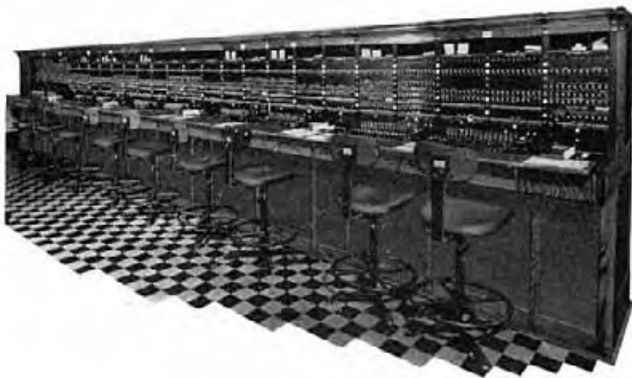


EASY ACCESSIBILITY—All equipment is freely exposed upon dropping the Bakelite faced panel forward. Keys, lamps, and wiring are readily available as are the generator, condenser, induction coils, relays, etc. Roominess, neatness and convenience are paramount features.



CHASSIS CONSTRUCTION—All equipment, such as relays, condensers, fuse panel, connecting rack and buzzer is mounted on a steel frame chassis which is fastened to the base board. Front panel hinged at the bottom. Cabinet lifts off in one piece.

TOLL SWITCHBOARDS



Kellogg toll switchboards are designed to provide the utmost in service and flexibility. They can be arranged for use in alignment with the local switchboard or in a separate line-up, and for use with either manual or dial exchanges.

Either universal-type cord circuits or cord circuits requiring that most of the relays be associated with the line and trunk circuits can be furnished. Any circuit requirement or special arrangements can be provided in these switchboards.

Shown above is a 10 position toll installation of Kellogg equipment. This switchboard employs a universal-type cord circuit. With this circuit less equipment and less floor and rack space is needed in the terminal room. The flexible "positional" units are easy to remove and change to meet varying traffic conditions.

The steel frame of these switchboards comes knocked down. Cord circuit equipment comes in complete positional units—factory assembled, wired and tested. No wiring of relay gates and key shelves is required on the job.

Interchangeable positional units permit easy and fast rearrangement of equipment when traffic conditions change. It is not necessary to interrupt service or disturb the multiple.

SPECIAL PURPOSE SWITCHBOARDS

Kellogg manufactures, in addition to standard telephone equipment, all types of special purpose switchboards, communication systems, and other equipment. Kellogg's more than 50 years experience in building quality equipment and in designing and engineering special equipment is available to produce any equipment desired in the communications and low voltage, low current category.

The same ability to engineer telephone equipment is available to engineer any special purpose equipment that incorporates the same degree of precision manufacture. It is this combination of

precision workmanship and ruggedness that is typical of telephone equipment. Examples of the many variations of Kellogg equipment and their uses in all types of businesses are contained in these pages under the general classification of "special purpose switchboards." The illustrations and descriptions contained here convey some idea as to the broad use of telephone type equipment in all sorts of industrial applications. The applications shown here do not represent the entire scope of Kellogg engineering but are shown for the purpose of indicating how telephone type equipment can be engineered for any special purpose or for any specific application.

Credit Authorization Systems



A—MANUAL SYSTEMS



B—RELAYMATIC SYSTEMS



C—FLUSH TYPE



D—SURFACE TYPE

The specialized equipment shown above is designed to enable business houses to rapidly contact central control files for verification of accounts or for credit authorization.

Manual and relaymatic systems are available. Manual systems (photo A) come in 3 standard sizes, 10, 20 and 30 lines. Sales floor station with perforator is shown at the right. Relaymatic systems, (photo B), are available from 10 lines to any number of lines.

Flush type authorizer's position (photo C) or surface type (photo D) are used with the relaymatic system. The type required is dependent upon the type of filing equipment used.

OPERATION. To obtain a credit authorization with a Relaymatic System the sales clerk dials directly to the proper credit authorizing clerk and identifies the account. After the connection

is made the sales clerk submits the information necessary for authorizing the charge and then places the sales slip in the authorizing perforator which lights a red lamp in the authorizer's turret.

The authorizing clerk checks the customer's file and, if the charge is in order, grants the authorization by pressing a button which actuates the perforator on the sales floor. If the charge is not in order, advises the sales clerk how to proceed with the transaction or refer it to a superior. Ten to thirty seconds are usually required to secure a charge approval.

The Manual System is used where the credit files and charge authorization requests do not exceed the capabilities of a single turret, two authorizers and 30 sales floor lines. Further information available upon request.

SPECIAL PURPOSE SWITCHBOARDS

Watchman's Reporting and Recording Systems



Kellogg engineers and builds equipment to meet the varied needs of many users of reporting systems for police departments, watchmen, etc.

This equipment can be arranged for any type of reporting service required for the installation. A typical system used in a penitentiary provides for reporting into the central office by guards, provides for recording the time and origin of these calls and provides for alarm or indication to the central office if the watchman does not make his rounds as prescribed.

Municipal Service Switchboards

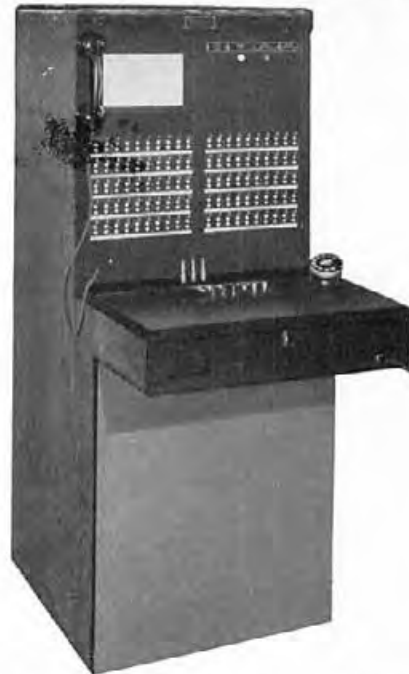


Kellogg switchboards for municipal service installations are available in all types and sizes. In some instances these switchboards require little more than ordinary PBX equipment; in others, many special features are incorporated for services entirely foreign to usual telephone practice. The equipment may vary in size from a 20-line cordless turret, to a board with thousands of lines and many operator's positions.

Municipal Service Switchboards (Cont'd)

The local telephone plant usually offers the logical distribution medium for the police and fire alarm signal system. In many cases the responsibility of furnishing and maintaining even a large network is placed upon the trained personnel of the telephone company. Whether a municipal protection system is part of, or independent of the commercial telephone system the equipment is essentially the same. In engineering the proper facilities for the specific job Kellogg functions in full cooperation with the city engineers.

Emergency Fire Reporting Switchboards



Regular floor type and cordless desk type fire reporting switchboards are specially designed to take care of communications between a large number of outlying stations and an operator. In this respect, fire reporting equipment is similar to watchman's reporting systems.

Standard sizes are 20-line cordless and 100-line floor type switchboards. Other capacities can be furnished wherever needed.

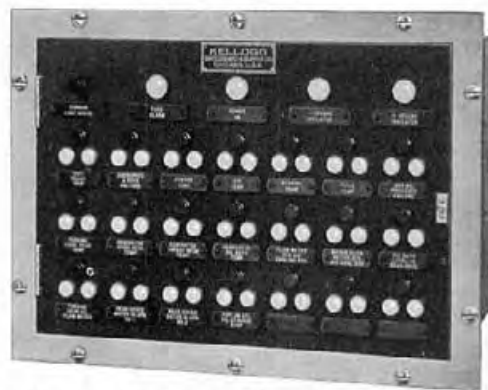
The cordless fire reporting board is equipped with 20 line circuits, a trunk circuit, hand generator, line-out-of-order alarm, and no-voltage alarm. The fire reporting lines terminate on lamp signals and are for communication between station and operator only.

The standard floor type switchboard incorporates many features contained in other commercial Kellogg boards—a swinging relay gate, oak cabinet, bakelite faced lamp and key shelf, etc. The capacity of this standard switchboard is 100 lines, 3 cord circuits, and 2 trunk circuits. It is equipped with an operator's handset, hand generator, night alarm, and power failure lamps.

Fire reporting equipment, in addition to the standard boards mentioned above, is available to meet a wide variety of conditions.

SPECIAL PURPOSE SWITCHBOARDS

Annunciator Units



Annunciator equipment is used wherever visual signalling or visual control is required. It may be used in elevators, shops, hotels, fire reporting systems, watchman systems, and has innumerable other applications. Bells or buzzers may be connected in the circuits to provide audible signals.

Kellogg annunciator units ordinarily are designed for specific conditions. Either lamp or drop signals may be used. They may be assembled in steel cabinets for rack mounting, of a type to match existing panels; or may be turret type in metal or wood cabinets for desks or table mounting; or may be mounted in floor type steel or wood cabinets. They may be self-contained, or be designed to fit into existing mounting frames or racks. Complete accessibility is provided and every precaution is taken to make each unit as near fire-proof and dust-proof as the nature of the particular installation requires.

Annunciator units for power plants can be provided for operation with either continuous or momentary alarm with manual, automatic, or remote lamp-reset features. Audible alarms of any size or voltage may be equipped with any of the reset features.

Information and Chief Operator's Equipment



INFORMATION DESK

Kellogg information and chief operator's equipment is designed and engineered specially for particular installations. In general the equipment described below is included with most installations.

A flat top desk with a tier of two drawers and a sliding writing shelf at the right supports a turret type cabinet. The turret may be furnished in any wood or finish to match the switchboard, woodwork, or furniture.

All turrets have wirings, drillings, punchings, etc., for one operator's set, generator master key, night alarm, magneto through trunk to local switchboard, two-way line to wire chief's desk, two-way line to toll switchboard, and a two-way line to the local switchboard. They are wired for 2 service observation lines, 3 incoming desk lines, 10 peg count meters, and 16 listening and monitoring circuits. All circuits are operated with keys which are mounted in the face of the turret.

In requesting information on this equipment information as to the make and type of switchboard should be included.

SWITCHES, FOOT



The Kellogg No. 1 type foot switch is a sturdy, reliable unit covered with a black enameled steel cover. The foot pedal is held in the non-operated position by a durable coil spring. Contact springs and terminals are insulated from the housing and foot pedal. The housing is 6½ inches high, 3 inches wide, and 2⅝ inches deep. Including the pedal the depth is 5⅞ inches. This foot switch is

available in three spring combinations. These combinations with the associated code numbers are listed below.

Code No.	Spring Combination
1-A	One Make contact, 1 Dummy Spring
1-B	One Make and 1 Break and Make contact (2 sets of springs)
1-C	One Break and Make, and 1 Break and 2 Make contacts. (2 sets of springs). On the Break and 2 Make contacts the Make contacts make in sequence.

TELEPHONES—1000 SERIES MASTERPHONES

The Kellogg 1000 series desk and wall Masterphone provides the utmost in style, engineering, and quality performance.

Recognized for such outstanding advantages as ease of installation, low maintenance cost, dependable operation, and subscriber approval, this telephone provides the following features:

ONE base plate for both desk and wall Masterphones. Desk and wall housings interchangeable in a matter of seconds.

ONE universal anti-side tone triad circuit for all service applications. Never necessary to change permanent wiring.

Color codes, physical circuit changes, and complicated servicing completely eliminated.

PLUG-IN type induction coil, condenser, and dial plug. Complete elimination of soldering and unsoldering reduces maintenance costs to a minimum.

INDUCTION coil provides best ratio between side-tone reduction, and transmission and reception. Three way switch permits matching induction coil to long or medium loops, and reduces



transmitter current supply on short loops.

ONE condenser for all circuit applications. Microfarad capacities of 0.5 or 1.0 mfd. provided by means of a simple switching unit.

TRANSMITTER provides greater electrical output and faithful

articulation throughout a wide range of applied voltages. Reliable and dependable under varying temperature and humidity conditions.

CONTROLLED response receiver eliminates objectionable characteristics throughout the voice frequency range. High fidelity voice reproduction is assured.

RINGING circuit selector quickly adapts circuit to metallic or divided ringing. Simply shifting the slide line to the desired position changes the universal circuit to the line installation desired.

RINGER equipped with large two-tone gongs provides maximum sound output of pleasing quality. Micrometer adjustment screw simplifies adjustment for volume and tone control.

Universal Standardization of Major Component Parts

Major components of the 1000 series Masterphone (handset, condenser, induction coils, and the interconnecting block)



Standard equipment on all 1000 series common battery and magneto instruments. Designed for increased efficiency, durability, and beauty. Receiver and transmitter are positioned to provide maximum transmission and reception. A four foot, three conductor straight handset cord is standard equipment.

HANDSET, NO. 46-C. Standard equipment on all 1000 series common battery and magneto instruments. Designed for increased efficiency, durability, and beauty. Receiver and transmitter are positioned to provide maximum transmission and reception. A four foot, three conductor straight handset cord is standard equipment.



TRANSMITTER, NO. 66521. Capsule type, designed for improved acoustic control. Provides greater electrical output, good non-positional qualities, and excellent response throughout a wide range of applied voltages.



RECEIVER, NO. 89-A. Capsule type, compact self-contained. Eliminates objectionable peaks or dips in the voice frequency range. A controlled response type which sustains improved high fidelity reproduction and articulation of voice frequencies.



CONDENSER, NO. 225. Plug-in type. Standard for all common battery and magneto services. Furnishes necessary capacity for all circuit applications. A simple slide-link switching unit provides 0.5 or 1.0

microfarad as required for particular ringer application.

are adapted to all classes of common battery or magneto subscriber services in both desk and wall Masterphones.



zoned to a particular loop.

INDUCTION COIL, NO. 113-A.

For all common battery services. Plug-in type. Provides best ratio between side-tone reduction, transmission, and reception regardless of the subscribers loop used. May be

INDUCTION COIL, NO. 114-A. Plug-in type for magneto service. This induction coil adapts the Kellogg universal triad circuit to any desired local battery application.



INTERCONNECTING BLOCK, NO. 64910. A molded one-piece interconnecting block which encases the "grid" type universal anti-side tone triad circuit and associated hook switch connections. This interconnecting block is standard equipment on all common battery and magneto 1000 series Masterphones. No circuit wiring or soldered connections are visible when interconnecting block is attached to the base plate. Induction coil and condenser plug in to the interconnecting block like radio tubes; no soldering to terminals required. Three slide link adjustments on this block permit zoning of the induction coil, adapting of circuit to metallic or divided ringing, and changing microfarad capacity of condenser as required.

TELEPHONES—1000 SERIES MASTERPHONES

ORDERING INFORMATION

The number of types of 1000 Series Masterphones which Kellogg manufactures to meet the many requirements of telephone companies, and the many combinations of telephones, ringers, and dials make it impractical to list the code number of each telephone separately.

To simplify the ordering of the 1000 Series Masterphone a listing of each type of telephone, ringer, and dial is provided. The code number of each of these components is selected and all written as a unit to form the complete ordering code number of the telephone.

For example, D-1000-HB1-K is the code number for a standard common battery signalling and talking telephone having a dial with numbers only, a 30 cycle ringer of the synchronomic, frequency selective, type, and a Coiled Kord handset cord.

DIAL	TELEPHONE TYPE	RINGER	HANDSET CORD
D	1000	HB1	K

This chart indicates the manner in which the code number described above is formed. The code number of the telephone type is first determined from the listings below. The type of ringer is selected from the "Ringers" chart and its code number added to that of the telephone type. A dial, with numbers only is specified by prefixing the letter "D" to the telephone code number (Dials with numbers and letters or with the word "Operator" over the number "0" are specified as indicated under "Dials" below.) A Coiled Kord handset cord is specified by adding the letter "K" to the complete code number.

Unless otherwise specified a standard 4-foot straight handset cord and a 6-foot straight base cord on desk Masterphones is furnished with these telephones.

FOR DETAILED INFORMATION ON EACH OF THE PARTS OF THIS CODE NUMBER SEE THE LISTINGS BELOW UNDER THE HEADINGS "DIALS," "RINGERS," AND "TELEPHONES."

DIALS

Three different dials are available for the 1000 Series Masterphone. Code numbers for all telephones which are to be equipped with dial must be prefixed with the letter "D". If a dial other than the standard "number only" dial is desired, special note must be made on the order after the code number of the telephone, as shown below.

10-D dial. This standard dial is faced with the numbers 1 to 0.

10-DO dial. This dial has the numbers 1 to 0 and the word "Operator" faced on the plate along with the "0" digit. To order this dial add the note "with 10-DO dial" to the telephone code number.

10-G dial. This dial is faced with both letters and numbers. To order add the note "with 10-G dial" to the telephone code number. This dial is often referred to as a "Metropolitan Dial."

RINGERS

Ringers for the 1000 Series Masterphone are available in biased or frequency selective types for common battery service, and in biased, or straight line types for magneto service. Kellogg No. 120 type ringers are used for biased ringers, No. 123 type for straight line ringers, and No. 122 or 124 for frequency selective ringers. For detailed information on these ringers see "Ringers" in this section.

In ordering telephones the code number of the correct ringer should be added to the code number of the telephone as described above. **If no ringer is desired add "LR" to the telephone code number.**

SELECTION OF RINGERS. Frequency selective ringers should be selected for their frequency application. Kellogg 124 type ringers are furnished as standard unless order requests our 122 high impedance type. Biased and straight line ringers should be selected for the particular line application. BA ringers are recommended for all dial and heavily loaded manual lines, but should not be mixed with ringers of a resistance less than 2500 ohms. BB ringers are recommended if present ringers on a line have a resistance of over 1500 ohms and under 3000 ohms. BC ringers are recommended if present ringers on a line have a resistance of over 500 ohms to 1500 ohms. SA, SB, and SC ringers for magneto applications are selected in the same manner as indicated for biased ringers.

Biased Ringers—No. 120 Type

Code No.	Description
BA	High Impedance (4000 ohms)
BB	Medium Impedance (2500 ohms)
BC	Low Impedance (1000 ohms)

Frequency Selective Ringers—No. 122 and 124 Types

HARMONIC TYPE		SYNCHROMONIC TYPE	
Code No.	Frequency	Code No.	Frequency
HA1	33 $\frac{1}{3}$ cycles	HB1	30 cycles
HA2	50 cycles	HB2	42 cycles
HA3	66 $\frac{2}{3}$ cycles	HB3	54 cycles
HA4	16 $\frac{2}{3}$ cycles	HB4	66 cycles
HA5	25 cycles	HB5	16 cycles

DECIMONIC TYPE

A special sub-cycle ringing converter for supplying decimonic type 20, 30, 40, 50, 60 cycles frequency selective ringing systems has been designed by the combined engineering staffs of Kellogg and the Lorain Products Corporation. This converter provides stabilized decimonic frequency voltages conservatively rated at 20 watts per frequency. For detailed information on this converter see "Power" in this section.

Code No.	Frequency	Code No.	Frequency
HC1	20 cycles	HC4	40 cycles
HC2	60 cycles	HC5	50 cycles
HC3	30 cycles		

Straight Line Ringers—No. 123 Type

Code No.	Description
SA	High Impedance (4000 ohms)
SB	Medium Impedance (2500 ohms)
SC	Low Impedance (1000 ohms)

TELEPHONES—1000 SERIES COMMON BATTERY MASTERPHONES



1000 TYPE



D1000 TYPE



1100 TYPE



D1100 TYPE

Common Battery Signalling and Talking
1000-1100 UNIT TYPES

Kellogg unit type common battery desk or wall Masterphones can be supplied with or without a dial. Biased and frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a three conductor 6-foot base cord is standard on desk Masterphones for this purpose.

Select the type of telephone desired from the following chart. Specify the type of dial, if desired, and the type of ringer needed in accordance with "Ordering Information."

Code No.	Description
1000	Desk Type Masterphone
1001	Desk type Masterphone with "press to talk" switch
1100	Wall type Masterphone
1101	Wall type Masterphone with "press to talk" switch

1060-1160 TWO PIECE TYPES

Kellogg Masterphones in desk (1060 types) or wall (1160 types), with or without a dial, can be supplied with associated common battery triad circuit desk set boxes (610 types). A four conductor base cord is standard on desk Masterphones for this purpose. Induction coil, condenser, and biased or frequency selective ringers are furnished in the 610 desk set box.

Select the particular type of telephone desired from the following chart. Specify if a dial is desired in accordance with "Ordering Information." Refer to "Boxes, Desk Set" and select the code number of the 610 box in accordance with the ringer type desired.

Code No.	Description
1060	Desk type Masterphone
1061	Desk type Masterphone with "press to talk" switch
1160	Wall type Masterphone
1161	Wall type Masterphone with "press to talk" switch

1062-1162 TWO PIECE TYPES

Kellogg Masterphones in desk (1062 types) or wall (1162 types) with or without a dial can be supplied with associated common battery booster circuit desk set boxes (602 types). A three conductor base cord is standard on desk Masterphones for this purpose. Induction coil, condenser, and biased or frequency selective ringers are furnished in the 602 desk set box.

Select the type of telephone wanted from the following chart. Specify if dial is wanted in accordance with "Ordering Information." Refer to "Boxes, Desk Set" and select the code number of 602 box in accordance with ringer type desired.

Code No.	Description
1062	Desk type Masterphone
1063	Desk type Masterphone with "press to talk" switch
1162	Wall type Masterphone
1163	Wall type Masterphone with "press to talk" switch

Common Battery Signalling—Local Battery Talking
1020-1120 UNIT TYPES

Kellogg unit type desk or wall Masterphones with or without a dial can be supplied where advantageous to adapt the telephone to local battery talking and common battery signalling to improve transmission on long subscriber loops. Biased or frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

These telephones come equipped with Kellogg No. 114-A local battery induction coil and a No. 64-A retard coil which is used to hold common battery central office equipment without introducing any appreciable loss in transmission or reception.

Select the particular type of telephone desired from the following chart. Specify if a dial is wanted and the type of ringer in accordance with "Ordering Information."

Code No.	Description
1020	Desk type Masterphone
1021	Desk type Masterphone with "press to talk" switch
1120	Wall type Masterphone
1121	Wall type Masterphone with "press to talk" switch

Simplex Signalling—Local Battery Talking
1081-1181 UNIT TYPES

Kellogg unit type desk or wall Masterphones, with or without a dial, can be supplied where necessary to signal over long subscriber's loops in excess of the standard accepted maximum resistance. Where economical to install the necessary simplex facilities this type of telephone is recommended. Biased or frequency selective ringers are available for any ringing application. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

These telephones come equipped with a Kellogg No. 114-A local battery induction coil and a No. 64-B retard coil which is used to hold common battery central office equipment and also to facilitate simplex signalling.

Select the particular type of telephone wanted from the following chart. Specify if a dial is desired and select the ringer needed in accordance with "Ordering Information."

Code No.	Description
1081	Desk type Masterphone
1181	Wall type Masterphone

TELEPHONES—1000 SERIES MAGNETO MASTERPHONES

1070-1170 UNIT TYPES WITH SELF-CONTAINED HAND GENERATOR



1070 TYPE



1170 TYPE

Kellogg unit type magneto desk or wall Masterphones can be supplied in biased or straight line ringer for any ringing application. Biased ringers which prevent bell tapping are recommended where future conversion to dial equipment is contemplated. The universal anti-side tone triad circuit can be quickly adapted to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose. A self-contained Kellogg No. GN-38-B hand generator is a part of this telephone, and a separate generator box is not needed.

Select the particular type of telephone wanted from the following chart. Specify the type of ringer needed in accordance with "Ordering Information."

Code No.	Description
1070	Desk type Masterphone
1071	Desk type Masterphone with "press to talk" switch
1170	Wall type Masterphone
1171	Wall type Masterphone with "press to talk" switch

1040-1140 UNIT TYPES FOR USE WITH HAND GENERATOR BOXES



1040 - 1050 TYPE



1140 - 1150 TYPE

Kellogg unit type Masterphones in desk (1040-1050 types) or wall (1140-1150 types) can be supplied in biased or straight line ringers. Biased ringers are recommended where future conversion to dial equipment is contemplated. Associated hand generator boxes (1200 types) are available for use with these telephones. Instruments can be adapted readily to metallic or grounded ringing, and a four conductor base cord is standard on desk Masterphones for this purpose.

Select the type of telephone desired from the following chart. Specify the type of ringer needed in accordance with "Ordering Information." Refer to "Boxes, Hand Generator" and select the code number of the 1200 type box required.

Code No.	Description
1040	Desk type Masterphone
1041	Desk type Masterphone with "press to talk" switch
1140	Wall type Masterphone
1141	Wall type Masterphone with "press to talk" switch
1050	Desk type Masterphone less No. 225 condenser
1150	Wall type Masterphone less No. 225 condenser

1062-1162 TWO PIECE TYPES FOR USE WITH DESK SET BOXES



1062 TYPE



1162 TYPE

Kellogg Masterphones in desk (1062 types) or wall (1162 types) can be supplied with associated magneto booster circuit desk set boxes (3300 types). These instruments also may be used with older style 2300 desk set boxes. A three conductor base cord is standard on desk Masterphone for this purpose. Induction coil, hand generator, and straight line ringer are furnished in the 3300 desk set box.

Select the type of telephone desired from the following chart. Refer to "Boxes, Desk Set" and select the code number of the 3300 type box required in accordance with the ringer required.

Code No.	Description
1062	Desk type Masterphone
1063	Desk type Masterphone with "press to talk" switch
1162	Wall type Masterphone
1163	Wall type Masterphone with "press to talk" switch

1040-1140 TWO PIECE TYPES LESS RINGER AND CONDENSER FOR USE WITH DESK SET BOXES



1040 TYPE



1140 TYPE

Kellogg Masterphones in desk (1040-LR) or wall (1140-LR) types can be supplied less ringer and condenser. Also desk (1040-C-LR) or wall (1140-C-LR) types can be supplied less ringer but with condenser. These telephones work with associated magneto desk set boxes (3500 types). They may also be used with older style 2500 type desk set boxes. A four conductor base cord is standard on desk Masterphones for this purpose. Hand generator and straight line ringer are furnished in the 3500 desk set box.

Select the type of telephone desired from the following chart. Refer to "Boxes, Desk Set" and select the code number of the 3500 type desk set box in accordance with the ringer required.

Code No.	Description
1040-LR	Desk type Masterphone less condenser
1040-C-LR	Desk type Masterphone with condenser
1041-C-LR	Desk type Masterphone with condenser and "press to talk" switch
1140-LR	Wall type Masterphone less condenser
1140-C-LR	Wall type Masterphone with condenser
1141-C-LR	Wall type Masterphone with condenser and "press to talk" switch

1000 SERIES MASTERPHONES FOR INTERCOMMUNICATION SYSTEMS



1004 - 1005 - 1007



D-1004 - D-1007 - D-1008



1104 - 1105



D-1104 - D-1107

Kellogg Unit type Masterphones in desk or wall types can be supplied as attendant or extension station telephones for use with Kellogg inter-communication systems having trunks to common battery manual or dial, or magneto central office main exchanges. For additional information refer to section on inter-communication equipment. Select the type of telephone needed from the following information.

ATTENDANT STATION TYPE

Code No.	Type Exchange	Type Telephone
1005-LR	C. B. Manual	Desk
1105-LR	C. B. Manual	Wall
D-1007-LR	C. B. Dial	Desk
D-1107-LR	C. B. Dial	Wall
D-1008-BA*	C. B. Dial	Desk

*For Relaymatic intercommunication systems.

EXTENSION STATION TYPE

Code No.	Type Exchange	Type Telephone
1004-LR	C. B. Manual	Desk
1104-LR	C. B. Manual	Wall
D-1004-LR	C. B. Dial	Desk
D-1104-LR	C. B. Dial	Wall

ATTENDANT OR EXTENSION STATION TYPE

Code No.	Type Exchange	Type Telephone
1004-LR	Magneto	Desk
1104-LR	Magneto	Wall

OTHER KELLOGG COMMON BATTERY TELEPHONES

Wall Type — With Hand Receiver



The Kellogg No. F-817 type telephone is equipped with regular transmitter and receiver. A dial is furnished only when specified. If divided ringing is desired it must be specified on the order.

These telephones are equipped with No. 121-C transmitter, No. F-41-A receiver, No. 39 transmitter arm, No. 103-A induction coil, No. 171 hook switch, and No. 185 condenser. Size: 9 inches high; 6½ inches wide, and 3½ inches deep. Housing is steel cover finished in black enamel.

Code No.	Ringer Code No.	Ringer Frequency (Biased)
F-817-BA	79-A	
F-817-HA-1	72-A-1	33½ cycles
F-817-HA-2	72-A-2	50 cycles
F-817-HA-3	72-A-3	66⅔ cycles
F-817-HA-4	72-A-4	16⅔ cycles
F-817-HB-1	73-A-1	30 cycles
F-817-HB-2	73-A-2	42 cycles
F-817-HB-3	73-A-3	54 cycles
F-817-HB-4	73-A-4	66 cycles
F-817-HC-1	74-A-1	20 cycles
F-817-HC-2	74-A-2	60 cycles
F-817-LR	Less Ringer	

Wall Type — With Handset



The Kellogg No. 9817 type telephone is the same as the No. 817 type except it is equipped with a handset instead of a separate transmitter and receiver. These telephones may be used for either manual or dial service although a dial is not supplied with the telephone and must be specified when ordering. The housing is a steel cover with a black enamel finish. Size: 9 inches high; 6½ inches wide, and 3½ inches deep.

These telephones are equipped with No. F-27-C handset, No. 103-A induction coil, and No. 157 hook switch, and No. 185 condenser.

Code No.	Ringer Code No.	Ringer Frequency (Biased)
9817-BA	79-A	
9817-HA-1	72-A-1	33½ cycles
9817-HA-2	72-A-2	50 cycles
9817-HA-3	72-A-3	66⅔ cycles
9817-HA-4	72-A-4	16⅔ cycles
9817-HB-1	73-A-1	30 cycles
9817-HB-2	73-A-2	42 cycles
9817-HB-3	73-A-3	54 cycles
9817-HB-4	73-A-4	66 cycles
9817-HC-1	74-A-1	20 cycles
9817-HC-2	74-A-2	60 cycles
9817-LR	Less Ringer	

OTHER KELLOGG COMMON BATTERY TELEPHONES

Bracket Type Telephones



"A"

"B"

"C"

**FOR MANUAL SERVICE
NO. 9710**

This telephone is used primarily as an extension set but can be used for regular two piece installations with the No. 605 series desk set boxes. Equipped with No. F-27-C handset, No. 158 hook switch, No. 104-A induction coil, and No. 186 condenser. This is a front mounting type telephone. For illustration see photograph "A" above.

NO. 9720

This telephone is arranged for a side mounting handset. Can be used for two piece installations with No. 605 series desk set boxes. Equipped with No. F-27-C handset, No. 164 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration see photograph "B" above.

NO. 9735

The No. 9735 telephone is adaptable for use with desk set boxes using either two winding booster or three winding anti-side tone induction coils. May also be used with magneto desk set boxes No. 3300 series for local battery service. For common battery desk set boxes for use with this telephone see No. 610 boxes in this section. Equipped with No. F-27-C handset and No. 164 hook switch. For illustration see photograph "B" above.

**FOR DIAL SERVICE
NO. 9740**

The No. 9740 telephone is used primarily for extension sets but may be used for two piece installations with No. 605 desk set boxes. Equipped with No. F-27-C handset, No. 164 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration see photograph "C" above.

NO. 9741

This telephone is the same as the No. 9735 listed above except it is arranged for dial operation. Equipped with a No. 27C handset and a 164 hookswitch. For illustration see photograph "C" above.

**FOR INTER-COMMUNICATION SYSTEMS
NO. 9721**

The No. 9721 telephone is designed for use with inter-communication systems. For additional information refer to section on Inter-communication Equipment. It is equipped with No. F-27-C handset, No. 174 hook switch, No. 106-A induction coil, and No. 187 condenser. For illustration of this telephone see photograph "B" above.

Weatherproof Type Telephones



NO. 4900—HANDSET TYPE



NO. 4901-A—HAND RECEIVER TYPE

These Kellogg weatherproof telephones are designed to provide an efficient operating telephone for outdoor applications. The telephones are contained in a ventilated, cast iron housing with facilities provided for locking the door. Ample space is provided in the housing for additional equipment for special applications. The over-all dimensions are 12 1/4 inches high, 9 3/4 inches wide, and 8 inches deep. These telephones are available for either dial or manual service. The dial is supplied only when specified. When these telephones are used in exposed locations on outdoor applications, they should be used with an arrestor for the subscriber's protection.

NO. 4900

This telephone is arranged for dial. Has three-inch gongs on ringer. Equipped with No. 108-GA ringer, No. 170 hook switch, No. 103-GA induction coil, No. 186 condenser, and No. F-35-EC handset.

NO. 4901-A

The No. 4901-A telephone is equipped with No. 108-A ringer, No. 178 hook switch, No. 103-A induction coil, No. 186 condenser, No. 121-C transmitter, and No. F-41-EA receiver.

NO. 4902

The No. 4902 telephone is the same as the No. 4900 except it has a resistor in the circuit. Other components are identical to those of the No. 4900.

NO. 4903

The No. 4903 telephone is similar to the No. 4901 but has a condenser in the ringer circuit. Equipped with No. 108-A ringer, No. 177 hook switch, No. 103-GA induction coil, No. 186 and 67 condensers, P-66528 transmitter assembly, and No. F-41-EA receiver.

OTHER KELLOGG MAGNETO TELEPHONES

Wall Type, with Handset



This anti-side tone telephone is assembled into an attractively finished oak cabinet and is equipped with a handset. The No. 5809-M has a 3-bar generator and is designed for local lines having one or more telephones or for lightly loaded rural lines. The No. 5845 has an extra heavy duty, 6-bar, generator. All other 5800 series telephones, except the No. 5820-M, have 5-bar generators and are for use on long heavily loaded lines. The No. 5820-M telephone has a special pulsating and alternating current generator for secret signalling. The mounting space required for these telephones is 10 by 7½ inches.

Code No.	Ringer No.	Hook Switch	Ind. Coil	Cond.	Handset	Gen.
5809-M	78-A	165	105-A	--	F-27-C	15
5812-M	78-D	165	105-A	--	F-27-C	53
5816-M	78-D	165	105-A	200	F-27-C	53
5820-M*	78-D	165	105-A	200	F-27-C	59
5824-M†	78-D	165	105-A	200	F-27-C	53
5845-M‡	78-G	165	111-A	200	F-43-C	75
5859-M	78-G	165	105-A	--	F-27-C	53
5880-M	78-G	165	105-A	200	F-27-C	53

Ringer resistances—78-A, 1000 ohms; 78-D, 1600 ohms; 78-G, 2500 ohms.

*Has No. 5 push button for secret signalling.

†Arranged for calling central secretly by ringing over one side of the line and through the drop to ground. Can be used only on two wire metallic lines which have all telephones equipped with push buttons and with the drop disconnected from one side of the line and wired to ground.

‡Has large woodwork.

Bracket Type NO. 9830

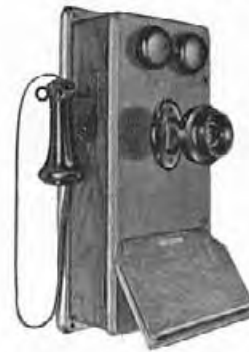


NO. 9830 TELEPHONE MOUNTED ON NO. 3528 DESK SET BOX

This telephone may be used either as an extension set or may be used as a complete telephone when used in conjunction with 3500 or 2500 series desk set boxes containing ringer and generator. The small steel box is furnished with black enamel and is 4 inches wide, 5½ inches high, and 2 inches deep. Condensers for these telephones are supplied only when specified.

Code No.	Handset	Hook Switch	Induction Coil	Condenser
9830	F-27-C	169	109-A	198

Compact Wall Type with Hand Receiver



The Kellogg compact local battery anti-side tone telephones are available with different generators and with ringers of different resistance values. The cabinet is made of oak. The over-all length is 19 inches, depth 9¾ inches, width of back-board 8¾ inches, and the over-all width including hook switch and crank is 11¼ inches. The three-bar generators are designed for local lines having one or more telephones or for lightly loaded farm lines. The

five-bar generators are designed for long heavily loaded lines. Only the No. 4809 telephone is equipped with the three-bar generator. All other telephones have five-bar generators. The No. 4820 telephone has a special pulsating and alternating current generator for secret signalling.

Code No.	Ringer No.	Hook Switch	Ind. Coil	Cond.	Trans.	Trans. Arm.	Rec.	Gen.
4809	78-A	163	105-A	--	121-C	50	F-41-A	15
4812	78-D	163	105-A	--	121-C	50	F-41-A	53
4816	78-D	163	105-A	200	121-C	50	F-41-A	53
4820*	78-D	163	105-A	200	121-C	50	F-41-A	59
4824†	78-D	163	105-A	200	121-C	50	F-41-A	53
4825-M	78-D	165	105-A	200	Has #F-27-C		handset	53
4880	78-D	163	105-A	200	121-C	50	F-41-A	53
6886‡	55-G	163	105-A	200	121-C	50	F-41-A	53

Ringer resistances—78-A, 1000 ohms; 78-D, 1600 ohms; 55-G, 2500 ohms.

*Has No. 5 push button for secret signalling.

†Arranged for calling central secretly by ringing over one side of the line and through the drop to ground. Can be used only on two wire metallic lines which have all telephones equipped with push buttons and with the drop disconnected from one side of the line and wired to ground.

‡Has 3-inch gongs on ringer. Large woodwork.

WEATHERPROOF TYPE TELEPHONES



Kellogg weatherproof telephones are designed to provide an efficient operating telephone for outdoor applications. The telephones are contained in a ventilated cast iron housing with facilities provided for locking the door. The housing is painted with a heavy black

enamel to resist corrosion. The over-all dimensions are 14½ inches high, 11⅝ inches wide, and 10¼ inches deep. When these telephones are used in exposed locations for outdoor applications, they should be used in conjunction with an arrester for the subscriber's protection.

These telephones are equipped with No. 55-G (2500 ohm) ringer, No. 159 hook switch, No. 100-A induction coil, Nos. 28 and 53 condensers, No. 121-L transmitter, No. 81-A receiver, and No. F-744-TR cord. Condensers are supplied only when specified.

Code No.	Generator	Code No.	Generator
4883	No. 53-5-Bar	4888	No. 75-6-Bar

SPECIAL APPLICATION TELEPHONES

Common Battery, Bracket Type with Two-Way Switching Key

NO. 9736



This telephone is equipped with a two-way switching key for switching one line to either of three extension telephones. It is adaptable for use with either two winding booster or three winding anti-side tone induction coil desk set boxes. Can be used with any common battery or magneto desk set box. For common battery desk set boxes for use with this telephone, see No. 610 boxes in this section.

MAGNETO TELEPHONES

Hotel Wall Type—Booster Circuit



The telephones listed below are similar in appearance. The F-1983 telephone is of the insulated type with rubber covered wiring and having all metal parts insulated. The over-all dimensions are 10³/₄ inches high, 8¹/₂ inches wide, and 6¹/₄ inches deep. The cabinet of both types is made of oak. Both telephones are equipped with No. 108-A induction coil, No. 121-L

transmitter, No. 41 transmitter arm, and No. 53, 5-bar, generator. Other components are listed.

Code No.	Ringer	Hook Switch	Condenser	Receiver	Description
F-1983	55-G	144	140	F-41-EA	Insulated type. Condenser furnished only when specified.
F-2921	78-A	103	--	F-41-A	Not insulated.

Heavy Duty Wall Type—Anti-Side Tone



The No. 6884 telephone is designed for heavy duty service and is used in oil fields, forestry service and by electric power companies. The primary and secondary windings of the induction coil are insulated from one another. Has 6-bar generator. The 6884 telephone is equipped with No. 78-G ringer, No. 163 hook switch, No. 111-A induction coil, No. 121-C transmitter, No. 50 transmitter arm, No. F-41-A receiver, and No. 75 generator. Has large woodwork for three batteries.

Railroad Telephones

The two telephones shown in next column are both used by railroads but for different applications. The F-2869 is of the composite type for use with composite telephone and telegraph lines. A No. 5 howler is used for signalling purposes but it not part of the telephone and should be ordered separately. The No. F-2945 telephone is of the insulated type to protect the operator from any high potential line current. It is used by trainmen for communication with the dispatcher. The cabinet of each type of telephone listed is made of oak.

Railroad Telephones (Cont'd)

NO. F-2869



This telephone is equipped with No. 99 hook switch, No. 66-A induction coil, two No. 25 and one No. 28 condensers, No. 121-L transmitter, No. 50 transmitter arm, and No. F-41-A receiver. It has No. 16-C retard coil and No. 14 push button for composite signalling. Over-all dimensions: 19 inches long; 8³/₄ inches wide, and 8¹/₂ inches deep.

NO. F-2945



This telephone is equipped with No. 109 hook switch, Nos. 97-A and 98-A induction coils, No. 171 condenser, No. 121-L transmitter, No. 50 transmitter arm, No. 80-A receiver, and No. 53, 5-bar generator. The No. 80-A receiver has a No. 2 head band and No. 668-TR cord. Over-all dimensions: 23 inches long, 9³/₄ inches wide, and 5¹/₄ inches deep.

Portable Type Telephones

NO. 3001



This telephone is built to withstand hard usage but is light enough to be carried conveniently. The cabinet is of varnished birch with brass reinforcements.

Equipped with No. 109-G ringer, No. 108-A induction coil, No. 28 condenser, No. 32-L handset, and No. 86 5-bar generator.

NO. EE-8-B



The No. EE-8-B telephone is contained in a metal housing which fits into a heavy leather or canvas case. This instrument is the same as the EE-8 telephone used by the Signal Corps. This telephone has a switch so that it can be used for either local battery or common battery service. The circuit is anti-side tone on local battery and uses straight retard coil for common battery. Has No. C-158 retard coil.

Equipped with No. MC-131 ringer, No. C-105 induction coil, No. CA-355 condenser, and No. GN-38-B generator.

TESTING EQUIPMENT

Junior Test Cabinet



The Kellogg Junior Test Cabinet is a small, compact unit suitable for mounting on or near the switchboard in small exchanges, or on the wire chief's desk in larger offices. This test cabinet may be used for tests for short circuits, grounds on either side of the line, for crosses, or for resistance measurements on line or apparatus.

These tests are made through three trunks, one wired for the main frame test shoe, one for the switchboard, and one for a pair of test clips. Any or all of these trunks may be equipped as required. Suitable cords, plugs, weights, and other apparatus are furnished to fit standard protectors and switchboard line jacks.

VOLTMETER. The oak turret includes a special Weston type 267 voltmeter with two scales, reading 0 to 30 and 0 to 3 volts. The low scale is calibrated for direct reading in ohms. A single scale voltmeter with one reading of 0 to 30 volts may be supplied when desired.

OPERATOR'S TELEPHONE. A set of terminals is provided for an operator's telephone. No instrument is furnished with the Kellogg junior test cabinet unless specified as it is not always necessary to talk directly to the subscriber through the testing circuits. A standard magneto wall or desk telephone may be used when the cabinet is designed for the magneto exchange. A common battery circuit is furnished in the cabinet for common battery exchanges, and any standard common battery telephone may be used as an operator's set.

KEYS. An order wire key may be furnished when desired. A single frequency ringing key is furnished on all sets, but a four or five frequency master key may be included for ringing on party lines.

SIZE. The cabinet is 10 inches wide, 6 inches deep, and 13½ inches high.

MOUNTING. The turret may be placed near the switchboard, on any desk or table. No drilling is necessary as the junior test cabinet is self contained, except for the batteries.

BATTERIES. Telephone dry cells or radio "B" battery may be used for testing with the junior test cabinet. The operator's telephone uses two dry cells if magneto, or operates from the exchange storage battery if common battery.

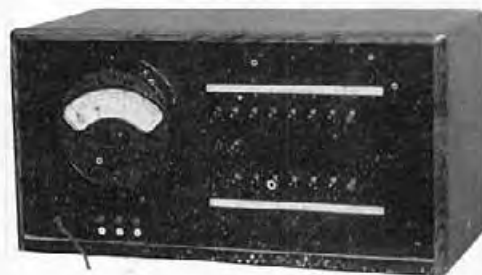
ORDERING INFORMATION

The following information should be included when ordering or requesting information on the junior test cabinet:

- Make and type of switchboard (for switchboard trunk).
- Make and type of main frame protection (for MDF trunk).
- Type of ringing system (for master key).

Specify voltmeter scale desired if order wire key should be furnished, and if operator's telephone is desired.

Senior Test Cabinet



The Kellogg senior test cabinet is designed as an aid to the wire chief in the average common battery exchange. With this equipment line, instrument, or exchange troubles may be quickly and easily located. Tests may be made for short circuits, grounds on either side of the line, for crosses, or resistance measurements on lines or apparatus.

VOLTMETER. The senior test cabinet is equipped with a Weston type 24, two-scale voltmeter, reading 0 to 30 and 0 to 150 volts, with resistance of 10,000 and 50,000 ohms.

KEYS. The voltmeter is controlled with a key and shunt, battery and reversing keys and a grounding key. Other keys in the test circuit are arranged for testing in or out from the main frame, connecting test trunks to switchboard order wire, connecting howler or bridge, flash key, key for reading voltage of test battery, ringing key for any ringing system and a listening key.

EQUIPMENT. Standard equipment includes an alarm buzzer, a two-way trunk to local switchboard with audible alarm, two test trunks to switchboard, one trunk to main frame test shoe, binding posts for Wheatstone bridge or howler, and two order wires. No bridge, howler, test shoe, or cords and plugs for local board are included, but may be added when desired. Kellogg engineers will recommend a suitable bridge for use with this cabinet.

MOUNTING. Suggestions on special desks for mounting the turret will be made on request, although any standard office desk is suitable. No drilling is necessary in the desk top as the senior turret is self-contained except for the extension alarm bell, batteries, bridge, and howler, which may be mounted in any convenient location.

BATTERIES. Telephone dry cells or radio "B" batteries are required to furnish the testing voltages of 30 and 150 volts. Current for operating the operator's telephone is obtained from the exchange storage battery.

SIZE. The senior test cabinet is 23-3/16 inches wide, 12 inches deep, and 12 inches high.

OPERATOR'S TELEPHONE. A desk Masterphone is included with the senior test cabinet.

ORDERING INFORMATION

The following information should be included when ordering or requesting information on the senior test cabinet:

- Make and type of switchboard.
- Make and type of main frame protection.
- Type of ringing system.

Whether set is to be equipped with bridge, howler, test shoe, or cords and plugs for local board.

Detailed specifications will be sent on request.

TESTING EQUIPMENT**Major Type Test Cabinet**

The major type test cabinet is specially designed for use in large central offices. It incorporates all the features of the senior type shown above plus additional cabinet space, line facilities and other refinements.

CABINET. The cabinet is of the turret type, suitable for mounting on a flat top desk or table. It may be furnished in any wood or finish to match the switchboard, woodwork, or furniture. The interior of the cabinet provides ample space to enclose all relays, condensers, coils, and terminal strips. A fuse panel is also located in the back of the cabinet for the protection of all circuits.

VOLTMETER. The turret includes a Weston type 24 voltmeter with two scales reading 0 to 30 volts and 0 to 150 volts.

FACE PANEL. The face panel is of the same material and finish as the other exposed woodwork. Approximately two thirds of this area is occupied by the testing equipment and the lamps and keys associated with the in and out lines and trunks. Pigeon holes and book stalls are provided at the right.

OPERATOR'S TELEPHONE. The operator's telephone equipment may be either a desk Masterphone or a suspended operator's set with a head receiver and suspended or breastplate transmitter. With this equipment the wire chief may talk on any of the desk lines, in and out trunks, or test trunks.

WIRING. Two incoming lines from the local switchboard can be installed. These lines terminate with a line lamp, listening key, holding key, and guard lamp in the wire chief's desk and may be used for trouble reports.

Wiring is provided for four order wires, two common battery test trunks, two magneto test trunks and one testing circuit, one generator circuit, one wire chief's telephone, one howler circuit, and one MDF test trunk.

TRUNKS. Space and drilling for ten combined test and hospital trunks terminating on supervisory lamps, a guard lamp, and a combined testing and reversing key are provided.

WHEATSTONE BRIDGE. Standard models of Wheatstone bridge type testing equipment can be supplied to work in conjunction with this test circuit.

ORDERING INFORMATION

Major type test cabinets ordinarily are specially designed and engineered by the Kellogg engineering staff. Requests for information on this cabinet should include information as to the make and type of switchboard, etc. Detailed specifications and equipment data will be sent on request.

Special Testing Equipment

Illustrated above is an example of special type testing equipment designed by expert Kellogg engineers and manufactured in the Kellogg plant to meet special requirements and applications of operating companies.

All types of special testing equipment can be supplied by Kellogg. Special trunk and line tests can be provided in addition to regular equipment or special arrangements of regularly used testing apparatus.

In requesting information on this equipment specify the type testing for which the equipment is to be used, the type of circuits or equipment to be tested, and all special features required from the equipment.

For small meters and linemen's test sets see the Supply Section of this catalog.

Wire Chief's Test Panels for Rack Mounting**SENIOR TYPE**

The senior type test panel is arranged on a bakelite faced panel for mounting on a relay rack power board. It is wired and equipped with the following circuits:

TESTING CIRCUIT—complete with a Weston No. 24, double-scale voltmeter with readings of 0 to 30 volts, 10,000 ohms resistance, and 0 to 150 volts, 50,000 ohms resistance, and the necessary test keys, etc.

OPERATOR'S TELEPHONE CIRCUIT—with a Masterphone handset.

Two-Way Line Circuit.

Order Wire Circuit.

Ringing Circuit.

Note: This panel will be furnished with single-frequency ringing keys unless otherwise specified. If five-party ringing is used a master key is required. A two-party master key is not required on the senior type panel as a reversing key is provided.

TESTING EQUIPMENT

Wire Chief's Test Panels for Rack Mounting Junior Type R-S-CB Test Panel

The junior type R-S-CB test panel is arranged on a bakelite faced panel for mounting on a relay rack power board. It is wired and equipped with the following circuits:

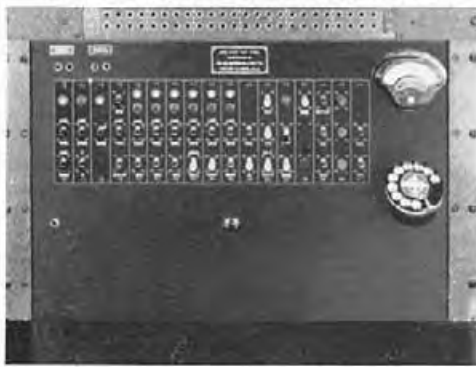
Testing Circuit—complete with a Weston No. 267 single-scale voltmeter with a reading of 0 to 30 volts, 10,000 ohms resistance, and the necessary test keys, etc.

Operator's Telephone Circuits—with a Masterphone handset.

Two Order Wire Circuits—wired but not equipped.
Ringing Circuit.

Note: This panel will be furnished with single-frequency ringing keys unless otherwise specified. If two or five-party ringing is used a master key is required.

Junior Type R-O-CB Test Panel



The junior type R-O-CB test panel is the same as the junior type R-S-CB except it is equipped with a Weston double-scale meter with an 0 to 30 volt reading and an ohm reading.

Test Sets, Lineman's

Kellogg lineman's test sets are supplied in two types: a bridging type for magneto lines and a common battery type for common battery lines. The bridging type is in reality a complete portable magneto telephone including dry cell batteries. The common battery type is a metal handset with test clips on the cord for connecting to the line under test.

NO. 1016 TEST SET (MAGNETO)

The No. 1016 test set is a complete portable telephone, sturdily constructed and designed to talk and ring over long or heavily loaded lines. It is equipped with a five-bar generator, 1600 ohm ringer, transmitter receiver, induction coil, hook-switch, and two dry cell batteries. Overall dimensions: 8 inches high;

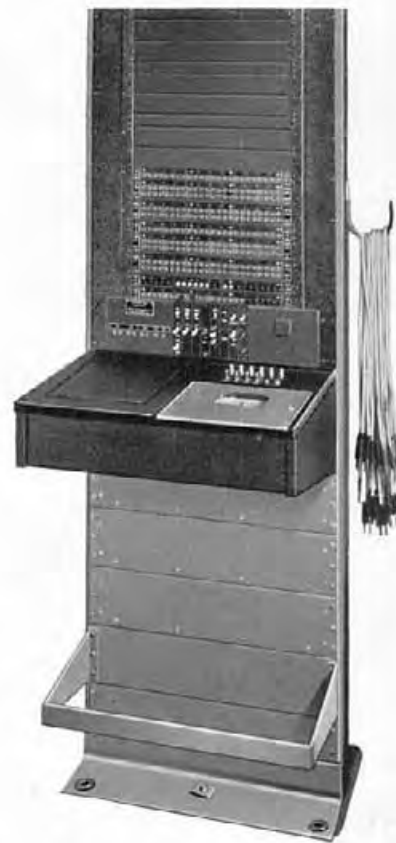
7 inches wide, and 8 $\frac{3}{4}$ inches deep. Net weight: 15 pounds.

NO. 1025 TEST SET (COMMON BATTERY)



The No. 1025 test set is a compact, easy to carry, metal handset equipped with test cords and two No. 27 universal test clips.

Toll Test Panels



Toll test panels can be furnished for any number of line circuits in either wall or floor type cabinets or for relay rack mounting as requirements demand. Patching cords, circuits, hand generator, and operator's telephone are furnished only as specified.

The toll test panel, in connection with the wire chief's testing equipment described above will permit routine tests and assist in locating line failures. The toll test panel is primarily a series of spring jacks, arranged in groups of 4, 6, 8, 10, 12 and sometimes more for testing, patching, talking, and ringing on toll lines. These jacks also form a rapid and convenient means of opening, shorting, and grounding the lines for test as well as for cutting in or out repeating coils, composite repeaters, or other toll line apparatus.

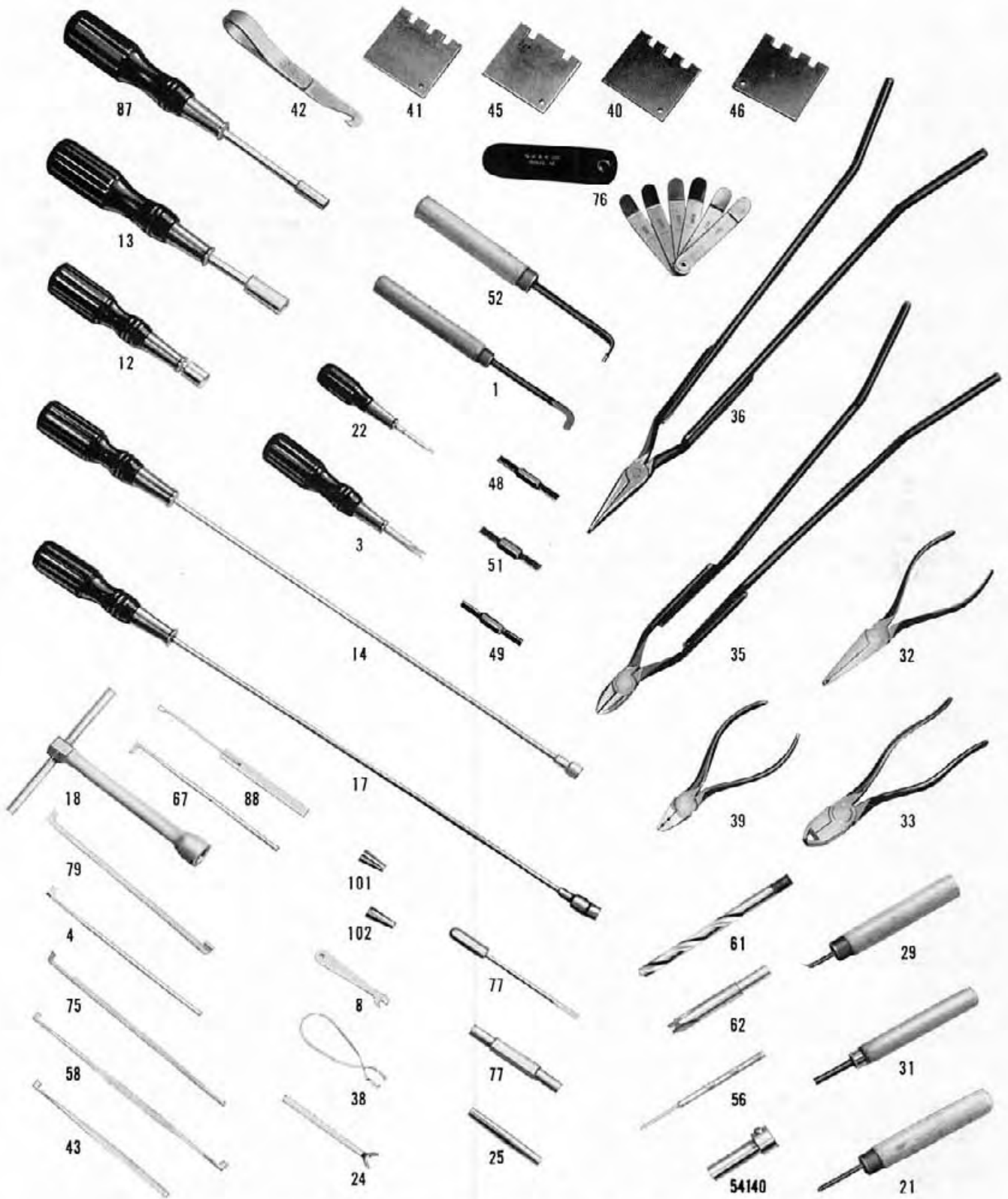
The usual minimum is six jacks to a line, each jack having a single conductor, and the group being arranged with two jacks for bridged listening, two for testing the line (out) and two for testing the drop (in).

Greater facility for patching and testing is accomplished by an increased number of jacks in each line. For the more complex toll circuits with simplex and composite equipment more than six jacks per line are required.

Because of the special nature of toll testing equipment, inquiries should include information on the ultimate line capacity desired, number of lines to be equipped, number of phantom circuits, number of jacks for each line, number of patching cords or cord circuits, and type of operator's set.

A drawing or description of the toll network would also assist Kellogg engineers in writing specifications. Recommendations on toll test equipment will be furnished without obligation.

TOOLS



FOR DESCRIPTION OF THESE TOOLS SEE PAGE 130.

TOOLS

(ILLUSTRATED ON PAGE 129)

Kellogg tools are available for use with all types of Kellogg equipment. These tools are especially designed to fit the job; each operation on telephone equipment can be handled with a Kellogg tool which will exactly fit the conditions required.

ARRESTERS

Socket wrench—No. 11 tool. Same as No. 12 tool.

CABLE Cable skinner—No. 42 tool.

COMBINED DROPS AND JACKS

Socket wrench—No. 12 tool.

Spanner wrench—No. 15 tool. Same as No. 14 tool.

CORDS Pliers—No. 39 tool.

DIALS Retaining ring—No. 86 tool.

Spring adjuster—No. 92 tool. Wrench—No. 3 tool.

DROPS Flat wrench—No. 8 tool.

HEAT COILS Pliers—No. 32 tool.

JACKS

Adjuster—No. 29 tool.

Jack Gauge—for No. 239 jacks No. 48 tool; for No. 258 jack No. 49 tool; for jacks taking No. 42 plug No. 51 tool.

Socket wrench—for fastening jacks in switchboard with Piece No. 989 nuts No. 14 tool; for No. 989 nuts for switchboard jacks, with adjustable feature, No. 17 tool.

Spring adjuster—No. 56 tool.

Wrench—No. 31 tool.

KEYS For contact cleaning and burnished—No. 68 tool.

Pliers—No. 33 tool. Socket wrench—No. 16 tool.

Springs—No. 4 tool. Spring adjuster—No. 67 tool.

LAMPS Lamp extractor—No. 25 tool.

CAPS, LAMP Extractor—for supervisory lamp caps No. 24 tool; for line lamp caps No. 38 tool.

MOUNTING PLATES Installing tool—No. 89 tool.

PLUGS

Gauges—for Nos. 106, 137, and 156 plugs No. 40 tool; for No. 201 plugs No. 41 tool; for No. 152 plugs No. 46 tool; for Nos. 112 and 187 plugs No. 47 tool; for No. 42 plugs No. 50 tool.

PLUGS

Screw driver—for hollow screws on plugs No. 22 tool.

PLUG CUSHIONS

For assembling No. 1-A plug cushions on plugs (sleeve diameter 0.2495 in.) No. 101 tool. For assembling No. 2-A plug cushions on plugs (sleeve diameter 0.2215 in.) No. 102 tool.

PLUG SEATS

Burnishing tool for plug seats for No. 106 plug No. 62 tool.

Drill for plug seats for No. 201 plug No. 63 tool.

Burnishing tool for plug seats for No. 201 plug No. 64 tool.

Tool kit for drilling plug seats for No. 106 plugs No. 65 tool kit.

Tool kit for drilling plug seats for No. 201 plug No. 66 tool kit.

RELAYS

Gauge—No. 76 tool.

Pliers, flat nose—No. 78 tool.

Screw driver wrench for removing No. 72 type major relay shells with round nut—No. 20 tool.

Screw driver wrench for residual pins and Relaymatic relays

The tools listed below are shown under the name of the piece of equipment for which they were designed. The equipment is listed alphabetically. For example, for a tool used to adjust ringers see Ringers, Adjusting.

(similar to Western Electric Co. No. 48 tool) No. 77 tool.

Socket wrench for relay armature nuts No. 11 tool.

Socket wrench for mounting major relays on mounting strip—No. 13 tool.

Spring adjuster (two end spring adjuster for relays—saw slot .023, maximum .025) No. 58 tool. Left half of No. 58 tool is No. 44 tool. Right half of No. 58 tool is No. 43 tool.

Spring adjuster (No. 20 B. & S. saw slot)—No. 1 tool.

Spring adjuster (for No. 700 and 800 type relays; No. 21 B. & S. saw slot on one end and No. 19 B. & S. saw slot on other end)—No. 75 tool.

Spring adjuster (for Nos. 7200 and 7300 type relays)—No. 79 tool.

Spring adjuster (for gang relays)—No. 88 tool.

Wrench for removing No. 22 type major relay shells—No. 19 tool.

Wrench for fastening relay coil to heel iron on Relaymatic relays—No. 91 tool.

RELAYMATICS AND RELAY RACKS

Socket wrench—No. 18 tool.

RINGERS

Adjusters—No. 85 tool.

Flat wrench for adjusting large type ringers—No. 9 tool. One end of No. 9 tool is 17/64 inch, the other end is 25/64 inch.

Flat wrench for adjusting large type ringers—No. 10 tool. One end of No. 10 tool is 1/4 inch, the other end is 41/64 inch.

Wrench for Nos. 72-A and 73-A type ringers—No. 59 tool.

SCREWS, SWITCHBOARD

Screw driver—No. 21 tool.

SOLDERING IRONS

For heavy duty work—No. 2-A soldering iron.

For light work—No. 1-A soldering iron.

TELEPHONE

Each cap and mouthpiece remover—No. 71 tool.

Socket screw wrench—No. 90 tool.

Spring adjuster—No. 52 tool.

TOOL KITS

For drilling leather faced plug shelves and lamp rails for No. 106 plugs and supervisory lamps (includes No. 65 tool kit)—No. 80 tool kit.

For drilling bakelite faced plug shelves and lamp rails for No. 106 plugs and supervisory lamps (includes No. 65 tool kit)—No. 81 tool kit.

For drilling leather faced plug shelves and lamp rails for No. 201 plugs and supervisory lamps (includes No. 66 tool kit)—No. 82 tool kit.

For drilling bakelite faced plug shelves and lamp rails for No. 201 plugs and supervisory lamps (includes No. 66 tool kit)—No. 83 tool kit.

SEE ALSO tool kits No. 65 and 66 under Plug Seats.

WIRE

Cutting pliers—No. 35 tool.

Long nose pliers—No. 36 tool.

TRANSFORMERS

Kellogg transformers are made for power panels, for use in transformer sets, and for insulating transformer applications. Transformers in general are listed in the first group below; insulating transformers are shown separately.

Code No.	Freq. (cycles)	Primary (volts)	Secondary (volts)	Pri. Res. (ohms) Parallel Wound	Sec. Res. (ohms)	Description
1-C	16-20	24	105-115	1.44-1.44	31	Used with Nos. 27-B and 29-A transformer sets and power panels.
2-A	25-42	24	120-135	1.32-1.32	56	Used with No. 29-A transformer set.
3-C	50-66 $\frac{2}{3}$	24	145-155	1.085-1.085	57	Used with Nos. 27-B and 29-A transformer sets.
5-C	16-20	48	105-115	3.9-3.9	26.5	For power panels.
28-B	25-42	48	125-135	6.2-6.2	54	Used with Nos. 30 and 31 transformer sets.
29-B	50-66 $\frac{2}{3}$	48	145-155	5.25-5.25	50	Used with Nos. 30 and 31 transformer sets.

TRANSFORMERS, INSULATING



Code No.	Resistance (ohms)				Description
	Terms. 1-2	Terms. 3-4	Terms. 5-6	Terms. 7-8	
19-A	23	23	23	23	Has four single windings. Frame of No. 18-A transformer. 5500 volt breakdown test.

Code No.	Resistance (ohms)			Description
	Terms. 1-2	Terms. 3-6	Terms. 7-8	
19-B	23	46	23	Has three single windings. 7500 volt breakdown test.

TRANSFORMER SETS—WALL TYPE

NO. 27-B



The No. 27-B transformer set is for use with the No. 42 pole changer. For 24-volt operation. 10 ohms resistance. Uses one No. 4 distributing bar; ten No. 66 and five No. 68 condensers; one No. 1-C, two No. 2-A, and two No. 3-C transformers, and ten No. P-65789 resistance coils.

TRANSFORMER SETS—WALL TYPE (Cont'd)

NO. 30

The No. 30 transformer set is the same as the No. 27-B except it is for 48-volt operation. All components are the same except for the transformers. One No. 5-C, two No. 28-B, and two No. 29-B transformers are used in the No. 30 transformer set.

NO. 31

The No. 31 transformer set is the same as the No. 30 except it uses terminal strips in place of distributing bar. Length of panel is 33 $\frac{1}{4}$ inch. Used with No. 45 pole changer. 48-volt operation.

TRANSMITTERS

Kellogg transmitters all use the Kellogg non-positional transmitter. These transmitters are divided into three groups with a separate code for each group. A separate chart for each type is shown below with descriptive information for each group. A suffix letter "C" designates the transmitter designed for common battery application and a suffix letter "L" designates the transmitter designed for local battery application in each case.

NO. 121 TYPE TRANSMITTER



This transmitter is designed for use with old style desk stand telephones, wall type, and weatherproof telephones. It is arranged with solder type terminals. Furnished less back assembly. The shell of this transmitter is made of bakelite.

Code No.	Transmitter Assembly No.
121-C	P-66521
121-L	P-66522

NO. 157 TYPE TRANSMITTER



This transmitter is designed for use in the operator's suspended type transmitter. It is arranged with solder type terminals and is furnished complete with back assembly. The shell is made of bakelite. Cords must be ordered separately.

Code No.	Transmitter Assembly No.
157-C	P-66521
157-L	P-66522

NO. 178 TYPE TRANSMITTER

(Operator's Type—For illustration see page 44.)

For operator's breast plate head and chest sets. This transmitter has a small diameter mouthpiece. It is especially light in weight and small in size. Shell is made of bakelite. The No. 178-C transmitter is used in the 1C, 2C, 3C operator sets. The No. 178-L transmitter is used in the 1L, 2L, 3L sets.

TUBE KITS

The No. 100 rare gas relay kit and the No. 101 vacuum tube kit are used in conjunction with the Kellogg No. 1000 Series Masterphone for divided ringing applications to isolate the telephone from ground. The No. 100 kit consists of a Vincent rare gas relay (RTC-2) and a mounting bracket (Pc. 64979) and the No. 101 kit consists of a Western Electric Co. No. 333-A vacuum tube and mounting bracket (Pc. 64979). Since the two tubes are different a detailed description is given below. The same mounting bracket is used to mount either tube.

VINCENT RARE GAS RELAY



This type of relay is an electronic device having no moving parts and possessing the electrical characteristic of having infinite resistance to the passage of electrical current of potentials below its predetermined breakdown voltage, while above this critical point it functions to pass a current of considerable magnitude. Its action in the telephone circuit is to isolate the telephone from ground until the ringing voltage is applied. The ringing voltage being higher than the 60-volt breakdown point of the tube causes the tube to break down to allow the ringing current to flow and operate the ringer.

The relay itself consists of a small glass tube containing rare inert gases acting in contact with special metal electrodes which allow current to pass above a closely predetermined voltage. The relay is usually mounted in the bell box alongside the ringer. No adjustment is necessary. The relay is connected in series with the ringer.

This relay may be used on magneto or common battery lines with either straight line, harmonic, or biased ringers. The relay cannot be used for selective pulsating or selective superimposed ringing and should not be used with ringers with more than 3000 ohms resistance.

WESTERN ELECTRIC CO. NO. 333-A VACUUM TUBE



This tube is intended for use principally on grounded ringing party line where superimposed or pulsating ringing current is employed for four party selective and eight party semi-selective lines. The tube is a three element type containing two control electrodes and a third electrode called the anode. The gaps between the electrodes are at practically open circuit at potentials below the approximate 70 volt breakdown potential. The

TUBE KITS

WESTERN ELECTRIC CO. NO. 333-A VACUUM TUBE (Cont'd)

control electrodes pass current equally well in either direction but the main gap between a control electrode and the relatively small anode passes current much better when the anode is positive. In the usual operating range for this tube, it will pass only one twentieth as much current when the anode is negative as when the anode is positive. This is the factor which is made use of in conjunction with the No. 1000 Series Kellogg Masterphone. Proper poling of the ringers is necessary, however, to achieve the desired result. The main, or working, gap rectifies alternating currents to provide pulsating direct currents for selective ringing systems which use biased ringers. The Western Electric Co. No. 333-A tube is used with biased ringers having 1000 or 2500 ohms resistance such as the Kellogg Nos. 120-BB or 120-BC. High impedance ringers such as the Kellogg No. 120-BA are not suitable for use in vacuum tube circuits. Space has been provided in the No. 1000 Series Masterphone to mount this tube. Complete instructions for connecting the No. 333-A vacuum tube with the telephone set ringers is supplied with the No. 101 vacuum tube kit.

WIRE, KELLOGG FLEXIBLE—INSULATED—STRANDED

SPECIFICATION G. M. 453

The type "S" Kellogg stranded wire is extensively used in Kellogg desk and wall telephones. Other stranded wire is recommended for general use where increased flexibility is desired.

In the table below the wire size is given in A. W. G. units. The impregnation for these wires consists of either one or two coats of moisture and flame proof lacquer. In the table below only the number of coats of this lacquer is given under "Impregnation."

Specify "Wire per G.M. 453" when ordering.

This wire is available in 24 colors. Specify colors desired when ordering. The colors available are listed below.

RED	GREEN	BLUE RED
RED WHITE	GREEN WHITE	ORANGE RED
BLACK	SLATE	GREEN RED
BLACK WHITE	SLATE WHITE	BLACK RED
BLUE	BROWN	SLATE RED
BLUE WHITE	BROWN WHITE	BLUE ORANGE
ORANGE	ORANGE GREEN	WHITE
ORANGE WHITE	ORANGE BLACK	YELLOW

Kellogg Type	No. of Strands	Wire Size	Insulation	No. of Coats of Impregnation
K	19	27	Rubber cover & single glazed braid. Rubber thickness 0.029 in. Diam. over braid approx. 0.160 in.	None
F	5	30	1/64 in. rubber cover & braid	1
G	5	30	Cotton wrap & braid	2
H	7	30	Single braid	2
J	7	30	Vinylite & braid	1
E	10	30	1/64 in. rubber & braid	1
N	10	30	Single braid	2
S	10	30	Two reverse servings of cellulose acetate yarn & braid	2

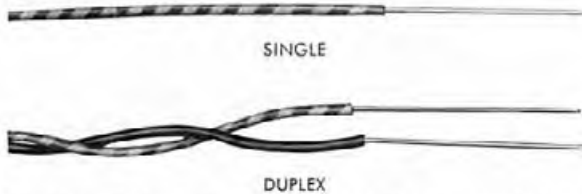
WIRE, KELLOGG FLEXIBLE—INSULATED—STRANDED
(Cont'd)

SPECIFICATION G. M. 453

Kellogg Type	No. of Strands	Wire Size	Insulation	No. of Coats of Impregnation
A	16	30	Rubber cover & braid (Approx. O.D. 0.087 in.)	1
B	16	30	One cotton wrap & braid (Approx. O.D. 0.82 in.)	2
D	41	30	One cotton wrap and braid	2
Q	3	35	Two reverse servings of cellulose acetate yarn	2
L	5	35	Two reverse servings of cellulose acetate yarn for white or solid colors. Three servings for two color combinations	2
R	7	36	Braided	2
M	21	36	One cotton wrap & 1/64 in. rubber jacket (max. O.D. 0.070 in.) can be furnished in black, white, or red	None
C	41	36	Rubber covered	None

All of the above wires are furnished in coils.

WIRE, SWITCHBOARD



Switchboard wire is the tinned or tinned and enameled copper wire used in Kellogg switchboard cables. These wires can be furnished in No. 19, 22, or 24 A. W. G. in all standard colors used for cable conductors. The tip conductor of duplex wires can be furnished as white, red, red-white, brown and brown-white. Specify color desired when ordering.

Two types of insulation are used on these wires. Type "B" insulation consists of three opposite wrappings, two of cellulose acetate yarn next to the wire and one overall cotton wrap.

The type "B" wire is the same as type "D" except for type of impregnation.

Code No.	Impregnation	Conductor Finish	No. of Conductors	Type Wire
B-T-1	Lacquered	Tinned	1	Single
B-T-2	Lacquered	Tinned	2	Duplex
B-TE-1	Lacquered	Tinned-Enameled	1	Single
B-TE-2	Lacquered	Tinned-Enameled	2	Duplex
D-T-1	Waxed	Tinned	1	Single
D-T-2	Waxed	Tinned	2	Duplex
D-TE-1	Waxed	Tinned-Enameled	1	Single
D-TE-2	Waxed	Tinned-Enameled	2	Duplex

NOTE: All of the above wires can be furnished with tropicalized impregnation for extreme humid conditions if specified.

WIRE, PUSH BACK

This wire also is known as telephone cable wire. Push back wire is used for wiring magneto desk set boxes, compact type wall telephones, and used generally for hook up wire.

This wire is furnished in single conductor only, with tinned copper conductors according to Kellogg specification G. M. 245.

Insulation on Push back wire consists of one braid only. Type "L" insulation is finished with wax and Type "M" with lacquer. If a heavier insulation is desired in either single or duplex wire, order generator wire shown below.

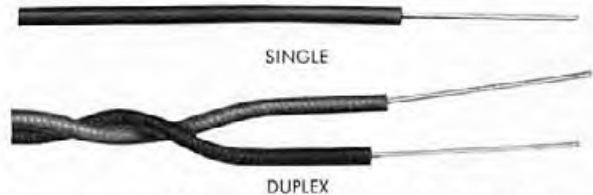
Specify "Wire per G.M. 245" in ordering this wire.

This wire is furnished in No. 20 A. W. G. in the following colors:

RED; RED WHITE; BLUE; BLUE WHITE; ORANGE; ORANGE WHITE; GREEN; GREEN WHITE; BLACK; BLACK WHITE; SLATE; SLATE WHITE; BROWN; BROWN WHITE; ORANGE GREEN; ORANGE BLACK.

Code No.	Insulation	Conductor Finish	No. of Conductors	Type Wire
L-T-1	L	Tinned	1	Single
M-T-1	M	Tinned	1	Single

WIRE, GENERATOR



Generator wire is for use as No. 16 or 20 A. W. G. battery leads in local cables and general wiring where the added protection of linned-enameled wire and braided covering is necessary. This wire also can be furnished with tinned conductors.

Insulation on this wire consists of two opposite wraps of cellulose acetate yarn over which a close cotton braid is applied. Type "O" wire is finished with wax and Type "P" wire is finished with lacquer.

Specify "Wire per G.M. 245" in ordering this wire.

Generator wire is furnished in the following standard colors:

RED; RED WHITE; BLUE; BLUE WHITE; ORANGE; ORANGE WHITE; GREEN; GREEN WHITE; BLACK; BLACK WHITE; SLATE; SLATE WHITE; BROWN; BROWN WHITE; ORANGE GREEN; ORANGE BLACK.

It is important that the desired colors be specified when ordering generator wire.

Code No.	Impregnation	Conductor Finish	No. of Conductors	Type Wire
O-T-1	Waxed	Tinned	1	Single
O-T-2	Waxed	Tinned	2	Duplex
O-TE-1	Waxed	Tinned-Enameled	1	Single
O-TE-2	Waxed	Tinned-Enameled	2	Duplex
P-T-1	Lacquered	Tinned	1	Single
P-T-2	Lacquered	Tinned	2	Duplex
P-TE-1	Lacquered	Tinned-Enameled	1	Single
P-TE-2	Lacquered	Tinned-Enameled	2	Duplex

NOTE: All of the above wires can be furnished with tropicalized impregnation for extreme humid conditions if specified.

ROTO WIRE FOR RELAYMATIC SWITCHBOARD CABLES

This wire is similar in construction to generator wire except that the overall braid is constructed with a finer cotton thread to hold hand-made cable arms for Relaymatic switchboards to a minimum diameter.

The insulation for these wires consists of two opposite wraps of cellulose acetate yarn, over which a close soft cotton braid is applied. The type "E" wire is finished with wax, the type "F" wire is finished with lacquer, and the type "G" has a tropicalized finish.

These wires are furnished in No. 22 or 24 A. W. G. in the following standard colors:

RED	RED WHITE
BLUE	BLUE WHITE
ORANGE	ORANGE WHITE
GREEN	GREEN WHITE
BLACK	BLACK WHITE
SLATE	SLATE WHITE
BROWN	BROWN WHITE
ORANGE GREEN	ORANGE BLACK

Code No.	Insulation	Conductor Finish	No. of Conductors
E-T-1	E	Tinned	1
E-TE-1	E	Tinned-Enameled	1
E-T-2	E	Tinned	2
E-TE-2	E	Tinned-Enameled	2
F-T-1	F	Tinned	1
F-TE-1	F	Tinned-Enameled	1
F-T-2	F	Tinned	2
F-TE-2	F	Tinned-Enameled	2
G-T-1	G	Tinned	1
G-TE-1	G	Tinned-Enameled	1
G-T-2	G	Tinned	2
G-TE-2	G	Tinned-Enameled	2

WIRE, POWER EQUIPMENT



The types "H", "J", and "K" wires shown in the next column above usually are furnished in a 5, 7, or 9-wire twist as cable and are used for leads from ringing equipment to switchboards.

Single conductor wire of these types can be furnished with standard tracer colors as follows:

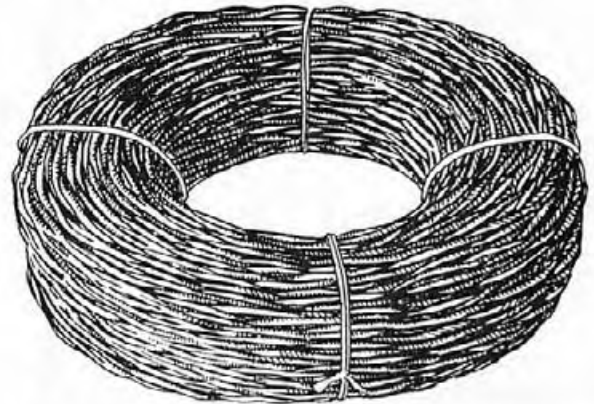
BLUE	BLUE ORANGE
ORANGE	BLUE GREEN
GREEN	BLUE BLACK
BLACK	BLUE SLATE
SLATE	ORANGE WHITE
BLUE WHITE	ORANGE GREEN

WIRE, POWER EQUIPMENT (Cont'd)

These wires are furnished in either No. 14 or No. 18 A. W. G. rubber covered tinned wire. Each type has a close overall cotton braid. When ordering this wire it is necessary to specify the desired wire gauge.

Type Wire	Type Impregnation
H-T-1	None
J-T-1	Lacquered
K-T-1	Tropicalized

Kellogg Flameproof Jumper Wire



This special Kellogg wire was designed to provide a jumper wire of small diameter with high insulation resistance and flame resisting qualities. In addition to these properties the wire is manufactured in bright, easily traced colors. This wire has a low mutual capacity rating and good moisture proof qualities.

This jumper wire is made of No. 22 B. & S. gauge tinned or tinned-enameled copper wire. Three wrappings of cellulose acetate yarn are applied to it in reverse directions and then an outer covering of cotton. These wrappings are then impregnated with a special Kellogg cellulose acetate lacquer, giving the wire a hard, smooth, dust-free finish. This compound resists flame, moisture, and corrosion.

Kellogg flameproof jumper wire is shipped in 500 and 1000 foot coils of one continuous length. This flameproof wire has a lay of approximately two inches, or six twists per foot.

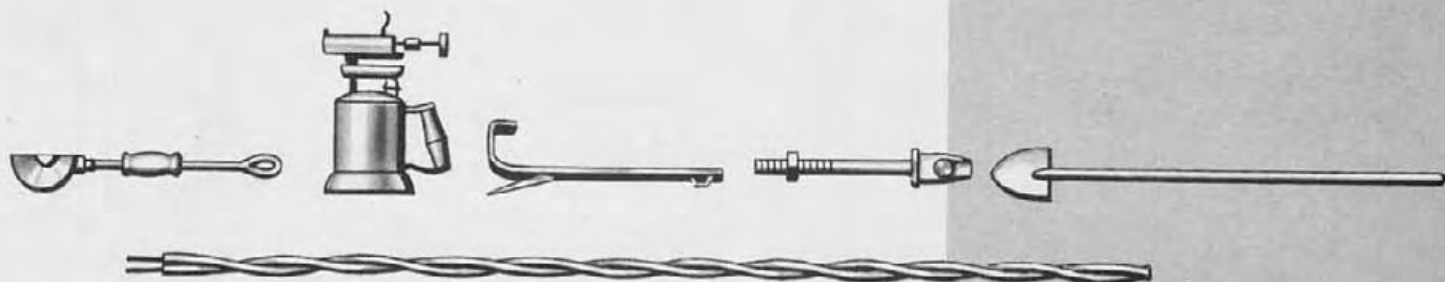
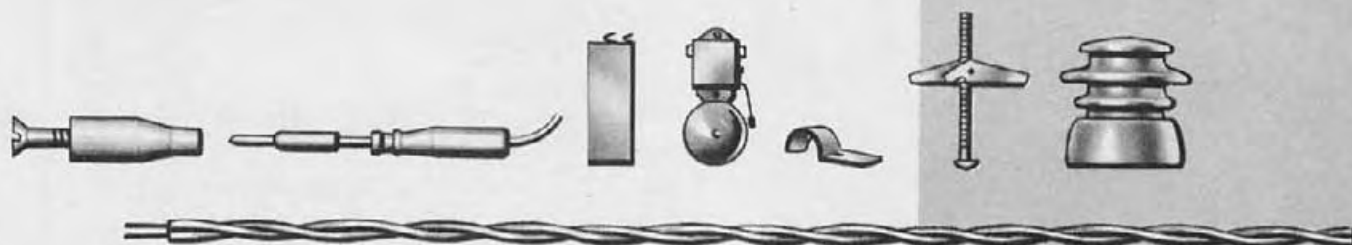
Code No.	Type Wire	No. of Strands	Colors	Weight per 1000 Feet
3002	Tinned	2	Red, White	10 lbs.
3002-E	Tinned-Enameled	2	Red, White	10 lbs.
3003	Tinned	3	Red, White, Blue	15 lbs.
3003-E	Tinned-Enameled	3	Red, White, Blue	15 lbs.

Wire for open line construction and drop, bridle, inside, and other wires sold by Kellogg may be found in the Supply Section of this catalog. Information on lead covered cable for outside plant use also is shown in the Supply Section.

Telephone and switchboard cords of Kellogg manufacture are shown under "Cords" in this section.

Kellogg

SUPPLIES



Adapters, Knob

Consists of copper wire formed to fit around telephone knobs and to engage drop wire clips. Used in conjunction with the replacement of twisted pair drop wire with parallel drop wire as they permit the use of existing installed fixtures.

Anchors, Cone



Where there are rocky earth formations or where moisture does not penetrate the earth very deeply this type anchor is highly recommended.

To install, use an earth auger slightly larger than the size of the anchor. Attach the anchor rod and drop the anchor to the bottom of the hole. Tamp a quantity of broken stone around the anchor and fill the hole with well tamped earth. Use standard anchor rods listed below.

CHANCE (LESS RODS)

Cat. No.	Anchor Diameter	Rod Diameter	Rod Length	Weight per 100
6	6 inches	1/2-5/8 in.	6 ft.	328 lbs.
8	8 inches	5/8-3/4 in.	7 ft.	647 lbs.
10	10 inches	5/8-3/4 in.	7 ft.	996 lbs.
12	12 inches	5/8-3/4 in.	8 ft.	1671 lbs.
16	16 inches	3/4-1 in.	9 ft.	2856 lbs.
19	19 inches	1-1/4 in.	10 ft.	4816 lbs.
23	23 inches	1-1/4 in.	10 ft.	6413 lbs.

EVERSTICK (LESS RODS)

Cat. No.	Anchor Size	Rod Size	Weight per 100
6-C	6 inches	5/8 inch	250 lbs.
8-C	8 inches	3/4 inch	575 lbs.
10-C	10 inches	3/4 inch	1000 lbs.
12-C	12 inches	1 inch	1400 lbs.

**Anchors, Expanding
ALBION-DILLON**



An expanding anchor of different design which features strong construction, simple installation, and great holding power. Approximately 80 percent of the area of the expanded anchor is in undisturbed earth with holding power varying from 2500 pounds in ordinary earth and 5500 pounds in hard pan for the smallest size anchor to 14,000 pounds in ordinary earth and 26,000 pounds in hard pan for the largest size.

Cat. No.	Rod Size Inches	Area Expanded	Weight per 100
3-34	1/2-5/8	33.8 sq. ins.	365 lbs.
4-64	5/8-3/4	63.8 sq. ins.	850 lbs.
6-118	5/8-3/4-1	118.0 sq. ins.	1150 lbs.
6-133	5/8-3/4-1	133.0 sq. ins.	1550 lbs.

**Anchors, Expanding
CHANCE (WITH RODS)**

Cat. No.	Area (sq. in.)	Rod Diameter	Rod Length
62	50	1/2 in.	7 ft.
64	70	1/2 in.	7 ft.
826	98	3/8 in.	7 ft.
846	115	3/8 in.	7 ft.
8410	130	3/4 in.	7 ft.
841	130	1 in.	7 ft.
1044	200	1 in.	9 ft.
124	300	1 in.	10 ft.

**Anchors, Expanding
EVERSTICK (LESS RODS)**

Cat. No.	Description	Rod Size Inches	Area Expanded	Weight per 100
62	6 in. 2-way	5/8	55 sq. in.	685 lbs.
82	8 in. 2-way	3/4	100 sq. in.	1130 lbs.
633	6 in. 3-way	5/8	65 sq. in.	780 lbs.
834	8 in. 3-way	5/8	90 sq. in.	1120 lbs.
836	8 in. 3-way	3/4	110 sq. in.	1380 lbs.
8310	8 in. 3-way	3/4	125 sq. in.	1515 lbs.
8312	8 in. 3-way	1	125 sq. in.	1590 lbs.

Anchors, Never-Creep



This type of anchor will not creep or move when properly installed. They pull against solid, undisturbed earth; all the holding area is utilized. There are only two pieces, the high-strength steel plate and the one-piece drop-forged steel rod.

To install, bore a hole for the plate at right angles to the line of pull, drive the rod into the hole through solid earth, in line with the pull. Hang the plate on the end of the ball point rod, fill the hole and the installation is completed.

Never-Creep Anchor Rods must be used with these anchors.

ANCHOR PLATES, NEVER-CREEP (LESS ROD)

Cat. No.	Size of Plate	Rod Diameter	Rod Length	Weight per 100
617	6 x 17 inches	5/8 inch	7 ft.	905 lbs.
622	6 x 22 inches	3/4 inch	8 ft.	1180 lbs.
822	8 x 22 inches	3/4 inch	8 ft.	1602 lbs.
827	8 x 27 inches	3/4 inch	9 ft.	2395 lbs.
835	8 x 35 inches	1 inch	9 ft.	2750 lbs.
1040	10 x 40 inches	1 inch	10 ft.	4761 lbs.

ANCHOR RODS, NEVER-CREEP (THIMBLEYE)

Cat. No.	Diameter	Length	Weight per 100
25	1/2 inch	5 ft.	300 lbs.
26	1/2 inch	6 ft.	450 lbs.
27	1/2 inch	7 ft.	500 lbs.
56	5/8 inch	6 ft.	680 lbs.
57	5/8 inch	7 ft.	755 lbs.
58	5/8 inch	8 ft.	830 lbs.
36	3/4 inch	6 ft.	960 lbs.

Anchors, Screw



Saving in installing time plus great holding surface makes this anchor well suited to most types of earth. There are no moving parts to adjust or assemble. Furnished with rods ready to install.

JOSLYN (WITH RODS)

Cat. No.	Anchor Size	Rod Size Diam. Length	Weight per 100
J-6524	4 inch	3/4" x 4'6"	805 lbs.
J-6526	6 inch	3/4" x 5'6"	1040 lbs.
J-6528	8 inch	1" x 5'6"	1900 lbs.
J-6530	10 inch	1 1/4" x 5'6"	3200 lbs.

CHANCE (WITH RODS)

Cat. No.	Anchor Size	Rod Diam.	Rod Length	Weight per 100
4345	4 in.	3/4 in.	54 in.	805 lbs.
6346	6 in.	3/4 in.	66 in.	1040 lbs.
816	8 in.	1 in.	66 in.	1842 lbs.
10146	10 in.	1 1/4 in.	66 in.	3200 lbs.
10148	10 in.	1 1/4 in.	96 in.	4100 lbs.

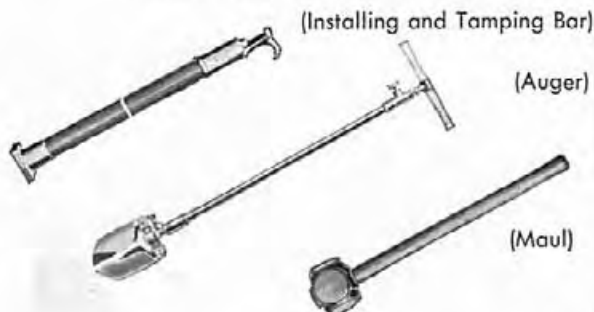
MATTHEWS (WITH RODS)

Cat. No.	Anchor Size	Rod Size Diam. Length	Weight per 100
412-R	4 inch.	1/2" x 6'	650 lbs.
612-R	6 inch.	1/2" x 6'	750 lbs.
658-R	6 inch.	5/8" x 6'	950 lbs.
758-R	7 inch.	5/8" x 6'	1100 lbs.
858-R	8 inch.	5/8" x 6'	1300 lbs.

567-Wrench-30 lbs. each

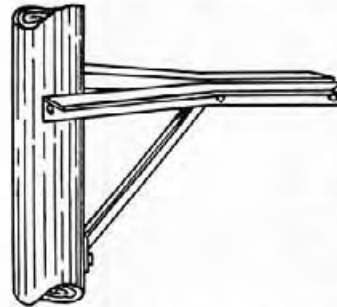
865-Ratchet Handle-17 lbs. each

Anchor Installing Tools



Cat. No.	DESCRIPTION	Weight Each
C-15	10-ft. Never-Creep Installing, Tamping Bar	9 lbs.
C-16	Wood-faced Maul	12 lbs.
C-610	Telescoping Auger, 5 3/8 to 7 3/4 inches	26 lbs.
C-812	Heavy Telescoping Auger, 8 to 12 3/4 inches	28 lbs.
C-177	Quick Catch, Telescoping Auger Handle (for other anchor installing tools, see Tools)	10 lbs.

Arms, Cable Extension



Used where it is necessary to extend cables from the pole. They are mounted at the top with one 5/8-inch through bolt. The "T" iron brace is fastened by 1/2 inch lag screws. Cables are attached by means of a short 5/8 inch machine bolt with a washer under the head. The bolt head and washer ride on

top of the angles with shank of the bolt between the two sides.

A three-bolt cable suspension clamp No. J-1096 is attached on the machine bolt under the arm in a flat position. When drawn tight the machine bolt clamps the entire assembly firmly together. Extension of the cable from the pole can be varied 8 1/2 inches with No. H-8920 and 18 inches with No. H-8921. Mounting bolts and nuts are not included.

Cat. No.	Extension from Center of Pole	Angle Size	Weight per 100
H-8920	26 inches	3x2 1/2 x 1/4 in.	3050 lbs.
H-8921	44 1/2 inches	3 1/2 x 2 1/2 x 5/16 in.	6050 lbs.

Arresters, Reliable No. 977-AA Indoor

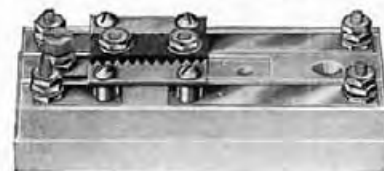


Self-cleaning, sawtooth air gap arrester for indoor use. Consists of low-absorption porcelain base, phosphor-bronze springs, heavy binding posts with treated studs, brass screw cover over two No. P-495 sawtooth discharge blocks and two No. P-197 carbons.

Mounting holes are 3/16 inch for No. 10 flat head wood screws.

Cat. No.	Size	Weight Each
977-AA	3 1/2 x 2 1/2 x 2 1/4 inches	1 lb.

Arresters, Reliable No. 975-B Indoor



Self-cleaning sawtooth air gap arrester for indoor use. Consists of porcelain base and two adjustable sawtooth metal discharge plates spaced .004 in. from a carbon ground. All-over metal cover is available when specified.

Mounting holes are 3/16 inch for No. 10 round head wood screws.

Cat. No.	Description	Size	Weight Each
975-B	Less Cover	5x2x1 1/2 ins.	1 1/4 lbs.
975-B	With Cover	5x2x1 1/2 ins.	1 lb.

Arrester, Cook No. 1 Outdoor



A weatherproof arrester for mounting on a cross arm to drain static or high potentials from aerial circuits, or on the outside of a subscriber's building as a sub-station lightning arrester.

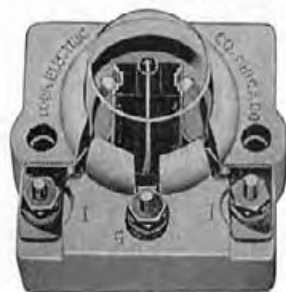
Base and back is a single piece of heavy glazed porcelain, so made that surface leakage is eliminated. Hood, bolts, nuts and washers and hood guide are of Everdur. Arrester springs are of phosphor bronze. Bracket is of steel,

galvanized. Two No. 4500 True Gap Dischargers and two No. 2080 carbons are standard.

Mounting bracket has 17/64-inch holes for No. 12, 1-inch RHI galvanized wood screws.

Cat. No.	Description	Size	Weight Each
501-7800	No. 1 Arrester	3 1/2 x 2 1/2 x 2 1/2 in.	3/4 lbs.

Arrester, Cook No. 2 Indoor



An indoor arrester, consisting of a solid piece of glazed porcelain fitted with Everdur binding posts, nuts, washers and phosphor bronze springs.

Lightning arresters are two No. 4500 non-grounding True Gap Dischargers and two No. 2080 ground carbons, set in a recess and covered with a ventilated metal cap.

Mounting holes are 7/32-inch for No. 8, 1 1/8-inch RHI galvanized wood screws.

Cat. No.	Description	Size	Weight Each
244-1606	No. 2 Arrester	3 x 2 3/4 x 2 inches	1/2 lb.

Arrester, Cook No. 7 Outdoor



10-Wire Capacity
Mounted on a pole or cross arm, this arrester will shunt to ground high potentials induced on open leads. Provides protection to cable from exposed drops connected to unprotected terminals.

When installed on open leads near their connection to a protected pole cable terminal, the No. 7 Lightning Arrester prevents excessive fuse operation.

Base and mounting bracket is a single piece of heavy steel, hot galvanized. Tight-fitting hood is of zinc. Springs are of heavy phosphor bronze. Studs are of Everdur metal.

Equipped with ten No. 4500 non-grounding True Gap Dischargers and ten No. 2080 carbons.

Mounting bracket has 11/32-inch holes for 5/16 x 2-inch galvanized lag screws.

Cat. No.	Description	Size	Weight Each
371-2200	No. 7 Arrester	7 1/2 x 2 x 5 inches	3 lbs.

Arrester, Cook Type O Sub-Station



Single circuit protectors, made for both indoor and outdoor use. The body of the arrester is a single piece of heavy white glazed porcelain, designed and made to prevent surface leakage. Fuse and arrester clips are of phosphor bronze securely fastened to the porcelain by Everdur metal bolts.

The non-corrosive Everdur hood fits tightly to the sides and bottom of the porcelain. The hood is grounded through a strong Everdur hood guide. Line connections are on one side of the porcelain and instrument

and ground connections are on the other side. All connections are terminated under hexagon Everdur nuts.

To simplify installation, the heavy hot galvanized bracket is split so the protector slides into place after bracket is mounted.

Equipped with two No. 4500 non-grounding True Gap Dischargers and two No. 2080 carbons mounted on a copper ground strip. The type "O" protector is made for various types and lengths of fuses, as listed below. Fuses are 5 amperes and blow at rating. When specified, fuses of higher or lower rating will be furnished.

Mounting bracket has 17/64-inch holes for No. 12, 1-inch RHI galvanized wood screws.

Cat. No.	Type	Fuses	Size	Weight Each
472-1582	O-7	A-7 wood	6 1/4 x 2 1/4 x 1 3/4 in.	2 lbs.
473-1583	O-9	A-9 comp.	6 1/4 x 2 1/4 x 1 3/4 in.	2 lbs.
471-1581	O-12	A-12 comp.	4 1/2 x 2 1/4 x 1 3/4 in.	1 1/2 lbs.
474-1584	O-16	A-16 wood	6 1/4 x 2 1/2 x 1 3/4 in.	2 lbs.
481-1585	O-44	A-44 wood	4 1/2 x 2 1/4 x 1 3/4 in.	1 1/2 lbs.
475-1586	O-52	A-52 fibre	6 1/4 x 2 1/4 x 1 3/4 in.	2 lbs.
493-1564	O-64	A-64 fibre	6 1/4 x 2 1/4 x 1 3/4 in.	2 lbs.

Arrester, Type R Sub-Station



The type R sub-station arrester mounting is available for two applications: the type RO for outside mounting on post, wall, etc., is equipped with bracket and heavy zinc weatherproof hood and the type RI (without hood) is for inside mounting. The type R is furnished with a heavy steel bracket.

Type R arrester mountings are equipped with heavy studs for connecting drop wires and ground. All structural parts of

both the hood and bracket of the type RO are grounded. The type R uses type H arrester mounts.

Cat. No.	Type	Height	Width	Depth	Shipping Weight
516-1	RO (outdoor)	7 ins.	2 1/2 ins.	3 ins.	3 lbs.
516-10	RI (indoor)	6 ins.	2 ins.	3 ins.	1 lb.

Arresters, Reliable No. 222 Outdoor



The No. 222, ten-wire cross arm arrester drains static from exposed lines. It is very sensitive and is used in connection with unprotected cable terminals where open wire or drop wire leads are too long to be left unprotected. It is also of outstanding value when placed one to three poles from a protected terminal. In

locations where static is very troublesome, cross arm arresters should be placed at frequent intervals.

Self-cleaning, sawtooth discharge blocks give protection without permanently grounding the line. Binding posts are treated to prevent the deposit of copper salts which cause surface leakage. Special low-absorption porcelain and phosphor bronze clips and springs are used. The metal body and cover are ruggedly constructed.

Equipped with ten P-495 self-cleaning sawtooth discharge blocks and ten P-663 carbons.

Mounting bracket has 5/16 inch holes for lag screws.

Cat. No.	Size	Weight Each
222	8 1/4 x 2 3/8 x 4 1/2 inches	4 lbs.

Arresters, Reliable No. 402-RR Outdoor

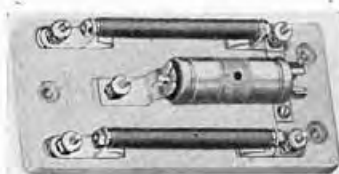


Weatherproof, self-cleaning sawtooth air gap arrester for outdoor use, used to discharge static at the telephone station or to drain exposed lines. Consists of metal cover and mounting bracket, porcelain base, two No. P-495 self-cleaning sawtooth discharge blocks and two No. P-1384 carbons.

Mounting bracket has two 3/16 inch holes for No. 10 round head wood screws.

Cat. No.	Height Over-all	Weight Each
402-RR	8 1/2 inches	2 lbs.

Arresters, Brach Vacuum



The Type 440 Arrester is equipped with a triple path cartridge and by bringing the two-line wires into the same vacuum chamber as the ground connection, the maximum

degree of protection is secured.

In addition, the three electrodes in one tube relieves either side of the line when subjected to abnormal conditions.

In addition to the vacuum cartridge, this arrester is equipped with regulation telephone type fuses.

Cat. No.	Description	Size, Inches	Weight
440	Arrester Complete	7 x 3 1/4 x 2 1/2	2 lbs.
53	Fuse Only		5 oz.
	Cartridge only		8 oz.
	Base only		1 1/2 lbs.

Arresters, VAC-M

VAC-M Arresters consist of a base on which are mounted electrodes in a vacuum tube. Uninterrupted service is assured with protection from static and sneak currents.



NO. 3-B VAC-M ARRESTER

Designed for metallic or two line circuit protection for lines that must remain closed at all times.

The arrester unit consists of a cylinder shaped glass tube, in which are three electrodes, the center one for the ground connection and the other two for the line connections. These electrodes are mounted on porcelain discs, supported on glass stems sealed into the tube and containing lead-in wires. The base of the arrester is porcelain with brass binding posts and phosphor bronze clips to hold the removable arrester unit and form the electrical contacts. Mounted with 1 1/2 inch flat head wood screws.

Size, 5 3/4 x 2 1/4 x 2 inches. Shipping weight each, 1 1/4 lbs.

NO. 4 VAC-M ARRESTER

Designed for grounded or single line circuit protection for lines that must remain closed at all times.

Same as No. 3-B except that there are two electrodes in the tube, one for grounded connection and the other for the line connections.

Size, 5 3/4 x 2 1/4 x 1 1/4 inches. Shipping weight, 3/4 lb.

Attachments, Guy



For attaching guys to poles. Rounded, 3/4 inch strand bearing surface eliminates need for wire rope thimble and prevents injury to strand. Will take strand up to 1/2 inch diameter.

Eye extends at 45° angle from pole. Has 9/16 and 11/16 inch holes for mounting with 5/8 inch through bolt and 1/2 inch lag. Also used with bolt and thimble nut on guy stub.

Cat. No.	Size	Std. Pkg.	Weight per 100
J-6505	2 x 1/4 in.	50	210 lbs.

Axes, Single Bit



Fine tool steel black finished bit, cutting edge honed. With bent or straight handles. If not specified axes will be furnished with bent handles. Available handled or unhandled.

Cat. No.	Description	Length	Width of Bit	Weight Each
3	Dayton Pattern	36 in.	4 1/2 in.	3 lbs.
3 1/2	Dayton Pattern	36 in.	4 1/2 in.	3 1/2 lbs.

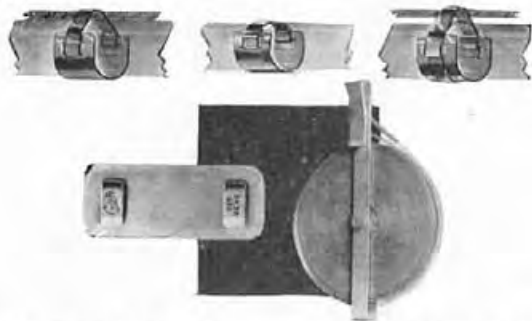
Bandages, Rubber

Rubber joint bandages are used to cover wire or cable joints. The end is held closed with friction tape. Furnished in rolls 3 or 4 inches wide and 14 feet long. Thickness is 1/32 inch.

Cat. No.	Size	Weight per Roll
S-414	4 in. x 14 ft.	12 oz.
S-314	3 in x 14 ft.	12 oz.

Bands, Cable

Consists of two parts, the 1 1/2 inch wide pad and the 1/2 inch wide supporting strap which is supplied in 100-foot coils. The coil is carried by the lineman on a belt reel. Both are made of zinc.

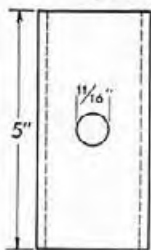
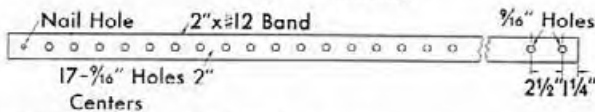


CABLE PROTECTOR PAD

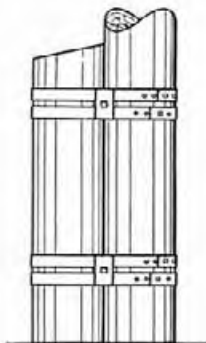
SUPPORTING STRAP

Length of Pad	Weight per 100	Length per Coil	Weight per Coil
2 in.	21 lbs.	100 ft.	5 lbs.
2 1/2 in.	26 lbs.		
3 in.	30 lbs.		
4 1/2 in.	45 lbs.		
6 in.	60 lbs.		

Bands, Stubbing



Stubbing bands are installed by nailing the end to the pole, wrapping the band around the pole and stub, and fastening the other end by a 1/2 inch lag screw through



one of the end holes and one of the other holes. The assembly is drawn up tightly by means of a 3/8 inch through bolt and the pipe spacers.

Four pipe spacers and four bands are required for an assembly. Specify bolts separately.

Cat. No.	Description	Length	Weight per 100
J-4850	Stubbing Band	68 1/2 in.	430 lbs.
J-4851	Stubbing Band	89 1/2 in.	455 lbs.

Cat. No.	Description	Weight per 100
J-4852	Pipe Spacer	215 lbs.

Bars, Digging



Double beveled 2-inch cutting blade at one end.

Cat. No.	Description	Size	Std. Bundle	Weight Each
1084	Octagon	1 1/8 in. x 7 ft.	2	26 lbs.
T-414-1085	Octagon	1 1/8 in. x 8 ft.	2	30 lbs.
T-413-1084	Round	1 1/8 in. x 8 ft.	2	28 lbs.

Bar, Electric Digging, Spud and Tamper



Steel tubing with malleable iron tamping shoe and forged crucible steel blade 3 1/2 inches wide. This tool is well balanced and the broad blade makes digging easy. A very serviceable tool for general use. Painted black.

Cat. No.	Diameter of Tubing	Length	Std. Bundle	Weight Each
T-415-852	1-5/16 i.t.	9 feet	2	21 lbs.

Bars, Octagon Tamping and Digging



Double beveled 2-inch cutting blade at one end; fitted with heavy malleable iron tamping shoe at the other end.

Cat. No.	Size	Std. Bundle	Weight Each
T-408-1071	1 in. x 7 ft.	2	20 lbs.
T-409-1072	1 in. x 8 ft.	2	25 lbs.
T-411-1074	1 1/8 in. x 7 ft.	2	25 lbs.
T-412-1075	1 1/8 in. x 8 ft.	2	30 lbs.

Bars, Octagon Crow and Digging



Double beveled 2-inch cutting blade at one end; pointed at the other.

Cat. No.	Size	Std. Bundle	Weight Each
T-401-1061	1 in. x 7 ft.	2	20 lbs.
T-402-1062	1 in. x 8 ft.	2	25 lbs.
T-404-1064	1 1/8 in. x 7 ft.	2	25 lbs.
T-405-1065	1 1/8 in. x 8 ft.	2	28 lbs.
T-406-1066	1 1/4 in. x 8 ft.	2	31 lbs.

Bars, Heavy Shoe Tamping



Selected maple handle, 1 5/8 inches in diameter, tapered at lower end. Fitted with heavy steel shoe 1/2 x 1 1/4 inches. Size of tamping face is 1 1/4 x 3 1/2 inches. Securely riveted to handle. Tamping end dipped in creosote to prevent decay. Handles smoothly sand finished.

Cat. No.	Diameter of Handle	Length	Std. Bundle	Weight Each
T-419-1054	1 5/8 in.	7 ft.	2	11 lbs.
T-420-1055	1 5/8 in.	8 ft.	2	12 lbs.
1056	1 5/8 in.	9 ft.	2	17 lbs.

Bars, A. T. & T. Pattern Tamping



Selected maple handles, 1 5/8 inches in diameter, tapered at lower end, fitted with extra heavy one-piece shoe, made of 1 1/4 inch square steel. Rivets passing through the handle and shoe with heads countersunk, hold the shoe firmly in place. An extremely high-grade tamper. Tamping end dipped in creosote to prevent decay. Handles smoothly sand finished.

Cat. No.	Diameter of Handle	Length	Std. Bundle	Weight Each
T-421	1 5/8 in.	7 ft.	2	12 lbs.
T-422	1 5/8 in.	8 ft.	2	13 lbs.

Bars, Light Shoe Tamping



Selected maple handle, 2 inches in diameter, tapered at lower end, fitted with steel shoe 1 3/4 x 1 1/4 inches securely riveted to handle. Tamping end dipped with creosote to prevent decay. Handles smoothly sand finished.

Cat. No.	Length	Std. Bundle	Weight Each
T-417-854	7 ft.	2	10 lbs.
T-418-855	8 ft.	2	11 lbs.
856	9 ft.	2	16 lbs.

Bar, Electric Tamping



Steel tubing with iron tamping shoes. Painted black.

Cat. No.	Length	Std. Bundle	Weight Each
T-416	7 1/2 ft.	2	18 lbs.

Maple Tamping Bar or Slick Handles Only

Cat. No.	Handle	Std. Bundle	Weight Each
T-425-1002	7 ft. for No. 417 Tamper	6	7 lbs.
T-426-1003	8 ft. for No. 418 Tamper	6	8 lbs.
1003-A	9 ft. for No. 856 Tamper	6	9 lbs.
T-427-2002	7 ft. for No. 419 Tamper	6	6 lbs.
T-428-2003	8 ft. for No. 420 Tamper	6	7 lbs.
2003-A	9 ft. for No. 1056 Tamper	6	6 lbs.
T-429	7 ft. for No. 421 Tamper	6	6 lbs.
T-430	8 ft. for No. 422 Tamper	6	7 lbs.
T-431	7 ft. for No. 423 Slick	6	7 lbs.
T-432-1001	8 ft. for No. 424 Slick	6	8 lbs.

Bars, Slick or Loy Digging



Select maple handles, 2 inches in diameter, tapered at lower end; fitted with extra heavy tool steel blades 4 inches by 1/2-inch.

Cat. No.	Diameter of Handle	Length	Std. Bundle	Weight Each
T-423	2 in.	7 feet	2	16 lbs.
T-424-853	2 in.	8 feet	2	18 lbs.

Bars, Wrecking



Octagon steel, black finish. Strong gooseneck pattern with slot for pulling nails. Back of the claw is flat for ripping purposes.

Cat. No.	Length	Diameter	Weight per Doz.
12	12 in.	1/2 in.	9 lbs.
18	18 in.	5/8 in.	22 lbs.
24	24 in.	3/4 in.	42 lbs.
30	30 in.	3/4 in.	51 lbs.
36	36 in.	7/8 in.	81 lbs.

Batteries, Air Cell



Eveready, air depolarized, constant voltage, primary batteries are specially made as a source of power for telephone operators' transmitters. They are designed for long life with constant voltage for sustained high quality transmission. There are two sizes, T-2600 and T-1600.

Two No. T-2600 batteries, connected in series, provide current at never over 5 volts and never below 4 volts. One No. T-2600 battery and one No. T-1600 battery, connected in series, will furnish current at never over 3.75 volts and never below 3 volts.

Their capacity is conservatively rated at 600 ampere-hours and when installed in modern switchboards drawing approximately 100 milliamperes they will supply 6000 talking hours of peak transmission.

These batteries use a liquid electrolyte but are shipped dry. In the dry state they undergo no depreciation. They can be activated for service by adding ordinary drinking water. The maximum load to which either battery should be subjected is 650 milliamperes.

Cat. No.	Voltage	Description	Size—Inches	Std. Pkg.	Weight Each
T-1600	1.25	air cell	5 1/4 x 6 5/8 x 1 1/4	1	13 lbs.
T-2600	2.5	air cell	9-15/16 x 6 5/8 x 1 1/4	1	24 lbs.

Batteries, Dry Cell



This is a medium, low current, long life battery, especially designed for telephone service.

Initial amperage is 18 to 22, 1 1/2 volts. Size is 2 5/8 x 6 5/8 inches. Fahnestock spring terminals are supplied unless screw connections are specified.

Cat. No.	Voltage	Description	Std. Pkg.	Weight Std. Pkg.
6-Gray Label	1 1/2	Round	25	58 lbs.

Batteries, General Utility



The Burgess Twin-Six is the electrical equivalent of two No. 6 cells. It is made of eight heavy duty cells connected in series parallel to give three volts. These eight cells have 12% more zinc area than two No. 6 cells. Supplies a higher working voltage through the service life of battery.

Cat. No.	Voltage	Size—Inches	Std. Pkg.	Weight Std. Pkg.
4F2H	3	5-5/16 x 3-13/16 x 2 5/8	8	22 lbs.

Batteries, No. 6 Telephone



Made with an internal protective coating which reduces shelf deterioration, making this battery especially serviceable in telephone work. Initial amperage is 18 to 22 amperes at 1 1/2 volts. Battery is 2 1/2 inches in diameter and 6 1/2 inches high. Furnished with spring clips unless screw terminals are specified.

Cat. No.	Voltage	Standard Package	Weight Std. Pkg.
6-Telephone	1 1/2	25	58 lbs.

Battery, Transmitter



Designed for use at operators' positions on telephone switchboards. Composed of a number of small, high efficiency cells connected in series parallel, to furnish 4 1/2 volts. Provided with long service capacity and a uniform voltage characteristic.

Cat. No.	Voltage	Size—Inches	Std. Pkg.	Weight Std. Pkg.
4945C	4 1/2	11 7/8 x 4 1/8 x 7	2	32 lbs.

Battery, Unit Type Telephone

This battery is manufactured by the Specialty Battery Company, a subsidiary of the Ray-O-Vac Company. Unit type plug in batteries No. 386C, 3 volts (the equivalent of two No. 6 cells) or No. 489C (the equivalent of three No. 6 cells) are housed in a single compact carton. These batteries are supplied in mailing cartons ready to be sent to the subscriber who then makes the change himself.

Cat. No.	Voltage	Size—Inches	Std. Pkg.	Weight Std. Pkg.
386C	3	3 7/8 x 2 5/8 x 5 3/8	10	27 lbs.
489C	4 1/2	3 7/8 x 3 7/8 x 5 3/8	10	43 lbs.

Beeswax Compound

Faultless A-1 Beeswax Compound is ideal for impregnating or boiling out cable forms, cores of wool or silk, and cotton cables to render them moisture resisting and prevent the insulation from fraying. Supplied in 1-lb. bars.

For Storage Batteries and other power equipment see Power in Apparatus Section.

Bells and Buzzers, Lungen Type



Sizes: 0 1 2 3



No. 13

Surface type—available in five sizes, varying in tone and volume to meet all conditions. Covers fit tightly making them bug and dust proof. They have phosphor bronze springs and double adjustment, pure, hard-drawn silver contacts. Standard finish is rustproof, polished chrome.

Standard voltage is 8-10 volts AC or 6-8 volts DC. Special voltages or resistances up to 48 volts are available—please specify exactly when ordering.

No. 15 Lungen Buzzers

Cat. No.	Size—Inches	Std. Pkg.	Weight Std. Pkg.
15-0	1 5/8 x 1 1/8	10	1 1/4 lbs.
15-1	2 1/8 x 1-5/16	10	2 1/2 lbs.
15-2	2-9/16 x 1 3/4	10	3 1/2 lbs.
15-3	3 x 2	10	5 lbs.

No. 13 Lungen Bells

Cat. No.	Size, Gong	Std. Pkg.	Weight Std. Pkg.
13-1	1 in.	10	1 7/8 lbs.
13-1 3/4	1 3/4 in.	10	2 1/2 lbs.
13-2 1/2	2 1/2 in.	10	5 lbs.
13-3	3 in.	10	7 lbs.

Bells and Buzzers, Marlo



These bells have pivoted armature and double lock spring tension adjustment. The mechanism is fully insulated from the frame. Cover encloses mechanism only—terminals are exposed. Standard finish of case and gong is black. These bells will operate on 6 to 8 volts, 60-cycle A.C. or 3 to 6 volts D.C.

Cat. No.	Type	Std. Pkg.	Shipping Wt. Std. Pkg.
571	2 1/2 in. Bell	10	6 3/4 lbs.
572	3 in. Bell	10	7 3/4 lbs.
573	4 in. Bell	10	9 3/4 lbs.
570	Buzzer	10	5 lbs.

DIRECTIONS TO ENSURE PROPER FIT OF LINEMEN'S BELTS

Linemen's belts are usually specified by waist or body size but to ensure comfort in use it is important that the "D" rings do not rest on the hip-bones of the wearer. The correct position of the "D" rings is about 1 inch in front of the hip-bone on either side.

To obtain correct body size of Klein's Tool Belts, measure around the back from hip-bone to hip-bone and add two inches to this distance. Then refer to table below and select the corresponding belt size. Sizes are in inches.

Distance Between "D" Rings	20	22	22	24	26	28
Belt Size	36	38	40	42	44	46

Belt, Klein No. 5202 Leather Tool



DROP FORGED DEE RINGS AND BUCKLE

Made of select first quality harness leather. The cushion, 2 1/4 in. wide, carries the "D" rings. The outer or loop layer is 1 1/2 inches wide formed into tool loops by riveting to the cushion. It also passes through the "D" rings.

The "D" rings and buckle are solid steel drop forgings, galvanized and tested to 1500 pounds. Surfaces taking the wear of the "D" rings are protected with copper safety liners riveted through the full thickness of belt. All rivets are solid copper set with burrs and sewing is with hot waxed linen thread, lock stitched.

Made in sizes 36, 38, 40, 42, 44 and 46 inches, other sizes to order (see table). Specify size on order.

Cat. No.	Type "D" Rings	Width	Weight per Doz.
5202	Standard, Double Bar	2 1/4 in.	32 lbs.

Belts, Klein No. 5204 Leather Tool



DROP FORGED DEE RINGS AND BUCKLE

Made of select first quality harness leather. The cushion, 3 1/2 in. wide, carries the "D" rings. The outer or loop layer is 1 1/2 in. wide formed into tool loops by riveting to the cushion. It also passes

through the "D" rings.

No. 5204-D.E. provides a leather pocket for pliers and a convenient snap for carrying knife. At the other end of the belt, a rawhide thong is attached with fibre crossbar for carrying tape.

Made in sizes 36, 38, 40, 42, 44, 46 and 48 inches, other sizes to order (see table). Specify size on order.

Cat. No.	Type "D" Rings	Width	Weight per Doz.
5204-D.E.	Standard	3 1/2 in.	38 lbs.
5204	Standard	3 1/2 in.	34 lbs.

Belt, Klein No. 5228 Leather Tool



A new pattern providing the ultimate in safety and comfort. The cushions, 4 1/2 inches wide at the center of back and tapered to 3 1/2 inches wide at the front, is made of one piece of soft, pliable, yet tough, russet latigo leather, doubled to form comfortable rolled edges.

A tool strap 1 3/4 inches wide with five loops in the 1 1/4 inch loop strap is carried on leather hangers from the 2-inch body strap to which it is looped at the ends. This arrangement keeps the tool loops from contracting when belt is buckled on and is also another comfort feature.

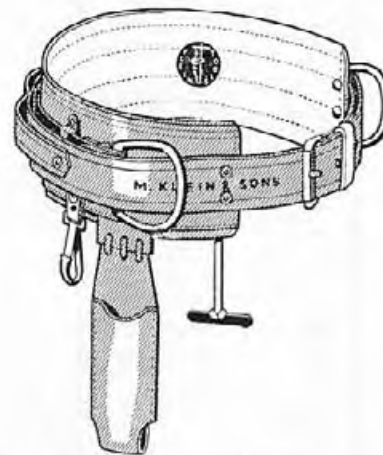
So constructed that no rivets come through to inside of belt, a safety insulation feature.

The "D" rings and buckle are solid steel drop forgings galvanized and tested to 1500 pounds. Fitted with leather plier pocket, knife snap and tape thong complete.

Made in sizes 36, 38, 40, 42, 44 and 46 inches, other sizes to order (see table). Specify size on order.

Cat. No.	Type "D" Rings	Width	Weight per Doz.
5228	Standard, Single Bar	4 1/2 in.	45 lbs.

Belt, Klein-Line Tool



The Klein-Line tool belt provides a maximum safety factor with comfort and convenience to the lineman.

A sliding trace of Klein-Kord (as used in safety straps) is mounted on the cushion and carries the drop-forged tested single bar "D" rings. The trace moves or slides freely through alloy steel guides, allowing a movement in either direction of approximately 6 inches.

By this means the lineman is relieved of the chafing experienced with conventional belts, and extra wear on the safety strap is prevented.

The two-inch wide belt strap is of heavy harness leather with drop-forged buckle. The one-inch wide harness leather tool loop strap is riveted to the main strap. Sewing is lock-stitched with hot waxed linen thread—rivets are solid copper hand set.

The cushion is 4 1/2 inches wide of pliable latigo leather with canvas interlining. The edges are rolled and smooth. Furnished complete with plier pocket, tape thong, and knife snap.

Cat. No.	Type "D" Rings	Width	Weight per Doz.
5229-S	Standard	4 1/2 in.	54 lbs.

Belt, Klein No. 5211 Leather Tool



First quality harness leather throughout. The inner or cushion layer, 3 in. wide, is narrowed at each end to carry the "D" rings. The body strap, 2 in. wide, is riveted and stitched to

the cushion and also passes through the "D" rings. Two tool straps are provided and formed into two tool loops at each side of the belt by riveting through the two layers of belt proper.

"D" rings and buckle are solid steel drop forgings, galvanized and tested to 1500 pounds. All rivets are solid copper, hand set with burrs. Sewing is with linen thread, hot waxed and lock stitched.

Made in lengths 36, 38, 40, 42, 44 and 46 inches, other sizes to order (see table). Specify size on order.

Cat. No.	Type "D" Rings	Width	Weight per Doz.
5211	Standard N.E.L.A. type	3 in.	34 lbs.

Binding Posts, Fahnestock

When ordering please specify catalog number and type desired.

NO. 3



Will take No. 10 B.&S. Wire. Length over-all, 1-1/16 inches. Width, 3/4 inch. Screw hole for No. 8 screw.

Catalog No.	Type
3	Brass
3	Bronze
3	Nickel Brass
3	Nickel Bronze

NO. 5



Will take No. 10 B.&S. Wire. Has projecting lug to which a wire can be soldered. Length over-all, not including soldering lug, 1-1/16 inches. Width, 3/8 inch. Screw hole for No. 8 screw.

Catalog No.	Type
5	Brass
5	Bronze
5	Nickel Brass
5	Nickel Bronze

NO. 9



Will take No. 10 B.&S. Wire. Length over-all, 2-1/16 inches. Width, 3/8 inch. Screw hole for No. 8 screw.

Catalog No.	Type
9	Brass
9	Bronze
9	Nickel Brass
9	Nickel Bronze

Bisector, Dillon



The Dillon Bisector is used to determine exact position at which telephone pole anchors should be placed. Handy, compact, the Bisector eliminates many hours of costly surveying time.

Made of stainless steel with etched scale showing pull feet, interior corner angle degrees, and resultant force (percent of load at dead end). Comes in leather pocket case. Size: 8 3/4 in. by 5/8 in. by 1 3/8 in. Weight: 14 oz.

Bits, 18-inch Cross Arm and Pole



Twist is 12 inches long and the over-all length is 18 inches.

Cat. No.	Diameter	Weight Dozen	Cat. No.	Diameter	Weight Dozen
56-6	3/8 in.	2 3/4 lbs.	56-10	5/8 in.	5 1/2 lbs.
56-7	7/16 in.	3 1/4 lbs.	56-11	1 1/16 in.	6 lbs.
56-8	1/2 in.	4 lbs.	56-12	3/4 in.	6 1/2 lbs.
56-9	9/16 in.	5 lbs.	56-14	7/8 in.	8 1/2 lbs.

Bits, 12-inch Cross Arm and Pole

Similar to No. 56 except 12 inches in over-all length and with 8-inch twist.

Cat. No.	Diameter	Weight Dozen	Cat. No.	Diameter	Weight Dozen
53-6	3/8 in.	2 1/4 lbs.	53-11	1 1/16 in.	4 1/4 lbs.
53-8	1/2 in.	3 lbs.	53-12	3/4 in.	4 3/4 lbs.
53-10	5/8 in.	3 3/4 lbs.	53-14	7/8 in.	5 1/2 lbs.

Bits, Expansive



Provides positive clearance of chips, permitting boring without interruption. Fits all standard makes of bit extensions.

Catalog Number	Cuts	Weight per Dozen
3	1/2 to 1 1/2 inches	3 3/8 lbs.
4	7/8 to 3 inches	7 1/2 lbs.
Extra Clamp for No. 3		1/8 lb.
Extra Clamp Screws for No. 3		1/8 lb.
Extra Clamp for No. 4		3/8 lb.
Extra Clamp Screws for No. 4		1/4 lb.

Bit Extensions



Will drive a bit from 5/8 to 1 inch in size. Positive lock prevents the loosening of the holding sleeve.

Cat. No.	Length	Weight Each
900-15	15 in.	1 lb.
900-18	18 in.	1 1/8 lbs.
900-24	24 in.	1 3/8 lbs.

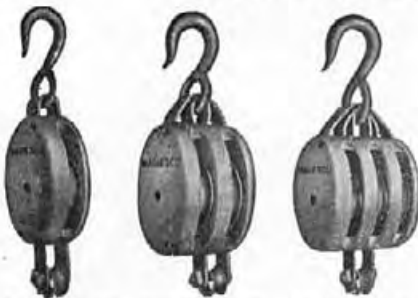
Bits, Single Spur Car



Entire tool is heat treated. Head is of single cutter type with one outlining spur which permits smooth boring and insures long life.

Diameter	12 inches		Twist Length 18 inches		24 inches	
	Cat. No.	Weight per Doz.	Cat. No.	Weight per Doz.	Cat. No.	Weight per Doz.
7/16 in.	57-7-12	6 3/4	-----	-----	-----	-----
8/16 in.	57-8-12	7 1/2	-----	-----	-----	-----
9/16 in.	57-9-12	8 5/8	57-9-18	10 3/8	57-9-24	12 3/8
10/16 in.	57-10-12	9 3/8	57-10-18	12	57-10-24	14 1/4
11/16 in.	57-11-12	10 1/2	57-11-18	13 1/2	57-11-24	16 1/2
12/16 in.	57-12-12	11 3/4	57-12-18	15 5/8	57-12-24	18 3/4
13/16 in.	57-13-12	12	57-13-18	16 1/2	57-13-24	20 1/4

Blocks, Wood Pulley FOR MANILA ROPE



Hard wood shells, steel strapped on the inside with iron sheaves, loose side hooks and becketts. Sheaves are furnished with iron roller bushings.

Cat. No.	Description	For Rope Size	Size Shell	Weight Each
1001-1/2-S	Single	1/2 in.	4 in.	1 1/4 lbs.
1001-1/2-D	Double	1/2 in.	4 in.	2 1/2 lbs.
1001-1/2-T	Triple	1/2 in.	4 in.	2 3/4 lbs.
1001-5/8-S	Single	5/8 in.	5 in.	2 1/4 lbs.
1001-5/8-D	Double	5/8 in.	5 in.	3 3/4 lbs.
1001-5/8-T	Triple	5/8 in.	5 in.	5 1/4 lbs.
1001-3/4-S	Single	5/8 or 3/4 in.	6 in.	3 1/2 lbs.
1001-3/4-D	Double	5/8 or 3/4 in.	6 in.	6 lbs.
1001-3/4-T	Triple	5/8 or 3/4 in.	6 in.	8 3/4 lbs.

Blocks, Steel Snatch FOR MANILA ROPE



Heavy steel shell with full length double steel straps, iron sheaves, steel heads and links and flat, stiff swivel hook. Rounded edges prevent chafing of rope. Sheaves are furnished with iron roller bushings, and blocks are black japanned.

Cat. No.	For Rope Size	Length of Shell	Weight Each
2706-3/4	3/4 in.	6 in.	5 3/4 lbs.
2706-7/8	7/8 in.	7 in.	7 lbs.
2706-1	1 in.	8 in.	12 1/4 lbs.
2706-1 1/4	1 1/4 in.	10 in.	21 1/2 lbs.

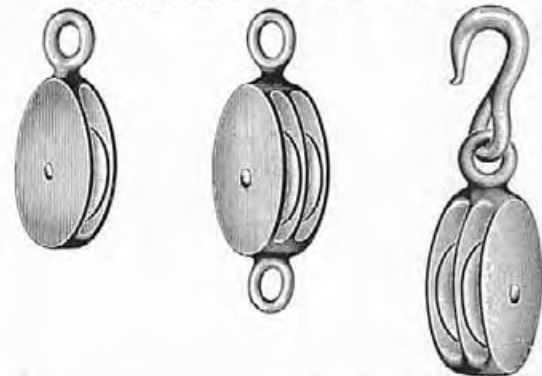
Blocks, Steel Pulley FOR MANILA ROPE



Shell is made of pressed steel with rounded edges to prevent chafing rope. Equipped with iron sheaves and round, loose side hook. Sheaves are furnished with iron roller bushings. Shell is black japanned.

Cat. No.	Description	For Rope Size	Size Shell	Weight Each
2001-1/2-S	Single	1/2 in.	4 in.	1 1/4 lbs.
2001-1/2-D	Double	1/2 in.	4 in.	2 lbs.
2001-1/2-T	Triple	1/2 in.	4 in.	2 1/2 lbs.
2001-5/8-S	Single	5/8 in.	5 in.	2 lbs.
2001-5/8-D	Double	5/8 in.	5 in.	3 lbs.
2001-5/8-T	Triple	5/8 in.	5 in.	4 1/4 lbs.
2001-3/4-S	Single	3/4 in.	6 in.	3 lbs.
2001-3/4-D	Double	3/4 in.	6 in.	5 1/4 lbs.
2001-3/4-T	Triple	3/4 in.	6 in.	6 3/4 lbs.

Blocks, Malleable Iron Pulley



Single or double sheave with single eye, double eye or hook.

Cat. No.	Description	Length of Shell Inches	For Rope Size Inches	Weight Each
932-5/16	Single Sheave, Single Eye	2	5/16	1/4 lb.
933-5/16	Double Sheave, Single Eye	2	5/16	3/8 lb.
932 3/8	Single Sheave, Single Eye	2 1/4	3/8	3/8 lb.
933 3/8	Double Sheave, Single Eye	2 1/4	3/8	5/8 lb.
932 1/2	Single Sheave, Single Eye	3	1/2	3/4 lb.
933 1/2	Double Sheave, Single Eye	3	1/2	1 1/4 lb.
935-5/16	Single Sheave, Double Eye	2	5/16	5/16 lb.
936-5/16	Double Sheave, Double Eye	2	5/16	7/16 lb.
935 3/8	Single Sheave, Double Eye	2 1/4	3/8	7/16 lb.
936 3/8	Double Sheave, Double Eye	2 1/4	3/8	5/8 lb.
935 1/2	Single Sheave, Double Eye	3	1/2	7/8 lb.
936 1/2	Double Sheave, Double Eye	3	1/2	1 1/4 lb.
937-5/16	Single Sheave, with Hook	1 3/8	5/16	3/8 lb.
938-5/16	Double Sheave, with Hook	1 3/8	5/16	7/16 lb.
937 3/8	Single Sheave, with Hook	1 1/2	3/8	7/16 lb.
938 3/8	Double Sheave, with Hook	1 1/2	3/8	3/4 lb.
937 1/2	Single Sheave, with Hook	2	1/2	1 lb.
938 1/2	Double Sheave, with Hook	2	1/2	1 1/2 lb.

Block Tackle, Klein Self-Locking



Especially for use with Klein Wire Grips. Consists of galvanized steel shell blocks, fitted with a detachable

snubbing hook to lock load in any position and 25 feet of 4-strand, 3/8 inch waterflex Manila rope and detachable hook. To lock the load, simply pull the luff rope under the hook. To release pull the rope. The blocks of No. 1802-30 are arranged with spring guard snap hooks and the blocks of No. H-1802-30 have guarded snaps.

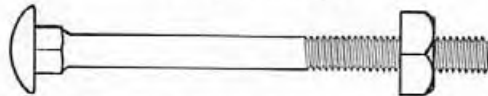
Cat. No.	Description	Weight Each
1802-30	Self-Locking Block Tackle	3 lbs.
H-1802-30	Self-Locking Block Tackle with Guarded Snaps	3 1/2 lbs.

Block Tackle, Klein Self-Lubricating, Heavy

Consists of two special double sheave blocks with wrought side plates, spring guarded snap hooks and drop forged eye. Pulleys are bronze bushed and self-lubricating. Shells are galvanized. 30 feet of four strand Manila rope is spliced to the eye of block with galvanized thimble.

Cat. No.	Description	Size Rope	Weight Each
1802-40	Heavy Block Tackle	1/2 in.	15 1/2 lbs.
1802-50	Heavy Block Tackle	3/8 in.	17 3/4 lbs.
1802-60	Heavy Block Tackle	3/4 in.	19 1/2 lbs.

Bolts, Carriage



Used for attaching braces to the cross arm. Rolled threads, square nuts. For correct length, order bolts 3/4 inch longer than the thickness of cross arm.

Cat. No.	Size	Thread Length	Std. Pkg. Quantity	Weight per 100
J-8633	3/8 x 3 in.	1 3/4 in.	500	13 lbs.
J-8633-1/2	3/8 x 3 1/2 in.	1 3/4 in.	500	14 1/2 lbs.
J-8634	3/8 x 4 in.	1 3/4 in.	500	16 lbs.
J-8634-1/2	3/8 x 4 1/2 in.	1 3/4 in.	500	17 1/8 lbs.
J-8635	3/8 x 5 in.	1 3/4 in.	500	18 1/2 lbs.
J-8635-1/2	3/8 x 5 1/2 in.	1 3/4 in.	500	19 1/2 lbs.
J-8644-1/2	1/2 x 4 1/2 in.	3 in.	250	33 1/2 lbs.
J-8645	1/2 x 5 in.	3 in.	250	35 5/8 lbs.
J-8646	1/2 x 6 in.	3 in.	250	40 lbs.

Bolts, Insulator Hook



An effective way to build long span telephone lines.

Cat. No.	Size Steel	Shank	Extension from Pole	Weight per 100
J-2581	5/8 in.	8 in.	6 1/4 in.	278 lbs.
J-2592	5/8 in.	10 in.	6 1/4 in.	298 lbs.

Bolts, Double Arming



Threaded full length—rolled threads. Furnished with four nuts. For correct length allow 1 1/4 to 1 1/2 inches for washers and nuts, add twice the thickness of cross arm plus diameter of the pole less depth of gains.

Cat. No.	Size	Std. Pkg. Quantity	Weight per 100
J-8842	1/2 x 12 inches	100	85 lbs.
J-8844	1/2 x 14 inches	100	94 lbs.
J-8846	1/2 x 16 inches	100	103 lbs.
J-8848	1/2 x 18 inches	100	112 lbs.
J-8862	5/8 x 12 inches	50	138 lbs.
J-8864	5/8 x 14 inches	50	154 lbs.
J-8866	5/8 x 16 inches	50	168 lbs.
J-8868	5/8 x 18 inches	50	183 lbs.

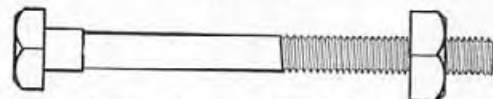
Bolt, Insulated Fork



Insulated Forks are made of open hearth steel, 1 1/2 inches wide by 1/4 inch thick. Used as span wire supports; provided with No. J-24 insulator. All bolts are 1/2 inch in diameter. No. J-24 Insulator is 1 7/8 inches in diameter and 1 7/8 inches high with 3/8 inch groove. From center of insulator pin to back of fork, 2 1/2 inches. Knobs must be purchased separately.

Cat. No.	Description	Weight per 100
J-79	Insulated Fork Only	130 lbs.

Bolts, Machine



Larger sizes of through or cross arm bolts are used for attaching cross arms to poles. Have rolled threads, square heads and nuts. To determine the correct length allow 3/4-inch for nut and washer, add the thickness of the crossarm to the pole diameter less depth of gain. Length is measured from inside of head to tip of bolt.

Cat. No.	Size	Thread Length	Std. Pkg. Quantity	Weight per 100
J-8603	3/8 x 3 in.	2 3/4 in.	500	12 1/2 lbs.
J-8603-1/2	3/8 x 3 1/2 in.	3 in.	500	14 1/4 lbs.
J-8604	3/8 x 4 in.	3 in.	500	15 1/2 lbs.
J-8604-1/2	3/8 x 4 1/2 in.	3 in.	500	17 lbs.
J-8605	3/8 x 5 in.	3 in.	500	18 1/8 lbs.
J-8605-1/2	3/8 x 5 1/2 in.	3 in.	500	19 1/4 lbs.
J-8606	3/8 x 6 in.	3 in.	500	20 1/2 lbs.
J-8704-1/2	1/2 x 4 1/2 in.	3 in.	250	33 1/4 lbs.
J-8705	1/2 x 5 in.	3 in.	250	33 1/2 lbs.
J-8706	1/2 x 6 in.	3 in.	250	40 lbs.
J-8712	1/2 x 12 in.	6 in.	100	69 lbs.
J-8808	5/8 x 8 in.	4 in.	100	82 lbs.
J-8810	5/8 x 10 in.	4 in.	50	98 lbs.
J-8812	5/8 x 12 in.	6 in.	50	112 lbs.
J-8814	5/8 x 14 in.	6 in.	50	129 lbs.

Bolts, Thimbleye

For attaching guys to poles. Eliminates strain plates, guy hooks, lags, nails and extra strand. Bolts 10 inches and shorter have 4 inches of thread; longer bolts have 6 inches of thread. All angle bolts are 45°. All 5/8 inch bolts have 9/16 eyes and 3/4 inch bolts have 11/16 inch eyes.

The shoulder type improved eyebolt for down guys is superior mechanically to the standard type. The shoulder prevents the curved portion being drawn into the pole and also prevents crushing the wood fibers. Eye will accommodate strand with a maximum diameter of 1/2 inch.

Bolts, Straight



Standard package is 50.

Cat. No.	Size Inches	Weight per 100	Cat. No.	Size Inches	Weight per 100
J-8049	5/8 x 6	112 lbs.	J-8060	3/4 x 8	174 lbs.
J-8050	5/8 x 8	131 lbs.	J-8061	3/4 x 10	198 lbs.
J-8051	5/8 x 10	148 lbs.	J-8062	3/4 x 12	223 lbs.
J-8052	5/8 x 12	165 lbs.	J-8063	3/4 x 14	247 lbs.
J-8053	5/8 x 14	183 lbs.	J-8064	3/4 x 16	272 lbs.
J-8054	5/8 x 16	200 lbs.	J-8065	3/4 x 18	296 lbs.
J-8055	5/8 x 18	218 lbs.	J-8066	3/4 x 20	332 lbs.

Bolts, Angle



Standard package is 50.

Cat. No.	Size Inches	Weight per 100	Cat. No.	Size Inches	Weight per 100
J-8149	5/8 x 6	116 lbs.	J-8159	3/4 x 6	154 lbs.
J-8150	5/8 x 8	135 lbs.	J-8160	3/4 x 8	180 lbs.
J-8151	5/8 x 10	152 lbs.	J-8161	3/4 x 10	204 lbs.
J-8152	5/8 x 12	169 lbs.	J-8162	3/4 x 12	229 lbs.
J-8153	5/8 x 14	187 lbs.	J-8163	3/4 x 14	253 lbs.
J-8154	5/8 x 16	204 lbs.	J-8164	3/4 x 16	278 lbs.
J-8155	5/8 x 18	222 lbs.	J-8165	3/4 x 18	302 lbs.

Guy assemblies can be made up on the ground and mounted on the pole afterward.

Bolts, Shoulder Type Straight



Cat. No.	Size	Std. Pkg.	Weight per 100
J-8406	5/8 x 6 inches	50	133 lbs.
J-8408	5/8 x 8 inches	50	152 lbs.
J-8410	5/8 x 10 inches	50	168 lbs.
J-8412	5/8 x 12 inches	50	185 lbs.
J-8414	5/8 x 14 inches	50	203 lbs.
J-8416	5/8 x 16 inches	50	220 lbs.
J-8418	5/8 x 18 inches	50	236 lbs.
J-8420	5/8 x 20 inches	50	253 lbs.

Bolts, Shoulder Type Angle



Cat. No.	Size	Std. Pkg.	Weight per 100
J-8006	5/8 x 6 inches	50	133 lbs.
J-8008	5/8 x 8 inches	50	152 lbs.
J-8010	5/8 x 10 inches	50	168 lbs.
J-8012	5/8 x 12 inches	50	185 lbs.
J-8014	5/8 x 14 inches	50	202 lbs.
J-8016	5/8 x 16 inches	50	219 lbs.
J-8018	5/8 x 18 inches	50	236 lbs.
J-8020	5/8 x 20 inches	50	252 lbs.

Lift plates for 5/8 inch standard thimbleye bolts have 11/16 inch holes and should be used on shoulder eyebolts where loads are excessive and guys are steep.

LIFT PLATES FOR ANGLE THIMBLEYE BOLTS

Mounted with 1/2 inch lag screws to increase load capacity of angle thimbleye bolts. All plates are 2 1/2 x 7 inches curved on a 3-inch radius. Plates for 5/8-inch eyebolts have 11/16-inch round holes; plates for 3/4-inch eyebolts have 1 x 13/16-inch oval holes. Packed in boxes of 100.



Cat. No.	Thickness	Weight per 100
J-7885	3/16 in.	94 lbs.
J-7886	1/4 in.	127 lbs.
J-7887	5/16 in.	145 lbs.



Cat. No.	Thickness	Weight per 100
J-7889	3/16 in.	94 lbs.
J-7890	1/4 in.	127 lbs.
J-7891	5/16 in.	145 lbs.



Cat. No.	Thickness	Weight per 100
J-7896	3/16 in.	94 lbs.
J-7897	1/4 in.	127 lbs.



Cat. No.	Thickness	Weight per 100
J-7893	3/16 in.	94 lbs.
J-7894	1/4 in.	127 lbs.

Bolts, Toggle



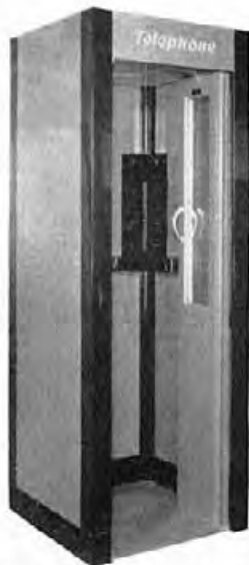
For making attachments to hollow tile, brick or lath walls. Made with two wings that engage a trunnion nut and a spring which forces the wings outward when the head has passed through the wall. One end of the spring is extended to prevent rotation of the head while turning in the screw. Furnished complete with round head bolt.

Additional sizes available on special order.

Diam. Inches	Length	Drill Holes	Spread of Wings	Std. Pkg.	Weight per 100
1/8	2 in.	1/4 in.	1-5/16 in.	100	2 lbs.
1/8	3 in.	1/4 in.	1-5/16 in.	100	3 lbs.
1/8	4 in.	1/4 in.	1-5/16 in.	100	3 1/4 lbs.
3/16	3 in.	3/8 in.	1-15/16 in.	100	3 3/4 lbs.
3/16	4 in.	3/8 in.	1-15/16 in.	100	4 1/2 lbs.
3/16	5 in.	3/8 in.	1-15/16 in.	100	5 1/8 lbs.

BOOTHS

Booths, Sherron Acoustic Metal



An all-metal square telephone booth of conservative modern design that can be assembled in single or multiple units. It is fireproof and practically indestructible. Walls are lined with sound insulating material to exclude outside noises. Booths are finished in high grade baked enamels and may be supplied in single colors or a combination of two colors to harmonize with surroundings.

The door is of the equal-leaf type and when in the open position does not extend beyond the space of the booth—operates smoothly and quietly in a stainless steel track. Handle is of hard aluminum alloy.

The light, with self-closing lens, is placed in the ceiling to give maximum illumination on the telephone

instrument. Adequate ventilation can be provided by a compact ventilating unit concealed between the ceiling and the roof. Both light and ventilator are controlled by a noiseless door switch. A rigid steel seat, covered with linoleum, can be provided which is readily installed or removed without drilling holes in floors or walls of booth.

The shelf and telephone instrument backboard are adjustable, without drilling or changing wiring, for either a standing or sitting position. Backboard is drilled with mounting holes for coin collector. Simple wiring instructions are furnished.

The steel floor of the booth is covered with linoleum and is provided with a stainless steel track at the entrance.

When ordering specify color and type of finish; ventilating unit, and seat. Shipped completely assembled or knocked down, if specified. The booth 83 3/4 in. high by 30 in. wide by 30 in. deep. Weight is 550 pounds.

Acousti-Booth

The Acousti-Booth is a radical departure from conventional booth design. It has patented, acoustic inner walls and ceiling which suppress outside noise, providing an "island of quiet" for the telephone user.

An outstanding feature of this booth is its open construction. No door is necessary on the Acousti-Booth and the bottom is left open. This permits ventilation by natural air currents and greatly simplifies the cleaning problem.

Models 210 and 211 Acousti-Booths



Model 210



Model 211

All-wood construction with walnut stain finish. Outside dimensions: 30 inches wide, 79 1/2 inches high, and 38 inches deep. Inside dimensions: 24 inches wide, 76 1/2 inches high, 35 inches deep. Shelf: 24 inches by 8 1/4 inches. Net weight 200 pounds. Shipping weight: 225 pounds.

Durable all-steel construction with black crackle finish. Outside dimensions: 31 inches wide, 79 1/4 inches high, and 38 1/2 inches deep. Inside dimensions: 24 inches wide, 76 1/2 inches high, and 35 inches deep. Shelf: 24 inches by 8 1/4 inches. Net weight 350 pounds. Shipping weight 410 pounds.

Models 601 and 602 Acousti-Booths



Model 601



Model 602

A shelf-type booth of all-wood construction with walnut stain finish. Outside dimensions: 28 inches wide, 32 inches high, and 26 inches deep. Shelf: 23 1/4 inches wide by 17 inches deep. Net weight, 60 pounds. Shipping weight, 80 pounds.

A durable all-steel construction, shelf-type booth with black crackle finish. Outside dimensions: 28 inches wide, 32 inches high, and 26 inches deep. Shelf: 24 inches wide by 17 inches deep. Net weight 85 pounds. Shipping weight 120 pounds.

Booths, Series 100 Folding Door



The new series 100 Telephone Booth is the result of years of scientific research, experiments and improvement of existing models. It is made of selected, kiln dried lumber by skilled cabinet makers. Handsome as a fine piece of furniture, it harmonizes with its surroundings and attracts favorable attention. Being acoustically designed and automatically lighted and ventilated this booth affords privacy and perfect comfort to the user.

Standard equipment includes a silent electric ventilator and complete automatic lighting equipment—both operated by an automatic door switch. This booth is completely metal lined. No floor—glass in door only.

Shipped "knocked down" unless order specifies to be shipped "set up." Size over-all 84³/₄ in. high x 30¹/₂ in. wide by 30¹/₂ in. deep.

Cat. No.	Material	Finish	Shipping Weight
100-A	Oak	Light or medium oak	300 lbs.
100-B	Birch	Light or medium mahogany	300 lbs.

Booths, Wall Type

An attractive, inexpensive telephone booth installation. Supplied for one, two, three or more phones—each booth 20 inches wide. Glass partitions projecting on each side of the phone are 11¹/₂ inches wide—large enough to make phone conversations comparatively private.



A 12-inch shelf for directories is provided under the telephone shelf.

Natural finish, or if opaque finish is desired send in sample and it will be duplicated.

Cat. No.	Description	Height Overall Inches	Shelf Height to Top Inches	Width Each Unit Inches	Depth of Shelf Inches	Weight
1	1 Phone Teleshelf	34	20	20	11 ¹ / ₂	50 lbs.
2	2 Phone Teleshelf	34	20	20	11 ¹ / ₂	65 lbs.
3	3 Phone Teleshelf	34	20	20	11 ¹ / ₂	85 lbs.

Boxes, Battery

Used wherever dry cells are used. Inexpensive, saves batteries and stores them neatly and conveniently where they can be readily inspected.



These boxes are neat and attractive—made of heavy, pressed steel, finished in black crackle and lined throughout with heavy fibre which insulates the sides of the box and edges of the holes. A tight fitting cover is attached to the box by a nickel-plated chain. Holes are provided in the

top and bottom for leading in wires. May be mounted on a hook or nail in the wall.

Cat. No.	Capacity	Size	Weight Each
2	Two No. 6 Dry Cells	2 ³ / ₄ x 5 ¹ / ₂ x 7 ¹ / ₂ in.	1 ¹ / ₂ lbs.
3	Three No. 6 Dry Cells	2 ³ / ₄ x 8 ¹ / ₄ x 7 ¹ / ₂ in.	2 lbs.

Boxes, Reliable Building Terminal



Surface mounting terminal boxes for terminating and distributing lead covered cable. Can also be supplied for flush mounting.

Type E Box is equipped with Type E terminal strips.

Type L Box is the same as the Type E except that it is equipped with Type L terminal strips having twin screw binding posts with one soldering washer.

Type EC Building Boxes are exactly like the Type E with jumper rings and space at top and bottom of running jumper wires.

Cat. No.	Capacity	Height Inches	Width Inches	Depth Inches	Weight
E-11	11 pairs	10	6	4	7 lbs.
E-16	16 pairs	16	6	4	8 lbs.
E-22	22 pairs	12	12	4	10 lbs.
E-26	26 pairs	16	12	4	14 lbs.
E-32	32 pairs	16	12	4	15 lbs.
E-52	52 pairs	20	12	4	19 lbs.
E-104	104 pairs	40	12	4	34 lbs.
E-208	208 pairs	48	12	4	125 lbs.
L-11	11 pairs	12	12	4	9 lbs.
L-16	16 pairs	16	12	4	11 ¹ / ₂ lbs.
L-26	26 pairs	20	12	4	16 lbs.
L-52	52 pairs	40	12	4	20 lbs.
EC-52	52 pairs	24	12	4	16 lbs.
EC-104	104 pairs	48	24	4	105 lbs.
EC-208	208 pairs	48	24	4	125 lbs.

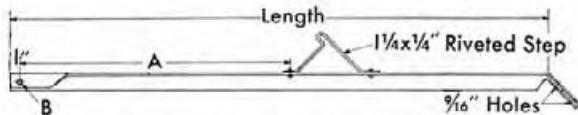
Brace, Guard Arm



Used for supporting guard arms at points on poles where a cable is suspended.

Cat. No.	Size of Steel	Hole Diameter Straight End	Bent End	Shpg. Wt. per 100
H-9240	18x1-7/32x ¹ / ₄ in.	7/16 in.	9/16 in.	170 lbs.

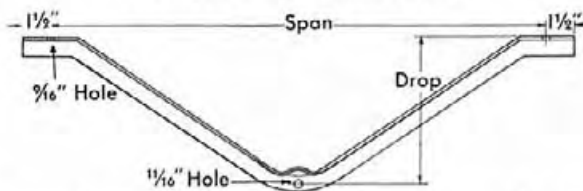
Braces, Alley Arm



Furnished with lineman's step. Punched with 9/16 inch holes for lag screws and machine bolts.

Cat. No.	Size Angle Inches	Length	A Inches	B Inches	Weight per 100
J-1521	1 1/2 x 1 1/2 x 3/16	5 ft.	30	9/16	1100 lbs.
J-1522	1 3/4 x 1 3/4 x 3/16	5 ft.	30	9/16	1300 lbs.
J-1523	1 1/2 x 1 1/2 x 3/16	6 ft.	30	9/16	1288 lbs.
J-1525	1 3/4 x 1 3/4 x 3/16	7 ft.	30	11/16	1788 lbs.
J-1526	2 x 2 x 1/4	10 ft.	30	11/16	3400 lbs.

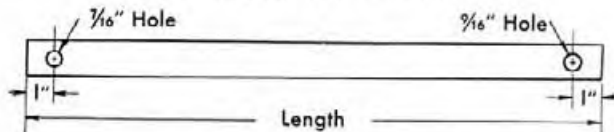
Braces, Angle Cross Arm



Fastened to the arm by 1/2 inch machine bolts at each end and to the pole by a 5/8 inch through bolt.

Cat. No.	Size of Angle Inches	Span Inches	Drop Inches	Std. Pkg.	Weight per 100
J-1505	1 1/2 x 1 1/2 x 3/16	37	12	5	720 lbs.
J-1506	1 1/2 x 1 1/2 x 3/16	42	12	5	795 lbs.
J-1507	1 1/2 x 1 1/2 x 3/16	48	14	5	882 lbs.
J-1514	1 1/2 x 1 1/2 x 3/16	48	18	5	976 lbs.
J-1508	1 1/2 x 1 1/2 x 3/16	60	18	5	1103 lbs.
J-1510	1 3/4 x 1 3/4 x 3/16	60	18	5	1300 lbs.
J-1511	1 3/4 x 1 3/4 x 3/16	66	20	5	1431 lbs.
J-1512	1 3/4 x 1 3/4 x 3/16	72	22	5	1546 lbs.
J-1513	2 x 2 x 3/16	72	22	5	1779 lbs.

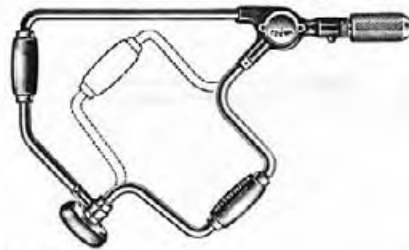
Braces, Flat Cross Arm



Braces are punched at one end with a 7/16 inch hole for 3/8 inch carriage bolt, and on the other end with a 9/16 inch hole for 1/2 inch lag screw.

Cat. No.	Length Inches	For Arms with Brace Bolt Spacing	Std. Pkg. Quan.	Weight per 100
J-7020	1-7/32 x 7/32 x 20	25	20	131 lbs.
J-7022	1-7/32 x 7/32 x 22	28	20	144 lbs.
J-7024	1-7/32 x 7/32 x 24	32	20	157 lbs.
J-7026	1-7/32 x 7/32 x 26	33	20	170 lbs.
J-7028	1-7/32 x 7/32 x 28	36-38	20	183 lbs.
J-7122	1 1/4 x 1 1/4 x 22	28	20	182 lbs.
J-7124	1 1/4 x 1 1/4 x 24	32	20	198 lbs.
J-7126	1 1/4 x 1 1/4 x 26	33	20	215 lbs.
J-7128	1 1/4 x 1 1/4 x 28	36-38	20	231 lbs.
J-7130	1 1/4 x 1 1/4 x 30	42	20	248 lbs.

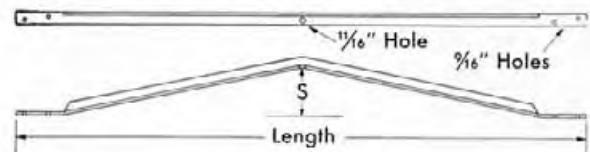
Brace, Corner



This corner brace is easy to operate because there is ample space between swivel and steadying handle to allow free use of the handle.

Cat. No.	Sweep	Length	Weight Each
502	10 in.	17 in.	1 1/2 lbs.

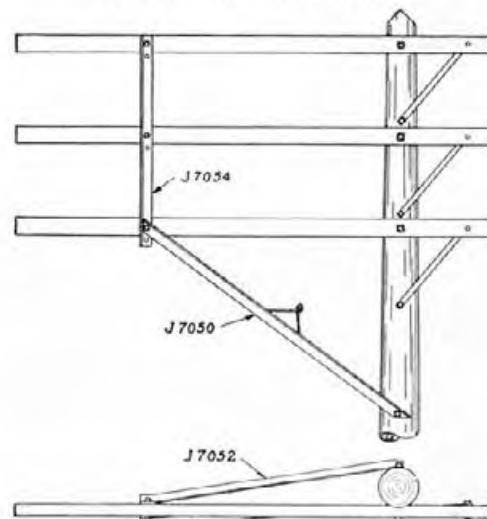
Braces, Cross Arm Back



Used for bracing cross arms at corners and terminal poles. Made of open hearth steel angle, punched with 11/16 inch center hole for 5/8 inch machine bolt and two 9/16 inch holes at each end for 1/2 inch carriage bolts.

Cat. No.	Length	S Inches	Size Angle Inches	Std. Pkg.	Weight per 100
J-6966	6 ft.	7	1 1/2 x 1 1/2 x 3/16	5	1060 lbs.
J-6967	7 ft. 10 in.	7	1 3/4 x 1 3/4 x 3/16	5	1660 lbs.
J-6969	9 ft. 1 in.	7	1 3/4 x 1 3/4 x 3/16	5	1825 lbs.

Braces, Extension Fixture



Used to clear buildings or trees without the use of high poles. A. T. & T. Standard.

Cat. No.	Description	Length Overall	Size Angle Inches	Size Holes Inches	Weight Per 100
J-7050	Diagonal	83 in.	2 x 2 x 3/16	9/16	1800 lbs.
J-7051	Back	54 1/2 in.	2 x 2 x 1/4	11/16 & 9/16	1450 lbs.
J-7052	Back	66-7/16 in.	2 x 2 x 1/4	11/16 & 9/16	1840 lbs.
J-7054	Vertical	30 3/8 in.	1 3/4 x 1 3/4 x 1/4	9/16	740 lbs.

Braces, Ratchet

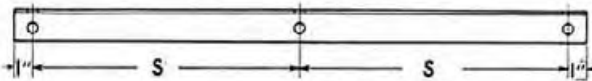


This Ratchet Brace is especially adapted for telephone work. The 10-inch sweep brace is most commonly used.

Cat. No.	Sweep	Wt. Each
7008	8 inches	3 lbs.
7010	10 inches	3½ lbs.

For bits and drills used with Braces see "Bit" and "Drill" headings in this section. For breast and straight type hand drills see "Drill" heading, this section.

Braces, Vertical



Used to clear buildings or trees by extending the load to one side of the pole, the angle iron vertical brace is used between cross arms in connection with alley arm brace. Designed to take care of 2, 3 or 4 arms. Punched with 9/16 inch holes for ½ inch machine bolts.

Cat. No.	Size Stock Inches	No. of Arms	S Spacing Arms	Weight per 100
J-1533	1½ x 1½ x 3/16	2	18 in.	260 lbs.
J-1534	1½ x 1½ x 3/16	3	18 in.	620 lbs.
J-1535	1½ x 1½ x 3/16	4	18 in.	840 lbs.
J-1536	1½ x 1½ x 3/16	2	24 in.	390 lbs.
J-1537	1½ x 1½ x 3/16	3	24 in.	720 lbs.
J-1538	1½ x 1½ x 3/16	4	24 in.	1160 lbs.

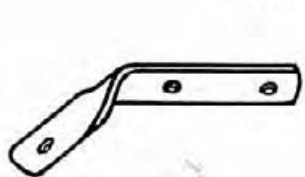
Brackets, Break



Used for dead ending and breaking communications system wires for a take off. Furnished complete with pins and a ½ x 6 inch machine bolt with clipped washer.

Cat. No.	Pin Spacing	Size Wood Cob	Pin Extension	Weight per 100
J-8281	6½ in.	1 in.	4¼ in.	447 lbs.

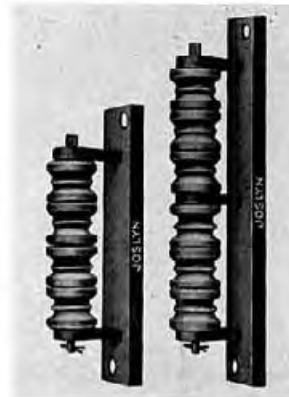
Brackets, Corner



There are two 9/32 inch mounting holes in the bracket. ¾ x 2¼-inch lag screws are recommended for mounting to wood buildings; ¾ x 2-inch Dryvin lead anchors for brick or masonry walls. See table below for bolts necessary to mount knobs.

Cat. No.	Size Steel	Length	Std. Pkg. Quantity	Weight per 100
J-2584	1¼ x ¼ in.	8 in.	25	55 lbs.
J-2585	1-7/32 x 7/32 in.	10¾ in.	25	108 lbs.

Brackets, Distributing



Knob racks are used for distributing twisted pair telephone wires. Stamped steel eyes are welded to 1¾ x 5/8-inch channel.

The J-72 two-groove knobs furnished with these racks are held in place by a ¾-inch bolt. A 9/16-inch hole is provided in each end for ½-inch lag screws. The extension from the pole to the center of the insulators is 2-7/16 ins.

Cat. No.	No. Knobs	Length Over All	Weight per 100
J-73	4	10 inches	288 lbs.
J-74	6	13 inches	395 lbs.
J-75	8	16 inches	496 lbs.

Brackets, Highway Cross-Over



Used to extend the height of a pole to carry drop wires across a road.

No. J-1207 consists of a 1½ x 1½ x ¼-inch steel angle 7½ feet long with six ¾-inch holes for mounting porcelain knobs and two 11/16 inch mounting holes for 5/8 inch bolts. Holes spread 10 inches apart.

No. M-781336 consists of a galvanized steel channel, 6½ feet long.

Cat. No.	Length	Weight per 100
J-1207	90 inches	1755 lbs.
M-781336	78 inches	921 lbs.

Bracket, Pressed Steel Pole



Will hold a load of 400 pounds on a dead end. Made of No. 9 gauge open hearth steel with 1-inch lead thread.

Cat. No.	Extension	Hole Size	Weight per 100
J-052	5 inches	11/16 in.	229 lbs.

For insulators for Break Brackets, and for Pressed Steel Pole Brackets, see "Insulator" heading in this section. For insulator pins see "Pins" heading, this section.

Brackets, House



Used with porcelain knobs for telephone service drops. Furnished less knobs and bolts. There are three 5/16-inch mounting holes in the bracket. No. 1 1/2 x 16 galvanized R.H. wood screws are recommended for mounting the bracket to wood frame buildings; 1/4 x 1-inch Dryvin lead anchors for brick or masonry walls. See table below for bolts necessary to mount knobs.

Cat. No.	Size Steel	Std. Pkg. Quan.	Weight per 100
J-1200	1 3/4 x 3/16 in.	200	57 lbs.

Brackets, Pole



Used with porcelain knobs for telephone service drops. Furnished less knobs and bolts. There are three 7/16-inch mounting holes in the bracket. 3/8 x 4-inch lag screws are recommended for mounting the bracket to pole. See table below for bolts necessary to mount knobs.

Cat. No.	Size Steel	Quan.	Weight per 100
J-1202	2 x 1/4 in.	125	92 lbs.

SIZE BOLTS FOR MOUNTING KNOBS TO HOUSE OR POLE BRACKETS

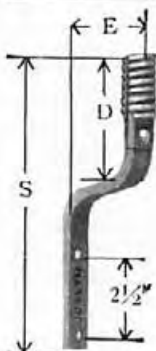
No. Knobs	Size Knob	Type of Bolt	Size Bolt
1	2-groove	Stove Bolt	5/16 x 2-inch
2	2-groove	Stove Bolt	5/16 x 3 1/2 inch
1	4-groove	Machine Bolt	3/8 x 3 inch
2	4-groove	Machine Bolt	3/8 x 5 1/2 inch

FLAT HEAD STOVE BOLTS

Used for fastening porcelain knobs and brackets. See table above.

Cat. No.	Size	Std. Pkg.	Wt. per 100
J-8232	5/16 x 2 in.	2000	6 1/2 lbs.
J-8233 1/2	5/16 x 3 1/2 in.	1000	8 1/2 lbs.
J-8243	3/8 x 3 in.	500	12 lbs.
J-8245 1/2	3/8 x 5 1/2 in.	500	18 lbs.

Brackets, Channel Pole



Channel Pole Brackets are furnished with 1-inch pressed steel threads.

No. J-11 is made of 3/4-inch channel and No. J-12 is made of 1-inch channel. No. J-11 extends 3 inches from the pole and No. 12 extends 3 1/2 inches.

They are fastened to the pole by means of lag screws.

Cat. No.	Length Over-all Inches	Drop "D" Inches	Channel Size Inches	Hole Size Inches	Weight per 100
J-11	9	4	3/4	5/16	70 lbs.
J-12	10	4 1/2	1	7/16	116 lbs.

Brackets, Side or Pole



Manufactured from oak thoroughly seasoned and dried, eliminating shrinkage after the brackets are installed. Threaded one inch in diameter, four threads to the inch, with 1/16-inch taper per inch of length. The length of the thread on all sizes is 2 1/4 inches. There are two 5/16-inch diameter holes for mounting with spikes.

The Kellogg Special and Giant Brackets are much stronger due to their short shank feature—furnished only by Kellogg.

All Brackets are furnished painted or unpainted except the Kellogg and Western Union sizes which are furnished unpainted only. Creosoted and paraffined Brackets are also available.

Cat. No.	Size Inches	Number per Bundle	Weight per 100
J-2550-4	1 1/2 x 2 x 10	25	600 lbs.
J-2553-L.D.	1 5/8 x 2 x 12	25	800 lbs.
J-2555-W.U.	2 x 2 3/8 x 12	20	1000 lbs.
J-2557-New. W.U.	2 x 2 3/4 x 12	20	1150 lbs.
2560-Kellogg Spcl.	1 1/2 x 2 x 10	25	600 lbs.
2561-Kellogg Giant	2 x 2 3/8 x 12	25	1000 lbs.

Bracket, "Farmyard" Service



Used for dead ending and drops. Can be used equally well on poles or buildings. Furnished complete with insulator which is held in place permanently with a spun copper rivet.

Bracket is mounted with a 3/8-inch carriage or machine bolt or two 1/4-inch lag screws.

Dead end strength, 1800 pounds.

Cat. No.	Insulator No.	Weight per 100
J-111	J-100	125 lbs.

Brackets, Span



Fastens to the strand and is used to take off service drops between poles. Consists of a No. J-1095 suspension clamp fastened with a bolt to a spreader strap. Has two 13/32-inch holes for mounting knobs.

Cat. No.	Description	Weight per 100
J-7910	Span Bracket	139 lbs.

Brackets, Swinging



Used for service drops—will readily adapt itself to any angle. Furnished complete with insulator which is held by a 3/8-inch pin and cotter pin in the 3/16 x 3/4-inch bale. Bale swings freely in the clevis which is made of 1 3/4-inch x No. 11 gauge steel. Clevis part is fastened by the nut of the pole bolt.

Cat. No.	Insulator No.	Type of Insulator	Weight per 100
J-1626	J-100	Dry Process	119 lbs.
J-1624	J-150	Wet Process	119 lbs.

Brackets, Transposition, Single Point Type



Nos. 450 and 451 Brackets are made of 1 1/4 x 5/16-inch steel and are provided with a 3/8-inch round hole for a 2-inch No. 14 R.H. galvanized wood screw used to prevent the bracket from pulling to one side on the arm. The bracket is clamped on the arm by a carriage bolt and all brackets have holes for Cat. No. 1193 1/2-inch Western Union Steel Insulator. Furnished less pins, screws, insulators and bolts.

Cat. No.	For Arm Size	Carriage Bolt Size	Std. Pkg.	Weight per 100
J-450	3 1/4 x 4 1/4 in.	3/8 x 4 1/2 in.	10	240 lbs.
J-451	2 3/4 x 3 3/4 in.	3/8 x 4 in.	10	220 lbs.

Brackets, W.U., Single Ckt. Type Trans.

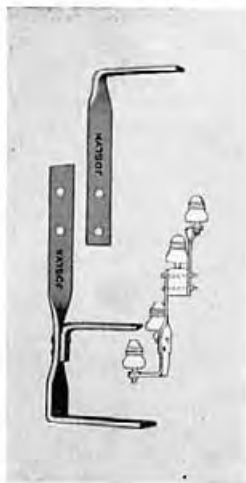


Provided with a 3/8-inch hole for a 2-inch No. 14 R.H. galvanized wood screw used to prevent the bracket from pulling to one side on the arm.

Furnished complete with wood cob and 3/8 x 4-inch carriage bolt.

Cat. No.	For Arm Size	Weight per 100
J-8269	2 3/4 x 3 3/4 in.	280 lbs.
J-8270	3 x 4 1/4 in.	288 lbs.
J-8272	3 1/4 x 4 1/4 in.	292 lbs.

Bracket, Transposition, Four Point Type



Made of 1 1/2 x 3/8-inch steel and is used for 4-wire transpositions. Fastened to the arm by two 1/2 x 5-inch machine bolts, spaced 2 3/8 inches apart, and has holes for Cat. No. 1193—1/2-inch Western Union Steel Pins shown under "Pins" in this section. Furnished in two parts as shown less pins, insulators and bolts.

Cat. No.	For Arm Size, Inches	Std. Pkg.	Weight per 100
J-8275	3 1/4 x 4 1/4	5	680 lbs.

Bracket, Wall



Made of pressed steel and furnished with one-inch pressed steel threads. 11/32-inch mounting holes.

Cat. No.	Description	Std. Pkg. Quan.	Weight per 100
J-5	Wall Bracket	100	100 lbs.

Bracket, Transposition, W.U. Phantom Ckt. Type

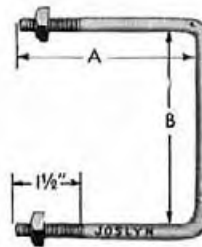


No. J-8271 is standard with the Western Union Telegraph Co.

Furnished complete with wood cobs and two 1/2 x 4-inch galvanized machine bolts with clipped washers.

Cat. No.	Machine Bolt Size	Weight per 100
J-8271	1/2 x 4 inches	810 lbs.

U-Bolts for Brackets

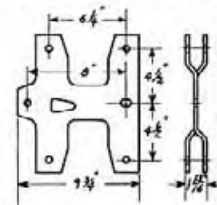


The thread size of Nos. J-0300 and J-0301 is 5/16-inch and of Nos. J-0306 and J-0302 is 3/8-inch.

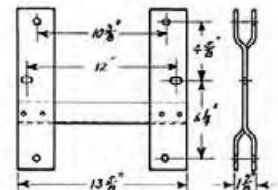
Furnished complete with two square nuts.

Cat. No.	Diameter Steel, In.	For Arm Size, In.	Weight per 100
J-0300	5/16	2 3/4 x 3 3/4	29 lbs.
J-0301	5/16	3 1/4 x 4 1/4	33 lbs.
J-0306	3/8	2 3/4 x 3 3/4	41 lbs.
J-0302	3/8	3 1/4 x 4 1/4	46 lbs.

Brackets, One-Piece Type Transposition Break



No. H-9286

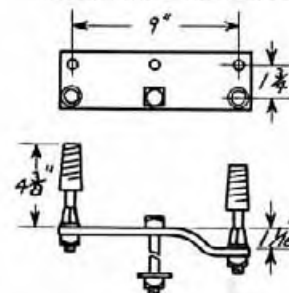


No. H-9287

Furnished in two sizes. As illustrated, diagonally opposite ends are offset so that proper clearance is obtained for transposing the wires. Furnished less pins and mounting bolts.

Cat. No.	Type	Size Steel	Size Mt. Holes	Size Pin Holes	Weight per 100
H-9286	Double	5/16"	11/16 x 1"	11/16"	660 lbs.
H-9287	Riveted	3/8"	11/16 x 7/8"	11/16"	1100 lbs.

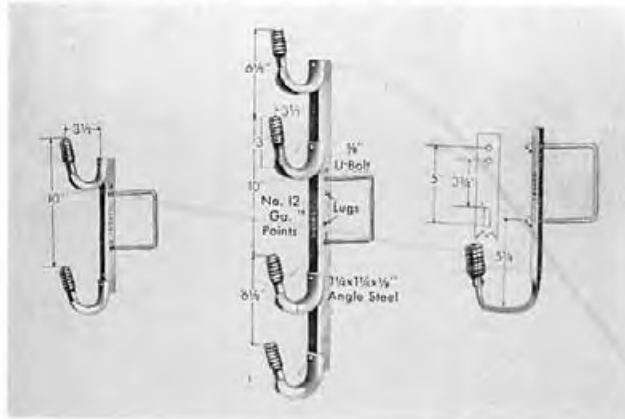
Bracket, Two-Piece Type Transposition Break



Two No. H-9285 are needed for a transposition. Furnished complete with forged steel pins and one 5/8 x 6 1/2-inch machine bolt with washer. Mounting holes are 11/16-inch.

Cat. No.	Diameter Pin Holes	Wt. per 100
H-9285	11/16 in.	470 lbs.

Brackets, U-Bolt Type Transposition



No. J-20 No. J-21 No. J-18

These brackets have pressed steel threads for insulators with 1-inch pin holes. No. J-18 is 3/4 x 3/8 x 1/8-inch channel, used for light work and No. J-19 is 1 x 1/2 x 1/8-inch channel for heavy duty.

Furnished with 3/8-inch U-Bolts for 3 1/4 x 4 1/4-inch cross arms unless otherwise specified. Can also be furnished for 2 3/4 x 3 3/4-inch cross arms.

Bracket No. J-21 provides for a wire spacing of 6 1/2 and 10 inches and No. J-20 provides for a wire spacing of 10 inches. Points of Nos. J-21 and J-20 are 12-gauge.

When ordering please specify size of cross arm on which bracket is to be mounted.

Cat. No.	No. of Wires	Extension	Size Rack	Weight per 100
J-18	1	3 7/8 in.	3/4 x 3/8 x 1/8 in. (channel)	104 lbs.
J-19	1	3 7/8 in.	1 x 1/2 x 1/8 in. (channel)	148 lbs.
J-20	2	3 1/2 in.	1 1/4 x 1 1/4 x 1/8 in. (angle)	206 lbs.
J-21	4	3 1/2 in.	1 1/4 x 1 1/4 x 1/8 in. (angle)	435 lbs.

Buzzers, Industrial



Non-weatherproof

For use on calling or warning systems where the volume of competitive noise is not excessive. The buzzer mechanism is attached directly to the removable steel cover of the case and the armature striking the metal cover produces the sound. Finished in battleship grey enamel.



Weatherproof

OFFICE AND FACTORY TYPE (NON-WEATHERPROOF)

Provided with one 1/2-inch knockout at the back and one on the side—mounts on 3 1/4 and 4-inch standard outlet boxes.

Cat. No.	Current	Size of Signal, Inches	Weight Each
8797	A.C.	2 3/4 x 5, Diameter	3 lbs.
8796	D.C.	2 3/4 x 5, Diameter	3 lbs.

MINE TYPE (WEATHERPROOF)

Assembly is sealed and provided with 8-inch insulated wire leads which feed through a water-tight bushing. Casings have two sets of mounting holes equipped with gaskets and spaced on 2 3/4 and 3 1/2-inch centers.

Cat. No.	Current	Diameter of Signal	Weight Each
8679	A.C.	5 1/8 inches	3 1/4 lbs.
8678	D.C.	5 1/8 inches	3 1/4 lbs.

Voltage and Frequency Must Be Specified When Ordering

Cabinet, No. EX 1278 Wire Chief's



These cabinets are 15 inches wide, 15 inches deep, and 78 inches high, including 6-inch legs. Recessed handles are fitted with number plates (specify numbering when ordering). Built-in flat key lock with two keys. Finished in green baked-on enamel. Shipped set up. Has five shelf openings, one 9 inches high, two 8 inches high, and two 4 inches high. Includes nine drawers, one 11-7/16 inches wide, 12 3/4 inches deep, and 1-5/32 inches high with 15 compartments, each 3 3/4 by 2-33/64 inches; two drawers 11-7/16 inches wide, 12 3/4 inches deep, and 1-5/32 inches high with nine compartments, each 3 3/4 inches by 4-7/32 inches; two drawers 11-7/16 inches wide, 12 3/4 inches deep, and 5-3/32 inches high with nine compartments, each 3 3/4 by 4-7/32 inches, and two drawers 11-7/16 inches wide, 12 3/4 inches deep, and 5-5/32 inches high with four compartments each 6-21/64 by 5-41/64 in.

inches high with nine compartments, each 3 3/4 by 4-7/32 inches, two drawers 11-7/16 inches wide, 12 3/4 inches deep, and 5-3/32 inches high with nine compartments, 3 3/4 by 4-7/32 inches, and two drawers 11-7/16 inches wide, 12 3/4 inches deep and 5-5/32 inches high with four compartments each 6-21/64 by 5-41/64 in.

Cabinet, No. EX 1278-8 Wire Chief's



This cabinet has eight shelf openings, one 13 inches high at top, six 8 inches high, and one 10 inches high at the bottom. This cabinet is 15 inches wide, 15 inches deep, and 78 inches high, overall. Height includes 6-inch legs. Recessed handles are fitted with number plates (specify numbering when ordering). Built-in flat key lock with two keys. Finished in green baked-on enamel. Shipped set up.

Cabinet, No. EX 1279 Cord



This cabinet has seven cord hooks 6 inches long, three on each side and one at the back. Two clips on each side to hold wedgeblocks. Cabinet is 15 inches wide, 15 inches deep, and 78 inches high including 6-inch legs. Finished in green baked-on enamel.

Cabinet, No. EX 1258-A Headset



These cabinets contain 15 compartments with sloping shelves for efficient storage of headsets. Aluminum number plates available (specify numbering desired when ordering). Cabinet section is 35½ inches wide, 8¾ inches deep, and 23 inches high. This cabinet consists of two parts, the compartment rack and the base. Base must be ordered separately. These cabinets can be made into 30 and 45 compartment units by ordering two or three, respectively, compartment sections.

Catalog No.	Description
EX 1258-A1	Base section for No. EX 1258-A Cabinet
EX 1258-A	Compartment section for Headset Cabinet

Cabinet, Wardrobe

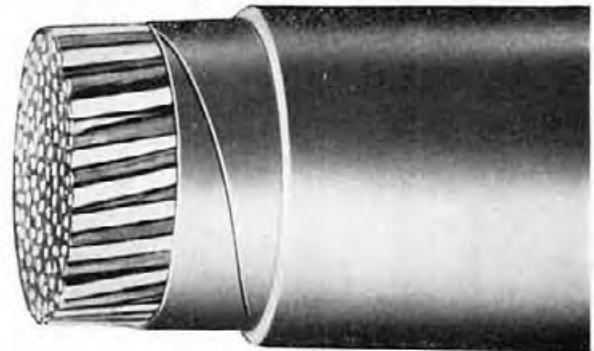


This wardrobe will hold 8 to 15 heavy coats and hangers and has full width adjustable shelf at top for hats and packages. Interior completely finished with no sharp edges to mar appearance of cabinet or damage clothing. Finished in green, baked-on enamel. Width 36 inches, depth 21 inches, height 78 inches.

Catalog No.	Description
No. 1005	Wardrobe (shipped set up)
No. 1006	Wardrobe (shipped knocked down)
No. 1051	Extra shelf with coat rod attached

CABLE

Roebling Paper Insulated, Lead Encased Telephone Cable



The Roebling Company exercises complete manufacturing control over all its wire products. Every step of manufacture, from hot rolling copper bars to applying the necessary insulation and testing the finished wire is performed in the Roebling Plants.

Many years of product research and development in Roebling laboratories stand behind Roebling telephone cables. This, coupled with complete manufacturing facilities provides well designed, structurally sound telephone cable. The user of Roebling telephone cable can feel confident that this product, closely controlled in every step of production, will meet the highest standards.

Telephone cable is regularly made with various electrostatic capacities and with conductors of Nos. 19, 22 and 24.

Each wire is insulated with one or more wraps of manila paper, or paper made from clear rope stock with suitable proportions of wood pulp or cotton rag stock added. The paper is wound loosely, in helical form, around the wire. When two or more papers are used they are applied in reverse direction. Dry paper is used because of its low specific inductive capacity which is further reduced by the air space introduced by the loose wrapping.

After insulation of the conductors they are twisted together to form pairs, each wire of a pair being wrapped with paper of a different color for tracing purposes. The length of lay of the twisted pair varies from two to five and one-half inches.

The twisted pairs are cabled together in layers, each layer being one pair thick. Alternate layers are cabled in opposite directions. The completed cable core is taped over with paper.

The cable is then treated under controlled high temperature and vacuum to remove the moisture from the cable without causing deterioration of the paper insulation.

The cable is then sheathed with lead containing one per cent antimony. Pure lead or lead containing up to three per cent in tin may be used in special cases. The lead-antimony sheath is usually used to give additional stiffness of the sheath and to prevent crystallization of the lead under continuous vibration.

After the cable is sheathed, it is tested for continuity of the conductors, dielectric strength, insulation resistance, capacity.

Efficiency of transmission depends upon the resistance of the conductors, the electrostatic capacity and, to a limited extent, on the insulation resistance.

Cable, Roebbling Paper Insulated, Lead Encased Telephone

SCOPE

Cable is regularly made in the following types:

Type	Size A.W.G. or B. & S.	Paper Insulation, Wrap	Mut. Cap. Microfarads per Mile	Grd. Cap. Microfarads per Mile	Resistance per Mile in Ohms	Trans. Loss in Decibels per Loop Mile
24-S-9	24	Single	.09	.135	135.5	2.5
24-D-8	24	Double	.08	.12	135.5	2.6
22-S-9	22	Single	.09	.135	85.2	2.0
22-D-95	22	Double	.095	.1425	85.2	2.0
22-D-75	22	Double	.075	.1125	85.2	1.8
19-S-9	19	Single	.09	.135	42.5	1.4
19-D-75	19	Double	.075	.1125	42.5	1.3

Conductor Resistance

Except for purposes of long distance transmission, where a lower conductor resistance may be necessary, cables are usually built of Nos. 19, 22 or 24 wires. The resistances of these wires per mile—approximately 42.5 ohms, 85 ohms and 136 ohms respectively at 20°C.—are increased by twisting into pairs and by cabling, but as the increase is not constant, the maximum resistance for any wire in the cable is usually specified.

Electrostatic Capacity

The electrostatic capacity is specified in microfarads per mile at a given temperature and is expressed as "Mutual Capacity" or "Grounded Capacity." By "Mutual Capacity" is meant the capacity between one wire of a pair and its mate, the measurement being made while all the other wires of the cable are connected to the sheath and to ground. By "Grounded Capacity" is meant the capacity between one wire and the balance of the wires and the sheath of the cable. The grounded capacity of a wire in a cable is approximately one and one-half times the mutual capacity of the pair of which that wire is a part.

The lower the capacity of a cable the greater the separation of the conductors . . . i.e. . . . for two cables with the same number of conductors of the same size, the cable with the lower capacity will have the larger diameter under the lead.

Insulation Resistance

The effect of insulation resistance under actual working conditions is not definitely known owing to the high frequencies employed. The usual practice is to specify a minimum of 500 megohm miles which is considered sufficiently high to prevent appreciable leakage. Actual tests of cables generally exceed 1000 megohm miles. Insulation resistance decreases with an increase in temperature so it is usual to specify the temperature at which a minimum resistance is desired.

Conductors

Each conductor shall be solid wire of commercially pure annealed copper, smoothly drawn, cylindrical, uniform in quality and resistance and free from scale and other defects. All joints in conductors shall be welded or brazed with silver alloy solder. The tensile strength of any sections of a conductor including a

joint shall be at least ninety (90) per cent of the tensile strength of an equal length of an adjacent section of the conductor without a joint. The resistance of any six-inch section of a conductor including a joint shall be not more than one hundred and five (105) per cent of the resistance of an adjacent six-inch sample of the conductor without a joint.

Insulation

Each conductor shall be insulated with a single or double wrap of paper, as required by the type of cable, applied helically with an overlap. When two wraps are used, they are applied in reverse directions. The paper shall be of clear rope stock with suitable proportions of either cotton rag or chemical wood pulp. By clear rope stock is meant stock composed of manila rope or of manila rope and hemp. Jute or sisal shall not be added and shall be present only in very small proportions. The paper shall be free from sizing and loading materials.

Twist of Pairs and Cabling

The insulated conductors shall be twisted in pairs. Adjacent pairs in each layer shall have different lengths of lay. The pairs thus formed are cabled together in layers, each layer being one pair thick. Succeeding layers are wound in reverse direction.

Core Covering

The core shall be covered with at least two wrappings of paper not less than .004-inch in thickness—laid on so that all portions of the core are covered with not less than two thicknesses of paper. The paper shall be clear rope stock or stock made from clear rope and chemical wood pulp, the wood pulp not exceeding 80% by weight.

Density of Cable

In the finished cable at least 38% of the volume inside the sheath excluding that occupied by the conductors and the paper covering of the core shall be occupied by the insulating paper on the conductors. This volume occupied by the insulating paper shall be calculated from the average width and thickness of this paper and the actual length of the paper used per unit of the cable.

Sheath

The core shall be enclosed in a sheath composed of an alloy of commercially pure lead and antimony, the amount of antimony by weight in any sample being not less than nine-tenths (0.9) per cent and not more than one and one-tenth (1.1) per cent.

The sheath shall be free from holes or other defects and shall be of uniform composition and thickness. The average thickness of sheath in each length of cable shall be as nearly as possible the values as given in the cable charts with such tolerances as are permitted in the best commercial practice.

Extra Pairs

The extra pairs in a cable will be the nearest unit per cent of the normal number of pairs.

Normal No. of Pairs	Extra Pairs	Normal No. of Pairs	Extra Pairs
6 to 150 Pairs	1 Pair	450 to 600 Pairs	5 Pairs
150 to 250 Pairs	2 Pairs	600 Pairs	6 Pairs
250 to 350 Pairs	3 Pairs	800 Pairs	8 Pairs
350 to 450 Pairs	4 Pairs	900 Pairs	9 Pairs
		1200 Pairs	12 Pairs

Cable, Roebling Paper Insulated, Lead Encased Telephone



Telephone Cable, Paper and Lead,
150 pairs



Telephone Cable, Paper and Lead,
24 pairs

Electrical Requirements

DIELECTRIC STRENGTH

The insulation of each conductor in every length of cable when tested against all of the other conductors and the lead sheath shall be capable of withstanding without rupture for two seconds, a 60-cycle AC potential, having approximately sine wave form whose maximum instantaneous value is not less than the following:

Type of Cable	Between Conductors	Between Conductors and Sheath	Type of Cable	Between Conductors	Between Conductors and Sheath
24-S-9	500	1,400	22-D-75	700	1,400
24-D-8	700	1,400	19-S-9	700	1,400
22-S-9	500	1,400	19-D-75	700	1,400
22-D-95	700	1,400			

Insulation Resistance

Each conductor in every length of cable, when measured against all other conductors and the sheath, connected to ground, after an electrification of not more than one minute with a potential of not less than 100 nor more than 500 volts, shall show an insulation resistance equivalent to not less than 500 megohms per mile at 60°F.

The insulation resistance shall be measured at a temperature not lower than 60°F. If the cable when measured at a temperature higher than 60°F. fails to meet this requirement, no temperature correction factor shall be applied, but in such case, the cable may be retested at a temperature not lower than 60°F.

Conductor Resistance

Each conductor in every length of cable shall have a resistance equivalent to not more than the following values at 68°F.:

24 A.W. Gauge	145 Ohms per Mile of Cable
22 A.W. Gauge	92 Ohms per Mile of Cable
19 A.W. Gauge	46 Ohms per Mile of Cable

Capacitance

In each length of cable the average 900 cycle A.C. mutual capacitance of all pairs shall be equivalent to not more than shown on page 157. The capacitance shall be measured at a temperature not lower than 60°F. If the cable, when measured at a higher temperature fails to meet this requirement, no temperature correction factor shall be applied, but in such cases, at the option of the manufacturer, the cable may be retested at a temperature not lower than 60°F. The mutual capacitance of a pair shall be measured between the two wires of the pair, the remainder of the conductors being connected to the sheath and ground.

Guarantee

There shall be no defective pairs caused by grounds. The number of defective pairs in each cable length caused by shorts, opens, or crosses, shall be not more than shown in the table on page 159, and the capacitance and conductor resistance shall not increase nor the insulation resistance decrease beyond the limits above specified for a period of one year from date of original shipment from the factory due to defective material or manufacture. The cable shall be so manufactured that when properly installed and spliced it will be commercially free from crosstalk.

The cable furnished under these specifications is guaranteed to be of first-class material and workmanship throughout. Any length of cable proven defective in material or workmanship within one year from date of original shipment from the factory will be replaced. All such replacements will be made free of charge, F.O.B. the destination called for in original order.

Cable thus replaced shall become the property of the manufacturer and shall be either returned by the purchaser F.O.B. point of original delivery or at the option of the manufacturer, the purchaser shall credit the manufacturer with the scrap value of the replaced cable.

Defective Pair Markings

Each pair which is found by the final factory tests to be defective shall be distinctly marked with a cloth tag at each end of the length of cable. Each of these tags shall denote the type of defect and shall be securely attached to the conductors of the defective pairs. The inspection report shall show location of the tagged pairs by color groups and where there are duplicate color groups in the same cable, the report shall indicate in which of the two groups the defective pairs are located, that is, the inner or outer groups.

Shipments

Each length shall be wound on a separate reel unless otherwise stated. The reels shall be substantial and able to withstand such reasonable handling as they are liable to receive in transit. The diameter of the drum shall be large enough to prevent damage to the cable from reeling. The outer end of the cable shall be securely fastened to the inner side of the reel head so that the cable will not come loose in transit.

Each end of every length of cable shall be effectively sealed with solder to prevent the entrance of moisture.

The reel shall be plainly marked to indicate the direction in which it should be rolled so as not to loosen the cable on the reel.

In each length of cable containing defects, the outer ends shall be painted for a distance of one foot and the inner ends as far as can be conveniently reached.

Cable, Roebling Paper Insulated, Lead Encased Telephone COLOR CODE

The colors in the insulating paper, the number of like colored pairs forming a color group, and the location of each color group for all types are given in the table below.

Actual No. of Pairs	1st *Red †Grey	2nd Blue Grey	3rd Orange Grey	4th Green Grey	5th Red Blue	6th Red Green	7th Red Grey	8th Blue Grey	9th Orange Grey	10th Green Grey	11th Red Blue	12th Red Green	Tracer Pairs Red Orange
6	5	---	---	---	---	---	---	---	---	---	---	---	1
11	10	---	---	---	---	---	---	---	---	---	---	---	1
16	15	---	---	---	---	---	---	---	---	---	---	---	1
21	20	---	---	---	---	---	---	---	---	---	---	---	1
26	25	---	---	---	---	---	---	---	---	---	---	---	1
31	30	---	---	---	---	---	---	---	---	---	---	---	1
41	40	---	---	---	---	---	---	---	---	---	---	---	1
51	50	---	---	---	---	---	---	---	---	---	---	---	1
61	60	---	---	---	---	---	---	---	---	---	---	---	1
76	75	---	---	---	---	---	---	---	---	---	---	---	1
101	49	50	---	---	---	---	---	---	---	---	---	---	2
152	50	50	50	---	---	---	---	---	---	---	---	---	2
202	49	51	50	50	---	---	---	---	---	---	---	---	2
253	49	51	50	51	50	---	---	---	---	---	---	---	2
303	49	51	50	51	50	50	---	---	---	---	---	---	2
354	100	101	101	50	---	---	---	---	---	---	---	---	2
404	100	101	101	100	---	---	---	---	---	---	---	---	2
455	100	101	101	101	50	---	---	---	---	---	---	---	2
505	100	101	101	101	100	---	---	---	---	---	---	---	2
606	100	101	101	101	101	100	---	---	---	---	---	---	2
808	100	101	101	101	101	101	101	100	---	---	---	---	2
909	100	101	101	101	101	101	101	101	100	---	---	---	2
1,010	100	101	101	101	101	101	101	101	101	100	---	---	2
1,212	100	101	101	101	101	101	101	101	101	101	101	100	2

*Wire. †Mate.

Note: Where one (1) tracer pair is required in accordance with the above table, it shall be placed in the outside layer of the cable. Where two (2) tracer pairs are required one shall be placed in the outside complete layer of the first color group and the other in the outside layer of the cable.

Cable Jute Protected

There are many situations where cables buried directly in the ground would offer advantages over other forms of construction. The life of unprotected cable sheath may be very short depending upon the particular soil conditions. To meet this need there has been developed a type of cover for the cable sheath which effectively protects the sheath from soil corrosion. This protection consists of wrappings of paper and jute which have been thoroughly impregnated with preservative compound and which are thoroughly flooded with asphaltic compounds while being applied to the cable. Cables having this type of covering are referred to as jute protected. Jute protected cables are about .2 inches larger in over-all diameter than the unprotected cables for the smaller sizes and about .3 inch larger for full size cables. Any lead covered cable can be furnished jute protected if so noted on the order.

Cable Tape Armored

In cases where somewhat more mechanical protection is desired or where some protection against low frequency induction from power lines is desired, a steel tape armor can be furnished. This type of sheath covering is similar to that used for jute protected cables except for the addition of the steel tapes and a further covering of asphalt flooded jute. For the tape armored cable the increase in diameter varies with the size of the cable from about .3 inch to about .6 inch. Any lead covered cable can be furnished tape armored if so noted on the order.

Cable Galvanized Tape Armored

Can furnish galvanized tape armored cable for aerial use where some protection against low frequency induction from power lines is desired. Information and prices on this type of cable sheath will be supplied on request.

Cable, Roebing Paper Insulated, Lead Encased Telephone

No. of Pairs	No. 19 A.W.G. Double Wrap .075 Mut. Cap.					No. of Pairs	No. 22 A.W.G. Double Wrap Paper .075 Mut. Cap.				
	Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet		Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet
6	.063	.451	427	524	3,500	6	.061	.365	310	384	3,500
11	.064	.570	608	719	3,500	11	.063	.451	425	499	3,500
16	.067	.631	724	880	2,500	16	.064	.495	497	594	3,500
26	.071	.776	1,005	1,161	2,500	26	.067	.600	669	781	3,500
51	.077	1.043	1,610	1,870	1,500	51	.071	.793	1,028	1,228	3,000
76	.082	1.249	2,170	2,610	1,500	76	.075	.942	1,360	1,600	2,500
101	.086	1.394	2,661	3,161	1,500	101	.077	1.047	1,630	1,894	2,500
152	.092	1.661	3,626	4,176	1,200	152	.082	1.239	2,186	2,516	2,000
202	.097	1.867	4,514	5,341	1,100	202	.085	1.388	2,673	3,086	1,600
253	.102	2.073	5,441	6,351	1,000	253	.089	1.537	3,199	3,639	1,500
303	.105	2.218	6,231	7,531	1,000	303	.091	1.642	3,631	4,281	1,400
354	.110	2.424	7,218	8,518	1,000	354	.095	1.791	4,192	4,950	1,200
404	.112	2.511	7,906	9,466	1,000	404	.097	1.854	4,579	5,338	1,200
455	.116	2.691	8,843	10,403	1,000	455	.100	1.984	5,103	5,930	1,100
---	---	---	---	---	---	505	.102	2.089	5,565	6,475	1,000
---	---	---	---	---	---	606	.107	2.282	6,517	7,817	1,000
---	---	---	---	---	---	808	.114	2.598	8,286	10,061	800
---	---	---	---	---	---	909	.118	2.747	9,193	11,087	750

No. of Pairs	No. 19 A.W.G. Single Wrap Paper .09 Mut. Cap.					No. of Pairs	No. 22 A.W.G. Double Wrap Paper .095 Mut. Cap.				
	Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet		Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet
6	.063	.427	403	500	3,500	6	.061	.349	296	370	3,500
11	.065	.538	568	665	3,500	11	.063	.429	404	478	3,500
16	.067	.594	684	795	3,500	16	.064	.470	473	547	3,500
26	.070	.729	941	1,141	3,000	26	.066	.568	630	741	3,500
51	.076	.976	1,511	1,751	2,500	51	.070	.747	970	1,170	3,000
76	.080	1.165	2,022	2,352	2,000	76	.073	.885	1,273	1,513	2,500
101	.083	1.299	2,469	2,881	1,600	101	.076	.983	1,543	1,783	2,500
152	.089	1.546	3,379	3,851	1,400	152	.080	1.162	2,061	2,436	1,600
202	.094	1.737	4,219	4,769	1,200	202	.083	1.300	2,526	2,939	1,600
253	.098	1.927	5,069	5,979	1,000	253	.087	1.439	3,029	3,469	1,500
303	.101	2.061	5,818	6,829	900	303	.089	1.536	3,445	3,953	1,300
354	.106	2.252	6,748	8,192	900	354	.092	1.675	3,958	4,508	1,200
404	.108	2.332	7,405	8,850	900	404	.094	1.733	4,332	5,090	1,200
455	.112	2.499	8,291	9,736	900	455	.097	1.854	4,831	5,658	1,100
---	---	---	---	---	---	505	.100	1.952	5,301	6,211	1,000
---	---	---	---	---	---	606	.103	2.131	6,157	7,168	900
---	---	---	---	---	---	808	.110	2.425	7,855	9,492	650
---	---	---	---	---	---	909	.113	2.563	8,689	10,689	650

Cable, Roebling Paper Insulated, Lead Encased Telephone

No. of Pairs	No. 22 A.W.G. Single Wrap Paper .09 Mut. Cap.					No. of Pairs	No. 24 A.W.G. Double Wrap Paper .08 Mut. Cap.				
	Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length Per Reel, Feet		Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet
6	.061	.350	294	368	3,500	6	.061	.365	301	375	3,500
11	.063	.431	401	475	3,500	11	.063	.451	408	482	3,500
16	.064	.471	469	566	3,500	16	.064	.495	473	570	3,500
26	.066	.569	624	735	3,500	26	.067	.600	630	717	4,500
51	.070	.748	956	1,086	3,000	51	.071	.791	950	1,121	3,500
76	.073	.886	1,251	1,491	2,500	76	.075	.941	1,245	1,459	2,800
101	.076	.985	1,515	1,755	2,500	101	.077	1.045	1,476	1,740	2,500
152	.080	1.164	2,018	2,393	1,600	152	.082	1.238	1,957	2,232	2,400
202	.083	1.302	2,468	2,881	1,600	202	.085	1.386	2,367	2,779	1,600
253	.087	1.442	2,957	3,397	1,500	253	.089	1.536	2,817	3,257	1,500
303	.089	1.539	3,358	3,829	1,400	303	.091	1.639	3,172	3,779	1,500
354	.092	1.677	3,855	4,405	1,200	354	.095	1.789	3,657	4,524	1,500
404	.094	1.736	4,215	4,765	1,200	404	.096	1.850	3,941	4,808	1,500
455	.097	1.858	4,701	5,301	1,100	455	.100	1.982	4,416	5,344	1,400
505	.099	1.955	5,128	6,095	1,100	505	.102	2.086	4,802	5,802	1,300
606	.103	2.134	5,981	7,163	1,100	606	.107	2.280	5,603	6,903	1,000
808	.110	2.428	7,619	9,063	900	808	.114	2.594	7,066	8,960	750
909	.114	2.568	8,461	10,319	700	909	.118	2.744	7,822	9,716	750

No. of Pairs	No. 24 A.W.G. Single Wrap Paper .09 Mut. Cap.				
	Thick-ness of Lead Sheath, Inches	Approxi-mate Outside Diam., Inches	Net Weight per M Feet, Pounds	Shipping Weight per M Feet, Pounds	Shipping Length per Reel, Feet
6	.060	.303	239	313	3,500
11	.061	.366	315	389	3,500
16	.062	.398	364	438	3,500
26	.064	.475	477	574	3,500
51	.067	.614	710	840	3,000
76	.070	.723	923	1,053	3,000
101	.071	.797	1,088	1,288	3,000
152	.075	.938	1,442	1,656	2,800
202	.077	1.045	1,743	2,016	2,200
253	.080	1.154	2,070	2,445	1,600
303	.082	1.230	2,346	2,759	1,600
354	.084	1.337	2,674	3,146	1,400
404	.085	1.382	2,902	3,374	1,400
455	.088	1.478	3,239	3,711	1,400
505	.089	1.553	3,512	4,020	1,300
606	.093	1.694	4,100	4,700	1,100
808	.098	1.922	5,172	6,082	1,000
909	.101	2.031	5,723	6,734	900
1,010	.103	2.138	6,261	7,399	800
1,212	.108	2.353	7,371	8,771	650

Cable, Feeder



Used to feed cable from the street reel into the conduit without injury to sheath. The funnel-like mouth facilitates the application of pulling compound. A brass bell casting, machined to a finish, is fixed to a heavy 4-inch galvanized, flexible steel tubing. A steel sleeve is brazed to the conduit end. This sleeve will take various sized brass nozzles to fit varying sizes of conduits.

Cat. No.	Description	Length	Weight
71	Feeder, Cable	9 feet	40 lbs.
72	Feeder, Cable	12 feet	50 lbs.
73	Feeder, Cable	16 feet	65 lbs.
74	Feeder, Cable	20 feet	80 lbs.
	Diameter		
83	Nozzle for Feeder	3 ins.	8 lbs.
83½	Nozzle for Feeder	3½ ins.	8 lbs.
84	Nozzle for Feeder	4 ins.	8 lbs.

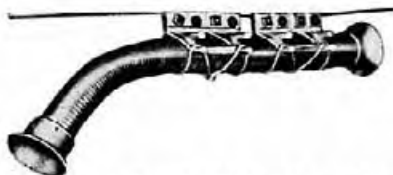
Cable Compound, Reliable



For pothead and cable terminals. Fills every crevice—does not crack. "Cold flows" slightly at all weather temperatures and adheres well to all surfaces. Fills cable terminals perfectly without pre-heating the terminals and without a second filling after cooling to make up for shrinkage.

One gallon cans—Shipping Weight—11 lbs.

Cable Feeder and Straightener



Used in placing aerial or underground cable. Wide mouth, aluminum bell and flexible steel tubing positively prevent danger

to cable or sheath. All interior surfaces are smoothly finished. The holding clamps which securely grip the messenger wire can also be used for dead-ending and splicing work. Accommodate up to 3-inch cables.

Consists of 6-foot tube and 2 pair of malleable iron clamps.

Cat. No.	Description
90	Aerial Cable Feeder and Straightener

Cable Pulling Skids and Sheaves



For leading the pulling line from the mouth of the duct out through the manhole to the capstan or winch. The skids have pin holes every 6 inches from top to bottom so that the sheaves can be placed to correspond to the height of the duct and top of manhole.

Standard length is 9 feet. Shipping weight per set 231 lbs. 10 and 12-foot lengths are also available.

Cable Bender



For forming and bending cable in underground construction. The wide bearing surfaces and rounded edges of the shoes prevent injury to the cable sheath. Has adjustable yoke which permits work in close quarters. The yoke and arm are made of alloy steel castings and the handle of heavy wall steel tubing. Overall length is 36 inches.

Cat. No.	Description	Weight Each
20	"C" Bender, Cable	20 lbs.

Cable Roller, "Matlock"



The "Matlock" Cable Roller expedites the work of running aerial cable. A suitable number of "Matlock" rollers are attached to the messenger wire, as shown in the above illustration, and fastened in place with wing handle screws. The cable is then

placed on the rollers and carried to any required distance. Many feet of cable can thus be run in a short time. The roller has a metal bushing extending beyond each end, preventing wear on the roller and keeping it in the center of the frame. The frame is of forged mild steel.

Cat. No.	Description	Weight Each
501	With Wooden Roller	4½ lbs.
502	With Iron Roller	8 lbs.

Cable Drawing-In Protectors



These protectors are used in the mouth of the conduit to protect the lead sheath of the cable from injury while it is being drawn into the conduit. Made of heavy cast brass, machined to a smooth, bell-shaped mouth.

Cat. No.	For Conduit	Weight
42	2 ins., round	1½ lbs.
42½	2½ ins., round	2 lbs.
43	3 ins., round	3 lbs.
43½	3½ ins., round	3½ lbs.
44	4 ins., round	4 lbs.
44½	4½ ins., round	4½ lbs.
45	3 ins., square	4½ lbs.
46	4 ins., square	5 lbs.

Cable Car, B. & L. Aerial



Chain links permit adjustment between the messenger strand and seat. Sturdily constructed, light in weight and conforms to highest safety standards. Available with rubber wheels on special order.

Cat. No.	Description	Weight Each
PU36	Aerial Cable Car	24 lbs.

Cable Car, Lineman's Safety



The design and construction of these cars assure

long, continuous service. Made strong and rigid to provide safety, service, and convenience. They are correctly balanced for comfort and the rubber

tread wheels give a smooth ride over cable rings. Equipped with hand brakes and can be furnished with wheel guards for added safety.

The chair frame is made of cold rolled steel and steel channels braced with steel straps. The seat is made of Western White Pine, reinforced with strap steel imbedded in wood to prevent bolts from pulling out of wooden ends.

Holes are provided in open side of chair frame for snapping on safety belt. If necessary chairs can be re-tired in a few minutes. Wheel guards available if specified.

Cat. No.	Height	Width	Weight Crated
20	25½ in.	21 in.	29 lbs.

Cable Car, Lineman's Safety



These flexible cable cars can be collapsed, strapped, or tied for convenient transportation. Adjustable up or down by snaps and chain.

The No. 7 seat is made of high grade fir lumber, reinforced with strap steel embedded in wood.

Holes are provided in open side of chair frame for snapping on safety chains. Equipped with hand brake. The rubber

tread wheels will give long service. Chairs can be re-tired in a few minutes if necessary.

Link chain is electrically welded, lineman's snaps are drop-forged steel galvanized. Wheel guards are available if specified.

Cat. No.	Height	Width	Weight Crated	Seat No.
27	Adjustable	21 in.	33 lbs.	No. 7

Carbon Blocks, Reliable Sawtooth Discharge



No. P-495 self-cleaning sawtooth discharge blocks eliminate dirty carbon trouble. They dissipate static discharges with no time lag and do not ground the line unnecessarily. They operate in the plant

just as sensitively as carbon to carbon discharge gaps and have none of the latter's faults. Carbon ground blocks of various shapes and thicknesses adapt the discharge block to fit any lightning arrester or cable terminal which uses standard carbon or copper blocks.

Cat. No.	Description	Std. Pkg.	Weight per 20
P-495	Sawtooth Discharge Block	20	3 oz.

Calculagraphs

By depressing a lever when the telephone conversation begins and another when it ends the operator secures a printed card record that determines the correct toll fee. Prevents loss by definitely and permanently establishing time intervals for toll circuits.

Round type calculagraphs can be furnished in either the Type A or Type C case. If the calculagraph is to be mounted on a pedestal the Type A case should be specified. Whenever the calculagraph is to be sunk in a switchboard shelf the Type C case should be ordered. The Type C case is 8¾ inches in diameter and 4 inches deep from the bottom of the flange. Specify voltage and frequency when ordering.

Model 33—Electric

Records elapsed time in minutes and seconds for maximum periods of 30 minutes and time of day in hours and minutes. The time of day record is printed with a 24-hour dial thus eliminating the A.M. and P.M. jumps at noon and midnight. A sweep second hand enables the operators to tell accurately when a call is approaching the initial period by glancing at the visible dial.

Toll tickets up to 2¼ inches in width may be used. Equipped with a self-starting synchronous motor designed to operate on 20 volts, 60, 50 or 25 cycles or on 115 volts, 60 or 50 cycles regulated A.C. Size is 7½ inches long by 3¾ inches wide by 3¼ inches deep.

This model may be placed in the large round opening made in a switchboard for Nos. 6 or 30 by using an adapter plate or may be installed in place of four Type A keys. It may be mounted on a pedestal by using a pedestal adapter.

Cat. No.	Description	Case Style	Mounting	Weight Each
33-C	Model 33	C	Flush with Keyshelf	11½ lbs.

Model 30—Electric



Records elapsed time in minutes and seconds for maximum periods of 30 minutes and time of day in hours and minutes. Also available with a 24-hour time of day imprint, eliminating the A.M. and P.M. jump at noon and midnight. Toll tickets up to 2¼ inches in width may be used.

Equipped with self-starting synchronous motor for 20 volts, 60, 50, or 25 cycles or for 115 volts, 60 or 50 cycles regulated A.C.

Models 30-XC and 30-XA are the same as Models 30-C and 30-A except the X models have a date printing device.

Cat. No.	Description	Case Style	Mounting	Weight Each
30-C	Model 30	C	Flush with keyshelf	20 lbs.
30-A	Model 30	A	Portable less pedestal	20 lbs.
30-XC	Model 30-X	C	Flush with keyshelf	20 lbs.
30-XA	Model 30-X	A	Portable less pedestal	20 lbs.

CALCULAGRAPHS

Model 6—Spring Drive

Records elapsed time in minutes and quarter minutes with 5 second indicator after each minute. Maximum period is one hour. At the same time records time of day in hours and minutes.

Model 6-XC and 6-XA are the same as Models 6-C and 6-A except the X models have a date printing device.

Cat. No.	Description	Case Style	Mounting	Wt. Each
6-C	Model 6	C	Flush with keyshelf	20 lbs.
6-A	Model 6	A	Portable less pedestal	20 lbs.
6-XC	Model 6-X	C	Flush with keyshelf	20 lbs.
6-XA	Model 6-X	A	Portable less pedestal	20 lbs.



Calculagraph Pedestals

Adjustable from 26 to 40 inches from floor to ticket plate. Calculagraphs to be mounted in a pedestal are furnished in a Type A case.

If a Calculagraph mounted in the pedestal is desired, specify the catalog number of the Calculagraph Model desired.

Cat. No.	Description
A	Pedestal for Type A Calculagraph

Ink Ribbons

When fitting ribbon to a Calculagraph the hooks are attached to the ribbon spools. The tin reel on which the ribbon is wound may be held in one hand while the ribbon is unwinding from this reel and being wound on the spools of the calculagraph, thus avoiding the smearing of ink on hands.

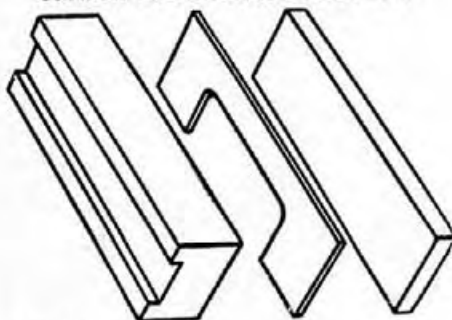
Standard color is blue record but other colors can be furnished. Furnished on metal reels in a square box.

Candles, Stearine Wickless

For application to lead sheath, prior to pouring on hot lead in making cable splices.

Cat. No.	Length	Diameter	Weight Each
3½	3½ in.	1½ in.	3 oz.

Carbon Blocks and Dielectrics



Reliable		Cook	
Cat. No.	Description	Cat. No.	Description
P-367	Grooved Carbon Block	41-3002	Plain Carbon Block
P-663	Plain Carbon Block	41-2002	Grooved Carbon Block
P-1384	Plain Carbon Block	41-11	U-Shaped Acetate Dielectric, .005 in.
P-215	U-Shaped Mica Dielectric, .005 in.	41-12	Acetate Dielectric, .010 in.

Capstan

Used for attaching guys, pole raising and placing, cable pulling, and general work in line construction. A rope pulley block with which one man can exert a direct pull or lift from 1000 to 5000 pounds.

Pulleys and drum are aluminum. Handle, housings, and hooks are drop-forged steel. Rope is manila. Numbers C-2, C-4, C-22, and C-44 include 33 feet of rope.



Cat. No.	Description	Capacity	Size of Rope	Weight Each
C-2	With Rope	2000 lbs.	½ in.	15 lbs.
C-2A	Less Rope	2000 lbs.	½ in.	13 lbs.
C-4	With Rope	4000 lbs.	⅝ in.	25¼ lbs.
C-4A	Less Rope	4000 lbs.	⅝ in.	20½ lbs.
C-22	With Rope	3000 lbs.	½ in.	19½ lbs.
C-22A	Less Rope	3000 lbs.	½ in.	16¾ lbs.
C-44	With Rope	5000 lbs.	⅝ in.	31¼ lbs.
C-44A	Less Rope	5000 lbs.	⅝ in.	25¾ lbs.

Detachable capstan to be used with ordinary blocks—will increase the leverage ratio 8 to 1.

Cat. No.	Capacity	Weight Each
C-3	2000 lbs.	5 lbs.
C-5	4000 lbs.	11 lbs.

Chair, Model 7335 Executives



This Model 7335 executive's chair is engineered to give correct posture support for the working executive. It is designed to synchronize with natural action of the body, giving natural support at all times.

The base of this chair is of one-piece aluminum construction. The overall width of base is 25½ inches with 22-inch center spread. Mounted on 2-inch ball bearing casters with soft tread.

The seat is oval shaped, 18½ inches wide and 17½ inches deep. Cushioned with molded foam rubber, 2½ inches thick. Seat has ball bearing tilt action and is adjustable from 17 to 20 inches in height and is also adjustable for depth. The arms also are cushioned with foam rubber. Width between the arms is 20 inches.

The back is 16½ inches wide and 18 inches high. Back is vertically adjustable.

The chair is finished in baked enamel. Upholstery is available in a variety of fabrics and colors. All covers are removable for dry cleaning or replacement.

Chair, Model 22 Utility



This chair has a 1 inch tubular steel base of welded construction. It is mounted on 2-inch ball bearing casters with soft tread.

All-around bumper protection is provided to protect the chair and other furniture from scars and marks. Removable covers provide for easy cleaning of upholstery.

The seat level of this chair may be adjusted from 17½ to 21 inches by means of a special "Hite-Control" adjustment. To raise or lower the seat it is necessary only to pull out a plunger at the center of the base, move chair to desired height, and release plunger, locking the seat firmly in place. Special lever design of the plunger makes this a finger-tip adjustment.

The seat of this chair is aluminum, perforated for cool air flow, and is padded with molded foam rubber. The upright is of spring steel, semi-rigid construction. The back is of self-balancing construction, also padded with foam rubber. Seat size is 17½ inches wide and 14½ inches deep. Back size is 13 by 8 inches.

Chair, Model 2422 Operator's



This chair is adjustable in height from 22½ inches to 30½ inches. The footrest is adjustable in height from 4 to 13 inches from the floor. Has special drop front seat designed to relieve pressure when the occupant leans forward. Seat is padded with foam rubber. Seat size, 16 inches deep and 17 inches wide. Back size 13 x 8 x 1 inches. Model No. 2422 chair comes equipped with either glides or casters. Round stools also are offered with or without cushions, glides, or casters.

The height of both the seat and the footrest is controlled by means of a special "Hite-Control" device. To raise or lower either it is necessary only to pull out a plunger on the vertical support of the chair, move the seat or footrest to the desired height, and release plunger, locking each firmly in place. Special lever design of the plunger makes this a finger-tip adjustment.

Chair, Model 2422 TR Operator's



This chair features a special tilt front design which permits the seat and back to tilt forward. Amount of forward tilt is controlled by means of a special tilt control at the front of the seat. Chairs are adjustable in height from 22½ inches to 30½ inches. The footrest is adjustable in height from 4 to 13 inches from the floor. The adjustment range of this chair is so wide that three ordinary chairs are required to equal its limit of adjustment.

The height of both the seat and the footrest is controlled by means of a special "Hite-Control" device. To raise or lower either it is necessary only to pull out a plunger on the vertical support of the chair, move the seat or footrest to the

desired height, and release plunger, locking each firmly in place. Special lever design of the plunger makes this a finger-tip adjustment.

The Model No. 2422-TR chair is available either with foam rubber cushioning or rubber impregnated hair cushioning. Either glides or casters can be furnished.

Chisels, Cold



Extra Refined Octagon Steel. This chisel is the standard pattern, first quality.

Cat. No.	Diam. of Steel	Size Cut.	Length	Weight per Doz.
45-¼	¼ in.	5/16 in.	5 in.	1 lb.
45-5/16	5/16 in.	¾ in.	5¼ in.	1½ lbs.
45-5/8	5/8 in.	7/16 in.	5½ in.	2¼ lbs.
45-7/16	7/16 in.	½ in.	6 in.	3½ lbs.
45-½	½ in.	¾ in.	6 in.	4 lbs.
45-5/8	5/8 in.	¾ in.	7 in.	7 lbs.
45-¾	¾ in.	¾ in.	7½ in.	11 lbs.
45-7/8	7/8 in.	1 in.	8 in.	15 lbs.
45-1	1 in.	1 1/8 in.	8½ in.	20 lbs.

Chisels, Socket Framing



The blades, 8 inches long, are made of extra heavy cross section solid steel. The over-all length ranges from 16 to 17½ inches. Order by blade width.

Cat. No.	Width	Weight Doz.	Cat. No.	Width	Weight Doz.
261-3/8	3/8 in.	7¾ lbs.	261-1	1 in.	13½ lbs.
261-½	½ in.	8¼ lbs.	261-1¼	1¼ in.	16 lbs.
261-5/8	5/8 in.	10½ lbs.	261-1½	1½ in.	18 lbs.
261-¾	¾ in.	11 lbs.	261-1¾	1¾ in.	22 lbs.
261-7/8	7/8 in.	11½ lbs.	261-2	2 in.	24 lbs.

Clamp, Reliable Drop Wire



Used for attaching twisted pair or parallel drop wire to poles and buildings, permits free swinging at the tie, places all wear on the hardware and eliminates all sharp bends.

These Type P clamps are wedge-shaped, with a copper wire loop at one end for hooking over a drive hook, masonry hook or porcelain knob. When using twisted pair it is essential to parallel the wires through the clamp. Clamps will accommodate standard #18, #17, or #16 AWG twisted pair or parallel drop wire with neoprene, braid, or plastic covering.

Cat. No.	Std. Pks.	Weight per 100
P Clamp	25	14 lbs.

FOR CABLE HANGERS SEE "HANGERS"

Clamps, Diamond Steel Grade

Used two on each side of a pole to overcome a tendency of cables to slide when the messenger is set on a grade. Made of cold rolled steel strip, hot galvanized. The three lower bolts grip the lead cable and are included.



Size of Clamp Inches	Average Cable Diameter	Std. Pkg.	Weight per 100
2½-A	1½ in.	25	110 lbs.
2½-B	1-11/16 in.	25	112 lbs.
2½-C	1-15/16 in.	25	114 lbs.
3	2-3/16 in.	25	130 lbs.
3½	2½ in.	20	140 lbs.
4	3¼ in.	15	165 lbs.

Clamps, Cable



A very efficient fastening where lighter construction is to be used and where it will not be subjected to severe strains. Made of cold rolled mild steel annealed and hot galvanized after forming.

ONE HOLE

Cat. No.	Cable Size	Conduit or Pipe Size	Size of Screw Hole	Std. Pkg.	Weight per 100
L-3-3/16	3/16 in.	----	7/32 in.	500	1 lb.
L-5-5/16	5/16 in.	----	7/32 in.	500	1 lb.
L-8-3	½ in.	¼ in.	7/32 in.	500	1¼ lbs.
L-12-1	¾ in.	½ in.	9/32 in.	500	4½ lbs.
L-16-2	1 in.	¾ in.	9/32 in.	250	7 lbs.

TWO HOLE

Cat. No.	Cable Size	Conduit or Pipe Size	Size Steel	Std. Pkg.	Weight per 100
T-7-4-0	7/16"	⅛"	½x.048"	500	7½ lbs.
T-10-2-0	⅝"	¼"	½x.048"	500	10 lbs.
T-11-0	11/16"	⅜"	⅝x.062"	500	16 lbs.
T-14-1-A	⅞"	½"	11/16x.062"	500	22 lbs.
T-18-2	1⅛"	¾"	¾x.080"	250	18 lbs.
T-20-3-A	1¼"	1"	⅞x⅛"	100	14 lbs.
T-24-3	1½"	--	⅞x⅛"	100	16 lbs.

ONE HOLE OFFSET TYPE

Cat. No.	Cable Size	Conduit or Pipe Size	Size Steel	Std. Pkg.	Weight Std. Pkg.
407	½"	⅛"	½x.048"	100	1.1 lbs.
408	9/16"	¼"	½x.050"	100	1.2 lbs.
411	11/16"	⅜"	¾x.060"	100	2.87 lbs.
413	⅞"	½"	¾x.078"	100	4.12 lbs.
417	1-1/16"	¾"	¾x.078"	100	5.31 lbs.
421	1½"	1"	¾x.115"	100	9.75 lbs.
425	1¾"	1¼"	¾x.115"	100	10.62 lbs.

Clamps, Copperweld Ground Wire



Standard Type



Type "B"

Bronze ground wire clamps are designed for use with copper and Copperweld ground rods. These clamps eliminate the need for soldered connections and provide dependable electrical and mechanical connections between the grounding wires and the ground rods.

These clamps are regularly available with either the safety set screw or the square head bolt. Hexagonal wrenches are furnished free with clamps equipped with the safety set screw.

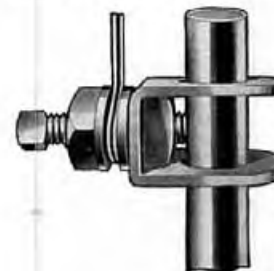
STANDARD TYPE—CAST BRONZE BODY

Catalog No.	With Safety Set Screw	With Square Head Bolt	Size Rod	Takes Ground Wire Size	Weight per 100
J-8390	J-8490		⅝ in.	6 to 12 A.W.G.	25 lbs.
J-8391	J-8491		½ in.	4 to 10 A.W.G.	30 lbs.
J-8392	J-8492		⅜ in.	¾ in. Strand to 8 A.W.G.	55 lbs.

TYPE "B"—DRAWN BRONZE BODY

Catalog No.	With Safety Set Screw	With Square Head Bolt	Size Rod	Takes Ground Wire Size	Weight per 100
J-5490	J-5590		⅝ in.	6 to 14 A.W.G.	8 lbs.
J-5491	J-5591		½ in.	2 to 10 A.W.G.	13 lbs.

Clamps, Kling Ground



For connecting ground wires to ½-inch and ⅝-inch ground rods. The set screw has a cup point which bites a circle into the rod forming a perfect electrical contact. The nut arrangement forms a positive lock and will accommodate any size of ground wire, either iron or copper.

Clamps should be attached before rod is driven.

Cat. No.	Description	For Rod Diameter	Weight per 100
J-8341	Kling Ground Clamp	½ in.	13 lbs.
J-8342	Kling Ground Clamp	⅝ in.	15½ lbs.

Clamps, Adjustable Ground



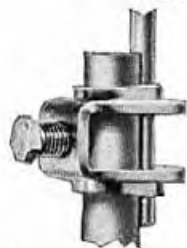
The most approved method of making ground connections at subscriber's stations where water pipes are available and it is inconvenient to solder ground wires onto ground rods. Made of copper strips, round edged with

close fitting threads.

These clamps can be used in any location where a natural ground exists by fitting the adjustable strap around the water pipes, or other ground, and tightening the clamping screw. Makes possible short ground lines by doing away with ground rods and the resulting lead-in lines. Saves time on all types of installations.

Cat. No.	Fits	Weight per 100
1	3/8 to 1 1/2-inch pipe	6 lbs.

Clamps, Reliable Ground Wire



Made of bronze for copper and copper-weld ground rods or made of steel, galvanized and lined for steel ground rods. Maintains high pressure contact directly between wire and rod—giving maximum conductivity to joint.

Cat. No.	Material	Rod Size Inches	Ground Wire Size AWG		Weight per 100
			Max.	Min.	
E48	Bronze	3/8 or 1/2	#1	#14	10 lbs.
S48	Steel	3/8 or 1/2	#1	#14	10 lbs.
E58	Bronze	1/2 or 5/8	#3/0	#14	17 lbs.
S58	Steel	1/2 or 5/8	#3/0	#14	17 lbs.
E68	Bronze	5/8 or 3/4	#3/0	#14	20 lbs.
S68	Steel	5/8 or 3/4	#3/0	#14	20 lbs.

Clamps, Guy

These clamps are rolled from structural bridge steel. No. J-930 is generally considered standard.

All sizes with three or more bolts are shipped with center bolt reversed.



SMOOTH GROOVE

Cat. No.	Description	Length Inches	Bolt Size Inches	Strand Size Inches	Std. Pkg.	Weight per 100
J-1061	1-Bolt	1 5/8	1/2	3/16 & 5/16	100	62 lbs.
J-1030	2-Bolt	3 3/8	1/2	3/16 & 5/16	50	132 lbs.
J-934	3-Bolt	6	1/2	3/16 & 5/16	25	230 lbs.
J-930	3-Bolt, Std.	6	9/16	5/16 & 7/16	25	246 lbs.
J-931	3-Bolt, Std.	6	5/8	5/16 & 7/16	25	284 lbs.
J-933	4-Bolt, Hvy.	8	5/8	5/16 & 7/16	25	366 lbs.
J-929	3-Bolt	4	9/16	5/16 & 7/16	50	176 lbs.

Clamps, Cable Suspension



Securely grips messenger strand. Made of rolled, open hearth steel 1-11/16 inches wide by 3/8 inch thick.

In attaching to the pole a nut and square washer are placed between the clamp and pole to provide clearance for the cable. When cables are to be mounted on both sides of the pole a 5/8-inch double arming bolt is usually used instead of the through bolt.

The one-bolt type is furnished without a bolt, the 5/8-inch through bolt being used for both attaching the clamp to the pole and tightening the clamp on the strand.

The three-bolt type is furnished with two 1/2-inch high carbon steel track bolts, the center hole being left blank for the 5/8-inch through bolt.

Cat. No.	Description	Length Inches	Size Strand Inches	Std. Pkg.	Weight per 100
J-1095	One-bolt	2 1/2	1/4 to 7/16	100	73 lbs.
J-1096	Three-bolt	5 3/4	1/4 to 7/16	50	198 lbs.

Clamps, Klein Combination Wire & Sleeve
NO. 132-12 LIGHT WEIGHT



Standard telephone splicing clamp for general line and trouble work. Has four round

holes, accommodating copper wire from 6 to 12 B. & S. gauge, and iron wire Nos. 8 to 14 B.W.G. The reverse side has four sets of chambers adapted for twisting double tube copper sleeve joints Nos. 8 to 17 B. & S. gauge, and iron sleeve joints Nos. 10 to 19 B.W.G.

Cat. No.	Description	Length	Weight per Doz.
132-12	Light Weight	9 inches	11 lbs.

NO. 132-15 HEAVY WEIGHT

For general telephone line work. Has five round holes for twisting copper wire Nos. 4 to 12 B. & S. gauge, and iron wire Nos. 6 to 14 B.W.B. and one oval hole for guy strand. The reverse side has five double chambers for twisting double tube copper sleeve joints Nos. 6 to 17 B. & S. gauge, and iron sleeve joints Nos. 8 to 19 B.W.G.

Cat. No.	Description	Length	Weight per Doz.
132-15	Heavy Weight	11 1/4 in.	18 lbs.

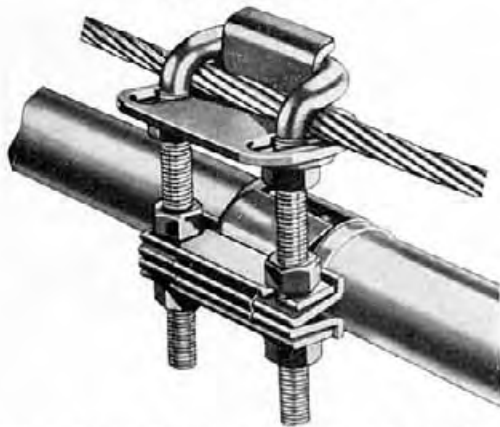
Clamps, Kearney Drop Wire



For use with both twisted pair and parallel drop wire. Permits slacking off or pulling up drop by merely pushing slack through "snub-action" spiral. The spiral channel is smooth and preserves the insulation as the strain is evenly distributed throughout its length.

Cat. No.	Description	Length	Weight per 100
6715	Copper	8 1/2 in.	12 lbs.
6715-1	Steel	8 1/2 in.	12 lbs.

Clamps, Kearney Grade



These specially designed grade clamps maintain the same clearance between the messenger strand and cable that has been fixed by the cable rings used—at the same time they prevent the cable from sliding when the messenger is set on a grade. The cable is gripped firmly without injury to the lead sheath.

The Kearney grade clamp is provided with three band sizes to fit all cables. A special double length clamp for clamping two cables suspended on one strand is available.

All of the clamps will securely hold the smallest cables and will accommodate the maximum sizes shown below.

A wide range of clearances is provided by the adjustable feature on each of the three sizes of clamps.

The strap band is stainless steel, eliminating galvanic action and preventing rust.

Cat. No.	Maximum Cable Size (inches)	Weight per Doz.
7551	1 (outside diam.)	110 lbs.
7551-1	1 1/8 (outside diam.)	112 lbs.
7551-2	2 5/8 (outside diam.)	114 lbs.
7551-11	2 cable (1 5/8 O.D.)	175 lbs.

Clamps, Klein Wire Splicing

Forged from a select grade of tool steel properly hardened and tempered. Handles will not buckle when closed. Have polished heads and temper blued handles.

NO. 102-1 BABY PATTERN



A handy pocket size adapted for telephone troublemen. Has five round holes for copper wire from 8 to 16 B. & S. gauge, and iron wire from 10 to 18 B.W.G.

Cat. No.	Description	Length	Weight per Doz.
102-1	Baby Pattern	8 inches	5 3/4 lbs.

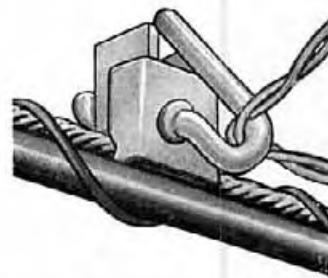
No. 102-3 Standard Size for Bare Wire



Five round holes accommodate copper wire from 2 to 12 B. & S. gauge and iron wire from 4 to 14 B.W.G. Oval hole can be used in serving guy wire or messenger strand and is sometimes used for No. 4 copper sleeves.

Cat. No.	Description	Length	Weight per Doz.
102-3	Standard	10 3/4 inches	16 3/4 lbs.

Clamp, Span



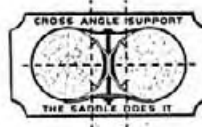
Span clamps are used primarily for taking off drop wire leads along the span. Also used for "pull-offs" to hold the cable away from trees, thus avoiding the use of tree guards.

This clamp can be used on lashed cable as well as suspended cable. The plates are made of 1/8-inch steel and the hooks of 5/16-inch round, high

tensile strength steel. All parts hot-dip galvanized.

Cat. No.	Description	Std. Pkg.	Weight per Std. Pkg.
866	Clamp, span	100	41 lbs.

Clamps, Stubbing



Stubbing Clamps make stubbed pole line as strong as a new line, save 75% in installation labor and can be salvaged and used over again.

Catalog number includes a saddle, a clamping band and a staple. The band encircles the pole and separates them slightly, allowing ventilation and preventing any rolling or slipping. This cross angle support given the assembly is an exclusive feature of these clamps. A 5/8-inch bolt of proper length is used through band and saddle, taking up the slack and making the assembly rigid and secure. The series of holes in the band permit adjusting to various sizes.

Bolts and square washers must be ordered separately. The length of the bolt should be slightly longer than the diameter of the pole.

Cat. No.	Description	Size of Band	For Pole Diam. Inches	Wt. Ea. Lbs.
J-6850	Giant No. 1	2 1/2" x No. 12	8' x 8 3/4 to 17 3/4	9 1/2
J-6851	Junior No. 2	2 1/4" x No. 12	5'10" x 6 to 12 1/2	6 1/4

Installing Wrenches



To simplify installation of Stubbing Clamps, use the forged steel Installing Wrench. One end is used for pulling the bands tight; the other pointed end is for lining up the holes.

Cat. No.	Description	Weight Each
J-6855	Installing Wrench	10 lbs.

Cleaners, Tornado Portable Blower-Type

These portable blowers produce a powerful stream of clean, dry air for removing dirt, dust, lint, and oily fuzz from relays, switches, switchboards, and similar equipment. The blast of dry air from these blowers is so strong that it pushes the dirt and air completely through the most complicated equipment and does not permit moist dirt to be imbedded in the equipment as high pressure air streams do.

All Tornado blowers can be converted to industrial vacuum cleaners for maintenance jobs where it is more desirable to collect the dirt and dust rather than blow it. Shown below is a blower adapted as a vacuum cleaner with the standard suction attachments.

Model 46

This blower is equipped with $\frac{1}{3}$ H.P. universal motor for operation on A.C. or D.C., mounted on permanently sealed bearings which require no greasing or oiling. Operates at a speed of 12,400 R.P.M. to discharge 53 cubic feet of air per minute at a velocity of 17,300 feet per minute. Static waterlift is 25.6 inches. Weight 7 pounds. Approved by Underwriters' Laboratories.



Model 50

This blower has a 1 H.P. universal motor operating at 12,200 R.P.M. and discharges 76.5 cubic feet of free air per minute. Velocity of air stream is 24,900 feet per minute and static waterlift is 49 inches. Weight 14 pounds. Approved by Underwriters' Laboratories.

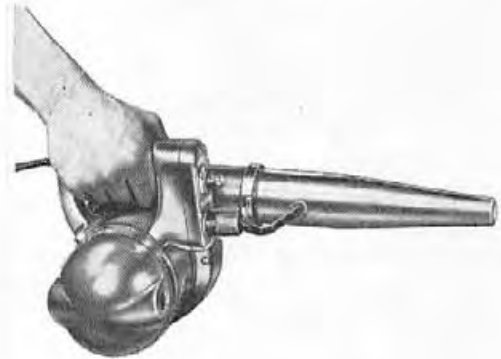


Model 52

This exceptionally powerful blower is designed for the heaviest industrial cleaning jobs. It is equipped with a $1\frac{1}{2}$ H.P. universal motor which operates at 13,000 R.P.M. and displaces 86 cubic feet of air per minute. The velocity of the air stream is 26,500 feet per minute and static waterlift is 58 inches. Weight 16 pounds. Approved by Underwriters' Laboratories.



Model 76



This Model 76 Tornado hot and cold air blower is especially useful for all types of telephone installations. This unit can be used for various drying purposes. The 200° F. blast of air will quickly dry up a spilled glass of water or other liquid, thus preventing short circuits, sticking relays, burn-outs, corrosion, and deterioration of insulation. Equipped with $\frac{1}{3}$ H.P. universal motor mounted on permanently sealed ball bearings. Discharges 53 cubic feet of air per minute with a velocity of 17,300 feet per minute at a static waterlift of 25.6 inches. Can be converted to suction cleaner. Weight 9 pounds.

Suction Attachments



These attachments include a woven shoulder strap, a hose connector with 4 feet of flexible cotton-covered rubber hose, a flat fibre nozzle, an aluminum cleaning nozzle, soft hair brush, and dust-proof bag. Also available is a special rubber nozzle with hair brush for switchboard cleaning. A special "scraptrap" attachment can be obtained which will trap screws, nails, clips, and other small items which might be picked up. This attachment prevents damages to the fan and fan chamber and permits easy salvage of valuable small parts.

Cleaners, Cadillac Portable Blower-Type



Easily adaptable to all kinds of cleaning work. Used for both vacuum cleaning and blowing. May also be used for all general plant cleaning as well as for spraying insecticides, varnishes, shellacs, paint, etc.

The units are powered from a standard light socket, AC-DC operation.

Five sizes are available.

Model AY

For light duty cleaning work. Has $\frac{1}{4}$ horsepower universal motor. Air velocity, 15,000 feet per minute. For 32 to 275 volts inclusive, 25 to 60 cycles. Displaced air, 70 cubic feet per minute. Weight 7 lbs.

Model F

For intermediate duty service. Has $\frac{1}{3}$ horsepower universal motor. Air velocity, 17,000 feet per minute. For 32 to 275 volts inclusive, 25 to 60 cycles. Displaced air, 80 cubic feet per minute. Weight $7\frac{1}{2}$ lbs.

Model G

For heavy duty service. Has $\frac{3}{5}$ horsepower motor. Air velocity, 20,000 feet per minute. For 32 to 275 volts, inclusive, 25 to 60 cycles. Displaced air, 95 cubic feet per minute. Weight $9\frac{1}{2}$ lbs.

Model HP

For extra heavy duty service, super-powered. Has a one horsepower, 11,600 R.P.M. motor. Air velocity, 27,000 feet per minute. For 110 to 275 volts inclusive, 25 to 60 cycles. Displaced air, 195.5 cubic feet per minute. Equipped with 20 feet of heavy duty 3-wire safety cord and rubber plug. Weight 15 lbs.

Model L—Hot and Cold Air

For use where moisture is an industrial problem. Has a double action switch that may be set for either hot or cold air. Has $\frac{1}{3}$ horsepower universal motor. For 32 to 275 volts, inclusive, 25 to 60 cycles. Weight $7\frac{1}{2}$ lbs. At room temperature of 70° Fahrenheit with element turned on, the displaced air is at approximately 130° Fahrenheit.

Attachments for Cadillac Portable Cleaners



A large variety of suction and blowing attachments is available for use with all Cadillac Cleaners except Model L which uses blowing attachments only. These attachments will take care of all ordinary cleaning jobs.

The attachments listed below fit Cadillac Cleaners Models HP, AY, F, and G.

Cat. No.	Description
6920	Paint, Powder, and Liquid Sprayer (quart size)
6900	Paint, Powder, and Liquid Sprayer (pint size)
7000	Insecticide Spray Tank (5 pint capacity)
6840	Steel Extension Handle, 44-inch
6408	10-inch Floor Nozzle (use with 6840 handle)
4501	14-inch Floor Nozzle (use with 6840 handle)
4419	10-inch Double Row Snap-On Brush
4420	14-inch Double Row Snap-On Brush
6609	2 $\frac{7}{8}$ -inch diameter Insulated Brush
6608	2-inch diameter Insulated Brush
6413	Aluminum Elbow (use with 6608 or 6609 Brush)
6755	Nipple
6754	Flat Cleaning Tool — side intake
6701	7-foot Hose
6407	Furniture Nozzle
6612	Snap-On-Brush for 6407 Nozzle
6610	4-inch Rubber Insulated Cleaning Brush
6421A	Round Dusting Brush, 2 $\frac{1}{2}$ -inch diameter (long bristle)

Cleaner, Conduit



This cleaner features a number of edges at right angles to the surface of the conduit which assure thorough cutting and removal of all foreign matter from the conduit. The flexible spring construction makes the cleaner self-conforming. The adjusting nuts on each end permit nominal adjustments in the outside diameter. Supplied in any diameter but size must be specified when ordering.

Cat. No.	Description	Weight
230	Cleaner, Conduit	5 lbs.

Cleaner, Duct

This cleaner is used for final wiping and cleaning of conduit. Consists of a flexible wire rope with tube spaces separating leather washers at graduated sizes, faced with steel. On both ends are fastened heavy socket eyes. Supplied in any diameter, but size must be specified when ordering.

Cat. No.	Description	Weight
340	Cleaner, Duct	8 lbs.

Cleaners, Switchboard Jack



These brushes are recommended for cleaning switchboard jacks. Use with carbon tetrachloride while revolving on a flexible shaft or wheel drill. This is an ideal way to clean switchboard jacks and is non-injurious. Brushes are furnished in two sizes—No. 32, diameter .249, fits all jacks approximately 1/4-inch in diameter; No. 22, diameter .221, fits all jacks using No. 201 Kellogg plugs.

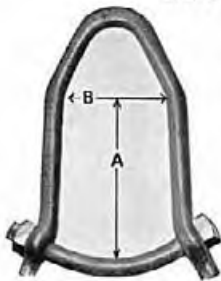
Cleats, Fibre



Fibre cleats are furnished in three styles as illustrated. These cleats furnish a neat and substantial method of permanently retaining interior wire in place, especially on lath and plaster walls where it is not desirable to fasten with nails or staples.

Cat. No.	Type	Size
1	Single Groove Fibre Cleats	5/16 in.
2	Two Groove Fibre Cleats	1/8 and 1/8 in.
2-A	Two Groove Fibre Cleats	1/8 and 3/16 in.

Clevises, Upset Type Steel



Made of 7/16-inch diameter steel with 3/8-inch curved bolt. Ultimate strength, 8000 pounds. The stock is first formed to a U shape and then heated and forged, both ends at once; therefore, both arms are of equal length. The clevis fits the insulator, can be installed easily and because it is symmetrical, does not throw unequal strain on the insulator.

Cat. No.	Dimensions		Weight per 100
	"A"	"B"	
J-702	4 in.	1 1/2 in.	70 lbs.
J-703	3 in.	1 3/4 in.	66 lbs.
J-52	2 1/2 in.	1 7/8 in.	61 lbs.
J-705	3 in.	2 in.	68 lbs.
J-706	4 in.	2 in.	80 lbs.
J-707	3 in.	2 1/4 in.	81 lbs.
J-708	4 in.	2 1/4 in.	84 lbs.
J-709	5 in.	2 1/4 in.	86 lbs.
J-711	4 in.	2 1/2 in.	83 lbs.
J-712	5 in.	2 1/2 in.	89 lbs.

Climbers, Adjustable



A high-quality climber which is adjustable from size 15 to size 18 1/2, or to any exact fit between those sizes. These climbers are fitted with foot and leg straps and with pads which are filled with rubberized wool and lined on the inside with soft chrome leather.

The gaffs on these climbers are replaceable. The gaff is locked to the body of the climber at an angle which will not permit it to become disengaged in normal use. Pressure exerted on it when the wearer is ascending or descending tends to lock the gaff tighter into the leg iron.

Adjustment of these climbers is made by a simple setting of two Allen head set screws against a loop made from 3/16 inch round, cold-drawn steel in a tubular steel socket. Weight 3 lbs., 2 ozs.

Cat. No.	Description
9205	Adjustable climber, complete
9206	Extra gaffs
9207	"Driv-Lok" pins for securing gaffs

Climbers, Brooks



An adjustable climber which can be used by all men in the crew. Available with either 1 1/2 or 2 inch gaffs to meet varying climbing conditions. These gaffs are removable for replacement.

Gaffs are securely fastened with locking buckle and steel taper pin. Gaffs and shanks are drop forged of high quality alloy and manganese steels. Climbers are available with or without leather straps and pads. All parts of these climbers are available separately for replacement.

Replaceable Parts for Brooks Climbers

Part No.	Description
1	Shank with buckle attached
2	Sliding metal top
3	1 1/2-inch gaff
4	2-inch gaff
5	Leather strap and steel locking buckle
6	Leather strap and pad

Climbers, Klein Standard and Lightweight

Safe, dependable and comfortable. They are designed for greatest strength and fit the foot and limb, giving the lineman the greatest comfort and freedom of action. The gaff is of tool steel, individually tempered and set at the correct angle. The leg iron is produced from the best grade of steel individually tempered. The gaff and leg iron are securely hand riveted and tested.

FURNISHED LESS STRAP UNLESS OTHERWISE SPECIFIED

When ordering please specify the length of shank wanted. Stock sizes are from 15 to 18 inches measured from the instep to the end of the shank which should come one inch below the knee for comfort.



No. 1903

Cat. No.	Description	Style of Loop	Weight per Pair
1901	Standard Climbers	Punched	3 3/8 lbs.
1903	Lightweight Climbers	Riveted	2 7/8 lbs.

Climbers, Klein No. 1939 "Streamlined"

A new design in which the use of any unnecessary metal has been carefully avoided. These climbers are approximately one-third lighter in weight than the Standard Pattern and about 10% lighter than the original Lightweight. They offer every possible comfort and a full measure of safety.

The leg irons are flexible and tapered in width and thickness. The critical section, from 3 inches above the gaff to half way across the stirrup has been designed for ample strength. A wrought ring carries the ankle strap.

The gaffs are the slender type—preferred on treated poles and are 3 1/2 inches long measured on the outside.

FURNISHED LESS STRAP UNLESS OTHERWISE SPECIFIED

Stock sizes are 15 to 18 inches, measured from the instep to the end of the shank which should come one inch below the knee. Other sizes to order. Use ankle straps Nos. 5301-16 or 5301-26.

Cat. No.	Description	Weight per Pair
1939	Riveted Top Loop, Ring at Ankle	2 1/2 lbs.

Climbers, Klein No. 1907 Tree

These climbers are similar to the No. 1901 but are furnished with extra long gaffs necessary to penetrate bark in tree climbing. The gaffs are 5 1/2 inches long measured on the outside and 3 1/2 inches long measured on the underside. They are set high in the leg iron so that the points clear the ground when walking.

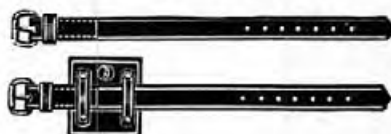
FURNISHED LESS STRAP UNLESS OTHERWISE SPECIFIED

Stock sizes are 15 to 18 inches, measured from the instep to the end of the shank. Other sizes to order.



Cat. No.	Description	Weight per Pair
1907	Punched Strap Loops	4 lbs.

Straps for Eastern Climbers



Made of first quality harness leather. All sewing lock stitched with genuine hot waxed, linen thread. The buckles and tongue are solid steel drop forgings tested to 1500 lbs.

The set consists of two upper straps 1 1/4 inches wide and 22 inches long with 4x4-inch plain leather pads and two lower straps 1 1/4 inches wide and 22 inches long.

Cat. No.	Description	Weight per Doz.
5301-1	One set with plain pads	20 lbs.
5301-2	One set with sheep lined pads	20 lbs.
5301-3	One set with felt lined pads	20 lbs.
5301-4	One pair (2 straps) without pads	8 lbs.
5301-5	One pair (2 straps) with plain pads	12 lbs.

Climber Pads, Klein



Standard square shape, made of select harness leather with loops at back through which climber straps pass.

Cat. No.	Description	Size	Wt. per Doz. Prs.
8200	One Pair (2 pcs.) Sheep Lined	4 x 4 in.	4 lbs.
8201	One Pair (2 pcs.) Felt Lined	4 x 4 in.	4 lbs.
8202	One Pair (2 pcs.) Plain Leather	4 x 4 in.	4 lbs.

Climber Pads, Klein Pear Shape



Made of two thicknesses of select harness leather riveted together. The outer piece is punched with two slots for the climber strap and one cross slot through which the leg iron of the climber is passed. Very comfortable as all edges are round.

Cat. No.	Description	Size	Wt. per Doz. Prs.
8206	One pair (2 pcs.) Plain Leather	3 1/2 x 6	4 1/2 lbs.

Climber Straps, Klein Special Ankle



For ring attachment on Klein No. 1939 Climbers. Made in two pieces and are punched and furnished with rivets and burrs, ready for quick attachment. If so ordered these straps will be riveted to No. 1939 Climbers.

Cat. No.	Description	Size	Wt. per Doz. Prs.
5301-16	One Pair (2 straps)	1 1/4 x 24 in.	10 lbs.
5301-26	One Pair (2 straps)	1 x 24 in.	8 1/2 lbs.

Clips, Kearney Guy Wire



Used to serve up strand ends. Aluminum or galvanized iron clips are available.

Half formed to fit the strand so that with the use of linemen's pliers, the clips are quickly and easily installed.

Cat. No.	Strand Size (ins.)	Material	Wt. per 100
400	1/4	Aluminum	2 lbs.
36	5/16	Aluminum	2 lbs.
37	3/8	Aluminum	2 1/2 lbs.
38	7/16	Aluminum	2 1/2 lbs.
401	1/2	Aluminum	2 3/4 lbs.
402	1/4	Galv. Iron	3 lbs.
336	5/16	Galv. Iron	3 lbs.
337	3/8	Galv. Iron	3 1/2 lbs.
338	7/16	Galv. Iron	3 1/2 lbs.
403	1/2	Galv. Iron	4 lbs.

Clip Tool, Kearney Guy Wire



Provides an efficient means of installing Kearney guy wire clips. Made of stamped steel. A latch ring is provided for hanging on lineman's belt.

Cat. No.	Description	Weight Each
2102	Guy Wire Clip Tool	3 lbs.

Clips, Mueller Alligator



60-CS



60-CHS

Accurately made with slim jaws and fine meshing teeth for test work in close quarters. Has convenient round thumb grip, barrel connection for banana plug. Has small soldering lip or wire may be staked in barrel by use of staking tool. Strong hinge to prevent jaw offset, spring gives hard bite. Made of solid copper, brass screw. Bright, natural copper finish.

Cat. No.	Description	Std. Ctn.	Weight per Ctn.
60-CS	Solid Copper Alligator Clip	100	1 lb.
60-CHS	Solid Copper Alligator Clip with insulated handle (red and black)	100	2 lbs.

Clips, Parallel Drop Wire



For use at intermediate attachments of parallel drop wire. Fits drive hooks, masonry hooks and knob adapters. Easy to install—the wire is placed in the supporting groove and the clip is crimped down as shown in the illustration. The pressure grips the wire firmly but does not injure the insulation.

Cat. No.	Description	Weight per 100
11452	Drop Wire Clip	5 lbs.

Clips, Bracket



Bracket Clips are used under the head of the nail to prevent the wood bracket from splitting. They are made of No. 14 gauge steel.

Cat. No.	Width Between Legs	Weight per 100
J-2560	1 1/2 in.	4 lbs.
J-2561	2 in.	4 lbs.

Clips, Crosby



Drop Forged—maximum grip is exerted without injury to the strand.

Cat. No.	Size Strand	Weight per 100
J-1038	1/4 in.	18 lbs.
J-1039	5/16 in.	30 lbs.
J-1040	3/8 in.	47 lbs.
J-1041	7/16 in.	71 lbs.
J-1042	1/2 in.	73 lbs.
J-1043	5/8 in.	101 lbs.

Clips, Tubase Guy



Drop forged—the two square shouldered bolts are a press fit in the square holes of the upper base, making a rigid assembly; two clamping members, two nuts.

This clip may be installed either way on the strand. The long grooves make a snug fit on the strand, provide maximum gripping surface and hold the strand firmly in line.

Cat. No.	Size Strand	Weight per 100
J-3014	1/4 in.	45 lbs.
J-3056	5/16 in.	57 lbs.
J-3038	3/8 in.	80 lbs.
J-3022	1/2 in.	80 lbs.

Clips, Reliable Test



Used for making temporary connections to insulated wires. Made of heavy nickel silver with hard, sharp insulation puncturing points and perfectly registering teeth. Illustration shows No. 1.

NO. 1—Fitted with screw, nut, and washer for attaching

to instrument cord.

NO. 2—Same as No. 1 but with the screw, nut and washer omitted. Preferred where connection to cord is to be soldered.

NO. 3—Same as No. 1 but without the spike.

Nos. 1, 2, 3—Shipping weight, 3 lbs. per 100.

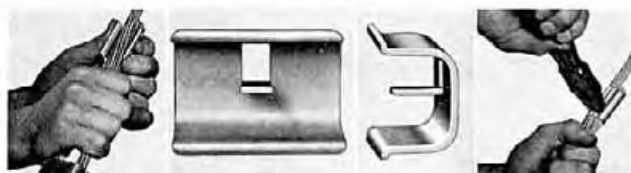
Clips, Wire Rope



Made of malleable iron bases and steel bolts.

Cat. No.	Size Strand	Weight per 100
J-1048	¼ in.	14 lbs.
J-1049	5/16 in.	19 lbs.
J-1050	¾ in.	30 lbs.
J-1051	½ in.	48 lbs.
J-1052	¾ in.	60 lbs.

Clips, Matthews Wire



Used to eliminate the cost of serving guy strand or drop service wire. The patented tongue is pushed between the two wires and then the lips are pulled together by a pair of pliers. This clamps the wires against the tongue so that there is no slippage or loosening under 150 pounds of pull.

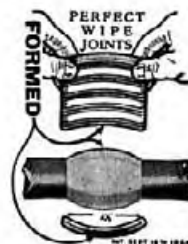
Cat. No.	Material	Size of Strand	Weight per 100
22	Aluminum	¼ in.	2½ lbs.
23	Aluminum	5/16 in.	2½ lbs.
24	Aluminum	¾ in.	2½ lbs.
25	Aluminum	7/16 in.	3 lbs.
26	Aluminum	½ in.	3 lbs.
32	Galv. Iron	¼ in.	4½ lbs.
33	Galv. Iron	5/16 in.	4½ lbs.
34	Galv. Iron	¾ in.	4½ lbs.
35	Galv. Iron	7/16 in.	5 lbs.
36	Galv. Iron	½ in.	5 lbs.

Cloth, Cable Wrapping

Waterproofed cotton for temporary closing of splices and sheath openings of aerial cable.

Cat. No.	Description
A-500	Cloth, in sheets 24 x 40 inches
A-600	Cloth, 39 inches wide. In ordering specify the length desired, in yards.

Cloths, Wiping



The permanent curved wiping surface of the formed finishing cloths produces perfectly symmetrical joints, uniform and smoothly finished. No waste of time or wear on cloths in breaking in. Used successfully on first joint. Solder will not stick to the smooth slick surface.

The catch cloths are straight edged, not formed.

FORMED, FLEXIBLE FINISHING CLOTHS

Supplied in moleskin or ticking. When ordering specify size and whether moleskin or ticking is desired.

The following sizes are available:

2 x 2 inches	3½ x 3½ inches
2½ x 2½ inches	4 x 4 inches
3 x 3 inches	

FLAT, FINISHED CATCH CLOTHS

Supplied in moleskin or ticking. When ordering specify size and whether moleskin or ticking is desired.

The following sizes are available:

5 x 5 inches	7 x 8 inches
6 x 6 inches	8 x 8 inches
6 x 7 inches	

FLAT FINISHING CLOTHS

Supplied in moleskin or ticking. When ordering specify size and whether moleskin or ticking is desired.

The following sizes are available:

2 x 2 inches	3½ x 3½ inches
2½ x 2½ inches	4 x 4 inches
3 x 3 inches	

Cloth, Upright Joint Wiping



This "Unique" Upright Joint Wiping Cloth makes joint wiping on vertical cable splices as easy as on horizontal splices.

The wiping side which comes in contact with the hot molten solder is perfectly smooth and free from stitches, laps, folds, seams and edges. The wiping surface is treated with a specially prepared dressing that protects the cloth

from the heat and prevents the half molten solder from sticking to the surface. The selected ticking that forms the wiping surface is unaffected by the hot molten solder, and one upright cloth will last a splicer for years.

Ticking Facing	1¾ in. center opening x 11 in. O.D.
Ticking Facing	1 in. center opening x 9 in. O.D.

CONDUIT, CLAY

A permanent protection for telephone cables. Clay conduit is manufactured from special high-grade clays, ground and mould-

ed into form, then vitrified into a flint-like rock by over 2000° of heat, and salt glazed to provide permanently smooth glass-like duct surfaces.

Permanence—Permanent because it will not soften, swell, deform or disintegrate on exposure to heat, moisture, frost, steam or chemical attack. It is also free from compounds that would harmfully affect the cable sheath.

Strength—Of high compressive strength, clay conduit will safely carry all normal street loads and stand up under severe traffic vibration. It permits immediate back-filling of trenches.

Flexibility—The comprehensive range of shapes and sizes assures extreme flexibility in construction, fewer manholes, less splicing and bending of cables and lower installation costs. The coefficient of friction is low—hence cable pulling is safe and easy.

Maintenance—Repairs to cable may be made quickly and the duct line restored to its original condition by the use of split conduit. Salvage or replacement of cables can be carried out at any time with no damage and little expense. There is no depreciation and little maintenance—service continuous, dependable.

Quality and Service—Rigorous inspection assures the highest quality and full stocks, large manufacturing facilities and skillful labor assure prompt shipments. Scientific shipping meth-

ods assure the arrival of the conduit on the job in good condition.

TYPES OF CLAY CONDUIT

Single Duct Clay Conduit

Adapted to laterals and made in round or square bore with

rounded corners. It is scarified lengthwise on four sides to provide anchorage for joint mortar.

Made in three sizes of bore, 3¼, 3½ and 4¼ inch. Specifications are shown in the table.

Multiple Duct Clay Conduit

Provides longer lengths and a multiplicity of duct holes, available in all shapes. Through dowel holes permit positive alignment. Economical and easy to install, and especially adapted to all telephone work. Scarifications around the outside at a short distance from each end provide anchorage for joint mortar. The bore of the duct holes is square with rounded corners.

Made in three sizes of bores, 3¼, 3½ and 4¼-inch. Specifications are shown in the table.

Split Clay Conduit

Made in all single and multiple duct forms. These split sections make it easy to replace or repair conduit lines and may also be used to enclose cable joints or splices in place of building manholes.

Specifications are shown in the table.

Underground Clay Conduit—Standard Shapes and Sizes

No. of Duct Holes	Standard Bore	Actual Bore	Outside Dimensions	No. of Dowel Holes	Standard Length	Duct. Ft. per Piece	Length of Short Pieces	Weight per Duct Ft.	Minimum Carload—Duct Feet
Single Duct									
Single Duct	3¼" round	3⅜"	4½" x 4½"	0	18"	1½ ft.	6", 9", 12"	8 lbs.	7,500
Single Duct	3½" round	3⅝"	5" x 5"	0	18"	1½ ft.	6", 9", 12"	10 lbs.	6,600
Single Duct	4¼" round	4⅞"	5⅝" x 5⅝"	0	18"	1½ ft.	6", 9", 12"	12 lbs.	5,400
Single Duct	3¼" square	3⅜"	4¾" x 4¾"	4	18"	1½ ft.	6", 9", 12"	10 lbs.	6,300
Single Duct	3½" square	3⅝"	5" x 5"	0	18"	1½ ft.	6", 9", 12"	11 lbs.	5,700
Single Duct	4¼" square	4⅞"	5⅞" x 5⅞"	4	18"	1½ ft.	6", 9", 12"	14 lbs.	4,500
Multiple Duct									
2-Duct	3¼" square	3⅜"	4¾" x 8¾"	2	24"	4 ft.	6", 8", 12"	8½ lbs.	7,000
3-Duct	3¼" square	3⅜"	4¾" x 12¾"	4	24"	6 ft.	6", 8", 12"	8½ lbs.	7,200
4-Duct	3¼" square	3⅜"	8¾" x 8¾"	5	36"	12 ft.	6", 9", 12", 24"	7½ lbs.	8,400
6-Duct	3¼" square	3⅜"	8¾" x 12¾"	2	36"	18 ft.	6", 9", 12", 24"	7½ lbs.	9,000
8-Duct	3¼" square	3⅜"	8¾" x 16¾"	3	36"	24 ft.	6", 9", 12", 24"	7 lbs.	9,000
9-Duct	3¼" square	3⅜"	13" x 13"	4	36"	27 ft.	6", 9", 12", 24"	7 lbs.	9,500
2-Duct	3½" square	3⅝"	5⅞" x 9⅞"	2	24"	4 ft.	6", 8", 12"	9½ lbs.	6,600
3-Duct	3½" square	3⅝"	5⅞" x 13¾"	4	24"	6 ft.	6", 8", 12"	9½ lbs.	7,000
4-Duct	3½" square	3⅝"	9⅞" x 9⅞"	5	36"	12 ft.	6", 9", 12", 24"	8½ lbs.	7,800
6-Duct	3½" square	3⅝"	9⅞" x 13¾"	2	36"	18 ft.	6", 9", 12", 24"	8 lbs.	8,100
2-Duct	4¼" square	4⅞"	6" x 11⅞"	2	24"	4 ft.	6", 8", 12"	12 lbs.	5,200
3-Duct	4¼" square	4⅞"	6" x 16¼"	4	24"	6 ft.	6", 8", 12"	12 lbs.	5,400
4-Duct	4¼" square	4⅞"	11⅞" x 11⅞"	5	36"	12 ft.	6", 9", 12"	11 lbs.	6,000
6-Duct	4¼" square	4⅞"	11⅞" x 16⅞"	2	36"	18 ft.	6", 9", 12"	10 lbs.	6,300
9-Duct	4¼" square	4⅞"	16⅞" x 16⅞"	4	24"	18 ft.	6", 9", 12"	10 lbs.	6,800
Splits									
Single Duct	3¼" and 3½" round and 3½" square			18"		6", 9", 12"			
2 and 3-Duct	3¼" and 3½" square			24"		6", 9", 12"			
4 and 6-Duct	3¼" and 3½" square			18"		6", 9", 12"			
9-Duct	3¼" square			18"		6", 9", 12"			

Minimum Car, 60,000 lbs.

Maximum Car, 75,000 lbs. (approximate)

CONDUIT, CLAY (Cont'd)

Standard Shapes

Single Duct — Round



Single Duct — 3/4, 3/2 and 4 1/4-inch round bore, 18 inches long.

Single Duct — Square



Single Duct — 3/4, 3/2 and 4 1/4-inch square bore, 18 inches long.

Two Duct



Two Duct — 3/4, 3/2 and 4 1/4-inch square bore, 24 inches long.

Three Duct



Three Duct — 3/4, 3/2 and 4 1/4-inch square bore, 24 inches long.

Four Duct



Four Duct — 3/4, 3/2 and 4 1/4-inch square bore, 36 inches long.

Six Duct



Six Duct — 3/4, 3/2 and 4 1/4-inch square bore, 36 inches long.

Nine Duct



Nine Duct — 3/4, 3/2-in. sq. bore, 36 in. long. 4 1/4-in. sq. bore, 24 in. long.

Special Shapes

Transposition



Transposition Conduit—for changing the height of conduit lines. 2, 3 and 6 duct, square bore, 24 inches long. 3/4-inch bore, 22 1/2° turn; 3/2-inch bore, 18° turn and 4 1/4-inch bore, 15° turn.

Split



Split Conduit—for quick repairs. Single duct, 3/4 and 3/2-inch square bore, 18 inches long; 2, 3, 4, 6 and 9 duct, 3/4 and 3/2-inch square bore, 18 inches long.

Branch



Branch Conduit—permits the division of multiple duct main lines into two or more branch lines—24 inches long. 2, 3, 4 and 9-way for 2 branches; 3 and 6-way for 3 branches; 6-way for 2 branches (2 or 3-way).

Mitered



Mitered Conduit—for curve construction, 3 degree, 10 ft. radius, approximate length 6x3/4 inches; 2, 3 and 6-way, edge or flat position, 4 and 9-way in one position.

Pipe Connectors



For connecting clay conduit lines to iron pipe lines as in pole risers or to enter buildings.

These connectors are made of cast iron, one end shaped to receive the end of the clay conduit line while the opposite end of the connector is reamed to receive the cast or wrought iron pipe.

The 3/4-inch bore is reamed for 3-inch pipe and the 4 1/4-inch bore for 4-inch pipe. Also furnished threaded on special order.

Bore Inches	No. of Ducts	Shipping Weight	Bore Inches	No. of Ducts	Shipping Weight
3/4	1	13 lbs.	4 1/4	1	16 lbs.
3/4	2	22 lbs.	4 1/4	2	30 lbs.
3/4	3	27 lbs.	4 1/4	3	41 lbs.
3/4	4	34 lbs.	4 1/4	4	52 lbs.

Single Duct Clay Conduit Bends



Single duct bends can be furnished in all standard bores in either 45 degree or 90 degree angles and in 12, 18, 24, or 36-inch radii. These curves can be furnished kerfed for splitting apart or without the kerfing.

Dowel Pins



Steel dowel pins are used in the ends of multiple duct clay conduit for lining up adjacent sections. Two pins are required for each piece of conduit.

Cat. No.	Diameter of Steel	Length	Diameter of Collar	Weight per 100
9050	5/16 in.	3-3/64 in.	3/8 in.	8 lbs.

CONDUIT, FIBRE

Standard Fibre Conduit, Drive Joint

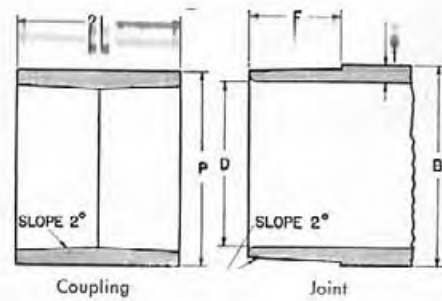


Standard—for Use with Concrete Encasement

Fibre conduit affords cable protection with no deformation or reduction in capacity through decades of service. Made of waterproof fibrous pulp, thoroughly impregnated with a preservative and waterproofing compound—not affected by heat, cold or acids which may be present in the ground. It is light in weight and is made in lengths that can be laid efficiently. Maximum protection to the cable is afforded both in the process of drawing and afterward. The bore is smooth, preventing any injury to the cable sheath.

The conduit ends are cut to a taper that fits snugly with a tapered sleeve or coupling which is furnished with each length of conduit. The fibre is sufficiently flexible to pass minor obstructions by slight deviations from straight runs. May readily be cut with lathe tools or saw.

This same type fibre conduit is also available with a thicker wall for installation without a concrete encasement.

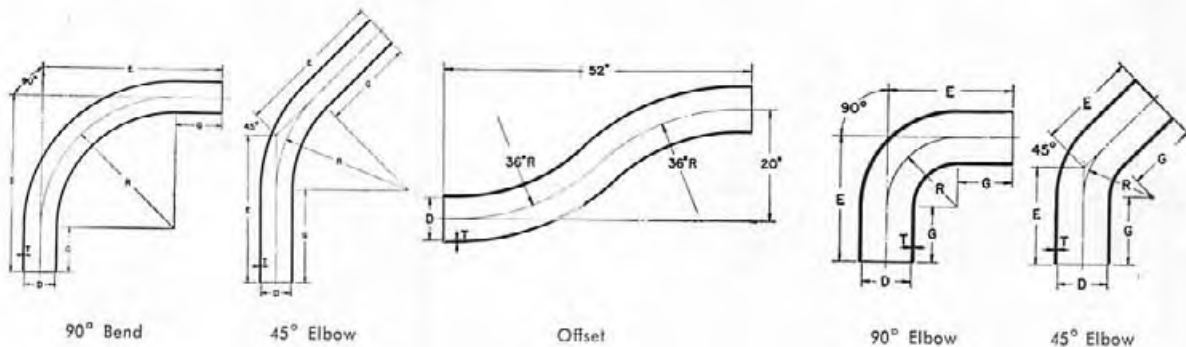


D Bore Diameter	T Wall Thickness Inches	F Joint Inches	Std. Length Feet	Drive Joint		Approx. Weight per 100 ft.
				2L Inches	P Minimum Inches	
1 in.	.20	.94	5	2.0	1.7	100 lbs.
2 in.	.25	1.43	5	3.0	2.97	150 lbs.
3 in.	.25	1.69	8	3.5	3.99	220 lbs.
4 in.	.26	1.94	8	4.0	5.12	320 lbs.
4½ in.	.28	1.94	8	4.0	5.73	400 lbs.
5 in.	.30	1.94	5	4.0	6.38	490 lbs.
6 in.	.40	1.94	5	4.0	7.47	710 lbs.

Bends and Elbows

Fibre conduit bends and elbows are accurately made with special forms to the required radius and degree. Furnished with standard drive joints, couplings included. All bends are 5 feet long. All elbows have short tangent beyond necessary length for angle required. Special angle, special radius, split bends or elbows can be furnished to order.

Please specify angle and radius when ordering.



D Bore Diam.	T Wall Thick.	Bends												Elbows					
		18 in. Radius				24 in. Radius				36 in. Radius				Radius		90°		45°	
		90°		45°		90°		45°		90°		45°		E G		E G		E G	
1 in.	3/16	34	16	31	23	35	11	31	20½	38	2	31	16	5¾	11¼	5½	8	5½	
2 in.	¼	34	16	31	23	35	11	31	20½	38	2	31	16	9½	15½	6	10	6	
3 in.	¼	..	..	..	..	35	11	31	20½	38	2	31	16	13	19¼	6¼	11½	6¼
4 in.	11/16	..	..	..	..	..	..	..	..	38	2	31	16	16	22½	6½	13¼	6½
4½ in.	¾	..	..	..	..	..	..	..	..	38	2	31	16	18	24½	6½	14	6½
5 in.	¾	..	..	..	..	..	..	..	..	36	..	30	15	24	30½	6½	16½	6½
6 in.	9/16	..	..	..	..	..	..	..	..	36	..	30	15	..	..	..	..	..

Dimensions are in inches.

Conduit, Creosoted Wood

An inexpensive, satisfactory means of carrying all forms of lead covered cable and wires—made of selected Yellow Pine and treated with the best creosote, 15 pounds per cubic foot.

Wood conduit is light, lessening transportation charges and because it is light it is easy to handle and install. It is unbreakable and can be opened up to allow the cable to be repaired and then closed up without any special tools or skilled labor.

The bore is smooth allowing the cable to slip through the ducts without the use of lubricants. The creosote process provides full protection against rot, decay or insects.

Sold in single ducts or in multiples up to twelve duct conduit. The single duct type has mortised and tenoned joints and the multiple duct type is finished with smooth joints. Shipped wrapped in burlap and coated with pitch for a finished installation.

Special split ducts can be furnished for placing around cable already installed.

SINGLE DUCT

Furnished in 2 to 10-foot lengths.

Bore Inches	Weight per 100 Feet	Bore Inches	Weight per 100 Feet
2	290 lbs.	3½	600 lbs.
2½	375 lbs.	4	650 lbs.
3	460 lbs.	4½	700 lbs.

MULTIPLE DUCT

Furnished in 1.4 to 6-foot lengths and in bores from 2 to 4 inches. Weight for 3-inch conduit averages 3 pounds per duct foot.

Conduit Fittings, Standard Fibre

ADAPTERS



Adapters from metal pipe to fibre conduit—available in combinations from 1 to 6 inches. Standard adapter has a drive joint at the fibre end and is threaded for metal pipe, the size specified at the other end. Sizes and types of connections must be specified.

REDUCERS

Reducers from one size conduit to another are available in all combinations from 1 to 6 inches. Fitted with drive joint at each end. Sizes and types of conduit, joints, etc., to be connected must be specified in detail.

END BELLS



For use at conduit terminals, in man-holes, at substations, etc., provide a wide radius flare which facilitates cable bending and protects the cable sheath from abrasion. The strength of end bells insures against breakage under all conditions. Available for conduit sizes from 1 to 6 inches. Furnished with standard drive joints.

FIBRE PLUGS

Available for all conduit sizes 2 to 5 inches.

Conduit Fittings, Standard Fibre (Cont'd)

FIBRE CAPS

For sealing spare ducts or exposed conduit ends, etc. Drive joint is standard. Made for conduit sizes 1 to 6 inches.

FIBRE CONDUIT SPACERS

For built-up fibre conduit installations, grooved spacers of fireproof composition are available for one, two, three or four conduit wide assemblies. These spacers are cast accurately and can be furnished for conduit sizes from 2 to 4½ inches.

Connecting Poles, Telephone

Used to connect to any two wires in a lead without climbing the telephone pole.

Consists of an 18-foot, four section, wood pole with bayonet joints. On one end of the pole are mounted a floating contact and a stationary contact. Both are simple spring brass, three prong contacts. These contacts are connected by 50 feet of stranded weatherproof wire to a standard socket which in turn is connected by 50 feet of twisted pair to clips to fasten to telephone binding posts.

The connection is made by hooking the floating contact over a wire and then by hooking the contact fastened to the pole over the other wire.

Cat. No.
33

Weight
7 lbs.

Connectors, Kearney



Simple and inexpensive means of making bridge or test connections. Galvanic action between iron and copper is eliminated by the use of a plated separating washer which places like metals together and assures maximum pressure distribution.

Cat. No.	Type of Connections	Maximum Wire Size	Weight per 100
86-7	Copper to Copper	12 NBS-10 B&S	2 lbs.
986-7	Copper to Bronze	12 NBS-10 B&S	2 lbs.
89-2	Copper to Copper	10 NBS-8 B&S	3 lbs.
989-2	Copper to Copper	10 NBS-8 B&S	3 lbs.
2449-7	Iron to Ironite	12 BWG	2 lbs.
2451-7	Iron to Iron	12 BWG	2 lbs.
5694-7	Iron to Copper	12 BWG	2 lbs.

Counter, No. AB-2 Hand

A Hand Tally Counter, useful for inventory, counting poles, calls, traffic work, etc. Quickly set back to zero by one turn of the knob. Can be operated with either hand. Has rounded corners so as not to irritate the hand of the user, or wear the pocket when carrying it. Counts up to 10,000. Size is 2x1½x2 inches. Weight is ½ pound.



Counter, No. 8 Straight



Designed to record incoming or outgoing telephone calls but can be used for many purposes.

The socket plate is intended to go flush into the keyboard slightly to the right of the operator and to remain there permanently. The counter can be then inserted and removed at will. At such periods as it is decided to make a count, counter is placed

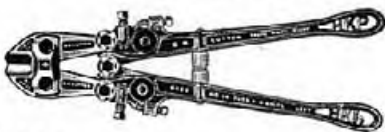
in socket plate in front of each operator and upon receipt of each call the operator presses the lever. This counter registers up to 100,000. Size is 1 3/8 x 1 x 1 3/8 inches. Weight is 5 ounces each.

Counter, No. A-8-T Set Back Ratchet



This counter is suitable where a hand operated set back counter is desired, and can be furnished with the drive shaft projecting either on right or left hand side. Furnished with 3, 4, or 5 figure wheels and thumb lever. Size is 2 3/8 x 1 1/2 x 1 1/4 inches. Weight is 1/2 pound.

Cutters, Porter Wire



Cuts high strength telephone and telegraph wire. Especially suitable for No. 85 and No. 135 wire in No. 10, 12, or 14

B.W.G. Similar in appearance to the Porter bolt cutter.

Cat. No.	Length	Capacity	Weight
1X	24 ins.	3/8 in.	5 1/2 lbs.
2X	30 ins.	1/2 in.	8 1/2 lbs.
3X	36 ins.	5/8 in.	12 1/2 lbs.

Cutters, Porter Bolt



Clipper cut jaws are beveled almost entirely from one side for cutting annealed bolts, wrought

iron, soft steel, cold drawn screw stock, and non-ferrous metals. Not recommended for cutting reinforcing rod, tempered wire or hardened material of any kind. The jaws can be dressed with a mill file when necessary.

Cat. No.	Length	Capacity Bolts	Capacity Soft Rods	Weight
0 NE	18 ins.	3/8 in.	5/16 in.	3 1/4 lbs.
1 NE	24 ins.	7/16 in.	3/8 in.	5 1/4 lbs.
2 NE	30 ins.	9/16 in.	1/2 in.	8 1/2 lbs.
3 NE	36 ins.	5/8 in.	9/16 in.	12 1/2 lbs.
4 NE	42 ins.	3/4 in.	5/8 in.	17 3/4 lbs.

CORDS
Koiled Kords



The Koiled Kord offers independent telephone companies an ideal solution to the replacement problem. Its compactness and retractable features, in addition to its wearing qualities, insure long life, few replacements, and satisfied subscribers.

The Koiled Kord is seven feet of high quality, tinsel conductor, telephone cord, coiled to a length of only nine inches. A pull of only one pound will extend the Kord to a length of four feet.

The special "no springs" construction of these Kords keeps them from becoming "baggy" or loose after months and years of service. Special construction features do away with the problem of kinking and twisting of the Kord. The small diameter and light, but strong, construction permit the Kord to extend with only slight pull.

These Kords are permanently molded into a spring-like shape. No metal springs or other mechanical devices are used to give this Kord its retractability and uniform, small diameter.

Installations where replacement is a problem—lunch rooms, restaurants, gas stations, paint and chemical plants, etc.—are ideal places to use the Koiled Kord.

The Kord is protected by a neoprene jacket over the rubber covered conductors against abrasion, perspiration, light, oil, grease, and acid.

No. 5001-1 Koiled Kord

For use with Kellogg No. 1000 series desk and No. 1100 series wall Masterphones.

No. 5001-2 Koiled Kord

For Kellogg No. 900, 925, 9900, 9917 series and other Masterphones using a No. 27-C handset.

No. 5001-3 Koiled Kord

For use with Western Electric, Stromberg Carlson, and North Electric handset type telephones.

No. 5001-4 Koiled Kord

For use with Automatic Electric handset type telephones.

No. 5001-5 Koiled Kord

For use with Leich Electric handset type telephones.

Desk Stand Cords by Koiled Kord

A special type Koiled Kord, designed to provide an extra long extension cord for connection between the handset and wall terminal block, is now available. These cords are made of the same three conductor tinsel cordage used for Koiled Kord telephone cords.

No. 5001-10 Koiled Kord

This Kord has a relaxed length of 16 1/2 inches and will extend to a length of 10 feet with a pull of approximately one pound. Trimmed as a universal line cord.

No. 5001-15 Koiled Kord

The No. 5001-15 Kord is the same as the No. 5001-10 but will extend to 15 feet with the standard one pound pull.

No. 5001-25 Koiled Kord

The No. 5001-25 Kord has a relaxed length of 42 inches and will extend to 25 feet. Trimmed as a universal line cord.

Cross Arms, Fir



Scope

These specifications cover material and workmanship of cross arms and alley arms in sizes 6x6 cross section and smaller, made of coast type Douglas Fir (*Pseudotsuga Taxifolia*).

General

Complete specifications and drawings include all instructions necessary for the manufacturer's guidance in his work. They are intended to supplement each other and any details indicated in one and not in the other shall be executed the same as if indicated in both. All arms shall be finished smooth on all four sides and ends shall be sawed square. Pin and bolt holes shall be smooth and free from splintering where the bit has broken through.

Dimensions

Cross arms shall be of the style and dimensions shown and allowable variations must not be exceeded. Figures on the drawings shall be followed in preference to scale measurements.

Seasoning

Arms shall be made of air-dried or kiln-dried lumber, the moisture content of which shall average not less than 12 per cent and not more than 20 per cent of its oven dry weight.

Materials

Finished cross arms shall not contain boxed hearts, checks along the same grain appearing at adjacent pin holes or through checks, cracks across the grain, any decay or fungus growth, loose or unsound knots, shakes, worm holes, pieces of exceptionally light weight or a combination of bow and crook.

Finished cross arms may contain the following defects, provided they do not exceed stated limits.

Annular Rings—Annular rings measured over a 3-inch portion of a radial line shall average not less than 8 nor more than 20 per inch. Six rings per inch will be permitted provided the piece contains $\frac{1}{3}$ or more summerwood. The radial line shall be at a right angle to the annular rings and the center of the three-inch portion of the line shall be at the center of the end of the piece. If a 3-inch portion of the radial line cannot be obtained, the measurement shall be made over as much of the 3-inch portion as is available.

Checks not exceeding $\frac{3}{4}$ inch in depth or $\frac{1}{16}$ inch in width. Other checks shall be permitted provided they do not exceed 6 inches in length on the top of the arm or where entering a pinhole, 12 inches in length on the bottom of the arm or where entering a bolt hole or 18 inches in length on the sides of the arm.

Grain—Spiral or diagonal grain, which departs from parallelism with the axis of the arm by an amount not greater than 1 inch in 12 inches of length (approximately 5 degrees).

Sound Knots not exceeding $\frac{1}{4}$ inch in diameter in any 3-inch longitudinal section having a pin or bolt hole at its center. In the center half of the arm single sound knots in any 6-inch longitudinal section shall not exceed $\frac{3}{4}$ inch in diameter. In the end quarter sections, the size of the knots may be increased to 1 inch in diameter. A plurality of knots shall not exceed in area the limits specified for single knots. The size of knots shall be taken as the smallest diameter.

Pitch Pockets—Pitch pockets not exceeding $\frac{1}{8}$ inch in width and 4 inches in length on top of the arm. Pitch pockets not exceeding $\frac{1}{4}$ inch in width and 8 inches in length or the equivalent area on sides and bottom of the arm.

Sapwood—Sapwood not in excess of $\frac{1}{3}$ of the girth of the arm.

Wane—All bark shall be removed from wane edges. Wane not in excess of $\frac{3}{4}$ inch of the beveled surface.

Warp—Bow or crook not exceeding $\frac{1}{16}$ inch per foot of length.

Combination of Defects—An 8-foot arm may contain either 4 allowable, sound, tight knots or smaller knots equivalent in area, or 4 allowable pitch pockets. These defects are to be reduced proportionately when they appear in combination. They are to be increased or decreased proportionately for longer or shorter arms.

Testing

Testing—Pin and bolt holes shall be tested with steel gages as follows:

1-17/32-inch pin holes shall admit the $1\frac{1}{2}$ -inch gage without forcing, but shall not admit the 1-9/16-inch gage.

11/16-inch bolt holes shall admit the $\frac{5}{8}$ -inch gage without forcing.

9/16-inch bolt holes shall admit the $\frac{1}{2}$ -inch gage without forcing.

7/16-inch bolt holes shall admit the $\frac{3}{8}$ -inch gage without forcing.

Inspection

Inspection—Arms not conforming with this specification shall be rejected and the manufacturer shall either replace such rejected arms with arms complying with this specification at his own expense or allow credit for such rejected arms.

Storage

Storage—Cross arms held for storage shall be stacked in cross piles on skids 6 inches above the floor in such manner as to provide good ventilation. Stacks shall be roofed to prevent the penetration of rain or direct action of the sun.

Standard Fir and Pine Cross Arms

The following have been recognized generally as standard arms. If any variation is desired be sure to show these changes.

STOCK NUMBER		Size Arm — Inches	PIN HOLES				Center Bolt Hole Inches	Brace Bolt Spacing Inches	Use Length Brace Inches	WEIGHT Per 100 Arms (Lbs.)	
Fir	Pine		Spacings — Inches			Size Inches				Fir	Pine
			Center	Sides	Ends						
		3 1/4 x 4 1/4	Electric Light Arms*								
J-5800	1	3 ft., 2 pin	28	--	4	1-17/32	5/8	25	20	1062	1500
J-5801	2	4 ft., 4 pin	16	12	4	1-17/32	5/8	28	22	1416	2000
J-5802	3	5 ft., 4 pin	18	17	4	1-17/32	5/8	28	22	1770	2600
J-5803	4	6 ft., 4 pin	22	21	4	1-17/32	5/8	32	24, 26	2124	3100
J-5804	5	6 ft., 6 pin	16	12	4	1-17/32	5/8	32	24, 26	2124	3100
J-5805	6	8 ft., 6 pin	18	17 1/2	4	1-17/32	5/8	32	24, 26	2832	4100
J-5806	7	8 ft., 8 pin	16	12	4	1-17/32	5/8	32	24, 26	2832	4100
J-5807	8	8 1/2 ft., 10 pin	16	9 3/4	4	1-17/32	5/8	32	24, 26	3009	4300
J-5808	9	10 ft., 8 pin	17 1/2	15 3/4	4	1-17/32	5/8	42	30, 32	3540	5100
J-5809	10	10 ft., 10 pin	16	12	4	1-17/32	5/8	42	30, 32	3540	5100
J-5810	11	10 ft., 12 pin	16	9 5/8	3 7/8	1-17/32	5/8	42	30, 32	3540	5100
		2 3/4 x 3 3/4	Pony Telephone Arms**								
J-5819	31	24 in., 2 pin	17	--	3 1/2	1-9/32	5/8	--	--	540	800
J-5820	32	30 in., 2 pin	23	--	3 1/2	1-9/32	5/8	--	--	675	1000
J-5821	33	36 in., 2 pin	29	--	3 1/2	1-9/32	5/8	25	20	810	1200
J-5822	34	42 in., 4 pin	16	9 1/2	3 1/2	1-9/32	5/8	28	22	945	1300
J-5823	35	62 in., 6 pin	16	9 3/4	3 1/2	1-9/32	5/8	28	22	1395	2000
J-5824	36	82 in., 8 pin	16	9 3/4	3 3/4	1-9/32	5/8	28	22	1845	2600
J-5825	37	102 in., 10 pin	16	9 3/4	4	1-9/32	5/8	28	22	2295	3200
J-5826	38	120 in., 12 pin	16	9 5/8	3 7/8	1-9/32	5/8	28	22	2700	3800
		3 x 4 1/4	Western-Union Arms								
J-5920	25	6 ft., 6 pin	20	11 1/2	3	9/16	21/32	--	--	1980	2900
J-5921	26	8 ft., 8 pin	21	11 1/2	3	9/16	21/32	--	--	2640	3800
J-5922	27	10 ft., 10 pin	22	11 1/2	3	9/16	21/32	--	--	3300	4800
		3 1/2 x 4 1/2	N. E. L. A. Arms								
J-5828	41	3 ft. 2 in., 2 pin	30	--	4	1-17/32	11/16	28	22	1267	1900
J-5829	42	5 ft. 7 in., 4 pin	30	14 1/2	4	1-17/32	11/16	38	28	2233	3400
J-5830	43	8 ft., 6 pin	30	14 1/2	4	1-17/32	11/16	38	28	3200	4800
J-5831	44	9 ft. 2 in., 8 pin	30	12	4	1-17/32	11/16	38	28	3667	5500
		3 1/4 x 4 1/4	N. E. L. A. (Light) Arms								
J-5833	51	3 ft. 2 in., 2 pin	30	--	4	1-17/32	11/16	28	22	1120	1600
J-5834	52	5 ft. 7 in., 4 pin	30	14 1/2	4	1-17/32	11/16	38	28	1976	2900
J-5835	53	8 ft., 6 pin	30	14 1/2	4	1-17/32	11/16	38	28	2832	4100
J-5836	54	9 ft. 2 in., 8 pin	30	12	4	1-17/32	11/16	38	28	3245	4700
		3 1/4 x 4 1/4	Guard Arms								
G-48		Guard Arms are 48" x 4 1/4" x 3 1/4", bored for one 5/8" machine bolt, one 3/8" carriage bolt and drop attachments — specify when ordering. Guard Arm braces are shown on page 150.								1416	2000

*Electric Light Arms are bored 1-9/32 inch for 1 1/4 inch pins or 1-17/32 inch for 1 1/2 inch pins. 1 1/4 inch pins are considered standard for telephone work. When ordering be sure to specify size of pins to be used. Orders not specifying will be shipped with 1 1/4 inch pin boring. **Pony telephone arms are bored for 1 1/4 inch pins only.

Pine Cross Arms: Standard are 8 lb. pressure treated. They are carried in stock at the mills only, can be shipped in carload lots, less than carload lots or in conjunction with shipments of carloads of pine poles.

Note: All standard arms are bored for 3/8 brace bolts unless otherwise specified. **Special Arms** with special borings or spacings to meet particular requirements can be furnished. A drawing should accompany such orders.

MINIMUM CARLOAD WEIGHTS

Fir Cross Arms: From Pacific Coast Mills, 38,000 lbs. Small cars are scarce and weight of at least 50,000 lbs. should be figured on. Cars to contain as high as 90,000 lbs. can be had.

Pine Cross Arms: (Cross arms alone or with Pine Poles.) From mills west of the Mississippi River, single load 30,000 lbs. if 36 ft. car; single load 34,000 lbs. if over 36 ft. car; double load 48,000 lbs. From mills east of the Mississippi River, single load 34,000 to 36,000 lbs.; double load 58,000 to 60,000 lbs.

Deadman



Made of 2 x 4-inch Maple with special steel fork and spike; fitted with steel bands at each end to prevent splitting. Fork is securely fastened by rivet through the band. This support is adapted for the heaviest kind of work.

Cat. No.	Size	Length	Weight Each
T-306-848	2 x 4 inches	8 ft.	30 lbs.

Desiccant, Drierite



In the desiccant method of splicing lead covered cables, the splice is dried by granular "Drierite" Desiccant which is put in among the conductors after the wire splicing work is completed. The bundle of spliced conductors and the desiccant are then compacted by a spiral wrapping of muslin and covered in the usual manner by a lead sleeve. This method involves no boiling out of conductor insulation with hot paraffin no matter how long the splice is unsheathed for wire joining work.

The desiccant method of splicing is particularly advantageous for use in buildings where fumes from hot paraffin may be objectionable. It is also recommended in aerial and underground work in cases where old splices have been boiled out so often the paper insulation has become brittle.

Desiccant also can be used successfully to dry out wet spots which have been caused by defective sheath and on underground work where gases are suspected and open flames are considered dangerous.

The moisture is absorbed by the desiccant, resulting in an effect equivalent to boiling-out with hot paraffin. Once absorbed the moisture will not be released except in temperatures considerably higher than are encountered under ordinary conditions in telephone cables. Desiccant will not injure or corrode the sheath, conductors, insulation, or cause any harmful effect to the skin of workmen.

It is not possible to compress a splice treated with desiccants as tightly as one boiled out with paraffin, so it is necessary to use lead sleeves 1/4 to 3/8 inch larger in diameter than would normally be required. Splice is sealed in usual manner.

The desiccant is packaged in cans with screw tops and seals and comes in the following sizes:

1/8 Pint	(50 Grams)	Small
1/2 Pint	(200 Grams)	Medium
1 Quart	(800 Grams)	Large

Diggers, Eureka



Lacquered, ash handles, polished steel blades, malleable iron castings. Iron work and upper half of blades painted black.

Cat. No.	Length Handle	Size of Blades	Weight Each
T-435	4 feet	5 1/4 x 9 in.	9 lbs.
T-436	7 feet	5 1/4 x 9 in.	11 lbs.

Digger Handles, Eureka

Cat. No.	Length	Std. Bundle	Weight Each
T-437	4 feet	12	2 lbs.
T-438	7 feet	12	3 1/2 lbs.

Dresser, Hardwood



Made of hardwood for shaping and dressing lead sleeving, pipe, pot heads, etc.

Cat. No.	Description	Weight per Doz.
295	Hardwood Dresser	15 lbs.

Drill, Automatic



For rapidly boring holes in wood by pushing down on the handle, which is forced back by a spring. The drill point revolves backward on up stroke of handle, clearing the chips and freeing the point. Points are held in chuck so they cannot be pulled out.

Drill is chrome plated and polished. The handle is a magazine for holding the drill points. It is quickly closed and locked and when unlocked the drill points are forced up into plain sight. Eight drill points are included with each drill: 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64 inch diameter.

Cat. No.	Diameter Holes	Length Over-all	Weight per Doz.
41	1/16 to 11/64 in.	11 1/4 in.	8 1/4 lbs.

Drills, Bell Hangers



Made of heat treated, alloy steel with a twist length of 3 3/4 inches. 18-inch lengths shown are standard for telephone work but 12 and 24-inch lengths also are available.

Cat. No.	Diameter	Weight Doz.	Cat. No.	Diameter	Weight Doz.
48-6	3/16 in.	1 3/4 lbs.	48-12	3/8 in.	3 lbs.
48-8	1/4 in.	2 1/2 lbs.	48-14	7/16 in.	3 3/4 lbs.
48-10	5/16 in.	2 7/8 lbs.	48-16	1/2 in.	6 1/8 lbs.

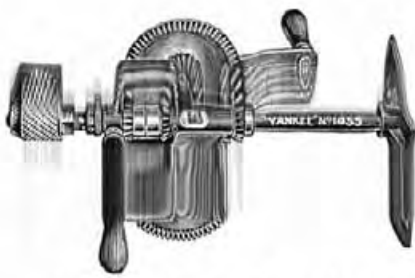
Drills, Wood Boring Brace



Length of twist varies from 2 1/4 to 4 inches and the over-all length from 4 1/2 to 8 inches. Order by diameter.

Cat. No.	Diameter	Weight Doz.	Cat. No.	Diameter	Weight Doz.
46-8	1/4 in.	7/8 lb.	46-14	7/16 in.	2 1/8 lbs.
46-10	5/16 in.	1 1/4 lbs.	46-16	1/2 in.	2 5/8 lbs.
46-12	3/8 in.	1 3/4 lbs.			

Drill, Double Speed Breast



Has 3-jaw chuck for round shank tools up to 1/2 inch. Handy sliding shifter instantly changes the speed or locks spindle for opening chuck. Steel spindle with adjustable ball bearing, cut gears and steel pinions. Breast plate is adjustable.

Cat. No.	Length Over-all	Capacity	Weight Each
1455	16 1/2 in.	0 to 1/2 in.	6 lbs.

Drill, Double Speed Hand



Double speed plain hand drill. Has 3-jaw chuck for round drills. Malleable iron

frame, finished in dead black. Hardwood handle, detachable at milled nut. Deep drill magazine inside. Bright parts chrome plated.

Cat. No.	Length Over-all	Capacity	Weight
1446	14 1/2 in.	0 to 3/8 in.	2 3/4 lbs.

Drills, Double Speed Ratchet Breast



Double speed ratchet breast drill with chrome plated chuck. Two-jaw style for round or square shank drills or 3-jaw style for round shank drills only. Malleable iron

frame with dead black finish. Breast plate adjustable, has polished face. Removable side handle has screw driver bit. Steel spindle has adjustable ball bearing. The ratchet attachment makes 5 different spindle movements available: plain drive; right-hand ratchet; left-hand ratchet; continuous ratchet (drill cuts on both back and forward strokes), and spindle locked (for opening chuck).

Cat. No.	Chuck Style	Length Over-all	Capacity	Weight
1555	3-Jaw	17 in.	0 to 1/2 in.	7 3/4 lbs.
555A	2-Jaw	18 in.	0 to 1/2 in.	7 7/8 lbs.

Drills, 4-Point Diamond N



For brick, stone or concrete. Made of high grade octagon drill rod.

Additional sizes and lengths are available on special order.

Diameter Drill	Length	Std. Pkg.	Weight per Doz.
1/4 in.	12 in.	12	2 lbs.
5/16 in.	12 in.	12	3 lbs.
3/8 in.	12 in.	12	4 lbs.
7/16 in.	12 in.	12	5 lbs.
1/2 in.	12 in.	6	5 lbs.
5/8 in.	12 in.	6	9 lbs.
3/4 in.	12 in.	6	12 lbs.

Drills, Di-Forge Twist



FOR HAMMER DRILLING. Forged from a solid bar of vanadium tool steel. Used with a hand or electric hammer. Rotate clockwise between each blow when used with hand hammer. Rotate continuously if used with electric hammer. Will stand hard use and abuse.

Diameter	Length Over-all	Depth Hole	Std. Pkg.	Weight per Doz.
3/16 in.	2 3/4 in.	1 3/8 in.	12	1/2 lb.
1/4 in.	3 1/4 in.	1 3/4 in.	12	3/4 lb.
5/16 in.	4 1/4 in.	2 1/2 in.	12	1 lb.
3/8 in.	5 in.	3 in.	6	1 1/4 lbs.
7/16 in.	5 1/4 in.	3 1/4 in.	6	1 1/2 lbs.
1/2 in.	5 3/8 in.	3 1/4 in.	6	2 lbs.
9/16 in.	5 1/2 in.	3 3/4 in.	6	2 1/2 lbs.
5/8 in.	5 3/4 in.	4 in.	6	2 1/2 lbs.



Drill Holders, Style B

A hand drilling tool for use where numerous small holes are to be drilled for fastening small fixtures, etc.

Either Di-Forge or Diamond N drill points may be used. Weight per dozen, 6 1/2 lbs.

Drill Holders, Style C Rubber Grip



For use with Di-Forge or Diamond N drill points. Made of vanadium steel with a soft rubber grip with flange to protect the hand of the operator. Hexagon flange also prevents rolling.

Weight per dozen, 10 pounds.

Drills, "Sudden-Depth" Masonry



These carboly tipped drill bits are especially designed for expansion anchor installation.

These drills can be used continuously, without a cooling agent, with no risk of fracturing or destroying the material. Drills are easily sharpened on silicon carbide grinding wheels. The following sizes are available:

Drill Diameter	Actual Min. Drill Diam.	Shank Diameter	Overall Length
3/16 in.	.197 in.	1/8 in.	3 in.
1/4 in.	.260 in.	3/16 in.	4 in.
5/16 in.	.327 in.	1/4 in.	4 in.
3/8 in.	.390 in.	1/4 in.	4 in.
7/16 in.	.457 in.	1/4 in.	6 in.
1/2 in.	.525 in.	3/8 in.	6 in.
9/16 in.	.587 in.	3/8 in.	6 in.
5/8 in.	.650 in.	1/2 in.	6 in.
11/16 in.	.712 in.	1/2 in.	6 in.
3/4 in.	.775 in.	1/2 in.	6 in.

Dynamometer, Dillon



This instrument was originally designed for the express purpose of pulling up wire and strand to correct tension. Eliminates guesswork of linemen's rule-of-thumb methods of adjusting tension.

The Dynamometer can be quickly shunted into existing wire or can be used in new construction. Ordinary chain hoist or rope block is employed in series between wire and instrument to apply load. Reads directly in pounds. Maximum hand records tension. These highly accurate units are shipped complete with heavy steel carrying case and shackles at no extra charge. Size: 8¼ in. long, 6¼ in. tall, and 3 in. thick. Weight: 5 lbs., 10 oz. Furnished in the following capacities: 500; 1000; 2500; 3500; 5000; 7500; 10,000; 15,000, and 20,000 pounds.

Fire Extinguisher, Pyrene
HEAVY DUTY UNIT



This Vaporizing Liquid Pressure Type extinguisher consists of a top and bottom casting made of high-pressure brass to which is fastened an inner and outer shell of heavy gauge, seamless drawn tubing forming two chambers. The inner chamber contains air pressure and the outer chamber contains Pyrene Fire Extinguishing Liquid. These two chambers are sealed tightly against each other. When the operating valve wheel is turned, air pressure enters the liquid chamber, thus expelling a continuous stream of liquid through a flexible metal hose, rubber insulated.

An efficient pump is built into this extinguisher to renew air pressure. For convenience, in addition, an air valve permits a service air line to be used where available.

The open face pressure gauge at the top indicates the air pressure in the inner chamber at all times. An inspection glass is also provided so that the liquid level may be observed. The normal level is the center of this glass.

To recharge, unscrew the filler cap, pour in one gallon of Pyrene Fire Extinguishing Liquid, replace the filler cap, open the small disc valve and pump to 100 lbs. pressure, close the small disc valve and the extinguisher is ready for use.

To operate the extinguisher, grasp the hose in right hand and with left hand operate wheel which simultaneously controls the flow of air and liquid at a quarter turn. The stream ranges from 25 to 30 feet.

This extinguisher is safe from freezing to 48° F. below zero. Inspected and labeled by the Underwriters' Laboratories and approved by the Associated Factory Mutual Laboratories.

Cat. No.	Description	Height	Diam.	Shipping Weight
C-43	1-gal., Polished Copper	24 in.	6 in.	39½ lbs.

Fire Extinguishers, Pyrene WALL BRACKET TYPE



Pyrene Fire Extinguishers are ideal for telephone companies. Easy to operate, women can handle them easily. They stop the fire before it can spread—thereby helping to maintain continuous telephone service. Pyrene Extinguishers are approved by the Underwriters' Laboratories and are the most effective type for smothering any class of fire in its incipient stage; particularly fires in flammable liquids or electrical equipment. The Pyrene liquid is a non-conductor of electricity and will not injure electrical apparatus.

The double-acting pump with patented rotating pickup will discharge a steady, continuous stream 25 to 30 feet, regardless of what position the extinguisher is held.

Pyrene Extinguishers are made in a standard brass finish. They can be furnished in chrome or nickel plate or colored Duco finishes to match interior decorative schemes. When ordering Duco finish, specify color and furnish sample.

Cat. No.	Capacity	Type	Shipping Weight
C-21	1 Quart	Wall Bracket	7½ lbs.
C-31	1½ Quarts	Wall Bracket	10 lbs.

Fire Extinguisher, C-O-Two



These C-O-Two extinguishers are especially recommended for highly inflammable liquids, paints, oils, solvents, and alcohol fires, and for the protection of electrical equipment.

The extinguishing agent, carbon dioxide, is a dry inert gas stored in cylinders under pressure. It leaves no odor, stain, or damage. It is non-corrosive and a non-conductor of electricity and does not deteriorate or freeze.

C-O-Two extinguishers feature the "Squeeze-Grip" valve with a "pressure-closing seal" which is sealed against leakage by the pressure of the gas stored within the cylinder. The valve is fast opening and there is no loss of gas or lost motion while maneuvering around a fire.

The gas cylinder is of high pressure steel and I.C.C. approved with a forged brass valve. The discharge hose is of wire-reinforced construction with cotton braided cover and die pressed couplings. The discharge horn is a non-conductor, resistant to corrosion or moisture and is of shatterproof construction.

A periodic check of the extinguisher is the only maintenance required. Full and empty weights are stamped on nameplate band and valve.

C-O-Two portable extinguishers are approved by Underwriters' Laboratories, Inc., Factory Mutuals, and comply with all federal regulations and requirements.

Cat. No.	Description	Size
PS2½	Squeeze-Grip Extinguisher with swivel tube	2½ lbs.
PS5	Squeeze-Grip Extinguisher with swivel tube	5 lbs.
PSH10	Squeeze-Grip Extinguisher with 3 ft. hose	10 lbs.
PSH15	Squeeze-Grip Extinguisher with 3 ft. hose	15 lbs.

Fire Extinguishing Liquid, Pyrene



For refilling vaporizing liquid type extinguishers. Non-conductor of electricity. Non-corrosive. Will not freeze at 50° below zero F.

Cat. No.	Description	Weight Std. Pkg.
CR-1	1 Pint can	39½ lbs.
CR-2	1 Quart can	76½ lbs.
CR-10	2 Quart can	56½ lbs.
CR-4	1 Gal. can	58½ lbs.

Fire Pot, C. & L. No. 44-A



The burner of the No. 44-A fire pot is of the coil type. The coils can be replaced when plugged with carbon. In addition to the regular shut-off valve this fire pot has the "Coiltrol" flame regulating valve. By the use of this valve a pot of metal can be quickly melted and the flame turned down, saving loss of metal and use of fuel.

Handles a full 6-inch metal pot.

The tank is seamless, drawn from heavy steel and thickly coated with tin inside and out to prevent corrosion. All fittings are interlocking. A large size pump produces air pressure quickly. Supplied with a 6½-inch diameter top shield. Regularly supplied for gasoline but can be furnished for kerosene if specified when ordering.

Cat. No.	Description	Capacity	Weight Each
44-A	Fire Pot	1 Gallon	14 lbs.

Fire Pot, C. & L., No. 75



A heavy duty fire pot with a 10¼-inch top shield to take a large metal pot.

Regularly supplied for gasoline but can be furnished for kerosene if specified when ordering.

Cat. No.	Description	Capacity	Weight Each
75	Fire Pot	1 Gallon	22½ lbs.

Fire Pot, Turner No. 275



Will melt 20 pounds of lead in three minutes. Has air siphoning tube which permits pot to operate at a pressure of only 20 to 30 pounds. A carburetor control permits easy adjustment of the flame to meet fuel and job conditions. Takes 6-inch melting pot.

Cat. No.	Description	Capacity	Weight
275	Fire Pot	9 pints	14 lbs.

First Aid Kits

Medical Supply Company First Aid Kits are designed especially to meet the requirements of telephone companies. They provide a quick, simple and more effective way of giving first aid. Most important is the ease in maintaining clean, accessible first aid materials at all times. This applies whether they are used by maintenance or operating crews, in an office or by an individual employee.

Features of these kits include:

1. Made of 20-gauge steel to stand rough handling.
2. Dust-proof construction keeps contents clean.
3. Water-tight gasket keeps out all moisture.
4. Special hinge bracket on back of kits make hanging easy anywhere.
5. First aid instructions given on inside cover of kit.

No. 750 Pocket First Aid Kit



Kit is prepared with the standard assortment shown below. For refills, units are purchased and individual dressings are added to kit. If desired, any of the listed items may be substituted, but must be purchased separately.

Contents of Standard No. 750 Kit	No. Individual Dressings in Kit	Cat. No. Replacement Unit
1-in. Adhesive Compresses	4	No. 100
2-in. Bandage Compresses	1	No. 108
3-in. Bandage Compresses	1	No. 121
Iodine Swabs	3	No. 105
Ammonia Inhalants	2	No. 104
Tan-A-Burn	2	No. 101

No. 500-A Medical Supply Company First Aid Kit



Standard contents are listed below. No. 500-A may be made up with any of the listed units so long as the total units involved equal 10 "A" units or the equivalent.

Contents of Standard No. 500-A Kit	No. Individual Dressings in Kit	Cat. No. Replacement Unit	No. of Individual Dressings in Refill Unit
1-in. Waterproof Adhesive Compresses	2	No. 100-A	16 per unit
Tan-A-Burn (Burn Treatment)	1	No. 101-A	Six—1/8 oz. tubes per unit
Ammonia Inhalants	1	No. 104-A	10 per unit
Iodine Swabs	1	No. 105-A	10 per unit
2-in. Bandage Compress	2	No. 108-A	4 per unit
4-in. Bandage Compress	1	No. 109-A	1 per unit
Army Tourniquet and Forcep	1	No. 111-AA	

First Aid Kit Replacements

- 100-A Sixteen adhesive compresses, non-ravel gauze pad on perforated strip of adhesive plaster, 1x3 $\frac{3}{8}$ in. Complete dressing for minor wounds.
- 108-A Four 2-inch bandage compresses. Gauze pad 2-in. square, sewn to center of a bandage strip 36 in. long, forming complete dressing for leg and arm wounds. Pads can be unfolded to double width.
- 109-A One 4-inch bandage compress. Gauze pad, 4-in. square, sewn to center of a bandage strip 84 in. long, forming complete dressing for leg and arm wounds. Pads can be unfolded to double width. Safety pins for fastening are enclosed.
- 136-A One compressed gauze. Folded and compressed piece of absorbent sterile gauze, 24x72 inches for dressing large wounds.
- 105-A Ten iodine swabs. For sterilization of wounds and instruments. Sealed glass tube prevents spilling or evaporation. Applicator swab over tip absorbs liquid when tube is crushed.
- 113-A Ten mercurochrome swabs. Same as above except containing mercurochrome.
- 104-A Ten aromatic ammonia inhalants for use as stimulant. Liquid is absorbed by cotton when glass tip is crushed.
- 101-A Six tubes Tan-A-Burn ($\frac{1}{8}$ oz.). A smooth insulating ointment for all types of superficial burns. In collapsible tubes.
- 130-A Six creosote burn wash—sealed applicator vials. Treatment for creosote burns.
- 116-A One wire splint. Flexible, heavy woven wire gauze for giving temporary support in case of fracture, etc.
- 115-A One triangular bandage. A piece of strong plain muslin folded in the approved cravat style for slings, supporting bandages and outer bandages, for tying splints and many other uses.
- 111-AA One army-type tourniquet with buckle and pad for application when needed. Instructions on package. Also a pair of splinter forceps.

Flag and Flag Holder



Holder is designed to fit all poles and is fitted with lock and chain to keep flag upright at all times. The chain wraps around the pole and hooks into main body of the clamp.

The red flag is 12 by 16 inches in size and is made of 6-ounce army duck. The hardwood staff is 1 by 18 inches.

Cat. No.	Description	Weight
1110	Danger Flag, 12x16 in.	1 lb.
1111	Danger Flag, complete with Holder	3 lbs.

Flare, Daco Safety Signal



This electric torch gives 250 warning flashes per minute for a guaranteed 200 hours operation without battery replacement. Takes the place of old-style oil and stick flares. Meets ICC requirements.

This flare is only 3 $\frac{1}{4}$ x4 $\frac{3}{4}$ x7 $\frac{1}{2}$ inches in size and weighs only 2 pounds, 9 ounces, complete with standard, 6-volt lantern type battery.

A metal carrying and storage rack is also available for the Daco Safety Signal Flare. Will hold three Flares. Order separately.

Signal Flare. Will hold three Flares. Order separately.

Fountain, Portable Drinking



This bubbler-type portable drinking fountain stops germ-spreading practices by doing away with unsanitary pails, kegs, dippers, and cups. Meets the requirements of public health authorities.

The fountain can be carried from place to place or mounted on work trucks, etc. Water is completely sealed from dust and dirt. Heavy insulation prevents water temperature from rising more than 10 degrees in

12 hours under extremes of weather. Large filler opening permits inserting ice when desired. The inner water container is stainless steel and all other parts in contact with water are nickel plated brass.

Accessories for the fountain include carrying strap, mounting bracket, spill cup for use indoors and salt tablet dispenser with capacity of 500 tablets.

Frames, No. 10 Pistol Grip Hacksaw



Hard rubber handle hung low to direct the entire force of stroke in line with the cutting edge of the blade. Frame is cold-rolled steel, 3/16-inch thick and 11/16-inch wide, nicked and highly polished. Adjustable, 8 to 12-inch blades—will cut at four different angles. Depth under back to cutting edge of blade is 3 inches.

Cat. No.	Description	Size	Weight per Doz.
10	Hacksaw Frame	8 to 12 in., Adj.	24 lbs.

Frames, Hacksaw

Has a hard rubber, open grip handle which gives the operator complete control of the saw at all times. Frame is made of extra high grade steel 11/16-inch wide and 3/16-inch thick. Nicked and polished. Depth under back to cutting edge, 3 inches.

Packed one per box with 10-inch blade.

Cat. No.	Description	Size	Weight per Doz.
11	Hacksaw Frame	8 to 12 inches—adjust.	20 lbs.

Furnaces, Unique Gasoline

ONE GALLON CAPACITY



This furnace will melt 20 lbs. of solder in 7 minutes or 40 lbs. in 10 minutes. The ten-inch flame can be finely regulated to

avoid over-heating or burning the metal. This is an economical furnace to use, operating 4 to 6 hours on a gallon of fuel.

Upper structure can be removed in five seconds, leaving the burner unit completely exposed. Attaching the side handle converts the furnace into a heavy duty torch, for thawing, melting or preheating.

The generator is a seamless steel "U" tube which is encased in a removable cast housing. It will give long, satisfactory service with little attention, is readily cleaned, inexpensive to replace and is fitted with removable orifice tube and valve.

The rugged saucer-shaped top plate cuts heating time by curling the flame up around the pot; pot shield locks to top plate. Furnace size is 8x12 inches.

Cat. No.	Fuel	Capacity	For	Weight Each
43	Gasoline	1 gallon	5 and 6 in. pots	12 lbs.
43-A	Gasoline	1 gallon	7 and 8 in. pots	12 lbs.

Furnaces, Unique Splicer's

FOR GASOLINE OR KEROSENE—ONE GALLON CAPACITY



Will melt 50 pounds of solder in 10 minutes and functions without attention. The patented figure "8" seamless steel tubing generator is responsible for the intense heat which actually consumes the carbon.

The flame is regulated as easily as a gas stove burner. As the control valve is opened and closed, the orifice (hole through which the gas blows) is automatically scraped and cleared of dirt particles.

The generator, control valve and orifice scraper are removable for cleaning and repairing by simply loosening union and top plate gate.

Tank is a drawn shell of 16-gauge steel with welded fittings and bottom. A steel protecting ring is welded into the bottom of the finished tank.

The kerosene model (No. 55-1) is recommended for greater safety and longer generator life. It is equal to the gasoline model in every respect and produces a larger, hotter flame. Size is 8x12½ inches. Both models accommodate an 8-inch solder pot.

Cat. No.	Fuel	Capacity	For	Weight
53-1	Gasoline	1 gallon	8 in. Pot	12½ lbs.
55-1	Kerosene	1 gallon	8 in. Pot	12½ lbs.

Blow Torches

For Blow Torches and other heating units see "Torches, Blow" in this section.

Fuses, Reliable Mica

Provided with copper terminals. When ordering please be sure to specify the amperage desired, also the catalog number of the fuse.

The fuses shown below are carried in stock in both ¼ and ½ ampere. When orders do not specify the enclosed type will be shipped.

Special mica and fibre fuses can be furnished promptly.

WESTERN UNION TYPE



Cat. No.	Length	Width	Std. Pkg.	Weight per 100
8	2½ in.	¾ in.	50	½ lb.
19	2 in.	¾ in.	50	½ lb.
22	2½ in.	½ in.	50	½ lb.

POSTAL TYPE



Cat. No.	Length	Width	Std. Pkg.	Weight per 100
11	2½ in.	¾ in.	50	½ lb.
21	2 in.	¾ in.	50	½ lb.
25	2½ in.	½ in.	50	½ lb.
137-1	1½ in.	¼ in.	50	½ lb.
137-2	2 in.	¼ in.	50	½ lb.

Fuse, Combination Heat Coil



Cat. No.	Material	Length Shoulder to Shoulder	Weight per 100
107	Fibre	3-1/16 in.	5 lbs.

Fuses, Terminal and Protector



Sizes and types for every telephone protector and cable terminal—wood, fibre, composition, porcelain and mica. When ordering, please be sure to specify the amperage desired, also the catalog number of the fuse. This will ensure the selection of the correct fuse.

Cat. No.	Material	Length Shoulder to Shoulder	Weight per 100
Reliable, 27L	Ceramic	4¾ in.	6 lbs.
Reliable, 31L	Ceramic	3 in.	5 lbs.
Reliable, 77	Fibre	4¾ in.	5 lbs.
Reliable, 95	Ceramic	4-3/16 in.	5 lbs.
Reliable, 77L	Ceramic	4¾ in.	6 lbs.

Fuses, Round Fibre with Nuted Ends



Cat. No.	Material	Length Shoulder to Shoulder	Weight per 100
Reliable, 53	Fibre	3¾ in.	6 lbs.
Reliable, 55	Fibre	4-1/16 in.	9 lbs.

Fuses, Round Fibre, 7/16 in. Hexagon Nut, 8-32 Threaded Tip



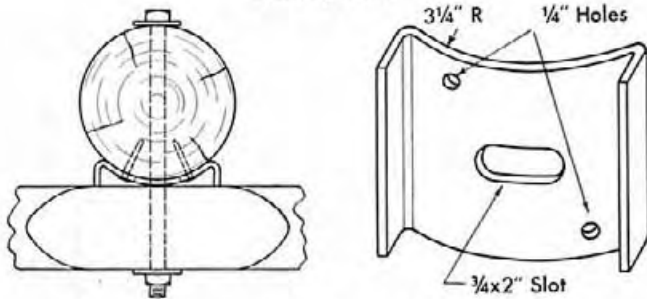
Cat. No.	Material	Length Shoulder to Shoulder	Weight per 100
Reliable, 56	Fibre	4-1/16 in.	8 lbs.

Fuses, Round Fibre with Flat Tip



Cat. No.	Material	Length Over-All	Weight per 100
Reliable, 52	Fibre	3 1/2 in.	4 lbs.

Gains, Pole



Made of 4x3/16-inch flat steel. Used where it is not possible or desirable to cut a gain in the pole.

Cat. No.	Description	Weight per 100
J-4060	Pole Gains	147 lbs.

Gauges, Wire



This gauge is made of high-quality steel, tempered, adjusted, and warranted accurate.

Cat. No.	Gauge
688-A	Am. St'd, 0-36, B. & S.
688-B	Am. St'd, 5-36, B. & S.
690-A	Eng. St'd, 1-36, B.W.G.
690-B	Eng. St'd, 6-36, B.W.G.

Grips, Flexible Cable

SINGLE WEAVE—SINGLE EYE



Used for drawing aerial cable through rings. They save trouble by feeding through aerial rings without displacing the rings.

For Cable Diameter, Inches	Cat. No.	Length Inches
1/2 to 3/4	821	18
3/4 to 1	822	24
1 to 1 1/2	823	24
1 1/2 to 2	824	24
2 to 2 1/2	825	24
2 1/2 to 3	826	24
3 to 3 1/2	827	24
3 1/2 to 4	828	24

Grips, Flexible Cable

DOUBLE WEAVE—SINGLE EYE

Used for pulling underground cable where wear is light and the use of reinforced grips is not warranted.

For Cable Diameter, Inches	Cat. No.	Length Inches
1 to 1 1/2	933	36
1 1/2 to 2	934	36
2 to 2 1/2	935	36
2 1/2 to 3	936	36
3 to 3 1/2	937	36
3 1/2 to 4	938	36

Grips, Reinforced Flexible Pulling

SINGLE EYE—DOUBLE WEAVE

For pulling underground cable. The reinforcement protects wires of the grip at shoulder where wear is greatest. The eye is formed of the wires themselves and reinforced. As there is no joint at the working end of the grip there is no loss of strength.

For Cable Diameter, Inches	Cat. No.	Length Inches	Cat. No.	Length Inches	Cat. No.	Length Inches
1 to 1 1/2	1023	24	1033	36	1043	48
1 1/2 to 2	1024	24	1034	36	1044	48
2 to 2 1/2	1025	24	1035	36	1045	48
2 1/2 to 3	1026	24	1036	36	1046	48
3 to 3 1/2	1027	24	1037	36	1047	48
3 1/2 to 4	1028	24	1038	36	1048	48

Grips, Hard Wire

SINGLE EYE—DOUBLE WEAVE



Hard, tough wire grip for attaching pulling line to the end of a cable. Resists wear in rough, sandy conduits. Large sizes used on aerial cable. The grip must fit exactly for best performance. May be used for swabbing ducts by packing with waste.

For Cable Diameter, Inches	Cat. No.	Length Inches	Cat. No.	Length Inches
1/2 to 3/4	801	18	811	24
3/4 to 1	802	22	812	30
1 to 1 1/2	803	22	813	30
1 1/2 to 2	804	22	814	30
2 to 2 1/2	805	22	815	30
2 1/2 to 3	806	30	816	45
3 to 3 1/2	807	30	817	45
3 1/2 to 4	808	30	818	45

Grips, Protecto



These grips for 6-, 7-, and 8-inch pliers make linemen's pliers easier to handle. While they are not a substitute for rubber gloves in line work, the dielectric strength of these plastic grips add a factor of safety.

Grips, Double Eye Luffing



Used for pulling slack or removing old cable. Pull is distributed as evenly as possible on all wires which results in a very long wearing grip. Shortest body permits longest pull in cramped manhole.

SINGLE WEAVE—FOR LIGHT PULLS

For Cable Diameter, Inches	Cat. No.	Length Inches
3/4 to 1	842	18
1 to 1 1/2	843	18

DOUBLE WEAVE—FOR HEAVY PULLS

1 1/2 to 2	954	24
2 to 2 1/2	955	24
2 1/2 to 3	956	24
3 to 3 1/2	957	24
3 1/2 to 4	958	24

Grips, Single Eye Luffing

When the strain is applied the eye lies flat against the cable.

SINGLE WEAVE

For Cable Diameter, Inches	Cat. No.	Length Inches
3/4 to 1	1842	18
1 to 1 1/2	1843	18

DOUBLE WEAVE

1 1/2 to 2	1954	24
2 to 2 1/2	1955	24
2 1/2 to 3	1956	24
3 to 3 1/2	1957	24
3 1/2 to 4	1958	24

Grips, Double Eye Split



Used for pulling slack in working cable. Can be attached and removed without cutting cables. A special hooking arrangement makes the grip easy to fasten or unfasten.

SINGLE WEAVE

For Cable Diameter, Inches	Cat. No.	Length Inches	Cat. No.	Length Inches
3/4 to 1	*862	18	872	24
1 to 1 1/2	863	18	873	24

*No hooks—wire lacing furnished.

DOUBLE WEAVE

For Cable Diameter, Inches	Cat. No.	Length Inches
1 1/2 to 2	974	24
2 to 2 1/2	975	24
2 1/2 to 3	976	24
3 to 3 1/2	977	24
3 1/2 to 4	978	24

Grips, Buffalo



For bare and insulated wire—with and without pulleys.

These grips will receive wire in open position without manipulating any part of

the tensioning tackle. Efficient, reliable, and simple they are made entirely of alloy steel and will not slip or injure the most delicate insulation.

Cat. No.	For Wire or Strand Size	Description	Max. Opening	Weight Each
1016	No. 6 and smaller	With Loop	1/4 in.	1 1/2 lbs.
1516	No. 6 and smaller	With Pulley	1/4 in.	2 1/4 lbs.
2037	No. 0 and smaller	With Loop	7/16 in.	3 lbs.
2537	No. 0 and smaller	With Pulley	7/16 in.	3 3/4 lbs.

Grips for Bare Wires, Klein "Chicago"

WITHOUT PULLEYS



The harder the pull, the tighter this grip holds. It pulls straight without leaving kinks in the wire. Handy to put on and holds itself in

place by means of a spring acting on the compressing lever.

Main body piece and lever are forged steel. Draw parts are of wrought steel. Gripping jaws are machined smooth.

Cat. No.	For Wire Size	Maximum Opening	Safe Load Pounds	Weight Each
1613-30	No. 6 and smaller	7/32	1500	1 1/2 lbs.
1613-30B	Same as 1613-30 but with bronze lined jaws			
1613-40	No. 0 and smaller	7/16	2250	3 lbs.
1613-40B	Same as 1613-40 but with bronze lined jaws			
1613-50	No. 0000 and smaller	1/2 in.	4000	8 lbs.
1613-50B	Same as 1613-50 but with bronze lined jaws			

Grips, Klein "Chicago"

FOR MESSENGER STRAND AND HEAVY CABLES



Similar in construction to No. 1613 series, but heavier. They can be modified on special order to accommodate strand and cable of larger diameters.

Cat. No.	Maximum Cable Size	Minimum Cable Size	Safe Load Pounds	Weight Each
1628-6	7/8 in.	3/16 in.	8,000	8 1/2 lbs.
1628-16	5/8 in.	5/16 in.	15,000	15 1/2 lbs.
1628-6B	Same as 1628-6 except has bronze lined jaws for stranded conductors.			
1628-16B	Same as 1628-16 except has bronze lined jaws for stranded conductors.			

Grips, Klein Improved "Chicago"

FOR MESSENGERS, GUYS AND CONDUCTORS
UP TO 1/2 IN. IN DIAM.



Has bronze-lined jaws to prevent slippage and consequent damage to galvanized finish or to copper or aluminum conductor. Forged from alloy steel, heat treated.

Maximum cable size: 4/0 B.&S. 7 strand copper (.522 in.) 3/0 A.C.S.R. Minimum cable size: No. 4 B.&S. solid copper (.202 in.) No. 6 A.C.S.R.

Cat. No.	Maximum Opening	Safe Load	Weight Each
1628-5B	.58 in.	8000 lbs.	6 lbs.
1628-5	Same as 1628-5B but with steel jaws.		

Grips, Haven's Steel



All parts are solid steel drop forgings, heat treated for maximum strength and service. A roller fitted to the body yoke makes the motion free and allows the load to come on

smoothly. Instantaneous hold yet a shake on the tackle rope releases the grip. These grips will not slip due to the hand cut serration in the face of the eccentric. All galvanized except eccentric.

Cat. No.	Maximum Opening	For Wire or Strand Size	Safe Load Pounds	Weight per Doz.
1604-10	15/64"	No. 4 B.&S. & smaller	2500	12 lbs.
1604-20	17/32"	1/2" and smaller	5000	28 1/2 lbs.
1604-20	25/32"	3/4" to No. 2 B.&S.	8000	45 lbs.

Guards, Flexibal Guy



A flexible-type guy guard which will take unusual abuse without damage to the guard or guy. The Flexibal guard is easily installed with just one nail through each of the sections. Nail is already inserted in the 6-inch spindles which make up the guard. The end of the guard is securely clamped at the end with a hot-dipped, galvanized bolt clamp supplied with each set of spindles. This guard will yield under pressure from animals, vehicles, etc., without damage. Readily transported, these guards come packed in easy-carry cartons only 6x14x4 inches in size.

Cat. No.	Description	Weight
85	5 ft. length (10 spindles)	4 lbs.
86	6 ft. length (12 spindles)	4 1/2 lbs.
87	7 ft. length (14 spindles)	5 lbs.
88	8 ft. length (16 spindles)	5 1/2 lbs.

Guards, Bierce Guy



Sure-Grip Guy Guards are half round—fastened by means of a hook clamp to the guy rod, with one U-clamp to the strand on the 7-foot and two U-clamps on the 8-foot protector. The hook clamp, which simplifies installation, is hooked on the guy wire with the protector in a vertical position. The protector is then brought down on the guy wire and clamped in place with a U-clamp. Holds surely on 1/2, 5/8, 3/4 or 1-inch guy rods.

Made of 14 gauge steel formed in a semi-circular shape.

Cat. No.	Length	Gauge Steel	Weight per 100
J-1667	7 ft.	14 gauge	1050 lbs.
J-1668	8 ft.	14 gauge	1200 lbs.

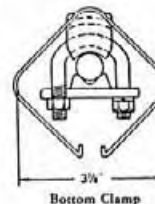
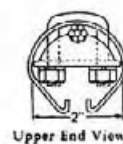
Guard, Klein Climber Gaff



Made of harness leather. The wings of the guard fit around the leg iron of climber just above the gaff and snap on. The gaff is covered and protected by the leather.

Cat. No.	Description	Weight per Doz. Pairs
1929-G	One Pair (2 pcs.)	1 3/4 lbs.

Guards, Joslyn Guy



The tapered, cylindrical guy wire protector is used largely in densely populated districts for greater protection to pedestrians and children. The protector completely covers and conceals the anchor and clamp.

Clamp parts are made of open hearth steel, either stamped or forged for greater strength. Guards are seamed along the lower edge for rigidity and are hot galvanized after fabrication.

Both light and heavy type guards are provided with the same U-bolt clamps and both types are 3 7/8 inches wide at the lower end, allowing ample room for guy clamps.

Cat. No.	Type	Length	Width at Top	Width at Bottom	Gauge Steel	Weight per 100
J-1617	Light	7 ft.	2 in.	3 7/8 in.	18	1200 lbs.
J-1618	Light	8 ft.	2 in.	3 7/8 in.	18	1350 lbs.
J-1604	Heavy	7 ft.	3 in.	3 7/8 in.	16	1600 lbs.
J-1605	Heavy	8 ft.	3 in.	3 7/8 in.	16	1800 lbs.

Guards, Matthews Guy



Stazrite Guy Guards cover and make visible and safe guy rods and guy wires. At the same time complete ventilation is provided around the guy strand preventing the accumulation of wet leaves, moisture, snow and ice which would accelerate corrosion.



Easily installed without special tools. Consists of one piece only which when installed becomes an integral

part of the guy. Clamping member is integral with the sheet metal of the guard which will lock it on the guy wire. So designed that the galvanizing on the guard and the strand will not be scarred or crushed when attaching the guard to one bolt of the guy clamp.

Available in two types—"Half Round" and "Full Round."

Cat. No.	Description	Length	Diameter	Metal	Weight per 100
1473	Half Round	7 ft.	3 in.	14 gauge	950 lbs.
1483	Half Round	8 ft.	3 in.	14 gauge	1100 lbs.
7016	Full Round	7 ft.	3 in.	16 gauge	1200 lbs.
8016	Full Round	8 ft.	3 in.	16 gauge	1300 lbs.
8118	Full Round	8 ft.	3 in.	18 gauge	1100 lbs.
7118	Full Round	7 ft.	3 in.	18 gauge	1000 lbs.

Guards, U-Cable

Protects cables entering the ground at the base of poles or sides of buildings.

Made from 14-gauge sheet steel, formed into a U shape. This U shape provides the additional strength necessary against collision and the rounded surface protects the pedestrian.

Cat. No.	Length	Inside Width	Std. Pkg.	Weight per 100
J-984	8 ft.	1 1/8 in.	5	600 lbs.
J-985	6 ft.	1 1/8 in.	5	480 lbs.
J-986	5 ft.	2-3/16 in.	5	770 lbs.
J-987	8 ft.	2-3/16 in.	5	1250 lbs.
J-988	5 ft.	3-3/16 in.	5	1350 lbs.
J-989	8 ft.	3-3/16 in.	5	1800 lbs.

MOUNTING STRAPS

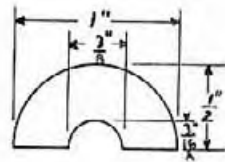
The Strap is made from flat steel and is shaped to fit the guard.

The Nos. J-995 and J-996 are fastened with 1/4-inch lag screws.

The No. J-997 strap is mounted to the pole with 5/16-inch lag screws.

Cat. No.	Size Steel	Used with Cable Guards	Diam. Holes	Std. Pkg.	Weight per 100
J-995	1/8 x 3/4 in.	J-985	9/32 in.	500	14 lbs.
J-996	1/8 x 3/4 in.	J-986-7	9/32 in.	200	19 lbs.
J-997	3/16 x 1 in.	J-998-9	11/32 in.	100	60 lbs.

Guard, Type B Tree



Wood guards for protecting drop wires in trees. A. T. & T. specification No. 6203. There are two grooves in each piece for lying the half rounds together with wire. Two feet of moulding are required for each foot to be protected. The wood is fir, creosote treated.

Description	Size Hole	Size Over-all	Std. Length	Wt. per 100 ft.
Type B, Half Round	3/8 in.	1 x 1 in.	7 to 12 ft.	75 lbs.

Gloves, Rubber



These gloves are of highest grade rubber, steam cured, seamless and form fitting. Qualities of high insulation, low leakage, strength, flexibility, and long life are evenly balanced.

Furnished in either "Curved Finger" or "Straight Finger" styles. In the "curved finger" type there is no surplus rubber to bunch in the palm. Rated voltage, 10,000.

Sizes: 9, 9 1/2, 10, 10 1/2, 11 and 12.

Cat. No.	Type	Length	Weight per Pair
90-B	Straight Finger	14 in.	1 1/2 lbs.
100-B	Curved Finger	14 in.	1 1/2 lbs.

Gloves, Protector



Designed to be worn over Linemen's Rubber Gloves to protect them from snagging, etc. Made of specially tanned, Grade A horsehide, will not become slippery when wet. Have full 4-inch gauntlets. A pair of these gloves is a necessary part of every lineman's outfit.

FOR USE WITH STRAIGHT FINGER RUBBER GLOVES

Cat. No.	Description	For Size Rubber Glove	Weight per Pr.
18-C	Closed Back	9, 9 1/2, 10	1/2 lb.
18	Open Back	9, 9 1/2, 10	1/2 lb.
20-C	Closed Back	10 1/2, 11, 12	1/2 lb.
20	Open Back	10 1/2, 11, 12	1/2 lb.

FOR USE WITH CURVED FINGER RUBBER GLOVES

Cat. No.	Description	For Size Rubber Glove	Weight per Pr.
118-C	Closed Back	9, 9 1/2, 10	1/2 lb.
118	Open Back	9, 9 1/2, 10	1/2 lb.
120-C	Closed Back	10 1/2, 11, 12	1/2 lb.
120	Open Back	10 1/2, 11, 12	1/2 lb.

Glove Bags



Used to protect Lineman's Rubber Gloves when not in use. Made of 42 ounce duck in two lengths, 15 inches to hold the gloves flat or 9 inches for easy fold at the wrist. Large enough to accommodate leather protector gloves also. Equipped with snap hooks and "D" rings to enable the lineman to attach the bag to his belt.

Cat. No.	Length	Weight Each
25	9 inches	9 oz.
35	15 inches	12 oz.

Guy Anchors

See Anchors

Hacksaw Blades, Hand



No. 300—For cutting annealed tool steel, high speed steel, rail, bronze, aluminum, light structural shapes, brass, copper, and cast steel. Raker set.

No. 310—For cutting iron, steel, brass and copper tubing; wrought iron pipe; drill rod; conduit; extra light structural shapes;

metal trim and sheet metal thicker than 18 gauge. Raker or undulated set—please specify which is desired.

No. 315—For cutting same materials as No. 310 except thinner than 18 gauge. Undulated set.

Cat. No.	Length	Thickness	Width	Teeth per Inch
300-8	8 in.	.025 in.	7/16 in.	18
300-10	10 in.	.025 in.	1/2 in.	18
300-12	12 in.	.025 in.	1/2 in.	18
310-8	8 in.	.025 in.	6/17 in.	24
310-10	10 in.	.025 in.	1/2 in.	24
310-12	12 in.	.025 in.	1/2 in.	24
315-8	8 in.	.025 in.	7/16 in.	32
315-10	10 in.	.025 in.	1/2 in.	32
315-12	12 in.	.025 in.	1/2 in.	32

Hacksaw Blades, Silver Steel

A superior quality blade designed for long life and outstanding performance.

No. 1810—For cutting tool steel, machine steel, cast iron, brass, bronze, rail, copper, and all other solid stock. Raker set.

No. 2410—For cutting angles, channels, pipe, conduit, drill rod, metal trim, and tubing thicker than 18 gauge. Undulated set.

No. 3210—For cutting above material, 18 gauge or thinner stock. Undulated set.

Cat. No.	Length	Thickness	Width	Teeth per Inch
1810	10 ins.	.025 in.	1/2 in.	18
1812	12 ins.	.025 in.	1/2 in.	18
2410	10 ins.	.025 in.	1/2 in.	24
2412	12 ins.	.025 in.	1/2 in.	24
3210	10 ins.	.025 in.	1/2 in.	32
3212	12 ins.	.025 in.	1/2 in.	32

Hammer, Nail



Bell Face—Octagon Neck Handle—White Lacquered Handle.

Cat. No.	Description	Length	Weight Each
111 1/2	Nail Hammer	13 in.	16 oz.

Hammers, Ripping



White Lacquered Handles.

Cat. No.	Description	Length	Weight Each
111-R	Ripping Hammer	14 in.	20 oz.
111 1/2-R	Ripping Hammer	13 in.	16 oz.

Hammers, Ball Pein



Black Finish—White Lacquered Handle.

Cat. No.	Description	Length	Weight Each	Weight per Doz.
2/0-B	Ball Pein Hammer	14 in.	12 oz.	14 lbs.
0-B	Ball Pein Hammer	14 in.	16 oz.	16 lbs.
2-B	Ball Pein Hammer	16 in.	24 oz.	24 lbs.
4-B	Ball Pein Hammer	17 in.	32 oz.	30 lbs.

Hammers, Linemen's Double Face



Polished Head—Black Body.

Cat. No.	Description	Length	Weight Each
0	Double Face Hammer	15 in.	36 oz.

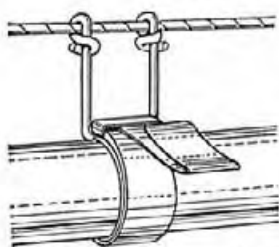
Hangers, Non-Breakable Messenger



Made of malleable iron with back curved to fit pole. It is mounted on a standard 5/8-inch through bolt. The vertical finger keeps the messenger in place while it is being pulled taut, after which the strand is dropped into the groove and the nut tightened.

Cat. No.	Size Strand	Std. Pkg.	Weight per 100
J-1045-1	5/16 inch or smaller	50	165 lbs.
J-1046-1	3/8 inch or larger	50	175 lbs.

Hangers, Diamond Aerial Cable



Two supports, 20 inches apart are placed on each side of the pole. Each support consists of a zinc strip in position on a soft, galvanized U-shaped wire, 5 inches long.

*No. 8 is the same as No. 7 except No. 8 has 10-inch long

U-shaped wire on end instead of 5-inch.

Cat. No.	Length of Strap	Diameter of Cable or Sleeve	Std. Pkg.	Weight per 100
1	10	3/4 in.	500	84 lbs.
2	16	1-3/16 in.	500	110 lbs.
3	22	2 in.	300	130 lbs.
4	28	2 5/8 in.	300	162 lbs.
5	34	3 1/8 in.	300	186 lbs.
6	50	5 in. sleeve	200	256 lbs.
7	64	6 1/2 in. sleeve	200	315 lbs.
8*	64	6 1/2 in. sleeve	200	350 lbs.

Hangers, National Adjustable Cable



Adjust-A-Straps have all the features of Zinc-Wraps. They differ, however, in that they are made with an adjustable support instead of a hook.

Cat. No.	For Cable Diameter	Std. Pkg.	Shpg. Wt. Std. Pkg.
2007	3/4 in.	500	39 lbs.
2010	1 in.	500	40 1/4 lbs.
2015	1 1/2 ins.	500	48 1/2 lbs.
2020	2 ins.	250	28 lbs.
2026	2 5/8 ins.	250	40 lbs.
2033	3 1/4 ins.	200	37 1/2 lbs.
2050	5 ins.	200	52 1/2 lbs.
2065	6 1/2 ins.	200	62 1/4 lbs.
2067 (10" hanger)	6 1/2 ins.	200	66 lbs.

Hangers, National Zinc-Wrap Cable



For hanging the entire cable on the messenger strand. Some of the most important advantages of using these cable hangers are: elimination of damage to the cable—elimination of all wear that threatens when the cable is in contact with the messenger—the fact that Zinc-Wraps follow the standard practice of suspending the cable below

the strand—hug the cable and will not slide along it once placed—ease and speed of installation—and great strength.

Cat. No.	For Cable Diameter	Std. Pkg.	Weight Std. Pkg.
2207	3/4 in.	500	39 lbs.
2210	1 in.	500	40 lbs.
2215	1 1/2 in.	500	48 lbs.
2220	2 in.	250	28 lbs.
2226	2 5/8 in.	250	40 lbs.

Hangers, Reliable Cable



For supporting lead covered cable or insulated conductors to galvanized steel strand. These hangers wrap around the cable, securely attaching them to the messenger, minimizing creep bow and fatigue. The zinc hangers bond the cable

sheath and strand to give added protection against lightning. Zinc hangers and steel strand should be used with neoprene jacketed wires. Copper hangers are available for use with copper-weld and bronze strand. Add letter "C" to code numbers shown below for copper hangers.

Cat. No.	Length	Strand Size	Maximum Cable Size	Shpg. Wt. per 1000
1	7 7/8 in.	5/16 in.	3/4 in.	40 lbs.
2	11 in.	3/8 in.	1 1/8 in.	60 lbs.
3	14 in.	3/8 in.	1 5/8 in.	98 lbs.
4	16 in.	3/8 in.	1 7/8 in.	115 lbs.
5	18 in.	3/8 in.	2 1/4 in.	132 lbs.
6	19 1/2 in.	3/8 in.	2-7/16 in.	150 lbs.

Hangers, Universal Messenger



Forged from open hearth steel with a curved wire groove which permits its use on corners as well as on straight runs.

Two 1/2-inch clamp bolts hold the messenger securely in place. The hanger is mounted by means of a 5/8-inch through bolt and a 1/2-inch lag screw.

Cat. No.	Size Stock	Size Strand	Std. Pkg.	Weight per 100
J-1070	1/2 x 2	3/8 or larger	25	322 lbs.
J-1071	3/8 x 1 3/4	5/16 or smaller	25	238 lbs.

Harness, Klein Leather Safety



Designed for use where danger from gas is present.

The harness is made so that it slings the wearer in a perpendicular position so that he can be readily hauled through an ordinary manhole opening.

A solid harness leather back plate, 2 3/4 inches by 10 inches is stitched and riveted around the 1 1/4 inch adjustable belt strap. The back plate also carries a tested drop forged "D" ring to which the 3/4-inch manilla life line, 25 feet in length, is permanently attached.

The adjustable shoulder straps are 3/4-inch wide and are riveted to the belt at the single ends. These straps serve to hold the belt in position around the chest so as not to encumber the wearer while working.

Cat. No.	Description	Weight per Doz.
5209	Harness Complete with Safety Rope	75 lbs.

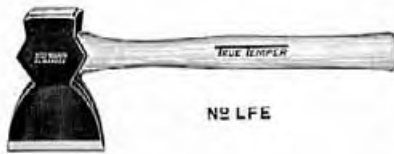
Hatchets, Linemen's Broad



Bit is thin for rapid cutting. Head has a smooth black finish and hickory handle is lacquered white.

Cat. No.	Length	Width of Bit	Weight Each
801	13½ in.	4 in.	24 oz.
802	14½ in.	4½ in.	28 oz.
803	18½ in.	5 in.	36 oz.
804	18½ in.	5½ in.	42 oz.

Hatchet, Linemen's Blunt Edge



Heavy head is 1-5/16 in. thick, tapered to cold chisel cutting edge. Head has gun metal finish; handle is high grade hickory.

Cat. No.	Length of Handle	Width of Bit	Weight Each
LFE	16 inch	4¼ in.	64 oz.

Heater, Aerial Tent



A lightweight heater for aerial work. This heater uses kerosene for fuel and will burn from 5 to 24 hours, depending on the intensity of the flame. Capacity of the fuel reservoir is ½ gallon. The heater is 11¾ inches in diameter and 19⅞ inches high.

Cat. No.	Description	Weight
11B	Aerial Tent Heater	6 lbs.

Hoists, Coffing Safety-Pull



Built on the ratchet and pawl principle. The load is always locked by sprocket and ratchet pawls. (Cannot slip or drop load.) Has free chain for quick up-or-down adjustment when there is no weight on the hoist. A reversible handle permits operating the hoist in any position. Safety stops prevent handle from spinning in case hand should slip off the handle.

Hooks are drop forged, heat treated alloy steel; frame and lever parts are malleable iron; sprocket and ratchet are cut from solid bar of special alloy steel; heat treated and ground. The handle will bend at maximum overload before chain will break or hooks will straighten out.

All Safety-Pull Hoists are factory tested at 100% over rated capacity.

Cat. No.	Rated Capacity	Lifting Speed per Minute	Standard Lift	Weight Each
A	¾ ton	36 in.	56½ in.	14 lbs.
F	1½ tons	48 in.	56½ in.	25 lbs.

Holder, Wire



Assembled with a lead alloy which will not deteriorate and which will develop the full strength of the unit. The porcelain is of the best quality and the corners are well rounded to prevent breakage. Galvanized screw is No. 20x2-inch.

Cat. No.	Size of Wire Hole	Std. Pkg.	Weight per 100
J-1980	9/16 x ¾ in.	50	56 lbs.

**Hooks, Carrying or Lug
STANDARD TYPE**



For handling poles, ties and heavy timbers. Handles are selected, air-seasoned hickory or hard maple with hand-turned knobs, smoothly sand finished. Hooks with duck-bill points are forged out of crucible steel hung in heavy malleable iron clasp and swivel.

Cat. No.	Wood	Size	Std. Bundle	Weight Each
T-100-295	Maple	2½ in. x 4 ft.	6	7 lbs.
T-101-296	Maple	2½ in. x 4½ ft.	6	8 lbs.
T-102-297	Maple	2½ in. x 5 ft.	6	9 lbs.
T-103	Hickory	2½ in. x 4 ft.	6	7 lbs.
T-104	Hickory	2½ in. x 4½ ft.	6	8 lbs.
T-105	Hickory	2½ in. x 5 ft.	6	9 lbs.

HEAVY DUTY TYPE

For handling extra large poles and timbers. Handles are selected, air-seasoned hard maple and hand-turned knobs, smoothly sand finished. Extra large, heavy hooks of crucible steel, hung from heavy malleable iron swivel attached to a malleable iron clasp on band around the handle.

Cat. No.	Wood	Size	Std. Bundle	Weight Each
T-112-298	Hickory	3 in. x 5 ft.	4	5 lbs.
T-113-299	Hickory	3 in. x 6 ft.	4	6 lbs.
T-114-300	Hickory	3 in. x 7 ft.	4	7 lbs.

CARRYING OR LUG HOOK HANDLES ONLY

Cat. No.	Wood	Size	Std. Bundle	Weight Each
T-106-593	Maple	2½ in. x 4 ft.	6	3 lbs.
T-107-594	Maple	2½ in. x 4½ ft.	6	4 lbs.
T-108-595	Maple	2½ in. x 5 ft.	6	5 lbs.
T-109	Hickory	2½ in. x 4 ft.	6	3 lbs.
T-110	Hickory	2½ in. x 4½ ft.	6	4 lbs.
T-111	Hickory	2½ in. x 5 ft.	6	5 lbs.

HEAVY DUTY TYPE HANDLES ONLY

Cat. No.	Wood	Size	Std. Bundle	Weight Each
T-115-963	Hickory	3 in. x 5 ft.	6	6 lbs.
T-116-964	Hickory	3 in. x 6 ft.	6	8 lbs.
T-117-965	Hickory	3 in. x 7 ft.	6	10 lbs.

Hook, Drive



Easy to install—formed head permits driving. Final seating is made by screwing in the hook.

Cat. No.	Description	Length	Weight per 100
J-3316	Large Drive Hook	5 1/4 in.	27 lbs.

Hook, Guard Arm



Used in attaching drop wires to guard arms. Threaded, with nut. Length over-all is 5 7/8 inches.

Cat. No.	Diam. of Steel	Diam. of Eye	Weight per 100
H-9245	1/2 in.	7/8 in.	45 lbs.

Hooks, Guy or Jay



Used to keep guys from slipping down. The one-bolt is recommended as it can adjust itself to the angle of the messenger whereas the two-bolt cannot and is inclined to tear the lag screws out of the pole. 1/2-inch or 5/8-inch through bolts are used for mounting. No. J-1016 is illustrated.

Cat. No.	Description	Size	Mounting Holes	Std. Pkg.	Weight per 100
J-1016	1 bolt	1 1/4 x 1/4 x 3 in.	9/16 in.	200	32 lbs.
J-1017	1 bolt	1 1/2 x 3/8 x 3 1/2 in.	9/16 in.	200	58 lbs.
J-1018	2 bolt	1 1/2 x 3/8 x 6 in.	9/16 in.	100	86 lbs.
J-1019	1 bolt	1 3/4 x 3/8 x 4 in.	11/16 in.	100	73 lbs.

Hook, Screw



Galvanized—used for attaching drop wires to buildings in conjunction with type P clamps or other drop wire fixtures.

Cat. No.	Description	Weight per 100
J-3317	4 in. Wood Screw House Hook	10 3/4 lbs.

Hook, Shave



Used for scraping lead sleeves, pipe, cable ends, pot heads, etc. The blade is fastened in place with a nut, so that it can be replaced when required.

Cat. No.	Pattern	Length	Weight per Doz.
304	Oval	5 1/2 in.	2 3/4 lbs.

Howlers, Heavy Duty Weatherproof



This signal produces an unusually loud sound for effective calling or coding in industrial or commercial locations.

The threaded ring, separable construction and plug-in type of wiring connection assures quick, simple installation. The entire projector assembly, including the signal mechanism, can be removed by unscrewing the threaded holding ring without disturbing the signal housing or wiring. Weatherproof, dust tight, and durably constructed, this howler will stand up under the most severe service. Finish is battleship gray enamel (red enamel when specified).

A.C. howlers operate on either series or multiple circuit. D.C. howlers operate on multiple circuits only. Six or eight D.C. howlers on one circuit require at least 24 volts. Signal transformers are required for signals operating on circuits with 24 volts or less. Sixty cycles is standard. When specified, signals to operate with 25 cycles are available in all voltages. The power consumption is 20 watts.

Voltage and frequency must be specified when ordering.

WITH 7 1/2-INCH BELL PROJECTOR

Cat. No.	Current	Weight Each
8546	A.C.	5 1/2 lbs.
8526	D.C.	6 lbs.

Howlers, Non-Weatherproof



A loud distinctive tone produced at low current consumption, easy wiring and maintenance, dust-proof construction—suitable for indoor use or where weatherproof construction is not required.

Can be attached to a flat surface or outlet box having mounting holes spaced on 2 3/4 and 3 1/2-inch centers. The housing is of heavy gauge pressed steel and the signal is finished in battleship gray enamel (red enamel when specified).

Signal Transformers are required for signals operating on circuits of 24 volts or less. Sixty cycles is standard. When specified, 25 cycle signals are available on all voltages.

Voltage and frequency must be specified when ordering.

WITH 7 1/2-INCH SINGLE BELL PROJECTOR

Cat. No.	Current	Weight Each
8755	A.C.	3 lbs.
8726	D.C.	4 lbs.

WITH DOUBLE BELL PROJECTOR

8795	A.C.	7 lbs.
8794	D.C.	7 lbs.

PROJECTOR-LESS TYPE WITH GRILLE FRONT

8741	A.C.	3 lbs.
8740	D.C.	3 lbs.

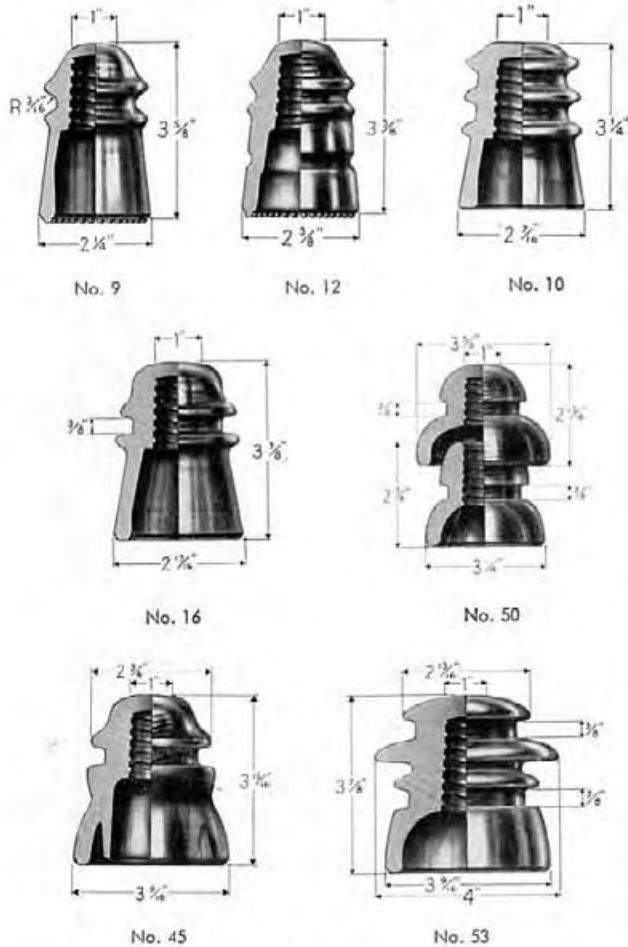
Insulators, Guy Strain



Dry process, brown glaze — for telephone and radio service where the dielectric strength is not important.

Cat. No.	Length	Width	Diam. of Hole or Groove	Std. Pkg. Quantity	Weight Std. Pkg.
M-500	2 1/4 in.	1 1/2 in.	5/16 in.	100	25 lbs.
M-502	3 1/2 in.	2 1/2 in.	1/2 in.	50	120 lbs.
M-504	4 in.	2 7/8 in.	3/8 in.	50	190 lbs.
M-506	5 1/8 in.	3 3/8 in.	3/4 in.	25	320 lbs.

Insulators, Screw Thread Glass



Made from a colorless glass which is non-porous, possesses high dielectric strength and is unaffected by sudden temperature changes. Supplied in clear glass only and packed in corrugated cartons with each insulator in a separate compartment.

Available in sizes and types shown below.

Cat. No.	Description	Wt. Each	Std. Pkg.	Shipping Wt. per 1000
9	Single Groove pony	9 oz.	50	600 lbs.
10	Exchange line	10 oz.	50	710 lbs.
12	Double Groove pony	10 oz.	50	670 lbs.
16	Long distance, new style	15 oz.	50	1070 lbs.
22	For carrier circuits	16 oz.	50	1100 lbs.
42	Double petticoat	24 oz.	40	1613 lbs.
45	Double petticoat	24 oz.	40	1625 lbs.
53	One-piece transposition	28 1/2 oz.	30	1950 lbs.
56	Point transposition	23 1/2 oz.	40	1500 lbs.

Irons, Pulling-In



Pulling-In Irons are set into concrete or brick walls of street vaults opposite duct entrances to provide a strong attachment for the blocks used in installing or removing cable. Made of 7/8-inch round steel to extend 10 inches from the wall.

Description
Pulling-In Iron

Wt. per 100
700 lbs.

Jack, Aerial Cable



Sufficiently powerful to easily pull up overhead and underground cables and to take up slack in trolley and guy wires. Because it weighs only 14 pounds, it does not handicap a man in overhead work. The steel lever is furnished with a safety spring clip that prevents it from falling. The jack is easy to set up because of its non-flexible rack bar. It exerts a direct line pull.

Cat. No.	Capacity	Travel	Weight Each
324	2 tons	20 1/4 in.	13 lbs.

Jack, General Utility



Same hinged base and general construction as the No. 329 Pole Jack. Single acting, automatic raising and lowering and cannot be tripped. An especially desirable jack for smaller telephone poles and general work around the exchange. Furnished with 5-ft. steel chain, steel auxiliary shoe, and 5-ft. steel pinch bar.

Cat. No.	Capacity	Lift	Height	Weight Complete
310-A	15 tons	14 in.	22 in.	109 lbs.

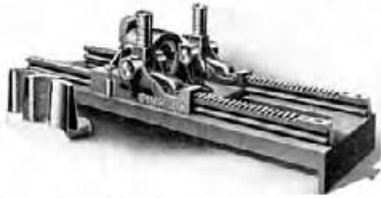
Jack, Van Web Hydraulic Pole



This jack will exert a 15,000 pound pressure at the hook with a lift of 60 inches through the pulley that doubles the lift of the ram. The pulley yoke is mounted on a loose piston so the whole yoke can be lifted out and a pike pole set in the cut at the top of the ram, for straightening poles. The jack with ram depressed is 41 inches long. The pump handle is 25 inches long and folds down the side.

Cat. No.	Description	Weight
100	Jack, Van Web Hydraulic Pole	60 lbs.

Jacks, Pipe Bushing



Designed for pushing pipe despite unfavorable soil conditions. Can be operated by two or four men, depending upon the soil encountered. The double levers can be operated singly, alternately or together, depending on the size of pipe, soil condition or cribbing. When solid cribbing or block is difficult to obtain it is possible to hold the jack against back pressure with one lever while the other lever is being operated. Pipe can be pulled for lead pipe and duct installations or "backed out" by reversing the machine.

Each size of pipe requires a pilot and set of tapered jaws to avoid crushing. When ordering specify size of jaws and pipe.

Each size of pipe requires a pilot and set of tapered jaws to avoid crushing. When ordering specify size of jaws and pipe.

Cat. No.	For Pipe Size Inches	Capacity Tons	Travel Inches	Weight of Jack	Weight Complete
R-332 R	¾ to 2	15	30	150 lbs.	218 lbs.
R-334 R	2 to 4	25	28½	208 lbs.	321 lbs.

Jacks, Pole Pulling and Straightening



These pole jacks enable one or two men to pull or straighten poles, pull butts or move loaded poles, regardless of size or depth, without digging around them or interrupting service. Both types listed here pivot on their base.

The No. 329 is a strong, powerful jack built to pull or straighten the heaviest poles. Single acting automatic raising and lowering—will not trip. Equipped with 8-ft. steel chain, 5-ft.

steel lever bar, and steel I-beam base.

The No. 325 is a light but strong jack designed for pulling poles up to 30 ft. in height. Also valuable for tightening guy wires, taking up slack in messenger wire and pulling underground cable. Furnished with pike pole, steel chain, detachable base and steel lever bar.

Cat. No.	Capacity	Height	Lift	Weight Jack Only
329	15 tons	37¾ in.	23 in.	95 lbs.
325	5 tons	50 in.	36 in.	34 lbs.

Jacks, Screw Type Cable Reel



Quick acting, efficient and inexpensive. Made in two sizes. No. 1-CR is built for cable reels from 40 to 60 inches; No. 2-CR is built for cable reels from 60 to 90 inches. Capacity is 5 tons.

Cat. No.	Height	Lift	Weight Each
1-CR	19¾ in.	13¼ in.	60 lbs.
2-CR	30½ in.	18 in.	88 lbs.

Jack, Cope Push-Pull



May be used for taking up slack in wires, guys, cables, luffing in underground cables, etc. Has a leverage of 30 to 1. Double action makes a secure lock at every half inch, extending the safety factor.

Easily and quickly converted into a pusher by reversing the draw bar—can be used for re-racking cables, pole stubbing, etc.

All wearing parts are made of high carbon, heat treated steel. Supplied with drop forged clevis and bronze double shackle swivel.

Cat. No.	Description	Capacity	Weight
360	Push-Pull Jack	4,000 lbs.	11 lbs.

Jack, Cable Reel

This heavy duty screw jack comprises a base made of 4-inch channel with steel upright and diagonal braces, electrically welded. The screw is wrought steel and is furnished with a ratchet head and swivel yoke. Shut height, 27¾ inches; extended height, 45½ inches; capacity, 10 tons.

Cat. No.	Description	Weight per Pair
350	Jack, Cable Reel	140 lbs.

Jacks, Standard Reel



Above: No. 320-A
Left: No. 322

The No. 322 is a double acting, automatic raising and lowering jack designed for reels from 36 to 84 inches in diameter. Furnished in pairs (one right and one left hand) for uniform operation on both sides of the reel. The "T" shaped base, with three adjustable braces, insures a firm non-rocking foundation.

The No. 321 is a single jack for reels from 20 to 96 inches in diameter and the No. 320-A, also a single acting unit, is for reels from 20 to 60 inches in diameter.

The No. 322 is recommended for outside work and the No. 321 and 320-A (which is identical in appearance with the No. 321 except for size) are recommended for warehouse service. All furnished with steel lever bars.

Cat. No.	Capacity	Height	Lift	Wt. Each
320-A	5 tons	21 in.	10 in.	46 lbs.
321	10 tons	34½ in.	15 in.	108 lbs.
322	10 tons	29 in.	14 in.	104 lbs.

Kettles, Double-Jacketed Compound



Used for melting compounds on the job. Furnished complete with double ring on the bail for raising and lowering on a pole.

The double jacket that completely covers sides, top and spout prevents explosion of the compounds while melting by conducting the heat from the furnace to all parts of the kettle and insures even melting of the compound in its entire mass. The outer

jacket also keeps the compound at correct pouring temperature after removing from the furnace.

Made of heavy steel with bottom and spouts brazed.

Description	Capacity	Weight
Compound Kettle	5 quarts	6½ lbs.

Kettles, Safety Compound



This kettle has been designed to eliminate the hazards usually encountered during the melting of insulating compounds. Two flues carry the heat from beneath the kettle through the middle of the can and then out high on the sides to insure uniform melting, preventing the danger of explosion.

Made of heavy steel with an extra heavy bottom set above the base and furnished with snug fitting lid. Capacity, 3 gals.; diameter, 10 inches; height, 12 inches.

Cat. No.	Description	Weight
370	Kettle, Safety Compound	10 lbs.

Knives, Razor Blade Draw



Highly finished sharpened steel blade, ready for use. Hardwood handles are mounted on shanks which are securely held in place by riveting on top of nickel plated caps.

Cat. No.	Width of Blade	Length of Blade	Weight Each
600-8	1¾ inches	8 inches	14 oz.
600-9	1¾ inches	9 inches	15 oz.
600-10	1¾ inches	10 inches	18 oz.
600-12	1¾ inches	12 inches	19 oz.

Knife, Electrician's

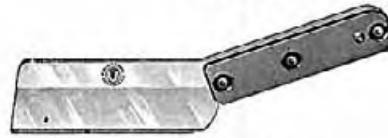


Combines an emergency screw-driver and a knife blade for cutting or stripping wire.

Blades are high grade cutting steel carefully tempered. Lock keeps blade safely open when in use.

Cat. No.	Description	Weight Per Doz.
1550-2	Electrician's Knife	2 lbs.

Knife, Sheath Splitting



Blade of Tool Steel tempered and ground to a keen edge. Strong leather handle securely riveted.

Cat. No.	Length Over All	Blade Length	Weight Per Doz.
1515-1	9¼ in.	4½ in.	13 lbs.

Knife, Heavy Stripping



For use in shaving poles preparatory to painting or treating with preservatives. Blades are full polished and shanks are enameled black.

Handles are fitted with heavy steel ferrules. With this form of handle no cap is required.

Cat. No.	Width of Blade	Length of Blade	Weight Each
625-14	2½ in.	14 in.	31 oz.

Knife, Cable Stripper



For stripping heavy insulated wire and cable. Has hard rubber handle, molded on securely providing

adequate insulation. Shoulder prevents accidental cutting of glove or finger. Back of blade ground flat for scraping. Forged from first quality cutting steel, individually tempered.

Cat. No.	Length Over All	Length Blade	Weight Per Doz.
1560-3	8 in.	3 in.	4¼ lbs.

Knobs, Alligator Nail



Furnished split as shown, with 3-inch cement coated 12d nails and washers. Knobs are 1¾ in. in height and 1⅞ in. in diameter.

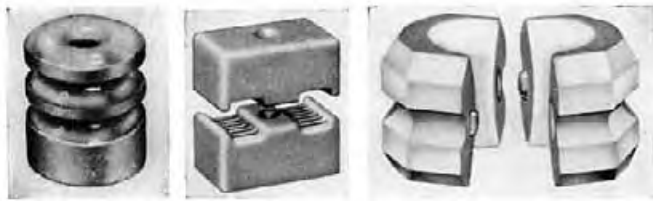
Weight per 1000, 165 lbs.

Knobs, Self-Tying



Self-tying knobs require only one screw to install. A 4-inch No. 18 flat head wood screw can be used for fastening to buildings; 4½-inch lag screw to poles, and ¼ x 3¾ inch expansion bolts to brick walls. Furnished less screw. Weight per 1000, 490 pounds.

Knobs, Porcelain



No. 4-2

No. 6066

No. 22



No. 4-1

No. 6064

No. 6061



No. 6062



No. 1916

Cat. No.	Description	Height Inches	Diameter of Knob Inches	Size of Hole Inches	Size of Groove Inches	Number per Barrel	Weight per 1000
4-1	Groove	1-11/16	1 1/2	3/8	3/8	2000	230 lbs.
4-2	Groove	1-11/16	1 1/2	3/8	5/16	2000	225 lbs.
22	Split Knob	1 5/8	2 1/8	1	5/16	1250	332 lbs.
37	Split Knob	1 1/2	1 3/4	1/2	1/2	1800	250 lbs.
6061-2	Groove, Type A	1 1/2	1 5/8	3/8	5/16	2000	210 lbs.
6062-4	Groove, Type B	2 1/4	1 3/4	7/16	5/16	1000	395 lbs.
6064-1	Groove, Type S	1-1/16	1 5/8	3/8	7/16	2500	150 lbs.
6065-2	Groove, Type T	1-13/16	1 5/8	7/16	7/16	1500	245 lbs.
6066-2	Groove, Type C	1 1/4	3/4	7/32	9/32	5000	95 lbs.
1916	Buckeye	1 3/4	1 1/4	--	--	2600	180 lbs.

Ladders

Ladders are shown on the next page.

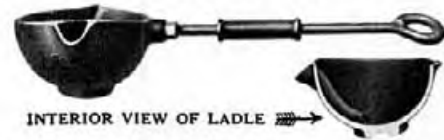
Letters and Figures, Embossed Aluminum



Provide permanence and legibility in any property marking. Made of 99% pure aluminum, they do not rust or tarnish, and being perfectly smooth will not catch or hold dirt. Furnished in both Letters and Figures in 1/2,

3/4, 1, 1 1/2, 2, 3, 4, or 6-inch sizes. Also available in polished brass.

Ladles, Bottom Pour



INTERIOR VIEW OF LADLE

Listed as standard by the Underwriters' Laboratories. Pours from the bottom—skimming is never required. A twist of the wrist and the metal flows out finely through the spout which runs from the bottom of the bowl to the lip. On each side of the pouring spout there are small openings to convey the last of the metal into the spout and to let the heat gases escape.

Bowl is made of universal alloy iron, the handle of SAE analysis steel and the sliding sleeve of gray iron on all but the 3-inch.

The handle is made doubly secure against turning in the bowl by a heavy steel check nut. The sliding sleeve is a protection against burns as it can be pushed to the other end of the handle while the ladle is in the forge or other fire.

Cat. No.	Diameter of Bowl	Lead Capacity	Length Over All	Weight Each
3	3 in.	4 lbs.	15 1/2 in.	2 lbs.
4	4 in.	4 1/2 lbs.	20 in.	3 lbs.
5	5 in.	9 lbs.	31 in.	5 lbs.

Ladles, Unique



These ladles enable the user to pour the metal more accurately, and easily. Comfortable, insulated "close to the bowl" grip eliminates the strain. Fibre shield protects hand from reflected heat. Air space between shank and wood keeps handle cool. Bowl has formed lips. A screw extending from rear of handle to metal shank prevents the ladle from twisting or pulling out. Handle can be attached or removed with a screwdriver.

Bowl Diam.	Bowl Depth	Capacity Pints	Overall Length	Weight
2 1/2 in.	1-3/16 in.	1/8	9 in.	10 oz.
3 in.	1 1/2 in.	1/4	10 in.	12 oz.
3 1/2 in.	1 3/4 in.	3/8	10 1/2 in.	14 oz.
4 in.	2 in.	1/2	11 in.	18 oz.

Light, 2-Way Portable



This handy portable light provides a 10-foot spot atop a 40 foot pole or an adequate work floodlight on the ground. Has 5-inch beam reflector and 5-inch flood reflector. Uses 2 No. 6 telephone type dry cells. Range is 1/5 mile. Rust-proof steel case, heavily enameled. Focusing bulb for changing intensity and size of spot. Height: 11 inches.

Cat. No.	Description
TNT	Light, 2 Way Portable

Ladders, Safety Platform



Easily handled by one man. Greater flare and extra spread insure positive stability. A guaranteed hand-safe lock prevents unexpected folding. The one-piece working platform is 15½ x 20½ inches and is guarded on three sides. There is a large working shelf at hip level and a convenient tool holder at top of ladder.

Cat. No.	Height Over All	Height to Platform	Width of Ladder	Weight Each
3	5 ft. 7 in.	2 ft. 10 in.	22 in.	29 lbs.
4	6 ft. 7 in.	3 ft. 9 in.	24 in.	33 lbs.
5	7 ft. 7 in.	4 ft. 8 in.	25¼ in.	36 lbs.
6	8 ft. 7 in.	5 ft. 7 in.	27½ in.	43 lbs.
7	9 ft. 7 in.	6 ft. 6 in.	29¼ in.	56 lbs.
8	10 ft. 7½ in.	7 ft. 9 in.	31 in.	60 lbs.
10	12 ft. 7 in.	9 ft. 5 in.	34½ in.	73 lbs.
12	14 ft. 6½ in.	11 ft. 2¾ in.	38 in.	85 lbs.

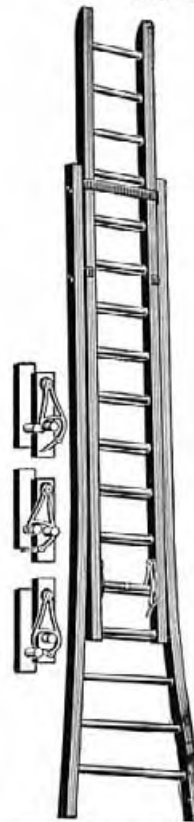
Ladders, Streamline



An all-aluminum ladder ideally suited for stockrooms or for working on racks and panels where only a short ladder is required. Mounted on rubber, ball-bearing casters which automatically retract when weight is placed on the ladder. Can also be used as a stool for use at filing cabinets, lockers, etc.

Cat. No.	Description	Weight
1	One-step ladder, 10 in. step	14 lbs.
2	Two-step ladder, 10, 20 in. steps	25 lbs.
3	Three-step ladder, 10, 20, 30 in. steps	34 lbs.

Ladders, Blue Ribbon Extension



Made with side rails of 100% vertical grain Douglas Fir, Ladder Grade stock, and rungs of selected hickory. Side rails are reinforced by wire trussing which makes the ladder 40% stronger. Perfect alignment of rungs and rails eliminates strain on the tenon. A special gravity lock guarantees positive action with ease of operation when the extension section is used.

Furnished in Standard Extension Type, Rope and Pulley Extension Type or Windlass Extension Type. Regularly furnished with plain ends—if desired sawtooth metal points or rubber ladder shoes are available. The rubber shoe also has spikes for cutting through snowy, icy surfaces.

The standard extension type is illustrated.

Total Length Extended Feet	Length Bottom Section Feet	Length Top Section Feet	Total Lineal Feet	Weight Pounds
17	10	10	20	40
21	12	12	24	48
25	14	14	28	56
27	16	14	30	60
29	18	16	32	64
33	18	18	36	72
36	20	20	40	80

Ladder, 2-Way Step and Straight



This ladder may be used either as a step ladder or straight ladder. Made of selected pine with all steps and rungs rodded with ¼ inch rod. All metal parts made of steel and finished in aluminum. Firmly bolted together with cadmium plated bolts.

Available in lengths from 4 to 10 feet in steps of one foot when used as a step ladder or from 8 to 20 feet in steps of two feet when used as a straight ladder. (Nine foot step ladder not made.) The 8 and 10 foot step ladders have rodded rails.

Ladder, Step and Extension



This ladder can be used as a step ladder, an extension ladder, or as a trestle. When used as a step ladder a safety catch at the top limits the amount the ladder will open. Available in lengths from 12 to 24 feet in steps of two feet. Sections are of equal length. Available in four models. Model No. C is without reinforcing rods in rungs and rails; weight 2 pounds per foot. Model No. CR has reinforcing rods under each rung; weight 2¼ pounds per foot. Model No. COR has rods under each rail; weight 2¼ pounds per foot. Model No. CRR is fully rodded with rods under each rung and rail; weight 2½ pounds per foot.

Ladder, Automatic Extension



This ladder is of special design in which the sides of the top section rest directly on the sides of the bottom section, releasing all strain from the rungs. Can be raised or lowered from the ground with a rope and pulley furnished as standard equipment. Ladder can be taken apart and used as two separate ladders. Available in lengths from 24 to 40 feet in steps of two feet. Model No. E is without reinforcing rods under rungs or rails. Model No. ER has rodded rungs. Model No. EOR has rodded rail. Model No. ERR is fully rodded with reinforcing rods under both rungs and rails.

Link, Cable Reinforcing



One is used on each side of the cable suspension clamp to relieve side strains at corners in the line. Fastened to the pole by 1/2-inch lag screws through the double eye.

Cat. No.	Size Steel	Length	Weight per 100
J-7929	1/2 inch	83/8 inch	110 lbs.

Load Binder, Coffing Safety



For booming telephone poles, logs, pipe, etc. Operates on straight ratchet principle with a free chain device for quick adjustment of the load chain. If load becomes loose it can be bound tight simply by drawing on lever. Furnished with 9/16-inch grab hooks and 24-inch load chain. By the use of the Super Attachment the pulling capacity is doubled. When ordering the Super Attachment specify whether it is to be used with Model A or F Load Binder.

Cat. No.	Description	Standard List	Capacity	Weight
A	Load Binder	2 ft.	3000 lbs.	11 1/2 lbs.
F	Load Binder	2 ft.	6000 lbs.	24 lbs.

Mandrel, Flexible



For testing conduits having bends through which a rigid mandrel would not pass and for cutting out obstructions which may be present. This mandrel is made of hardened steel discs machined to graduated sizes, mounted on wire rope securely fastened to heavy drop forged socket eyes. Will withstand a pull of 5000 pounds. Can be supplied in any diameter specified. The following sizes are available in stock: 2 1/2 ins.; 3 ins.; 3 1/2 ins., and 4 ins.

Cat. No.	Description
250	Mandrel, Flexible

Mandrel, Laying



This 36-inch mandrel is made of selected hardwood. The leading end has a steel eye recessed into the wood and a steel cutting edge; the rear end has a leather washer for wiping the inside of the duct. Can be had in any size. Please specify when ordering. Following sizes available in stock.

Cat. No.	Description	Stock Size Diam.
261	Mandrel, Laying	3 in.
262	Mandrel, Laying	3 1/2 in.
263	Mandrel, Laying	4 in.

Mandrel, Test



This 12-inch mandrel is made of hardwood with steel cutting ends machined to exact size for testing conduits after laying. They can be made to any size required. Please specify size when ordering.

Cat. No.	Description	Type	Diameter
311	Mandrel, Test	Round	3 in.
312	Mandrel, Test	Round	3 1/2 in.
313	Mandrel, Test	Round	4 in.
314	Mandrel, Test	Square	3 in.
315	Mandrel, Test	Square	3 1/2 in.
316	Mandrel, Test	Square	4 in.

Manhole Frames and Covers



These manhole frames and covers are made of cast iron. The weight given is approximate but variation does not exceed specified weight limits in accordance with ASTM standards. The weight of the frame and cover to be used is dependent upon traffic to be supported.

ROUND TYPE

Cat. No.	Height	Diameter Cover	Weight
R-1020	9 in.	20 1/2 in.	470 lbs.
R-1030	9 in.	20 1/2 in.	450 lbs.
R-1040	9 in.	20 1/2 in.	400 lbs.
R-1640-C	10 in.	25 3/4 in.	550 lbs.

SQUARE TYPE

Cat. No.	Height	Size of Cover	Outside Size	Weight
R-1646	3 in.	13x13 in.	15x15 in.	60 lbs.

Manhole Cover Hooks



Designed to raise a heavy manhole cover by prying the wedged point end of the hook under the groove provided in the cover for the purpose.

Cat. No.	Length	Weight Each
1936	26 1/2 in.	5 lbs.

Manhole Guard Rails



An all steel, electrically welded guard rail, heavy enough to stay in place and light enough to be handled easily. It is made of 3/4-inch steel pipe, equipped with a flag holder. Painted with durable red enamel unless otherwise specified.

In the No. 402 guard rail a bow-shaped wing brace holds the rail rigid against collapse

when in place, leaving the open side free for work.

The No. 401 guard rail is of the same material but lighter construction than the No. 402. Has a steel hook (instead of the wing brace) for holding rail rigid when open.

Cat. No.	Size Open	Size Closed	Weight
402	32x32x42 in.	32x42x2 in.	49 lbs.
401	32x32x42 in.	32x42x3 in.	40 lbs.

Manhole Ladders, Steel



Made with side bars of 1 1/2x9/16x3/16-inch open hearth channel and rungs of 3/8-inch round steel. The rungs are completely welded to the side bars, both inside and outside and are placed on 14-inch centers with an inside width of 12 inches between side bars.

Supplied in lengths from 6 feet to 14 feet. Approximate shipping weight per foot is 4 pounds.

Cat. No.	Description	Weight
380	Ladders, Steel Manhole	

Manhole Sheave



For pulling cable or carrying the winch line at right angles. May be used on the end of a truck or over the edge of a manhole in connection with a snatch block in the manhole.

Will handle cable up to 3 inches in diameter or any size winch line.

Furnished with a 1/4-inch chain, 24 inches long, with special hook, as shown, for anchoring when winch line is released suddenly.

Cat. No.	Large Sheave		Small Sheave		Weight Each
	Diam.	Width	Diam.	Width	
220	7 3/4 in.	3 in.	4 3/4 in.	3 in.	100 lbs.

Manhole Steps



To be set into the wall of the vault. Formed from 3/4-inch round steel. Extends 8 inches from the face of the wall.

Description	Weight per 100
Manhole Step	450 lbs.

Meter, Shallcross Current Flow



Provides for a complete and rapid means for testing the flow of current through relays and other telephone and telegraph equipment.

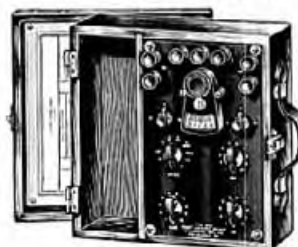
Current range, 0-15, 0-75, and 0-150 M.A. Voltage ranges 0-7, 5, 0-15 and 0-75 volts.

Furnished in oak carrying case with leather handle and removable

lid. Net weight 6 1/2 pounds.

Cat. No.	Description	Size, Inches	Shpg. Wt. Each
695	Current Flow Test Set	10 1/2x9x6 in.	13 lbs.

Meter, Shallcross Fault Location



Provides three types of measurements: Wheatstone Bridge, Murray and Varley Loop. As a Wheatstone Bridge, cable resistance is measured from 1 ohm to 11.1 megohms. Murray Loop tests will locate grounds, crosses, opens and shorts and inductive crosses or split pairs,

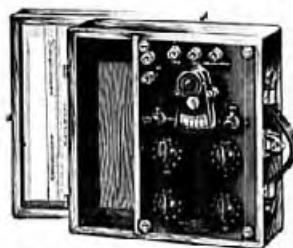
with a high degree of accuracy. Varley Loop tests will locate grounds, crosses and shorts.

Rheostat range 1 to 11,110 ohms with four decades in 1 ohm steps. Coil accuracy is ±0.1%. Bridge resistance range, 1 ohm to 11,100,000 ohms. Four rheostat coils 10 X 10 + 1000 + 1000 ohms. Accuracy ±0.1%, ratio coils ±0.1%.

Uses one No. 6 dry cell which must be ordered separately. Net weight each is 7 pounds.

Cat. No.	Description	Size	Shpg. Wt. Each
629	Fault Location Bridge	10 1/2x9x6 in.	14 lbs.

Meter, Shallcross Cableman's Wheatstone Bridge



A portable instrument having fixed ratio arm arranged for the Varley Loop Tests for locating faults, grounds and crosses. The rheostat dial reading is referred directly to a chart and the distance to fault determined without computation.

Four rheostat decades, total range, 1,111 ohms variable in steps of 0.1 ohm. Range 0.1 to 1,111 ohms.

Uses one No. 6 dry cell which must be ordered separately. Net weight each is 6 pounds.

Cat. No.	Description	Size, Inches	Shpg. Wt. Each
627	Cableman's Wheatstone Bridge	10x10x6 1/2	13 lbs.

Meter, Fault Location



The type L Telefault will find wet trouble of high or low resistance, grounds, crosses, split pairs and dead shorts. It will not "noise up" other working pairs. Cannot be confused with other inductive noises—has a tone like a woodpecker on a pole. The exploring coil and receiver will tell whether power circuits are alive before touching them. Operates on one No. 6 dry cell. Furnished less battery. Net weight is 10 pounds.

Cat. No.	Description	Shpg. Wt. Each
L	Woodpecker Telefault—Complete	15 lbs.
L	Exploring Coil Only	3 lbs.
L	Receiver Only	1 lb.

Meter, Resistance



The Midget Detecto-Meter will measure all resistances of line wire and telephone parts up to 10,000 ohms and will locate all bad joints and noisy connections. The instruction book furnished with each meter gives resistance of all gauges of line wire in mile steps and the resistance of all cable in general use.

The meter will read both resistance and voltage.

Power is two flashlight batteries.

Made with bakelite top and bottom and constructed for long service. Size: 6 1/8 inches by 3 inches by 2 inches. Weight: 1 1/4 pounds.

Made in two voltage ranges, 0 to 1.5 volts and 0 to 60 volts. Specify which range desired when ordering.

Meter, Pocket



Useful in all kinds of battery testing, servicing telephones, radios, automotive ignition, gas engines, door bells and in low-voltage electrical work. Also serves as polarity indicator—indicating the direction of the current.

Has calibrated scales, durable, clearly marked dial and full nickel-finished case, 2 1/4 inches in diameter and 3/8-inch thick.

Equipped with a flexible cord

and spur for making connections.

Cat. No.	Reading-Scale	Standard Package	Weight Std. Pkg.
24	Ammeter, 0-35 amp., 1 amp. divisions	10	4 lbs.
34-C	Voltmeter, 0-50 volts, 1 volt divisions	10	4 lbs.
44	Voltammeter, 0-35 ampere, 0-10 volts, 1 ampere and 1/5 volt divisions	10	4 lbs.

Meter, Wheatstone Fault Location Bridge



L.&N.—TYPE S TEST SETS

This set comprises a compact Wheatstone Bridge convenient for electrical resistance measurements with provisions for Murray and Varley Loop tests in location of faults in communication circuits. With a buzzer and telephone receiver it can be used to locate opens.

Ratio dial has multiplying values of 0.001, 0.01, 0.1, 1, 10, 100 and 1000 for resistance measurements and for Varley Loop tests; also settings of M1000, M100 and M10 for ratios in Murray Loop tests. Rheostat has 4 decades 9(1+10+100+1000)ohms. Limit of error in ratio resistors ±0.05%; in ratio arm, resistance change from zero setting of dials equals dial settings ±(0.1 percent ±0.01 ohm). Includes pointer galvanometer of 1-megohm sensitivity, 4.5-volt battery, and keys for galvanometer and battery.

Furnished in oak case with hinged lid and carrying strap.

Cat. No.	Description	Size, Inches	Weight Each
5300	Type S Portable Test Set	8 7/8 x 7 3/8 x 5 1/2	8 lbs.
5431	Leather Carrying Case		
5412	Buzzer		
9872	Telephone Receiver Set with Head Band		
PI-124-C	Extra Galvanometer System		
Std. 986	Eveready No. 950 Flashlight Cell, 3 required.		



L. & N.—TYPE U TEST SETS

A portable Wheatstone Bridge especially designed to measure conductor resistance, identify faulty wires in cable, locate grounds, shorts and crosses by Murray, Varley, Hillborn and other loop tests. With a buzzer and telephone receiver it can be used to locate opens.

Dial switches have positioning stops. Knobs are undercut and switch, keys and binding posts are so placed that a man wearing gloves can manipulate them easily.

Ratio dial has multiplying values of 1/1000, 1/100, 1/10, 1/9, 1/4, 1/1, 10/1 and 100/1 for resistance measurements and for Varley Loop tests, also settings of M1000, M100 and M10 for ratios in Murray Loop tests.

Rheostat has 4 decades, 10(1+10+100)+9×1000 ohms +infinity. Limit of error in ratio resistors ±0.05%; in ratio arm, resistance change from zero setting of dials equals dial settings ±(0.1 per cent ±0.01 ohm). Includes pointer galvanometer of 1 megohm sensitivity, 4.5 volt battery and keys for galvanometer and battery. Hillborn Loop test can be made using internal galvanometer.

Furnished in oak case with metal protecting corners, removable lid and carrying strap. Net weight each is 8 pounds.

Cat. No.	Description	Size Inches	Shpg. Wt. Each
5430-A	Type U Portable Test Set	8 7/8 x 7 3/8 x 5 3/4	9 lbs.
5431	Leather Carrying Case		
5412	Buzzer		
9812	Telephone Receiver Set with Head Band		
PI-124-C	Extra Galvanometer System		
Std. 986	Eveready No. 950 Flashlight Cell, 3 required.		

Meters, Resistance



Designed for the service man who relies upon resistance and continuity tests in checking circuits. The type 1-E scale is calibrated with a double range and resistance readings are available from 0-5000 and 0-50,000 ohms, and type 1-F with ranges 10 and 1000 ohms.

A magnetic shunt provides convenient adjustment to compensate for variations in battery voltage. This adjustment may be made before each series of tests, thus assuring accurate resistance readings.

Complete with No. 950, 1½-volt battery and a long pair of test leads.

Cat. No.	Description	Size, Inches	Shpg. Wt. Each
689-1-E	Weston Ohmmeter, Complete	5x2 ⁷ / ₈ x1 ⁷ / ₈	1 lb.
689-1-F	Weston Ohmmeter, Complete	5x2 ⁷ / ₈ x1 ⁷ / ₈	1 lb.
Leather Carrying Case for either 689-1-E or 689-1-F.			

Meter, Teleohm



For testing and locating line circuit, telephone and switchboard trouble, shorts, grounds, high resistance, and open circuits in coils of all kinds, also partially shorted coils, high resistance transmitters, cut-outs in receiver, desk stand and switchboard cords, hook switch contacts, etc.

Uses two No. 950 dry cells. Equipped with a Weston 0-3 Volt Direct Reading Ohmmeter 0-10,000 Ohm Scale, mounted in a walnut case.

Cat. No.	Description	Size	Weight Each
4300	Telohm Test Unit	1 ⁵ / ₈ x3 ¹ / ₂ x6 in.	1 ¹ / ₄ lbs.

Meter, Shallcross Transmission



Specifically designed to provide a convenient and inexpensive method of measuring transmission losses in lines, switchboard circuits, apparatus, etc. In addition to these tests, comparative measurements of the

capacity of condensers may be made as well as tests for balance of repeating coils and relays. The 1000 cycle oscillator output may be used as a tone source for fault location measurements with the Shallcross Nos. 628, 629 or similar Fault Location Bridges. Operates on 110-120 volts, A.C. or D.C.

Cat. No.	Description	Size, Inches	Shpg. Wt. Each
692	Transmission Test Set Complete	14 ¹ / ₄ x8x8	12 ¹ / ₂ lbs.
690	Transtester-Decibel Meter	7 ¹ / ₈ x5x4 ¹ / ₄	3 lbs.
355	Attenuation Box	7 ¹ / ₈ x5x4 ¹ / ₄	2 lbs.
691	Tone Generator	6x6x6 ¹ / ₂	5 ¹ / ₂ lbs.

Meter, Shallcross Telephone Service



Useful for testing subscriber set output, dry cells, transmitter current, receiver resistance, capacity of condensers, ringing impedance, magneto output and impedance, central office commercial supply voltage, ringing machine voltage, battery charging current, etc.

The measurements possible with this meter are: D.C. voltage ranges, 0-6-30-150-300 volts; D.C. current ranges, 15-150-300 milliamperes and 6 amperes; A.C. Voltage ranges, 0-6-30-150-300 volts; resistance range D.C. 0-500-50,000 ohms; capacitance ranges, .001 to 0.1-1-10 mfd.; approximate artificial load, 600 ohms 6-30 volts A.C.; inductance, 1- to 100- 1000- 10,000 Henrys; and resistance range A.C. 25-3,000,000 ohms.

Uses one No. 6 dry cell which must be ordered separately. Furnished in an oak carrying case with leather handle and removable lid. Net weight each is 12 pounds.

Cat. No.	Description	Size	Shpg. Wt. Each
614-A	Telephone Service Meter	10x8 ¹ / ₂ x6 ¹ / ₂ in.	18 lbs.

Meter, Universal



A complete pocket size tester measuring A.C. and D.C. voltages to 5000 volts at 1000 ohms per volt; D.C. milliamps to 500 milliamps at 250 millivolts, and resistances to 2000-400,000 ohms with center scale readings of 1200 to 240,000 ohms. Mounted in black molded case, completely insulated. Black molded panel with white markings. Battery self-contained, plug-in type, 1.5 volt Eveready No. 935 or equivalent.

Furnished with 50-inch test leads with plugs and clips.

Cat. No.	Description	Weight
666-HH	Volt-Ohm-Milliammeter	1 ¹ / ₂ lbs.
669	Leather Carrying Case with Leather Handle	1 lb.

Meter, Volt-Ohmmeter



Has a useful selection of voltage and resistance ranges. Changes in battery potential are compensated for by short-circuiting the resistance pin jacks of any range and adjusting pointer to zero ohms by turning the battery adjustment knob.

Ranges are available from engraved pin jacks moulded internally with the panel. A toggle switch connects meter in circuit as a voltmeter or ohmmeter.

Voltage ranges: 3/30/300/600 d.c. all 1000 ohms per volt. Resistance ranges: 1000/10,000/100,000 and 1,000,000 ohms full scale.

Complete with pair of 4-foot test leads and a No. 781, 4 ½-volt battery.

Cat. No.	Size	Shpg. Wt. Each
564-3C	5 ¹ / ₂ x 3 ³ / ₄ x 2 ¹ / ₂ in.	1 ³ / ₄ lbs.

Nail Anchors, Hammer Drive



For nailing to concrete, brick or stone. Shields are one piece, non-rusting aluminum alloy.

Furnished with heavily hot galvanized nails.

Diameter and Length of Shield	Diameter of Drill to Use	Standard Package	Weight per 100
3/16 x 7/8 in.	3/16 in.	100	1 lb.
3/16 x 1 1/4 in.	3/16 in.	100	1 1/4 lbs.
1/4 x 1 in.	1/4 in.	100	1 1/2 lbs.
1/4 x 1 1/4 in.	1/4 in.	100	1 3/4 lbs.
1/4 x 1 1/2 in.	1/4 in.	100	2 1/4 lbs.
5/16 x 1 1/4 in.	5/16 in.	100	2 3/4 lbs.
5/16 x 1 3/4 in.	5/16 in.	100	3 1/2 lbs.
5/16 x 2 1/4 in.	5/16 in.	100	4 1/2 lbs.
5/16 x 2 1/2 in.	5/16 in.	100	5 lbs.
3/8 x 2 in.	3/8 in.	100	6 1/2 lbs.
3/8 x 3 1/4 in.	3/8 in.	100	8 1/4 lbs.
1/2 x 2 1/4 in.	1/2 in.	100	11 1/2 lbs.
1/2 x 3 1/2 in.	1/2 in.	100	15 1/2 lbs.

Nails, No. 18, Insulated



Used for installing two-conductor or three-conductor twisted insulated wire. Easy to handle and has excellent insulating characteristics. Diameter of head is 7/16 inches.

Dark green nails are carried in stock.

Cat. No.	Length Under Head	Standard Package	Weight per 1000
1812	1/2 in.	100	1 5/8 lbs.
1858	5/8 in.	100	1 7/8 lbs.
1878	7/8 in.	100	2 1/8 lbs.

Nails, Insulated

Same as the No. 18 Fibre Head Insulated Nails except with smaller, 5/16 in., diameter head.

Cat. No.	Length Under Head	Standard Package	Weight per 1000
1412	1/2 in.	100	1 1/4 lbs.
1458	3/8 in.	100	1 1/2 lbs.
1478	7/8 in.	100	1 5/8 lbs.

Oil, Neatsfoot



It pays to give safety straps and tool belts proper attention. Neatsfoot Oil should be rubbed into the leather at least every 90 days.

Cat. No.	Description	Weight per Doz.
N.O.-1	Pint Can of Neatsfoot Oil	15 lbs.
N.O.-2	Qt. Can of Neatsfoot Oil	27 lbs.
N.O.-4	Half Gal. Can of Neatsfoot Oil	52 lbs.

Paint Brush, Tree



For use in applying tree paint from the ground. Overall length is 5 feet. Extension handles for use with Newman Tree trimmers can be used with this brush.

Cat. No.	Description
1400	Tree paint brush, complete, 5 ft. overall, 1 1/2-in. pole
1400A	Tree paint brush, complete, 5 ft. overall, 1 1/4-in. pole
1450	Tree paint brush assembly
1425	Tree paint brush only

Paint, Newco Tree

Newco tree paint is a bituminous product for protecting exposed live wood and preventing decay. It produces a black, elastic coating over the end of the cut limb that excludes moisture, thus preventing evaporation of the sap.

The following sizes are available:

- 55 gal. steel barrels, weight 550 lbs.
- 5 gal. steel pails, weight 55 lbs.
- 1 gal. cans (6 to case), weight 75 lbs.
- 1 qt. cans (12 to case), weight 35 lbs.

Pay Stations

For pay stations see next page.

Peavies and Cant Hooks

Handles are selected, air-seasoned hickory or hard maple with hand-turned knobs, smoothly sand finished. Sockets, clasps and toe rings are of malleable iron and duck-bill hooks and pikes are hammered out of crucible steel. A stop is provided to prevent hook from falling back onto handle and injuring fingers of user. Handles are lacquered.

PEAVIES



Cat. No.	Wood	Size	Standard Bundle	Weight Each
T-124-137	Hickory	2 1/2 in. x 4 ft.	6	8 lbs.
T-125-138	Hickory	2 1/2 in. x 4 1/2 ft.	6	9 lbs.
T-126	Hickory	2 1/2 in. x 5 ft.	6	10 lbs.
T-127-124	Maple	2 1/2 in. x 4 ft.	6	8 lbs.
T-128-125	Maple	2 1/2 in. x 4 1/2 ft.	6	9 lbs.
T-129	Maple	2 1/2 in. x 5 ft.	6	10 lbs.

CANT HOOKS



Cat. No.	Wood	Size	Standard Bundle	Weight Each
T-118-199	Hickory	2 1/2 in. x 4 ft.	6	7 1/2 lbs.
T-119-200	Hickory	2 1/2 in. x 4 1/2 ft.	6	8 lbs.
T-120	Hickory	2 1/2 in. x 5 ft.	6	8 1/2 lbs.
T-121-188	Maple	2 1/2 in. x 4 ft.	6	7 1/2 lbs.
T-122-189	Maple	2 1/2 in. x 4 1/2 ft.	6	8 lbs.
T-123	Maple	2 1/2 in. x 5 ft.	6	8 1/2 lbs.

CANT HOOK AND PEAVIE HANDLES ONLY

These handles are of the same high quality used in the above tools—selected, air-seasoned hickory or hard maple, with hand-turned knobs, smoothly finished.

Cat. No.	Wood	Size	Standard Bundle	Weight Each
T-130-575	Hickory	2 1/2 in. x 4 ft.	6	3 1/2 lbs.
T-131-576	Hickory	2 1/2 in. x 4 1/2 ft.	6	4 lbs.
T-132	Hickory	2 1/2 in. x 5 ft.	6	4 1/2 lbs.
T-133-544	Maple	2 1/2 in. x 4 ft.	6	3 1/2 lbs.
T-134-545	Maple	2 1/2 in. x 4 1/2 ft.	6	4 lbs.
T-135	Maple	2 1/2 in. x 5 ft.	6	4 1/2 lbs.

PAY STATIONS, GRAY POST-PAYMENT ATTACHMENT TYPE

These pay stations have no moving parts or electrical connections other than the telephone line. Signals to the operator are produced by coins striking gongs or chimes. These tones are transmitted to the central office through the transmitter of the telephone at which the pay station is located. In the case of

handset type pay stations, the signals are picked up by a special signal transmitter, mounted within the box. These pay stations cannot be used for pre-payment service as the coin is not under the control of the central office operator.

No. 11 Side Mounting Type



The No. 11 pay station will fit any regular wall telephone in present use. It is connected to the telephone by a mounted plate furnished with the pay station. Has nickel, dime, and quarter slots. Coin capacity \$10.00.

Furnished less telephone set unless instrument code number is specified when ordering.

The pay station is 9 inches high, 4½ inches wide, and 3 inches deep. Shipping weight, 16 pounds.

No. 23-D Self-Contained Type



The No. 23-D pay station is the three slot type, for nickels, dimes, and quarters. Coin capacity is approximately \$20.00.

The upper compartment is hinged, allowing inspection without opening the coin drawer or disconnecting any wiring, the repair man and inspector being confined to the top section while the collector needs open only the lower compartment. Each compartment has a lock.

The universal mounting plate on this station allows either the wall or shelf mounting. Standard equipment includes the mounting for transmitter, switch-hook and hook-switch springs.

Furnished less transmitter, receiver, and ringer box unless code numbers for these parts are specified when ordering.

For complete installation of No. F-41-A Receiver, a No. 121-C Non-Positional Transmitter, and a No. F-602-BA Common Battery Desk Set Box or any standard 3-conductor magneto desk set box should be ordered.

No. 23-D pay station is 10½ inches high, 6 inches wide, and 4½ inches deep. Shipping weight is 20 pounds.

No. 11-J Handset, Side Mounting Type



The No. 11-J pay station is the same as the No. 11 except it is arranged for use with wall type or desk type Masterphone.

A universal mounting plate is arranged for either wall or shelf mounting and a No. LD-72 signal transmitter is mounted within the box to pick up the coin signals. It is not necessary to mechanically connect the pay station to the telephone set but the signal transmitter must be cut into the handset transmitter circuit, preferably at the ringer box terminal block. A two-conductor cord is required for this purpose.

Coin capacity is \$10.00.

Furnished less telephone set unless instrument code number is specified when ordering.

The No. 11-J pay station is 9¾ inches high, 4⅞ inches wide, and 3⅞ inches deep. Shipping weight is 16 pounds.

No. 11-AJ Handset, Side Mounting Type

The No. 11-AJ is the same as the No. 11-J pay station except that the coin capacity is \$13.50.

No. 23-J Handset, Self-Contained Type



Similar to No. 23-D but arranged for use with a handset. Standard equipment includes switch-hook, hook-switch springs, and No. LD-72 signal transmitter. Coin capacity is approximately \$20.00.

Furnished less handset and desk set box unless code numbers for these parts are specified when ordering.

For a complete installation a No. F-27-C Handset and No. 610-BA Desk Set Box should be ordered.

The No. 23-J pay station is 10½ inches high, 6 inches wide, and 4½ inches deep. Shipping weight is 20 pounds.

PAY STATIONS, PRE-PAY AND CONVERTIBLE POST-PAY TYPES

These pay stations can be furnished for pre-payment or post-payment service on manual or automatic exchanges.

They are arranged for wall mounting but may be mounted in a corner by using a No. 153-A Bracket or on a shelf with a No. 139-A Backboard.

These stations are sturdily constructed of heavy, pressed steel, and the cash compartment doors are hardened to prevent burglary. They are furnished in black japan with chromium plated trimmings.

When used for pre-payment service, special central office equipment is required to switch 110-volt direct current onto the line to operate the coin-collecting and refunding magnet.

Type "60" stations are equipped with short-air-gap induction coil, 100-ohm balancing resistor, 5 mf. transmission condenser, 1 mf. ringing condenser, and hook-switch. Connects directly to line if no ringer is required or may be used with any type of signal or a ringer box containing only a ringer. Wiring diagram showing connections to the line (and to a signal, if desired) is included in each pay station. Order ringer No. A0-71 if desired.

Type "34A" stations are identical in appearance and size to the "60" series but must be used with a three-winding induction coil. Order No. 610-BA desk set box for complete installation.



PRE-PAY TYPE

These pay stations will provide central-battery pre-pay service with any central-office equipment—either automatic or manual—which provides 110-volt coin-control facilities for operating the coin-control relay in the pay station (relay requires 70 volts or 65 m.a. for dependable operation). Coins are deposited before connection is made, and may be collected when, or after, connection is completed, or refunded if connection cannot be made.

Type 62, Pre-Pay, Handset Type

For complete installation, order with No. 27-C Non-Positional Handset and Cord. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate. If ringer is desired order No. A0-71 Ringer.

Type 61, Pre-Pay, Hand-Receiver Type

Like Type 62 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C Transmitter, No. F-41-A Receiver, and No. A0-71 Ringer if local ringer is desired. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 34A-9, Pre-Pay, Handset Type

Similar to the Type 62 but requires ringer box. For complete installation order with No. 27-C Non-Positional Handset and Cord and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 34A-8, Pre-Pay, Hand-Receiver Type

Like Type 34A-9 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C Transmitter, No. F-41-A Receiver, and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.



**POST-PAY (Convertible to Pre-Pay) TYPE
For Free Local Service**

These stations have no coin-control relay and do not require control equipment at the central office. Operator must supervise deposit of coins—hence these pay stations are not used in automatic exchanges unless local service is provided free. These pay stations are designed to permit ready conversion to pre-pay operation by the addition of the coin-control relay and hopper assembly. Conversion Kit. No. S-5725 for automatic operation and No. S-5726 for manual operation.

Type 64, Post-Pay, Handset Type

For complete installation order with No. 27-C Non-Positional Handset and Cord. If local ringer is desired order No. A0-71 Ringer. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 63, Post-Pay, Hand-Receiver Type

Like Type 64 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C Transmitter and No. F-41-A Receiver. If local ringer is desired order No. A0-71 Ringer. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 34A-9P2, Post-Pay, Handset Type

Similar to Type 64 but requires ringer box. For complete installation order with No. 27-C Non-Positional Handset and Cord and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 34A-8P2, Post-Pay, Hand-Receiver Type

Like Type 34A-9P2 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C Transmitter, No. F-41-A Receiver, and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

PAY STATIONS, POST-PAY (Reverse-Battery) TYPES

These pay stations provide toll service as described for Types 64, 63, 34A-9P2, and 34A-8P2 but permit collection of charges for local pay station service without the aid of an operator. They can be used in any automatic exchange which provides for reversal of transmission battery when the called party answers. These pay stations do not provide for ready conversion to pre-pay operation.

Type 66, Post-Pay (Reverse-Battery), Handset Type FOR DIAL ONLY

For complete installation order with No. 27-C Non-Positional Handset and Cord, No. AK-11 Dial, No. D-53594 Extended Number Plate. If local ringer is desired order No. A0-71 Ringer.

Type-65, Post-Pay, Hand-Receiver Type FOR DIAL ONLY

Like Type 66 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C transmitter, No. F-41-A Receiver, No. AK-11 Dial, and No. D-53594 Extended Number Plate. If local ringer is desired order No. A0-71 Ringer.

Type 34A-11, Post-Pay, Handset Type FOR DIAL ONLY

Similar to Type 66 but requires ringer box. For complete installation order with No. 27-C Non-Positional Handset and Cord, No. AK-11 Dial, No. D-53594 Extended Number Plate, and No. 610-BA Desk Set Box.

Type 34A-10, Post-Pay, Hand-Receiver Type FOR DIAL ONLY

Like Type 34A-11 but with transmitter swivel and hookswitch for hand receiver. For complete installation order with No. 121-C Transmitter, No. F-41-A Receiver, No. AK-11 Dial, No. D-53594 Extended Number Plate, and No. 610-BA Desk Set Box.

PAY STATIONS, POST-PAY (Operator-Controlled)

These pay stations are similar to Types 64, 63, 34A-9P2, and 34A-8P2 except they provide for conversion to Post-Pay Reverse-Battery Operation, not to pre-pay. They are inexpensive pay stations for use in central-battery manual or automatic exchanges and may be converted to reverse-battery operation by the addition of a polarized relay assembly available in Conversion Kit. No. S-5729.

Type 68, Post-Pay, Handset Type

For complete installation order with No. 27-C Non-Positional Handset and Cord. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate. If local ringer is desired order No. A0-71 Ringer.

Type 67, Post-Pay, Hand-Receiver Type

Like Type 68 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 22-C Transmitter and No. F-41-C Receiver. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate. If local ringer is desired order No. A0-71 Ringer.

PAY STATIONS, POST-PAY (Operator Controlled) Type 34A-11P2, Post-Pay, Handset Type

Similar to Type 68 but requires ringer box. For complete installation order with No. 27-C Non-Positional Handset and Cord and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Type 34A-10P2, Post-Pay, Hand-Receiver Type

Like Type 34A-11-P2 but with transmitter swivel and hookswitch for hand-receiver. For complete installation order with No. 121-C Transmitter, No. F-41-A Receiver, and No. 610-BA Desk Set Box. If for dial service order No. AK-11 Dial and No. D-53594 Extended Number Plate.

Pike Pole, Coffing Power



Made of two pieces of galvanized pipe, one telescoping the other. Power may be obtained through the use of a Coffing Load Binder or Safety Pull Hoist. For straightening leaning poles one man with this tool can do the work of from two to six men.

The Power Pipe Pole has a heavy steel base and the type is so constructed that it cannot slip off the pole.

Cat. No.	Min. Height	Max. Height	Weight Each
C-2	8 ft., 2 in.	11 ft., 7 in.	32 lbs.

Pike Poles, Heavy Duty Type Fir



Diameter at center 2½ inches, tapering to 2 inches at ends. This gives extra strength at center where needed with very little increase in weight. Pike projects 4 inches from end.

Cat. No.	Size	Standard Bundle	Weight Each
817	2½ in. x 10 ft.	6	12 lbs.
T-219-818	2½ in. x 12 ft.	6	12 lbs.
T-220-819	2½ in. x 14 ft.	6	14 lbs.
T-221-820	2½ in. x 16 ft.	6	16 lbs.
T-222-821	2½ in. x 18 ft.	6	18 lbs.
T-223-822	2½ in. x 20 ft.	6	20 lbs.

Pike Poles, Light Type



Poles of Douglas Fir with pikes of ¾-inch crucible steel protruding 4 inches and set in creosote. Poles are 2 inches in diameter—not tapered.

Cat. No.	Size	Standard Bundle	Weight Each
T-204-805	2 in. x 10 ft.	6	6 lbs.
T-205-806	2 in. x 12 ft.	6	9 lbs.
T-206-807	2 in. x 14 ft.	6	11 lbs.
T-207-808	2 in. x 16 ft.	6	13 lbs.
T-208	2 in. x 18 ft.	6	15 lbs.
T-209	2 in. x 20 ft.	6	17 lbs.

Pike Poles, Guarded



Made of selected Douglas Fir with one-piece malleable iron ferrule and fork driven onto pole and secured by a rivet. Handles are furnished in two sizes—the 2-inch are straight, and the 2½-inch are tapered to 2 inches at the ends.

Cat. No.	Size	Standard Bundle	Weight Each
T-226-832	2 in. x 10 ft.	6	9 lbs.
T-227-833	2 in. x 12 ft.	6	11 lbs.
T-228-834	2 in. x 14 ft.	6	13 lbs.
795	2 in. x 16 ft.	6	15 lbs.
796	2½ in. x 12 ft.	6	13 lbs.
797	2½ in. x 14 ft.	6	14 lbs.
T-229-835	2½ in. x 16 ft.	6	17 lbs.
T-230-836	2½ in. x 18 ft.	6	19 lbs.
T-231-837	2½ in. x 20 ft.	6	21 lbs.

Pike Pole and Raising Fork Handles Only

Made of selected Douglas Fir. Smooth finished.

Cat. No.	Size	Standard Bundle	Weight Each
T-240-970	2 in. x 10 ft.	6	6 lbs.
T-241-971	2 in. x 12 ft.	6	8 lbs.
T-242-972	2 in. x 14 ft.	6	10 lbs.
T-243-973	2 in. x 16 ft.	6	12 lbs.
T-244	2 in. x 18 ft.	6	14 lbs.
T-245	2 in. x 20 ft.	6	16 lbs.
981	2½ in. x 10 ft.	6	11 lbs.
T-248-982	2½ in. x 12 ft.	6	11 lbs.
T-249-983	2½ in. x 14 ft.	6	13 lbs.
T-250-984	2½ in. x 16 ft.	6	15 lbs.
T-251-985	2½ in. x 18 ft.	6	17 lbs.
T-252-986	2½ in. x 20 ft.	6	19 lbs.

Pins, Western Union Steel



The cobs are made of the best grade of air-dried oak, boiled in paraffin to exclude all moisture. The pins are forged from stiff, high carbon open hearth steel and are cut threaded on the top to receive the cobs.

The Long Shank Pin is equipped with one square nut and a round washer, clipped on one side to permit locking the nut by driving a nail into the arm.

Short shank pins are furnished with nut only and are used on transposition brackets, steel crossarms, ridge irons, etc. Extra cobs can be furnished.

Cat. No.	Diameter of Shank	Length Below Shoulder	Length Above Shoulder	Std. Pkg.	Weight per 100
J-1190	½ in.	5 in.	4¼ in.	100	72 lbs.
J-1191	⅝ in.	5 in.	4¼ in.	100	108 lbs.
J-1193	½ in.	1 in.	4¼ in.	25	49 lbs.
J-1195	⅝ in.	1 in.	4¼ in.	25	69 lbs.

Pins, Corner and Duplex Insulator



These pins are especially designed for use on corners and strain points. They are reinforced with a ¾-inch galvanized bolt which extends through the entire length of the pin. An extra large washer 2 inches in diameter is provided so that the nut may be tightened and the pin securely fastened in place.

Duplex pins are threaded on both ends and also are used for transposition insulators.

All pins are shipped in heavy burlap bags.

Cat. No.	Pin Size Inches	Description	Weight per 1000
J-1784	Corner 1¼ x 8	No. 1 Grade Locust	590 lbs.
J-1758	Corner 1½ x 9	No. 1 Grade Locust	750 lbs.
J-1786	Duplex 1¼ x 11½	No. 1 Grade Locust	500 lbs.

Pins, Standard Wood Insulator



The Locust Wood Pin is most popular because the hard, close-grained wood cannot be penetrated by moisture and is practically impervious to decay. Because of its great strength and uniform quality, locust wood is well suited for making wood insulator pins where accurate turning and freedom from shrinking or warping are primary considerations.

Threaded one-inch in diameter, four threads to the inch, with 1/16-inch taper per inch of length. Length of the thread is 2¼ inches.

Made of No. 1 Grade Locust and shipped in heavy burlap bags.

Cat. No.	Pin Size Inches	Top Size	Standard Bag	Weight per 1000
J-1760	1¼ x 8	1 in.	250	325 lbs.
J-1761	1½ x 9	1 in.	250	480 lbs.

Pins, Transposition



Transposition Pins conform to the above specifications but have an extra long thread for use with transposition insulators. They are made of No. 1 Grade Locust and are shipped in heavy burlap bags.

Cat. No.	Pin Size Inches	Standard Bag	Weight per 1000
J-1782	1¼ x 9	250	400 lbs.

Pins and Eyelets, Escutcheon

Specialized galvanized steel nails or brass escutcheon pins are available for all aluminum markers listed above.

Special bulletin on request.

Size	Description	No. per lb.
1 inch	No. 15 Galvanized Steel	900
⅝ inch	No. 15 Cadmium Plated Steel	1200

Turn Pins—Drift Plugs

Used for expanding ends and for smoothing out lead sleeves. Turn pins furnished in sizes 2¾, 3, 3½, 4, 4½, 5, 5½ and 6 inches.

Drift Plugs are furnished in all sizes corresponding to the inside diameter of lead sleeves with which they are to be used from ¾ to 6 inches. All are treated hardwood.

Plier Pockets, Klein



Made of good quality leather. For carrying 6, 7, 8, or 9-inch pliers. A loop is riveted at back through which belt may be passed or can be riveted on. No. 5107 has bottom left open to prevent accumulation of dirt and water.

Cat. No.	Size	Weight per Doz.
5107	3½ x 9 inches	3 lbs.
5112	3½ x 9 inches	4¾ lbs.

Pliers, Klein Side-Cutting



For use on bare and insulated wire. All Klein pliers have polished heads and temper blued handles. Powerful leverage and

kept reinforced cutting knives make this plier adaptable for heavy cutting in telephone and telegraph work.

Cat. No.	Size	Standard Package	Weight per Doz.
201-5	5 inches	6	3 lbs.
201-6	6 inches	6	5¼ lbs.
201-7	7 inches	6	7¼ lbs.
201-8	8 inches	6	11¾ lbs.
201-9	9 inches	6	14 lbs.

Pliers, Klein Side-Cutting



WITH SLEEVE-JOINT TWISTER

For use on bare or insulated wire with joint twister.

Cat. No.	Size	Standard Package	Weight per Doz.	Size Sleeve Twister	
				N.B.S.	B. & S.
212-6	6 in.	6	5 lbs.	14 and 17	12
212-7	7 in.	6	7½ lbs.	14 and 17	12
212-8	8 in.	6	11¾ lbs.	12	10

Pliers, Klein Round Nose Side-Cutting



For use on bare or insulated wire. Identical with series 201 except that the nose is round

to permit working in confined space and all edges are rounded to prevent nicking of wire.

Cat. No.	Size	Standard Package	Weight per Doz.
201-5 N.E.	5 inch	6	3 lbs.
201-6 N.E.	6 inch	6	5¼ lbs.
201-7 N.E.	7 inch	6	7¼ lbs.
201-8 N.E.	8 inch	6	11¼ lbs.
201-9 N.E.	9 inch	6	13½ lbs.

Pliers, Klein Side-Cutting



WITH SLEEVE-JOINT TWISTER

Identical with series 201-N.E. but have opening provided for twisting double tube sleeve joints.

Cat. No.	Size	Standard Package	Weight per Doz.	Sleeve Opening for Wire Size	
				N.B.S.	B. & S.
212-6 N.E.	6 in.	6	5¼ lbs.	14 and 17	12
212-7 N.E.	7 in.	6	7¼ lbs.	14 and 17	12
212-8 N.E.	8 in.	6	11¾ lbs.	12	10

Pliers, Oblique Cutting



Has two "W" shaped notches at back of the cutting knives specially designed for removing acetate cellulose insulation from .050 to .058 wires.

Cat. No.	Size	Standard Package	Weight per Doz.
245-5-W	5 inches	6	3 lbs.

Pliers, Klein Oblique Cutting



For Close Cutting

Cuts close, the narrow head permitting its use in confined places. The knives are perfectly fitted, so that they meet accurately at all points.

Cat. No.	Size	Standard Package	Weight per Doz.
202-5 Klein's	5 inches	6	3¾ lbs.
202-6 Klein's	6 inches	6	4 lbs.
15-5 Swedish	5 inches	6	4 lbs.

Pliers, Klein Oblique Cutting



All-purpose cutting tool for telephone work. The "W" notches will slit acetate cellulose and other insulation from wires up to .058 O.D. A stripping hole .052 diameter is provided in the blades. Sleeve

openings are in the handle. The notch may also be used for "crimping" on .032—.025 single tube copper sleeves.

Cat. No.	Size	Standard Package	Weight per Doz.
202-5-SW	5½ inches	6	3¾ lbs.

Pliers, Oblique Cutting



Same as No. 202 series with the addition of stripping notch and openings for twisting sleeves. Notch may also be used for "crimping" on .032—.025 single tube copper sleeves often used in telephone work

for splicing .032 bridle wire and .025 inside wire. When so used two "crimps" are made at each end of the sleeve for .032 bridle wire and three "crimps" for .025 inside wire.

Cat. No.	Size	Standard Package	Weight per Doz.
240-5-S	5 inches	6	3¾ lbs.

Pliers, Oblique Cutting



Same as series 202 with the addition of a notch in the cutting knives for stripping small wires. The notch can be used for "crimping" single tube copper sleeves.

Cat. No.	Size	Standard Package	Weight per Doz.
240-5	5 inches	6	3¾ lbs.
240-6	6 inches	6	4 lbs.

Pliers, Oblique Cutting



For telephone men and switchboard builders. Convenient as it can easily be carried in vest pocket.

Cat. No.	Size	Standard Package	Weight per Doz.
245-5	5 inches	6	3 lbs.

Pliers, Klein Long Oval Nose



WITH OR WITHOUT CUTTERS
Adapted to stripping the ends of insulated wire, and for work in confined spaces.

No. 203-6 has the same features as the No. 301-6 series with the addition of the cutting knives. Points are 3/32-inch round. Nos. 301-7 and 203-7 have extra long noses—2 3/4 inches from center of hinge to point.

Cat. No.	Description	Size	Standard Package	Weight per Doz.
301-5	Without Cutter	5 inches	6	3 1/4 lbs.
301-6	Without Cutter	6 inches	6	3 3/4 lbs.
301-7	Without Cutter	7 inches	6	4 1/4 lbs.
203-5	With Cutter	5 inches	6	3 1/4 lbs.
203-6	With Cutter	6 inches	6	3 3/4 lbs.
203-7	With Cutter	7 inches	6	4 1/4 lbs.

Pliers, Klein Long Needle Nose



The thin points make these pliers useful for the general class of work done in central offices. Points are 1/16-inch round.

Cat. No.	Description	Size	Standard Package	Weight per Doz.
303-6	Without Cutter	6 inches	6	3 3/4 lbs.

Pliers, Klein Long Nose Sleeve



Same as No. 301-6 with the addition of sleeve openings for twisting No. 17 N.B.S. and smaller copper sleeves. Point 3/32-inch round.

Cat. No.	Size	Standard Package	Weight per Doz.
316-5	6 inches	6	3 3/4 lbs.

Pliers, Klein Long Nose Cord Crimping



Same as No. 301-6 with the addition of an oval groove for crimping telephone cords. Point is 3/32-inch round.

Cat. No.	Size	Standard Package	Weight per Doz.
301-C	6 inches	6	3 3/4 lbs.

Pliers, Klein Chain Nose



For general use where a short nose is desirable.

Cat. No.	Size	Standard Package	Weight per Doz.
317-6	6 inches	6	3 1/2 lbs.

Pliers, Klein Chain Nose



Similar to No. 317-6 but with side cutting knives.

Cat. No.	Size	Standard Package	Weight per Doz.
217-6	6 inches	6	3 1/2 lbs.

Pliers, Klein Long Flat Nose



Adaptable to switchboard work, telephone and telegraph work, armature winding, etc. A very handy tool for spring adjusting. Can be supplied with inside of jaws left smooth if desired.

Cat. No.	Size	Standard Package	Weight per Doz.
305-6	6 inches	6	3 1/2 lbs.

Pliers, Klein Long Flat Nose, Side-Cutting



Has long, wide, flat nose and cutting knives, polished head and temper blued handles. The inside of the jaws is smooth.

Cat. No.	Size	Standard Package	Weight per Doz.
206-6	6 inches	6	3 1/2 lbs.

Pliers, Klein Long Flat Nose, Spring Adjusting



Hollow ground on the outside of the jaws to reach between and grasp springs easily.

Cat. No.	Size	Standard Package	Weight per Doz.
311-5 1/2	5 1/2 inches	6	3 1/4 lbs.

Pliers, Klein Long Duck Bill



Fitted with duck bill jaws, wider and heavier than those of the ordinary flat nose pliers affording a tool with a firmer gripping surface.

Cat. No.	Size	Standard Package	Weight per Doz.
304-6	6 inches	6	3 1/2 lbs.

Pliers, Klein Long Duck Bill, Side-Cutting



Same as No. 304 duck bill with the addition of the cutting knives.

Cat. No.	Size	Standard Package	Weight per Doz.
205-6	6 inches	6	3 1/4 lbs.

Pliers, Klein Heat Coil



Adapted for removing heat coils from switchboards and telephone terminals, the points of the nose being shaped to fit the coils.

Also used for removing battery caps as well as holding any cylindrical object.

Cat. No.	Size	Standard Package	Weight per Doz.
313-6	6 inches	6	3 3/4 lbs.

Pliers, Klein Long Curved Nose



A handy plier for working around switchboards, terminals and telephones, due to the nose being curved. The angle is arranged to give full clearance and prevent skinning of knuckles.

Cat. No.	Size	Standard Package	Weight per Doz.
302-6	6 inches	6	3 1/4 lbs.

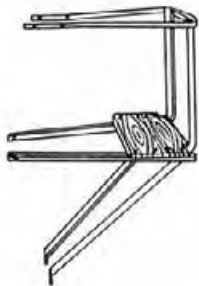
Pliers, Klein Cord Tip Closing



Jaws are of sturdy design to permit its use as a hand press for closing cord tips such as W.E. 101 and 102. The circular opening in the jaws is correctly sized to insure a perfect connection when the closure is completed.

Cat. No.	Size	Standard Package	Weight per Doz.
039	5 inches	6	3 lbs.

Pole Balconies



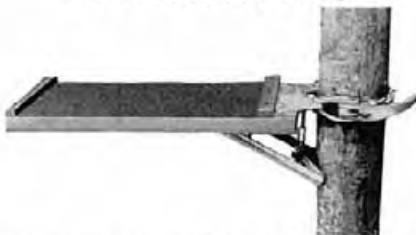
Frame braces and guard rails are made of open hearth steel, hot galvanized. The wooden platform is made of thoroughly seasoned oak, painted with two coats of standard green pole paint.

Numbers H-9035 and H-9045 are the same except that the railing on No. H-9035 is constructed for fastening to a telephone terminal box and the railing on the No. H-9045 fastens to the pole.

The upright braces are 1 1/2 x 1 1/2 x 3/16 inch steel; the platform supports are 1 3/4 x 1 3/4 x 3/16 inch angle steel and the guard rail is 1 1/4 inches wide flat steel. The complete balcony includes all bolts for fastening the parts together but not the bolts for attaching to the pole. There are two 7/16-inch holes, two 11/16-inch holes and two 9/16-inch holes, for mounting to the pole with lag screws.

Cat. No.	Size of Platform	Weight Each
H-9035	14 x 30 inches	63 lbs.
H-9045	14 x 30 inches	67 lbs.

Pole Platforms, Utility



The Chance utility platform is designed for use on poles where space is limited or when only a small working area is required. The board is 30 by 11 by 1 5/8 inches, surfaced with Griptread. Fittings are aluminum alloy. The strut brace folds against the board, making it easy to transport. Rated working load is 750 pounds on the end of the board.

Cat. No.	Size	Weight
M4950	30 x 11 x 1 5/8 inches	20 lbs.

Pole Platforms, Chance Adjustable and Pilot ADJUSTABLE TYPE

Made with chain tightener for attachment to poles. Braces fold for easy transportation. Plank and brace are spruce, castings are aluminum alloy and chain is welded steel.

Cat. No.	Description	Size of Platform	Weight
M4901-2	Pole Platform Only	1 5/8" x 11" x 6'	46 1/4 lbs.
M4901-35	Rope Railing		12 3/4 lbs.

PIVOT TYPE

Can be rotated through an angle of 180° making both ends of the cross arm accessible with the same setting on the pole. Plank is Douglas Fir, brace is spruce, castings are aluminum and chain is welded steel.

Cat. No.	Description	Size of Platform	Weight
M4901	Swivel Platform Only	1 5/8" x 10" x 6'	68 3/4 lbs.
M4901-35	Rope Railing		12 3/4 lbs.

Pole Plates, Butt



Used on a corner pole to protect it from the hubs of wagons and trucks. The dimensions given are those of the flat plate before bending; the guard is bent to a 7 1/2-inch radius. All holes are 9/16-inch diameter for 1/2-inch lag screws, there being three holes on each side of the No. J-1037 Guard and five on the No. J-1237.

Cat. No.	Size	Weight per 100
J-1037	16 x 18 x 1/8 inches	1040 lbs.
J-1237	16 x 30 x 3/16 inches	2550 lbs.

Pole Unloader, Chance Safety Trip



The safety trip pole unloader makes safe one of the most dangerous operations in unloading poles from flat cars. It provides a mechanical means of releasing the load in which all workers may remain at a safe distance.

Two safety trip pole unloaders are fastened to the side of the car opposite the unloading rack and a cable laid from each to the opposite side. Standards on the unloading side may then be removed and the load released by pulling the hand lines which release the trips, freeing the cables.

This equipment can be supplied complete with two Safety Trips with bolts and large washers, two steel rope cables, 3/8 inch by 25 feet, two Thimbleye bolts 3/4 by 12 inches with large washers, and four Crosby wire rope clamps for 3/8 inch wire rope. The Safety Trips also can be obtained separately.

Cat. No.	Description	Weight
325	Safety Pole Unloader Set Complete (see above)	58 1/2 lbs.
329	Safety Trip Pole Unloader (2 required)	13 3/8 lbs.

POLES

Creosoted Southern Yellow Pine—Northern White Cedar—Western Red Cedar



Typical Pole Yard from which Kellogg Poles are shipped.

There are three species of wood poles commonly used in telephone work—southern yellow pine, northern white cedar and western red cedar. These comprise approximately 95 per cent of the poles in current use. Advantages of cedar and pine are discussed below.



Cedar

The two cedars which are among the most durable woods known contain powerful decay and termite-resistant toxins in their fibrous substance, particularly in the heartwood which is more than 90 per cent of their volume. Cedar sapwood, while much more durable than pine sapwood, is less toxic than cedar heartwood. For this reason, cedar poles are usually given a preservative butt treatment by the open tank method to secure extra protection of the butts, particularly in the region of the ground line where the pole is subjected to conditions which foster decay, such as prolonged moisture, fungus, and termites. The sapwood above the ground line of sound poles, free from infection when erected, has seldom been known to decay prematurely except under extreme conditions of moisture, or shade, or from lack of air circulation about the pole.

Pine

Because of the very perishable nature of pine, a pine pole must be treated its entire length under pressure to insure the fullest possible penetration of the sapwood by the preservative. Framing must be done before treatment to avoid subsequent exposure of untreated sapwood or heartwood. In standard sizes the average yellow pine pole consists of about 80 per cent sapwood. There is no appreciable difference in strength between sapwood and heartwood. This applies to all species of wood poles. Heartwood, in all species, while very resistant to penetration of the preservative is, at the same time, relatively more durable and resistant to decay and termite attack than is the sapwood of the same species.

Concentrating Yards and Treating Plants

Large stocks of seasoned poles in concentrating yards, adequate treating facilities and a diversified location of plants permit prompt shipment. The utmost care in production, seasoning, and yarding provides the necessary insurance against incipient decay and deterioration in storage.

Prompt service is assured from producing plants strategically located to conveniently serve Kellogg customers.

Creosoted Southern Yellow Pine

Brewton, Alabama	Shreveport, Louisiana	Gulfport, Mississippi
Heber Springs, Arkansas	Winnfield, Louisiana	Louisville, Mississippi
Savannah, Georgia	Fernwood, Mississippi	Panama, Oklahoma
New Orleans, Louisiana	Norfolk, Virginia	Jackson, Tennessee
	Franklin Park, Illinois	

Northern White Cedar

Gladstone, Michigan
Minneapolis, Minnesota

Western Red Cedar

Sandpoint, Idaho
Minneapolis, Minnesota
Gladstone, Michigan

Dimension Specifications

There are three distinct specifications under each species of pole:

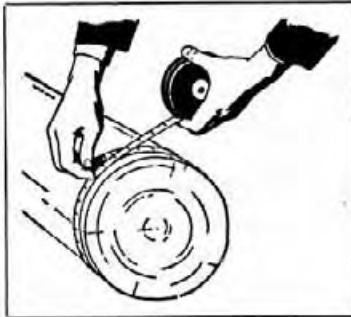
1. A.S.A. (American Standards Association). Covers numerical classes 1 to 10; each class (from 1 to 7) signifying the same breaking load for all species. This specification is the most popular of the three now in use.
2. Woods run or top size. Guarantees no minimum ground-line circumference. Poles under this specification are furnished with minimum tops and natural or "woods run" taper.
3. N.E.L.A. (National Electric Light Association, A. T. & T.) covers alphabetical classes.

Summary of Information Necessary to Quote or Fill Pole Orders

1. Quantities (minimum car).
2. Sizes.
3. Species (S.Y.P., N.W.C., W.R.C.).
4. Specification (A.S.A., Woods Run, N.E.L.A.).
5. Treatment: Cedars, AA, B, 1/2; Pine 8 lb., 10 lb., 12 lb.
6. Framing instructions, essential for all pine orders. See below.

INSTRUCTIONS FOR MEASURING POLES

Measuring Diameter of Poles



The terms "5-inch top—20 foot," "7-inch top—30 foot" are used to designate the top diameter and length of poles respectively. Because the tops and butts of poles are not perfect circles the diameter cannot be measured direct. To get the diameter it is necessary to measure the circumference and divide it by 3.1416. The sketch at the left illustrates how poles should be measured and the table at the right shows the top size of the pole when the circumference is known.

Designated Top Size	Circumference Necessary
4 inches	12 inches
5 inches	15 inches
5½ inches	17 inches
6 inches	18½ inches
6½ inches	20 inches
7 inches	22 inches
8 inches	25 inches
9 inches	28 inches
10 inches	31 inches

Measurement of Sweep and Short Crook in Poles

The correct way to measure the sweep of a pole is to stretch a tape tightly from the top to a point six feet from the butt end. A rule can then be used to determine the amount of sweep at

the greatest distance between the pole and the tape. See the illustration below.

Diagram 1—Measurement of Sweep in One Plane and One Direction

Stretch a tape measure from the top to a point 6 feet from the butt end. Use a rule to determine the maximum sweep between the pole and tape.

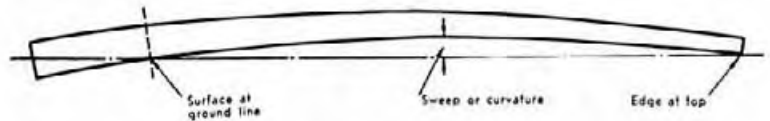


Diagram 2—Measurement of Sweep in Two Planes (Double Sweep) or in Two Directions in One Plane (Reverse Sweep)

Stretch a tape measure from the mid-point of the top to the mid-point at the ground line. Use a rule to determine the maximum sweep of each side between the pole and tape.



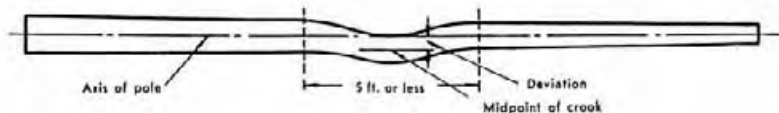
NOTE: This diagram applies to the measurement of double sweep in Western Red Cedar and Southern Pine poles. For measurement of double sweep in Northern White Cedar and Chestnut poles, see text.

Diagram 3—Measurement of Short Crook (Three Cases Shown)

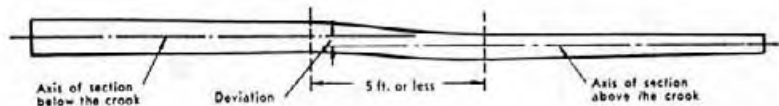
When the reference axes are approximately parallel.



When the axes of sections above and below the crook coincide or are practically coincident.



When the axis of section above the short crook is not parallel or coincident with axis below the crook.



NOTE: The three cases shown under Diagram 3 are typical and are intended to establish the principle of measuring short crooks. There may be other cases not exactly like those illustrated.

CEDAR POLES

Orders

All orders should clearly specify the size of poles desired and the specifications under which they are to be inspected. In order to keep the shipping cost of each pole at a minimum, it is advisable to order a sufficient quantity of poles to make a carload shipment. If it is impossible to do this, Northern White Cedar cross arms can be included to provide the proper weight for the best rates. Upon arrival of the car at destination, the freight is to be paid by the customer direct to the railroad company. Freight charges may be deducted from gross amount of invoice. Shortage claims should be reported to the Kellogg Com-

pany within ten days from receipt of shipment and supported with original freight bill with agent's notation as to shortage.

Carload Weights

For the purpose of figuring the number of Northern Cedar Poles required for the minimum carload to points west of the Illinois-Indiana State line, a minimum of 36,000 pounds should be used; to points east of the Illinois-Indiana State line 43,000 pounds should be used.

In Western Cedar, the minimum carload weight for poles 40 feet and shorter is 50,000 pounds; for poles from 45 to 50 feet long, 62,500 pounds and for poles 55 feet long and longer, 82,500 pounds.

Shipping Weights — N.W.C.A. Northern White Cedar Poles

WEIGHT PER POLE IN POUNDS

Length	Top Diam. 4 in.	Top Diam. 4½ in.	Top Diam. 5 in.	Top Diam. 5½ in.	Top Diam. 6 in.	Top Diam. 6½ in.	Top Diam. 7 in.	Top Diam. 8 in.	Top Diam. 9 in.
16 ft.	85	---	105	---	135	---	165	200	300
18 ft.	95	---	125	---	155	---	200	325	425
20 ft.	100	100	130	130	190	---	250	350	450
25 ft.	150	---	200	200	250	250	350	450	---
30 ft.	---	---	275	275	350	350	450	600	---
35 ft.	---	---	375	375	450	450	600	850	---
40 ft.	---	---	---	---	625	625	850	1100	---

Shipping Weights — A.S.A. Northern White Cedar Poles

WEIGHT PER POLE IN POUNDS

Length	Class 10	Class 9	Class 8	Class 7	Class 6	Class 5	Class 4	Class 3	Class 2	Class 1
16 ft.	85	105	135	135	190	230	---	---	---	---
18 ft.	95	125	155	155	210	300	300	420	---	---
20 ft.	100	130	190	190	230	300	350	540	600	720
22 ft.	150	200	225	225	315	420	500	540	780	1020
25 ft.	150	200	250	250	300	420	515	600	780	1020
30 ft.	---	275	350	350	420	520	630	870	1170	1320
35 ft.	---	---	---	450	510	720	820	1060	1320	1620
40 ft.	---	---	---	---	625	790	1020	1280	1675	2040

A.S.A. Dimensions of Northern White Cedar Poles

Class	1	2	3	4	5	6	7	8	9	10
Minimum Top Circumference (Inches)	27	25	23	21	19	17	15	18	15	12
Length of Pole (Feet)	Ground Line Dist. from Butt (Feet)									
	Minimum Circumference at Six Feet from Butt Inches									
16	3½	---	---	---	26.0	24.0	22.0	No	---	---
18	3½	---	---	32.5	30.0	28.0	25.5	23.5	---	---
20	4	39.5	37.0	34.0	31.5	29.0	27.0	25.0	Require-	---
22	4	41.0	38.5	36.0	33.0	30.5	28.0	26.0	ment	---
25	5	43.5	41.0	38.0	35.5	32.5	30.0	28.0	---	No
30	5½	47.5	44.5	41.5	38.5	35.5	32.0	30.5	---	Butt
35	6	50.5	47.5	44.0	41.0	38.0	35.0	32.5	---	Require-
40	6	53.5	50.0	46.5	43.5	40.0	37.0	---	ment	---
45	6½	56.0	52.5	49.0	45.5	42.0	---	---	---	No
50	7	58.5	55.0	51.5	47.5	44.0	---	---	---	Butt
55	7½	61.0	57.5	53.5	49.5	46.0	---	---	---	Require-
60	8	63.5	59.5	55.5	51.5	---	---	---	---	ment

*The standard height of butt treatment is to a point one foot above the groundline.

PINE POLES

Framing Specifications

These are indispensable for prompt handling of Pine orders, as all Pine poles must be completely framed before treatment. Information needed is as follows:

1. Number of gains (all same size?).
2. Dimensions of gains, width and depth.
3. Distance from apex of roof to center of first gain.
4. Spacing of gains, center to center.
5. Diameter of through-bolt hole.
6. Angle and type of roof.
7. Special pole step holes, etc.

Convenient sheets "Instructions for Framing Poles" will be furnished on request.

Requirements for Carload

Origins West of Mississippi River:

- Single Load—30,000 lbs. (if 36 ft. car).
- Single Load—34,000 lbs. (if over 36 ft. car).
- Double Load—48,000 lbs.

Origins East of Mississippi River:

- (Weights depend on destination.)
- Single Load—34,000 to 36,000 lbs.
- Double Load—58,000 to 60,000 lbs.

**Shipping Weight Woods Run Poles
(Top Measurement—Natural Taper)**

Length Feet	WEIGHT PER POLE IN POUNDS				
	Top Diam. 4 in.	Top Diam. 5 in.	Top Diam. 6 in.	Top Diam. 7 in.	Top Diam. 8 in.
16	130	150	---	---	---
18	150	200	280	---	---
20	170	220	310	---	---
22	210	290	350	---	---
25	220	310	390	500	580
30	---	400	540	670	780
35	---	---	670	870	1010
40	---	---	820	1060	1260
45	---	---	1010	1260	1500
50	---	---	---	1470	1740
55	---	---	---	1700	2010
60	---	---	---	1900	2260

These poles have no size requirement other than top measurement as indicated above.
 4-inch top poles are same as ASA Class 10.
 5-inch top poles are same as ASA Class 9.
 6-inch top poles are same as ASA Class 8.
 7-inch top poles approximate ASA Class 5.
 8-inch top poles approximate ASA Class 4.

Shipping Weights—A.S.A. Poles

8-LB. TREATMENT—WEIGHT PER POLE IN POUNDS

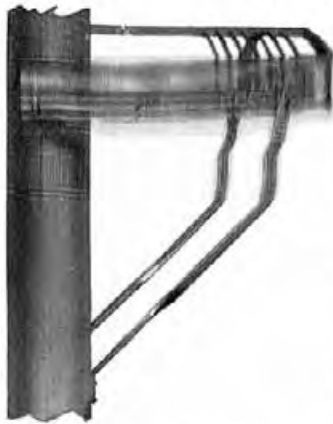
Length	Class 10	Class 9	Class 8	Class 7	Class 6	Class 5	Class 4	Class 3	Class 2
16 ft.	130	150	---	---	---	---	---	---	---
18 ft.	150	200	280	---	---	---	---	---	---
20 ft.	170	220	310	---	---	---	---	---	---
22 ft.	210	290	350	---	---	---	---	---	---
25 ft.	220	310	390	350	410	500	580	---	---
30 ft.	---	400	540	480	570	670	780	---	---
35 ft.	---	---	670	590	710	870	1010	1140	---
40 ft.	---	---	820	730	870	1060	1260	1460	---
45 ft.	---	---	1010	900	1060	1260	1500	1740	1990
50 ft.	---	---	---	1042	1254	1470	1740	2020	2340
55 ft.	---	---	---	---	1480	1700	2010	2300	2700
60 ft.	---	---	---	---	1630	1900	2260	2680	3080

A.S.A. Dimensions of Creosoted Southern Pine Poles

Class	1	2	3	4	5	6	7	8	9	10
Minimum Top Circumference (Inches)	27	25	23	21	19	17	15	18	15	12
Length of Pole (Feet)	Ground Line Dist. from Butt (Feet)*	Minimum Circumference at Six Feet from Butt (Inches)								
16	3½	---	---	---	---	21.5	19.5	18.0	No Butt Requirement	No Butt Requirement
18	3½	---	---	26.5	24.5	22.5	21.0	19.0	---	---
20	4	31.5	29.5	27.5	25.5	23.5	22.0	20.0	---	---
22	4	33.0	31.0	29.0	26.5	24.5	23.0	21.0	---	---
25	5	34.5	32.5	30.0	28.0	26.0	24.0	22.0	---	---
30	5½	37.5	35.0	32.5	30.0	28.0	26.0	24.0	---	---
35	6	40.0	37.5	35.0	32.0	30.0	27.5	25.5	---	---
40	6	42.0	39.5	37.0	34.0	31.5	29.0	27.0	---	---
45	6½	44.0	41.5	38.5	36.0	33.0	30.5	28.5	---	---
50	7	46.0	43.0	40.0	37.5	34.5	32.0	29.5	---	---
55	7½	47.5	44.5	41.5	39.0	36.0	33.5	---	---	---
60	8	49.5	46.0	43.0	40.0	37.0	34.5	---	---	---
65	8½	51.0	47.5	44.5	41.5	38.5	---	---	---	---
70	9	52.5	49.0	46.0	42.5	39.5	---	---	---	---
75	9½	54.0	50.5	47.0	44.0	---	---	---	---	---

*The figures in this column are intended solely for use whenever a definition of ground line is necessary in order to apply specification requirements relating to scars, straightness, etc.

Pole Seats



Although light in weight, this type of seat is very rigid and strong. The frame and braces are made of 1x1/2-inch channel iron and the cross bars on the seat are of 3/8-inch square bars with the edge up, which provides a rough surface and prevents slipping. Sufficient space between the cross bars prevent

ice and snow from collecting.

Six 1/2-inch lag screws are required for attaching to the pole. They are designed to fit a 10-inch diameter pole but may be fitted to 8 or 12-inch diameter poles.

Cat. No.	Size of Seat	Extension From Center of Pole	Weight Each
J-285	15 x 12 inches	2 ft. 4 in.	13.25
J-287	12 x 12 inches	2 ft. 8 in.	13.5

Pots, Unique Melting



Made from select gray iron—well proportioned. Provided with steel handle. Handle clearance for removing metal when cold.

Cat. No.	Diameter Top of Pot	Lead Capacity	Weight
398-6	6 in.	24 lbs.	3 1/2 lbs.
398-8	8 in.	50 lbs.	8 lbs.

Pot Stands, Unique Solder

This sturdy pot stand provides a safe resting place for a pot of molten solder. The broad base prevents tipping and spilling. Pot is supported off the floor or ground; saves truck floors; cuts down chances for accidents.

Stand is constructed of 1 x 1/2-inch steel bands; all joints are welded.

Takes 8-inch pot only. Weight 3 pounds.

Preservative, Kellogg Formula 401



A non-corrosive, acid resisting, non-conducting material applied to cables. Sets quickly and forms a protection against chemical fumes, rodents and abrasion.

Easy to apply—a trench is dug and a wooden or metal trough is placed beside it. A strip of tarred felt paper is then laid on it and a coating of Formula 401 is applied. After the compound has cooled slightly, the cable is laid on it and more Formula 401 is poured over it. The paper is

then wrapped around the cable and as soon as the compound cools, the cable is laid in the trench and the earth filled in.

For new cable 100 pounds coats 325 feet of 25 pairs, 300 feet of 50 pairs, 200 feet of 75 pairs, 165 feet of 100 pairs, 150 feet of 125 pairs, 125 feet of 150 pairs, 100 feet of 200 pairs of No. 22 B. & S. Gauge new cable, if properly applied.

Cat. No.	Description	Weight
401	Cable Coating and Preservative	100 lbs.

Preservative, Carbosota



A preventive against the attack of white ants, fungus growth, rot and decay to which poles and crossarms are subject. It is a refined liquid creosote oil which flows freely and penetrates deeply. Can be applied simply.

Quantity	Container	Description	Weight Each
55 gals.	Drum	Carbosota	550 lbs.
5 gals.	Can	Carbosota	50 lbs.
1 gal.	Can	Carbosota	10 lbs.

Protectors, Cook No. B-7 Indoor



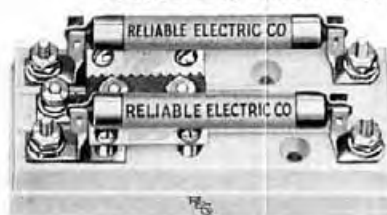
Base is of heavy, highly glazed porcelain, on which are mounted phosphor bronze contact springs. Screws, nuts, and washers are of Everdur.

Lightning arresters consist of two No. 4500 non-grounding True Gap Dischargers and two No. 2080 flat carbons set in a well in the porcelain and covered by a vented metal cap. Equipped with two No. 2104-A-9, 5 ampere fuses.

Mounting holes are 7/32-inch for No. 8, 1 1/8-inch R.H. galvanized wood screws.

Cat. No.	Description	Size	Weight Each
115-1530	B-7 Protector	3 x 6 3/4 x 2 in.	1 1/2 lbs.

Protectors, Reliable No. 975 Indoor

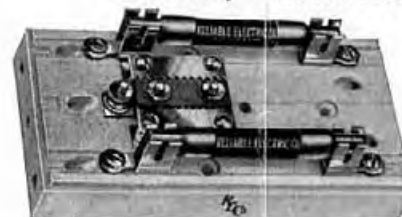


Listed as Standard by Underwriters' Laboratories. Self-cleaning, sawtooth air gap protector for indoor use. Consists of porcelain base, two No. 31L, 3 ampere ceramic

fuses, and two adjustable, sawtooth metal discharge plates.

Cat. No.	Description	Size	Weight Each
975 With Metal Cover		5 x 2 x 2 inches	2 lbs.
975 Less Cover		5 x 2 x 2 inches	1 1/2 lbs.

Protector, Reliable No. 976 Indoor

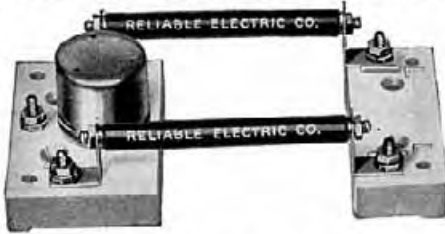


Listed as Standard by Underwriters' Laboratories. Self-cleaning, sawtooth, air gap protector for indoor use. Consists of porcelain base, two No. 52, 7 ampere round

fibre fuses and two adjustable sawtooth metal discharge plates. All-over metal cover is supplied unless otherwise specified.

Cat. No.	Description	Size	Weight Each
976		6 x 3 x 2 1/8 inches	2 1/2 lbs.

Protector, Reliable No. 977-HH Indoor



Listed as Standard by Underwriters' Laboratories. Self-cleaning, sawtooth, air gap protector for indoor use. Consists of low absorption porcelain base, phosphor bronze fuse clips and discharge block springs, two No. 55, 7 ampere fibre fuses, a brass screw cover over two No. P-495 sawtooth discharge blocks and two No. P-197 carbons.

Mounting holes are 3/16-inch for No. 10 flat head wood screws.

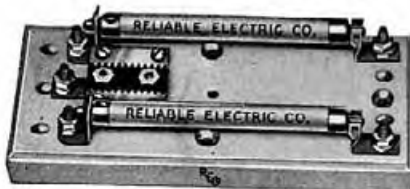
Cat. No.	Size	Weight Each
977-HH	7 1/8 x 3 5/8 x 2-5/16 inches	2 lbs.

Protector, Reliable No. 977-DD Indoor

Listed as standard by Underwriters' Laboratories. Same as No. 977-HH except equipped with clips that bite into the tips of two No. 77, 7 ampere fibre fuses.

Cat. No.	Size	Weight Each
977-DD	7 1/2 x 3 1/2 x 2 1/4 inches	2 lbs.

Protectors, Reliable No. 998-C Indoor



Listed as Standard by Underwriters' Laboratories. Self-cleaning sawtooth air gap protector for indoor use. Consists of porcelain base; two No. 77L,

7 ampere ceramic fuses, held in place by phosphor bronze clips which bite into the fuse tips; and two adjustable sawtooth metal discharge plates.

Mounting holes are 3/16-inch for No. 10 flat head wood screws.

Cat. No.	Size	Weight Each
998-C With Metal Cover	6 1/2 x 3 x 1 7/8 in.	3 lbs.
998-C Less Cover	6 1/2 x 3 x 1 7/8 in.	2 1/2 lbs.

Protector, Reliable No. 997-B



Weatherproof, self-cleaning, sawtooth, air gap protector for outside use. Consists of weatherproof cover, porcelain base, two No. 95L, 3-ampere ceramic fuses, two adjustable sawtooth metal discharge blocks.

Mounting holes are 5/32-inch for one No. 8 flat head and two No. 8 round head wood screws.

Cat. No.	Size	Weight Each
997-B	8 7/8 x 3 3/4 x 2 5/8 inches	5 lbs.

Protectors, Reliable No. 1000 Outdoor



Listed as Standard by Underwriters' Laboratories.

The fuses and air gaps are for protection against static and crosses with electric circuits. Equipped with a weatherproof, drawn aluminum cover which cannot be contacted with line fuse clips. Hot galvanized mounting bracket is slotted for a knob to take up slack in a ring run of drop wire—a great convenience when mounting on stone, brick or similar type buildings.

The No. 1000 protector has ample space for terminating wires—even from four-party line telephones. Bevelled washers also simplify installation of wires.

Has special, low absorption porcelain, treated binding posts and phosphor bronze clips and springs. Reliable No. P-495 self-cleaning sawtooth discharge blocks and No. P-197 carbons.

Mounting bracket has two 7/32-inch holes for No. 12 round head wood screws.

Other fuse capacities will be supplied on these protectors when specified.

Nos. 1000-C and 1000-H are equipped with inverted mounting brackets turned up along the side of the protector.

Cat. No.	With Fuse No.	Type of Fuse	Type of Bracket	Size Overall Inches	Weight Each
1000	55, 7 amp.	Fibre	Upright	8 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.
1000-E	77, 7 amp.	Fibre	Upright	8 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.
1000-C	55, 7 amp.	Fibre	Invert.	5 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.
1000-H	77, 7 amp.	Fibre	Invert.	5 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.
1000-A	95, 7 amp.	Wood	Upright	8 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.
1000-F	27, 7 amp.	Wood	Upright	8 3/4 x 3 1/2 x 2 1/4	2 1/2 lbs.

Nos. 1000A and 1000-F are not listed by Underwriters' Laboratories.

Protectors, Reliable No. 955 Station

Listed as Standard by Underwriters' Laboratories.

Self-cleaning, sawtooth, air gap protector for indoor use. Consists of low absorption porcelain base, phosphor bronze fuse clips and discharge block springs and heavy binding posts, two No. 55, 7 ampere, fibre fuses, brass screw cover over two No. P-495 sawtooth discharge blocks and two No. P-197 carbons.

Other fuse capacities will be supplied on these protectors when specified.

Mounting holes are 3/16-inch for No. 10 round head wood screws.

Cat. No.	Size	Weight Each
955	5-9/16 x 3 1/2 inches	2 lbs.

Protectors, Reliable No. 955-A Station

Listed as Standard by Underwriters' Laboratories.

Same as No. 955 except equipped with clips which bite into the tips of the two No. 77, 7 ampere, fibre fuses.

Cat. No.	Size	Weight Each
955-A	5-9/16 x 3 1/2 inches	2 lbs.

Other fuse capacities are available for all protectors.

Protectors, Serjdetour Telephone

For all communication circuits exposed to power line induction or possible contact. A weatherproof air gap protector, no moving parts or auxiliary relays. Will carry discharge of 25 amperes for ten minutes without becoming short-circuited, and hence may be mounted in connection with 25 ampere fuses. Serjdetour will sustain voltage of 66 KV without blowing and without allowing any of the high voltage to get past to damage the station telephone equipment. Equipped with cover. Shipping weight, 25 lbs.

Pruner, Hand



A powerful hand pruner employing the same principle as the Newman Tree Trimmer. Will make a full 3/4-inch cut. This pruner is 8 inches long, weighs 12 ounces, and has criss-cross machining on handle for firm grip. Blades and springs are replaceable.

Pruner, Bartlett Two-Hand



The blade and the hood of the No. 777 Bartlett Two-Hand Pruner are made of hardened drop forged crucible tool steel. It is furnished with 26-inch white ash handles, riveted and double ferruled for security. This tool, because of its draw cut, is easily operated on large branches.

Cat. No.	Description	Weight
777	Two-Hand Pruner	3 3/4 lbs.

Pruner, PowerAire



This fast-cutting pruner is powered with compressed air and will cut limbs up to 7/8 inches in diameter. A fifty pound air supply will give a 150 pound pull on the cutting knife. Has a 10 foot reach. Highly portable, the pruner weighs only 8 1/2 pounds.

This pruner can be powered with any air compressor which will provide a pressure of 75 pounds per square inch. Available with the PowerAire pruner is the wYe air compressor. This unit fits any 4, 6, or 8 cylinder car, truck, or tractor motor and will develop up to 100 pounds pressure. The vehicle to which the compressor is attached can be moved under its own power while the compressor is hooked up.

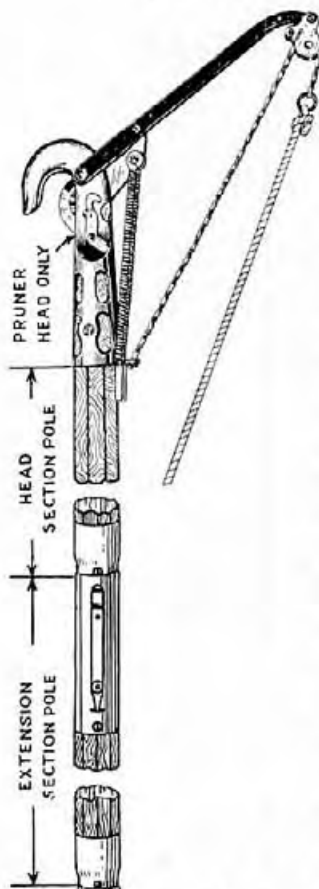
Description	Shipping Weight
Pruner, PowerAire	14 lbs.
No. 1780 Unit (wYe Compressor)	5 1/2 lbs.

Pruner, No. TR3-14 Roberts

A strong pull cut pruning saw of silver steel. Highly polished and etched. Has closed pattern handle which is interchangeable with a pistol grip. Seasoned beech, lacquered handle is held by three nicked screws.

Cat. No.	Length	Width of Point	Width at Butt	Weight per Doz.
TR3-14	26 in.	1 3/8 in.	3 1/4 in.	21 lbs.

Pruners, Seymour Smith Tree



A sturdily constructed tree pruner designed to withstand hard usage.

In the Seymour Smith tree pruner the cutting and operating mechanism is contained in the head—a simple construction with few parts. The pruner features a "center cut" action. A thin cutting blade is supported on both sides by heavy strong side pieces. The branch being cut is held on both sides of the cut by these same pieces. Thus the thin blade can cut easily and cleanly through large, tough branches without damage to the cutting edge.

Operation is by pulling a rope attached to a strong steel cable chain by a welded wire ring. The chain works through a ball bearing pulley—a simple and powerful action that easily cuts the roughest branches up to the full capacity of pruner.

The head casting is malleable iron; the cutting blade is hardened, tempered cutlery steel; the double music wire compression coil spring is supported by tempered, flat wire guides and the lever is heat treated alloy steel with a safety catch. The pole is octagonal, of selected Sitka or Airplane Spruce, in jointed sections, furnished with two coats of weatherproof varnish, 1 3/4-inch diameter.

CUTS 1 1/2-INCH DIAMETER BRANCHES

Cat. No.	Description	Shpg. Wt. Each
12-18	Complete Pruner with rope and 18-ft. pole	19 lbs.
12	Pruner head only	4 lbs.
2-6	6-ft. head section of pole	4 1/2 lbs.
2-6	6-ft. extension section of pole	5 1/2 lbs.

CUTS 1-INCH DIAMETER BRANCHES

Cat. No.	Description	Shpg. Wt. Each
111-18	Complete pruner with rope and 18-ft. pole	10 lbs.
11	Pruner Head only	1 1/2 lbs.
1-6	6-ft. head section of pole	2 1/4 lbs.
1-6	6-ft. extension section of pole	3 lbs.

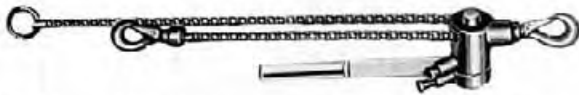
Pullers, Klein, "Chicago" Fish Tape



Pocket size fish tape—light in weight, yet strong. Grips automatically and holds like a vice.

Cat. No.	Description	Weight
1629	For Fish Tape	2 1/2 lbs.
1629-A	For No. 12 Iron Wire	2 1/2 lbs.

Puller, Coffing "Mighty-Midget"



A light-weight, 500-pound capacity ratchet-type puller useful for light line work. The handle may be used either as a crank or a lever. Has the special Coffing safety feature—at approximately 150% overload the handle will bend, thus preventing dropping or slipping of the load. Weight: 6½ pounds. Shipping weight 7 pounds.

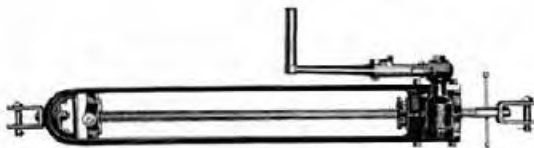
Puller, Slack



These slack pullers will take up sufficient slack in messengers to permit making splices or other repairs in aerial cable. Steel rollers at each end of the puller are used for support on the messenger strand. The lifting groove is also equipped with a roller. Tension is applied by tightening standard nut on upper end. Finished in black.

Cat. No.	Description	Weight
869	Diamond Slack Puller	10 lbs.

Pullers, Matthews Slack



Used for line maintenance, for pulling slack from conductor and guy wires, etc.

One man can pull as much strain with a Slack Puller as four men with block and tackle. No slack is lost in dead-ending because the strain is held to the exact point to which it has been pulled. After the job is done the Slack Puller is readily removed.

No. 732 is the same as No. 731 but is equipped with a quick take-up feature.

With the new, quick release feature, when the entire take-up has been used the wire is temporarily dead ended and the lock released. This permits the Slack Puller to be immediately extended.

Nos. 730, 731 and 732 have a maximum take-up of 19 inches. No. 732 is illustrated, showing a clevis at each end.

Cat. No.	Description	Pulling Strain	Weight
730	With Hook and Clevis	3000 lbs.	17 lbs.
731	With Clevis at both Ends	6000 lbs.	17 lbs.
732	With Clevis at both Ends	6000 lbs.	17 lbs.

Racks, Type T Underground Cable



The rack is 1½x9/16x3/16-inch open hearth channel with hot galvanized finish and can be either purchased in full 10-foot lengths to be cut as desired or can be supplied already cut to any lengths desired. Punched the entire length with ¾x7/8-inch holes on 1½-inch centers which are used for both arms and anchorage.

RACKS

In ordering please specify the number of 10-foot lengths or the quantity of the specified lengths desired. Shipping weight is 1 lb. per foot.

ARMS

Length	Weight
4 inches	38 lbs.
7½ inches	70 lbs.
10 inches	90 lbs.

Insulators for Type T Cable Racks

Made of porcelain, used on channel type rack—provide a smooth, rounded surface which permits creepage without injury to the cable and furnishes adequate insulation between cable and rack. Shipping weight per 100 is 100 lbs.

Reels, Matthews Adjustable



May be used for both paying out and taking up wire. When used for taking up the old wire is coiled perfectly without kinks.

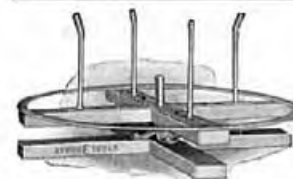
Very ruggedly built—no sharp edges to damage wire. The steel table can easily be grounded. The frame is made of durable white oak.

The steel table is supported on the under side by roller bearings eliminating any side bending strain on the center shaft. The five arms for holding the coil of wire can be contracted or expanded to snugly fit inside coils of any diameter from 13 to 18 inches inside diameter.

If the reel is to be used only for taking up wire the brake is not necessary.

Description	For Coil Size	Weight
Reel with Brake	13 to 18 inches	105 lbs.
Reel without Brake	13 to 18 inches	103 lbs.

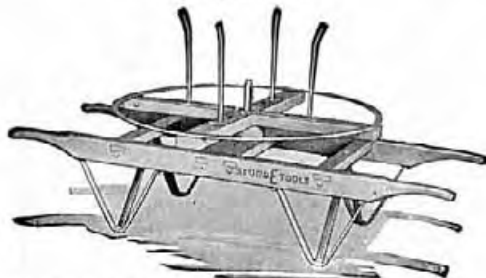
Reels, Pay-Out



This reel is of hardwood, reinforced and braced through-out with metal strips. The pins are adjustable for 12, 18, 21 and 24-inch coils.

Cat. No.	Description	Weight Each
T-510-902	Pay-Out Reel	40 lbs.

Reels, Barrow



Reel pins are adjustable for 12, 18, 21 and 24-inch coils.

Cat. No.	Description	Weight Each
T-520-900	Barrow Reel	80 lbs.
T-521-901	Extra set of 4 Guard Pins	4 lbs.

Reel, Folding Take-Up



This reel is the collapsible type, composed of two parts—the wooden stand and the metal reel. The stand is of hard-wood mortised and framed—reinforced with steel. Reel is malleable iron and steel. Takes up wire, making a coil with an inside diameter of 21 inches.

Cat. No.	Size of Coil	Weight Each
T-501-897	21 inches	42 lbs.

Reel, Extension Cord, with Lamp



This cord reel stores away an electric extension cord until it is wanted, releases it for use where it is wanted, takes it back when the work is done. This "automatic handling" saves time and bother, reduces hazards, protects the cord.

The cord reel with lamp is suitable for overhead installation. Only three screws or bolts are required for installation. A steel stop can be placed at any desired distance from end of cord to permit lamp to hang within easy reach at all times. A universal swivel permits approximately 180° swivel and 90° rocker action.

Spring tension, for retracting cord, is balanced with weight of lamp guard to prevent sudden or quick return of cord when latching arrangement is released. Cord is locked in position for work by ratchet. Cord is released for retracting by pulling cord out slightly beyond ratchet teeth and releasing cord.

Equipped with 20 feet of SJ 18/2 heavy rubber covered cord and heavy duty lamp guard with reflector and switch in handle. Has male attachment plug molded on end of cord for plugging into receptacle.

Cat. No.	Description
700-20-SJ	Reel, Extension Cord, with Lamp

Reel, Extension Cord

This reel is the same as the No. 700-20-SJ Extension Cord Reel with lamp except it is fitted with a molded-on female attachment plug in place of the lamp guard and reflector.

Reels, Jumper Wire



Single or double units are available. Wire may be reeled from the top or bottom at any angle without kinking or snarling. The reel turns easily but never coasts as the correct tension is held by a center spring.

The diameter of the coil eye may be adjusted from 5 inches to 8½ inches. To load, the reel is placed on its side and the tension cone face plate is removed. The coil of wire is placed in position and pins adjusted to correct tension. The face plate is replaced and the reel is ready for use. A hole is provided in the face plate to anchor the free end of the wire.

The Individual Reel is made for mounting to a frame-work or on service trucks, etc. The Double and Single Unit Reels rest on the floor on legs. All are of metal with black enamel finish.

Description	Size Reel	Weight Each
Individual Reel	15 inches	14 lbs.
Individual Reel	21 inches	22 lbs.
Single Unit Reel	21 inches	48 lbs.
Double Unit Reel	15 inches	30 lbs.
Double Unit Reel	18 inches	36 lbs.

Reel, Combination Pay-Out and Take-Up



Easy to handle with no back-lash or tangling—one man can tend several reels. May be used either as a pay-out reel or it may be set upright and used as a take-up reel. Braces and crank are furnished. The reel is easily portable as the guide pins fold flat making the reel compact. These guide pins are adjustable to take any size coil of wire from 13 to 27 inches in inside diameter—just press the lock spring and the guide slides to any required adjustment.

An important feature is the automatic brake. As the wire is pulled the brake releases and the wire pays out freely. The instant tension is released, the brake sets and any possibility of back-lashing is prevented.

The carrier frame is easily removable so the reel can be bolted to a truck. A thumb screw terminal is provided for grounding the reel. Light weight but of strong, durable all-metal construction.

Size Overall		Takes Coil Size		Weight
Length	Width	Inside Diam.	Outside Diam.	
63 in.	34 in.	13 to 27 in.	34 in.	75 lbs.

Relay, Telecode



Where an auxiliary 110-volt loud-sounding extension signal is required instead of the usual standard telephone bell, the Telecode Relay is used to actuate the signal. It is operated by the regular ringing impulses and the auxiliary signal is actuated in turn without affecting the talking and ringing efficiency of the telephone system.

These relay contacts are rated at .8 ampere at 110 volts, sufficient to operate five vibrating type howlers. Standard coil windings are 1000 ohms for operation on 110 volt, 60 cycle, A.C. or D.C. circuits. For ringing circuits of standard telephone systems, relays should have the same coil resistance as the bell ringer coils of the telephone. For use on intercommunicating systems relays must be of the same voltage as the ringing circuit as well. The finish of all units is battleship gray enamel.

In ordering, specify the resistance of telephone bell ringer coils or voltage of ringing circuit.

FOR PANEL MOUNTING

The relay mechanism is mounted on a bakelite base 4½ inches in diameter. Two mounting screw holes are spaced on 3½-inch centers.

Cat. No.	Description	Weight Each
8313-P	Open Circuit	2½ lbs.
8313-L	Locking Armature	2½ lbs.

WITH EXPLOSION-PROOF BOX

Cast iron base is threaded for a 5½-inch cast red brass cover. Close fitting joints prevent the escape of flames in the event of an internal explosion. Base has two mounting lugs and two hubs equipped with conduit stops. Regularly tapped ½ inch straight through.

Cat. No.	Description	Weight Each
8319-P	Open Circuit	10½ lbs.
8319-L	Locking Armature	10½ lbs.

WITH STEEL BOX

For general use indoors—the hinged, pressed steel cover box supplied is 6 x 6 x 4 inches in size with ½-inch knockouts on all four sides.

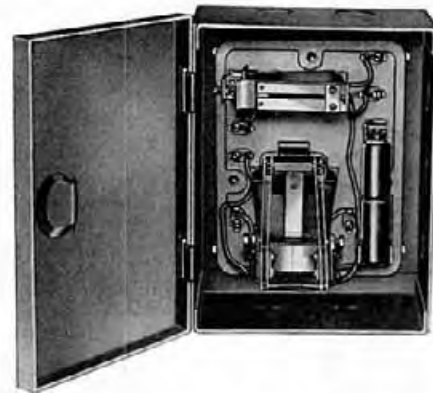
Cat. No.	Description	Weight Each
8315-P	Open Circuit	5¼ lbs.
8315-L	Locking Armature	5¼ lbs.

WITH WATER-TIGHT BOX

Vapor-proof, the box has a cast iron base, threaded for 5½-inch cast aluminum cover and sealed with a rubber gasket. Base has two mounting lugs and two hubs equipped with conduit stops. Regularly tapped ½ inch straight through.

Cat. No.	Description	Weight Each
8322-P	Open Circuit	7½ lbs.
8322-L	Locking Armature	7½ lbs.

Relay, Super-Sensitive



For operating extension signals on long, heavily loaded telephone communication lines—18 to 30 cycles, A.C. service.

Consists of two distinct units, a super-sensitive, polarized relay with its coils connected across the telephone ringer circuit, and a delay relay. The contacts of the super-sensitive relay control a low voltage circuit to the delay relay which in turn controls the signal circuit.

May be used in lines having 1000 to 2500 ohm relays or ringers and will operate over a voltage range of from 8 to 135 volts, 18 to 30 cycles, A.C., but will not respond to a high frequency. Contact capacity is one ampere at 110 volts or 110 watts, at other voltages. The signal circuit requires 6 volts, 2 amperes, D.C. Delay relay is arranged to operate on D.C. only and will be wound to operate on higher than 6 volts if specified.

Cat. No.	Description	Weight Each
8330	Relay with 6 x 8 x 4 inch steel box	13 lbs.
8331	Relay only	8½ lbs.

Relay, Vincent Rare Gas



An electronic device for use on telephone lines instead of mechanical ringing relays. Has no moving parts, may be placed in any position and may be used on either harmonic or coded ringing bells.

Lines equipped with the Vincent Rare Gas Relay are free from grounds in normal operations and therefore free from noise which would ordinarily be picked up through grounds. Prevents premature tripping in machine ringing from manual or dial offices and acts as a protector against lightning discharges.

Inserted in series with the bell, condensers are left in the circuit as usual.

Cat. No.	Description	Size	Weight Each
RTC-2	Vincent Rare Gas Relay	2½ x 1½ in.	8 oz.

Rings, Bridle

For pole line and interior distribution. Each ring has a 5/16-inch opening in the eye. Furnished either hot galvanized or dark blue enameled. When order does not specify galvanized rings will be shipped.

Cat. No.	Size of Eye	GALVANIZED		Weight per 1000
		Length of Shank		
A-1 $\frac{5}{8}$	1 $\frac{5}{8}$ in.	1 $\frac{1}{4}$ in.		110 lbs.
C-1 $\frac{1}{4}$	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.		95 lbs.
E- $\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$ in.		35 lbs.
F-3	3 in.	1 $\frac{7}{8}$ in.		300 lbs.
ENAMELED				
A	1 $\frac{5}{8}$ in.	1 $\frac{1}{4}$ in.		150 lbs.
C	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.		125 lbs.
E	$\frac{5}{8}$ in.	$\frac{7}{8}$ in.		50 lbs.



Rings, National Cable



Left:
Regular Ring
Right:
Extra Long Ring

Cable can be pulled in either direction and neither the strain of this operation nor the swaying of the cable by the wind can move the ring from its original position—the greater the strain the tighter the grip.

Made of high carbon wire, hot dip galvanized and packaged in clusters of five to prevent tangling.

Furnished in standard length or extra long for placing a second cable on an existing messenger.

In ordering it is important to specify the size of strand on which rings are to be used.

Also available in copperweld on special order.

STANDARD LENGTH—GALVANIZED

Made for all strand sizes—specify size desired.

Size	For Cable Diameter	Standard Package	Weight per 1000
1 $\frac{1}{2}$ in.	$\frac{1}{2}$ to 3/16 in.	1000	47 lbs.
2 in. light	15/16 to 1-9/16 in.	500	66 lbs.
2 in. heavy	15/16 to 1-9/16 in.	500	90 lbs.
2 $\frac{1}{2}$ in.	1-5/16 to 1-15/16 in.	500	106 lbs.
3 in.	1-15/16 to 2 $\frac{1}{4}$ in.	400	125 lbs.
3 $\frac{1}{2}$ in.	2 $\frac{1}{4}$ to 2 $\frac{5}{8}$ in.	300	140 lbs.
4 in.	2 $\frac{5}{8}$ to 3 in.	250	200 lbs.
4 $\frac{1}{2}$ in.	3 to 3 $\frac{1}{2}$ in.	250	210 lbs.

EXTRA LONG—GALVANIZED

Made for all strand sizes—specify size desired.

Size	Length Under Strand	Standard Package	Weight per 1000
1 $\frac{1}{2}$ in.	4 $\frac{3}{4}$ in.	500	114 lbs.
2 in.	5 $\frac{1}{4}$ in.	300	170 lbs.
2 $\frac{1}{2}$ in.	6 $\frac{3}{4}$ in.	250	216 lbs.
3 in.	7 $\frac{1}{2}$ in.	200	255 lbs.
3 $\frac{1}{2}$ in.	8 in.	200	270 lbs.

Rings, Toggle Bridle

Used in material of hollow construction as magnesia blocks, wallboard, lath, plaster, hollow tile, etc.

Furnished complete with 5/16 x 1 $\frac{1}{4}$ -inch round washer and square nut.

The 3/16-inch size is furnished with cadmium plated finish and the 1/4-inch size is furnished with hot galvanized finish.

Supplied with either spring or No. 5 type toggle head. Spring type will be furnished unless otherwise specified.

Diameter of Screw	Length of Screw	Diameter of Eye	Size Drill Required	Standard Package	Weight per 100
3/16 in.	4 in.	$\frac{5}{8}$ in.	$\frac{1}{2}$ in.	250	8 $\frac{1}{2}$ lbs.
$\frac{1}{4}$ in.	4 in.	1 $\frac{1}{4}$ in.	$\frac{5}{8}$ in.	250	17 $\frac{1}{2}$ lbs.



Rings, Drive

These rings accomplish the same purpose as the screw threaded, pigtail bridle ring but are designed for driving instead of screwing into structures. When attached to wood they are driven as an ordinary wire nail. When attached to hard substances such as brick, stone or concrete, Hammer Drive Anchors are employed.

Made of hard nail wire, hot galvanized.



Diameter of Eye	Size of Hammer Drive Anchor to Use	Standard Package	Weight per 1000
$\frac{1}{2}$ in.	3/16 x $\frac{7}{8}$ in.	100	16 lbs.
$\frac{5}{8}$ in.	$\frac{1}{4}$ x 1 in.	100	28 lbs.
$\frac{7}{8}$ in.	$\frac{1}{4}$ x 1 in.	100	53 lbs.

Rods, Ground

WITHOUT WIRE

The unwired type has a drilled hole 3/16-inch in diameter for inserting the ground wire, which also facilitates soldering.

Cat. No.	Size	Standard Bundle	Weight per 100
J-1102	$\frac{3}{8}$ in. x 5 ft.	20	190 lbs.
J-1103	$\frac{3}{8}$ in. x 6 ft.	20	230 lbs.
J-1104	$\frac{1}{2}$ in. x 5 ft.	20	334 lbs.
J-1105	$\frac{1}{2}$ in. x 6 ft.	20	400 lbs.
J-1106	$\frac{1}{2}$ in. x 7 ft.	10	468 lbs.
J-1120	$\frac{1}{2}$ in. x 8 ft.	10	534 lbs.
J-1107	$\frac{5}{8}$ in. x 6 ft.	10	600 lbs.
J-1108	$\frac{5}{8}$ in. x 7 ft.	10	700 lbs.
J-1109	$\frac{5}{8}$ in. x 8 ft.	10	800 lbs.
J-1110	$\frac{5}{8}$ in. x 10 ft.	5	1000 lbs.

WITH WIRE

The wired type has five turns of .104-inch tinned copper wire (free end 18 inches long) soldered to the upper end of the rod, insuring a perfect electrical connection.

Cat. No.	Size	Standard Bundle	Weight per 100
J-1098	$\frac{1}{2}$ in. x 5 ft.	10	342 lbs.
J-1099	$\frac{1}{2}$ in. x 6 ft.	10	408 lbs.
J-1100	$\frac{5}{8}$ in. x 6 ft.	10	608 lbs.
J-1148	$\frac{5}{8}$ in. x 8 ft.	10	808 lbs.



Rods, Copperweld Ground
WITHOUT WIRES

The Copperweld Ground Rod is non-rusting. Its heavy exterior layer of pure copper is inseparably molten-welded to the steel core, assuring dependability and long life.

The rod is rigid and easy to drive. The core, of specially selected steel, provides "stiffness" sufficient for driving in any soil.

When a Copperweld Ground Rod is used with a copper ground wire, the connection is copper to copper. There is no danger of harmful corrosion or increased rod-to-wire contact resistance.

The top end of the Copperweld Ground Rod is chamfered to reduce "mushrooming" during driving. Clamp may be slipped over the top of the rod after driving.

The top 5 inches of the Copperweld Ground Rod is tinned to facilitate soldering, if soldered connections are desired.



Cat. No.	Size	Standard Bundle	Weight per 100
J-8315	3/8 in. x 5 ft.	10	200 lbs.
J-8316	3/8 in. x 6 ft.	10	240 lbs.
J-8287	3/8 in. x 7 ft.	10	280 lbs.
J-8325	1/2 in. x 5 ft.	10	340 lbs.
J-8326	1/2 in. x 6 ft.	10	410 lbs.
J-8327	1/2 in. x 7 ft.	10	480 lbs.

WITH ANNEALED COPPER PIGTAILS

The cold drawn Copperweld 3/8-inch Ground Rod is as stiff as ordinary half-inch rod. In the five and six-foot lengths it is as easy to drive as a larger diameter ground rod, and provides an economical, dependable non-rusting ground.

Cat. No.	Size	Pigtail	Standard Package	Weight per 100
J-7105	3/8 in. x 5 ft.	18 inches	10	225 lbs.
J-7106	3/8 in. x 6 ft.	18 inches	10	265 lbs.
J-7107	3/8 in. x 7 ft.	18 inches	10	305 lbs.
J-7205	3/8 in. x 5 ft.	36 inches	10	245 lbs.
J-7206	3/8 in. x 6 ft.	36 inches	10	275 lbs.
J-7207	3/8 in. x 7 ft.	36 inches	10	315 lbs.

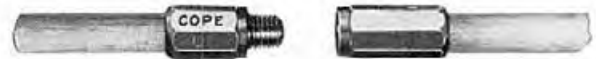
Rods, Quick Coupling Conduit



Made of best grade hickory, straight grained and toughened by an oil process to insure long life. The castings are malleable iron and are power driven onto the sticks and securely riveted.

Cat. No.	Length	Description	Weight Each
461	2 ft. rod	Straight Stick	1 lb.
462	3 ft. rod	Straight Stick	2 lbs.
463	4 ft. rod	Straight Stick	2 1/2 lbs.
465	3 ft. rod	Swell Center Stick	2 1/4 lbs.
466	4 ft. rod	Swell Center Stick	2 3/4 lbs.

Rods, Screw Coupling Conduit



Constructed of the highest grade materials. Couplings are bronze, cast in octagon shape with 3/4-inch U. S. standard threads. Furnished in two sizes, 7/8 and 1-inch.

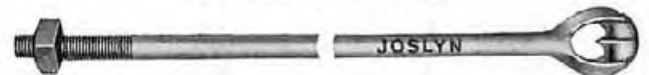
Cat. No.	Description	Diameter of Rod	Length	Weight per 100
481	Straight Stick	7/8 inch	3 feet	155 lbs.
482	Straight Stick	7/8 inch	4 feet	185 lbs.
483	Straight Stick	1 inch	3 feet	195 lbs.
484	Straight Stick	1 inch	4 feet	235 lbs.
486	Swell Center Stick	1 inch	3 feet	220 lbs.
487	Swell Center Stick	1 inch	4 feet	260 lbs.

Rods, Standard Anchor
THIMBLEYE (SINGLE GUY)



Cat. No.	Diameter	Length	Diameter of Eye	Std. Pkg. Quantity	Weight per 100
J-7405	1/2 in.	5 ft.	1/2 in.	10	350 lbs.
J-7406	1/2 in.	6 ft.	1/2 in.	10	410 lbs.
J-7416	5/8 in.	6 ft.	9/16 in.	10	650 lbs.
J-7417	5/8 in.	7 ft.	9/16 in.	10	750 lbs.
J-7418	5/8 in.	8 ft.	9/16 in.	10	850 lbs.
J-7427	3/4 in.	7 ft.	11/16 in.	5	1090 lbs.
J-7428	3/4 in.	8 ft.	11/16 in.	5	1240 lbs.
J-7429	3/4 in.	9 ft.	11/16 in.	5	1390 lbs.
J-7438	1 in.	8 ft.	15/16 in.	3	2250 lbs.
J-7440	1 in.	10 ft.	15/16 in.	3	2810 lbs.

TWINEYE (DOUBLE GUY)



Cat. No.	Diameter	Length	Diameter of Eye	Std. Pkg. Quantity	Weight per 100
J-7528	3/4 in.	8 ft.	1/2 in.	5	1260 lbs.
J-7529	3/4 in.	9 ft.	1/2 in.	5	1410 lbs.
J-7538	1 in.	8 ft.	5/8 in.	3	2280 lbs.
J-7540	1 in.	10 ft.	5/8 in.	3	2820 lbs.

Rope, Manila



The finest commercial grade, 3-strand Manila rope for hand lines, block and tackle, etc. Full coils of rope 1/2-inch in diameter and larger contain approximately 1200 feet and half coils about 600 feet. Coils less than 1/2 inch in diameter contain more than 1200 feet. Furnished cut to any length desired.

Diameter	Circumference	Feet per Pound	Weight per Coil
3/8 in.	1 1/8 in.	24 1/2	65 lbs.
1/2 in.	1 1/2 in.	13 1/3	90 lbs.
5/8 in.	2 in.	7 1/2	160 lbs.
3/4 in.	2 1/4 in.	6	200 lbs.
1 in.	3 in.	3 3/4	324 lbs.

Saddles, National Galvanized Cable Ring

Eliminates ring cutting on lead sheath due to vibration and assures a longer life to the cable.

Made of steel, hot dip galvanized after forming. Used with standard cable rings.



Size	Standard Package	Weight per 1000
1½ in.	1000	90 lbs.
2 in.	1000	100 lbs.
2½ in.	500	110 lbs.
3 in.	500	135 lbs.
3½ in.	500	150 lbs.

Saws, No. 2 Back



Silver steel, hardened and tempered. Spring steel back keeps blade true.

Cat. No.	Points per Inch	Weight per Doz.
2-8	14	8 lbs.
2-10	14	13 lbs.
2-12	14	17 lbs.

Saw, Cableman's No. 24



This saw is arranged particularly for cable work. Ground 17 x 19 gauge, 10 points per inch on one side, 13 points on the other. One of these saws should be in every tool kit. Will also cut wood.

Cat. No.	Length	Width at Point	Width at Butt	Std. Pkg.	Weight per Doz.
24-16	16 inches	¾ in.	2¼ in.	6	9 lbs.

Saws, No. 9 Compass



Extra heavy blade for telephone work. Ground 16 x 17 gauge, 9 point filed and set. Blade is slotted and punched. Equipped with interchangeable beech handle, nicked wing nut and screw.

Cat. No.	Description	Length	Weight per Doz.
9-12	Compass Saw	12 in.	6 lbs.
9-14	Compass Saw	14 in.	7 lbs.

Saw, No. 59-18 Electricians'



A strong blade made of highly tempered spring steel. Tooled on both edges. 12-point teeth on one edge for cutting cables, nails, etc., and 8-point teeth on other edge for sawing wood. Varnished hardwood handle with nickel plated screws.

Saws, One Man Crosscut, No. 389



This one man crosscut saw is made of silver steel, the blade taper ground, 15 x 19 x 17 gauge in all lengths. Two cutting teeth and raker. Slight skew back. Has beech handle with large hand hole, sanded sides, orange lacquered edges. Curved grip. Fastened to blade with two nicked screws and one medallion. Filed and set, ready for use.

Cat. No.	Length Feet	Width at Point, In.	Width at Butt, In.	Weight Each, Lbs.	Case Quantity	Shpg. Weight
389-2½	2½	2¼	6¼	2¼	25	125
389-3	3	2¾	6½	2¾	25	145
389-3½	3½	2⅝	6¾	3¼	25	170
389-4	4	2⅞	7	4½	25	190

Saws, One Man Crosscut, No. 390



This saw has special steel straight back, hardened and tempered. Taper ground. Needs very little set. Beech handle, large grip, fully lacquered. Securely fastened to blade by two brass screws and medallion. Filed and set, ready for use. The 2½ to 4 foot saws are 16 x 18 gauge. The 4½ and 5 foot saws are 15 x 17 gauge.

Cat. No.	Length, Feet	Width at Point, In.	Width at Butt, In.	Weight Each, Lbs.	Case Quantity	Shpg. Weight
390-2½	2½	2¼	6½	2¼	25	120
390-3	3	2¼	6¾	2⅞	25	140
390-3½	3½	2¼	7	3¼	25	165
390-4	4	2¾	7¼	4½	25	180
390-4½	4½	2¾	7½	5½	25	200
390-5	5	2¾	7½	6¼	25	220

Saws, Pruning



Special steel, high grade full tooth pattern. Has extra sharp teeth which hold edge longer due to their extra fine temper. Handle is air-dried beech, Davey pattern.

Cat. No.	Length	Width at Point	Width at Butt	Weight per Doz.
40-20	20 in.	1½ in.	5½ in.	17 lbs.
40-24	24 in.	1½ in.	6¼ in.	21 lbs.

No. 41

Silver steel, skew back blade, ground 18 x 11 gauge. Has six point bevel filed handsaw teeth with wide set. Handle is lacquered and polished, fastened to the blade with 3 nicked screws and a medallion.

Cat. No.	Length	Width at Point	Width at Butt	Weight per Doz.
41	36 in.	1½ in.	6 in.	28 lbs.

Saw, Docking



A useful saw for telephone construction crews. Made of high-grade special steel, full breast, tempered blade, ground 18 x 20 gauge, polished ribbon edge, 4½ points per inch, peg teeth, filed and set. Handle has easy grip and is made of malleable iron, fanned and riveted. Each saw sharpened and set ready for use.

Cat. No.	Type	Length	Standard Package	Weight per Doz.
590	Skew Back	30 in.	4	37 lbs.
591	Straight Back	30 in.	4	37 lbs.

Saw, Bartlett Pole



The No. 44 Bartlett Pole Saw is for use on limbs larger than the capacity of the regular No. 1 Type Trimmer. It has a 16-inch peg tooth blade with seven teeth to the inch. The blade is adjustable to three angles and cuts on both the up and down stroke. Furnished with 1¼ x 1⅝ inch poles. Ferrules are not attached to top sections unless extra sections are ordered. Extra sections are listed under the Bartlett No. 1-W Pulley Type Tree Trimmers.

Cat. No.	Description	Weight Each
44-4	4-ft. rectangular pole	3 lbs.
44-6	6-ft. rectangular pole	3½ lbs.
44-8	8-ft. rectangular pole	4 lbs.
44-10	10-ft. rectangular pole	4½ lbs.
44-12	12-ft. rectangular pole	5 lbs.
44-14	14-ft. rectangular pole	5½ lbs.
44-16	16-ft. rectangular pole	6 lbs.

SAW BLADES, BARTLETT POLE



To be used on Bartlett No. 44 Pole Saw. Peg teeth cut the full length of the stroke.

Cat. No.	Description	Length of Blade
4402-16	Pole Saw Blade	16"

Saws, Double Edge Pruning



The concave edge is toothed for fine cutting and the opposite for coarse work. Lacquered beech handle is attached to blade with 3 nickeled screws.

Cat. No.	Length	Width at Point	Width at Butt	Weight per Doz.
22-18	18 in.	1⅝ in.	3⅞ in.	12 lbs.
22-22	22 in.	1⅝ in.	3⅞ in.	14 lbs.
22-24	24 in.	1⅝ in.	3⅞ in.	18 lbs.

Saw, Forester Pruner



Silver steel blade will not bind and the wider butt adds stiffness. Four and one-half points to the inch gives large teeth that cut large or small limbs readily. Teeth are filed and set.

Cat. No.	Length	Width at Point	Width at Butt	Std. Pkg.	Weight per Doz.
17	26 in.	1½ in.	3½ in.	6	16 lbs.

Saws, Seymour Smith Pruning



For line clearing work. An excellent companion tool for Seymour Smith tree pruners since the same extension section poles may be used for both.

The lightweight aluminum alloy head has a hook for pulling out dead or cut branches and a holder for a paint brush.

Saw blade is special steel, taper ground with fast, easy-cutting needle teeth. The saw is attached to the head by bolt and thumb nut with lock washer—it is adjustable to three different positions.

Cat. No.	Description	Weight Each
10	Saw head complete with blade (less Pole)	1¼ lbs.
10-G	Heavy leather guard for Saw Blade	½ lb.
1	6-ft. head section pole	2¼ lbs.
1	6-ft. extension section pole	3 lbs.
10-B	Extra blade, 16 in. long	½ lb.

Saws, Curved Type Tree Pruning



Designed for cutting limbs more than 1½ inches in diameter. Adjustable to three angles. The blade is long and is ground for clearance which prevents binding. Separate extension handles may be used or the extension handles for the Nos. 700, 800, and 900 Newman Tree Trimmers may be used. Over-all length of saw and ferrule-equipped handle is 6½ feet.

Cat. No.	Description	Weight
1300	Curved Type Tree Saw, for 1½-inch pole	3¾ lbs.
1300A	Curved Type Tree Saw, for 1¼-inch pole	3¾ lbs.

Saw, No. S4-14 Hand Tree



A curved saw with uniform temper steel blade. Long needle point teeth, 8 points to the inch, set to cut on the pull stroke. Extra wide set of teeth. Quality hardwood handle with nickel plated screws.

Saw, No. S8-18 Hand Tree

A straight double-edge tree saw. One edge has cross cut teeth, 8 points to the inch for finish stroke and barking; other edge has coarse "Champion" teeth for easy sawing in green wood. Hardwood handle with natural varnish finish.

Saw, No. 52-24 Hand Tree



Strong, rigid construction for heavy work. Extra fine sharp teeth, perfectly filed and set. Solid hardwood handle with large grip. Dowel extends through entire grip of handle to give added strength. Chromium plated screws and medallion.

Saw, No. 51-15 Universal

The Universal Saw can be attached to the head of Newman Tree Trimmers Nos. 700, 800, 900.

Saw, Newman No. 1200 Tree



A long blade tree saw designed for cutting limbs up to 4 inches in diameter. By under-cutting, limbs up to 8 inches in diameter may be cut.

Cat No.	Description	Weight
1200	Newman Tree Saw, for 1½-inch pole	3 lbs.
1200 A	Newman Tree Saw, for 1¼-inch pole	3 lbs.

Scissors, Electrician's



Designed for the electrician and mechanic. Will stand continued hard service. Made of high-grade steel properly tempered. Has a screw-hinge,

allowing adjustment. Nickel-plated finish.

Cat. No.	Size	Weight per Doz.
2100-5	5 inch	2 lbs.

Screws

Wood screws are furnished with oval heads, round heads, or flat heads, except as indicated. Available galvanized, blued, or bright. Specify head.



3/8 in. No.	1/2 in. No.	5/8 in. No.	3/4 in. No.	7/8 in. No.
6	6	6	6	6
--	8x	8	8	8
--	--	--	10x	10x
1 in. No.	1 1/4 in. No.	1 1/2 in. No.	1 3/4 in. No.	2 in. No.
6	6	6	--	--
8	8	8	8x	8x
10	10	10	10	10
14x	14x	14x	14x	14x
--	16*	16*	16*	16*
--	--	18*	--	18*
2 1/4 in. No.	2 1/2 in. No.	3 in. No.	3 1/2 in. No.	4 in. No.
--	6	--	--	--
--	8x	--	--	--
10*	10x	10x	10*	--
14*	14x	14x	14*	14*
--	16*	16*	16*	16*
--	18*	18*	18*	18*

*Flat head only. xRound and flat head only.

Screw Gauge

No.	Diameter of Screw	Flat Head, Diameter of Head	Round Head, Diameter of Head
6	.138 in.	.257 in.	.240 in.
8	.164 in.	.308 in.	.287 in.
10	.190 in.	.359 in.	.334 in.
14	.242 in.	.461 in.	.429 in.
16	.268 in.	.512 in.	.476 in.
18	.294 in.	.563 in.	.523 in.
20	.320 in.	.614 in.	.570 in.

Screws, Phillips



The Phillips screw has proved itself with its characteristics of faster starting, faster driving, better holding power, reduced spoilage, and fewer accidents. Only half the pressure required to drive the regular slotted screw is needed for the Phillips screw. The tapered head of the Phillips screw driver fits into the tapered recess in the Phillips screw and holds and guides the screw.

Phillips screws are available in approximately the same range of sizes as regular slotted screws; galvanized, blued, or bright; flat head, round head, or oval head.

PHILLIPS DRIVERS FOR PHILLIPS WOOD SCREWS

Phillips drivers for Phillips wood screws are available in four sizes. Two sizes will drive Phillips wood screws sizes No. 5 to 16.

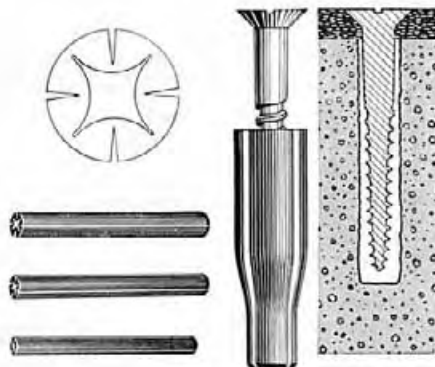
Cat. No.	Description
1	Drives Nos. 2, 3, and 4.
2	Drives Nos. 5, 6, 7, 8, and 9.
3	Drives Nos. 10, 11, 12, 14 and 16.
4	Drives Nos. 18, 20, and 24.

The No. 2 driver is used for No. 10 round head screws.

APPLICATIONS OF WOOD SCREWS IN TELEPHONE WORK

Length	No.	Type	Use
2 1/2 in.	18	Flat Head Galv.	No. 6061, Type A, 2 groove knob, other than first knob.
2 1/2 in.	18	Flat Head Galv.	No. 6064, Type S, single groove knob.
2 1/2 in.	18	Flat Head Galv.	No. 4, single groove knobs.
3 in.	18	Flat Head Galv.	No. 6061, Type A, 2 groove first knob.
3 in.	18	Flat Head Galv.	No. 6065 Type T, 2 groove knobs.
3 1/2 in.	18	Flat Head Galv.	No. 6061, Type A, to stucco walls.
3 1/2 in.	18	Flat Head Galv.	No. 4, 2 groove knobs.
3 1/2 in.	10	Round Head Galv.	No. 6066, Type C, 2 groove knobs.
1 1/2 in.	16	Flat Head Galv.	For house brackets.
2 in.	14	Round Head Blued	For transposition brackets.
1 in.	6	Round Head Blued	For connecting blocks.
1 in.	8	Round Head Blued	For subsets on oak.
1 1/4 in.	6	Round Head Blued	For subsets on oak.
1 1/4 in.	8	Round Head Blued	For subsets on oak.
1 1/2 in.	6	Round Head Blued	For fanning strips.
1 1/2 in.	8	Round Head Blued	For subsets.
2 in.	8	Round Head Blued	For subsets on plastic walls.
2 1/2 in.	8	Round Head Blued	For old style subsets on plaster walls.

Screw Anchors



This plastic anchor can be used to secure screws, nails, lag screws, etc., in any type material where additional holding power is required. Tests conducted by a testing laboratory showed an average force of 2,194 pounds was required to pull either the screw or stud from concrete on a test of No. 20 screws anchored in a 1½-in. anchor.

These anchors are made of extruded ethyl cellulose. This plastic material is resistant to moisture, weather, and acids and is immune to age and corrosion.

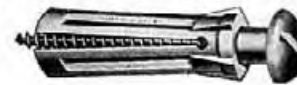
To install these anchors a hole slightly smaller than the outside diameter of the anchor is drilled, the anchor tamped home, and the screw driven.

Anchors are available in standard cartons or in special kits which include an assortment of anchors and suitable carbide tipped rotary masonry drills.

Anchor No.	For Wood Screw Size	For Wood Screw Length	Anchor Length	Hole Diameter	Std. Carton
6	5 or 6	1" or 1¼"	¾"	11/64"	100
		1½"	1"	11/64"	
8	7 or 8	1" or 1¼"	¾"	3/16"	100
		1½"	1"	3/16"	
		2" or 2½"	1½"	3/16"	
10	9 or 10	1" or 1¼"	¾"	7/32"	100
		1½" or 1¾"	1"	7/32"	
		2" or 2½"	1½"	7/32"	
12	11 or 12	1¼"	¾"	¼"	100
		1½"	1"	¼"	
		1¾" or 2"	1½"	¼"	
14	14	1½" or 1¾"	1"	9/32"	100
		2" or 2½"	1½"	9/32"	
		3" or 3½"	2"	9/32"	
16	16 or ¼" lag screw	1½"	1"	5/16"	50
		2" or 2½"	1½"	5/16"	
		3" or 3½"	2"	5/16"	
20	20 or 5/16" lag screw	1½"	1"	¾"	50
		2" or 2½"	1½"	¾"	
		3" or 3½"	2"	¾"	

Assortment Kit No. 3 contains 525 assorted anchors Nos. 6, 10, and 12 and three carbide tipped masonry drills for use with these anchor sizes.

Screw Anchors, Multi-Size



Designed to accommodate in one anchor several diameters of wood screws. The purpose is to reduce the number of anchors required to accommodate all sizes of screws. They are made in several lengths covering the majority of uses. For instance, the No. 10 to 14 x 1-inch anchor will work successfully with all sizes of wood screws ranging from No. 10 to No. 14, inclusive.

Screw enters the shield easily without danger of marring the head of the screw.

Furnished less wood screws.

Cat. No.	Use Wood Screws No.	Length of Anchor	Drill Hole	Weight per 100
6 to 8 x ¾ in.	6 to 8	¾ in.	¼ in.	1 lb.
10 to 14 x 1 in.	10 to 14	1 in.	5/16 in.	2 lbs.
10 to 14 x 1½ in.	10 to 14	1½ in.	5/16 in.	2¾ lbs.
16 to 18 x 1½ in.	16 to 18	1½ in.	¾ in.	4¼ lbs.

Screw, Angle

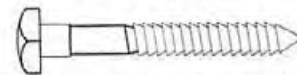
FURNISHED LESS KNOBS



Provides a convenient and economical fastening for drop wiring on frame or brick buildings. By inclining the angle of the screw the porcelain knob may be set at any desired angle. Knobs must be ordered separately.

Cat. No.	Type	Length of Screw	Length of Shank	Use Knob No.	Weight per 1000
J-1211-S	5/16 in.	2¼ in.	2¼ in.	6061-2 Groove	12 lbs.

Screws, Lag



Used to fasten cross arm braces to pole. The fetter drive type may be driven into the wood without tearing the fibres. By adding a few turns it is securely seated.

Cat. No.	Size	Std. Pkg. Quantity	Weight per 100
J-8742½	¾ x 2½ in.	1000	8½ lbs.
J-8743	¾ x 3 in.	1000	10 lbs.
J-8743½	¾ x 3½ in.	1000	11¼ lbs.
J-8744	¾ x 4 in.	500	12½ lbs.
J-8744½	¾ x 4½ in.	500	14 lbs.
J-8753	½ x 3 in.	500	18¼ lbs.
J-8753½	½ x 3½ in.	500	20½ lbs.
J-8754	½ x 4 in.	500	22¾ lbs.
J-8754½	½ x 4½ in.	500	25 lbs.

Screw Handles, Solder Copper



This handle was especially designed for use around telephone main frames. A tight grip is maintained on the shank at all times.

Cat. No.	Handle for Shanks	Length of Handle	Weight
1	7/32 to ¾ in.	6 in.	4 oz.
2	¾ to 9/16 in.	6¼ in.	5 oz.

Screw Driver, Angle-Screw

This special brace bit is specially designed to fit standard telephone angle-screws used for mounting insulators. The use of this bit eliminates the need for pre-boring for the installation of these screws.



The above illustration shows the driver ready for use, with the angle screw inserted in the holding slot. The barrel of the driver protects the upper threaded end of the screw from marring.

Cat. No.	Weight per Dozen	Length (Inches)
727	4½ oz.	5

Screw Drivers, Cabinet



Same as standard style except with light, slim blades. All lengths have about the same size points. Blades are the same width all the way back and tempered entire length.

Cat. No.	Blade Length	Length Overall	Diameter of Blade	Weight per Doz.
95- 4½	4½ in.	8¼ in.	3/16 in.	1⅛ lbs.
95- 5½	5½ in.	9¼ in.	3/16 in.	1¾ lbs.
95- 6½	6½ in.	10¼ in.	3/16 in.	2 lbs.
95- 8½	8½ in.	13 in.	7/32 in.	2⅞ lbs.
95-10½	10½ in.	15 in.	7/32 in.	3⅞ lbs.
95-12½	12½ in.	17 in.	7/32 in.	3⅞ lbs.

Screw Drivers, Newco Phillips



With shock and break proof "Numaryl" sloburn plastic handles. Hand forged high temper alloy steel blades.

Cat. No.	Description	Blade Size	Over-all Size	Weight per Doz.
NP2	No. 2 point	¼ x 4 in.	7½ in.	2 lbs.
NP3	No. 3 point	5/16 x 6 in.	9⅝ in.	3½ lbs.
NP6	No. 2 point—stub	¼ x 1¾ in.	5⅞ in.	1¼ lbs.

Screw Drivers, Ratchet



Saves time and labor. No tiresome grip-and-let-go movement is necessary. Right-hand ratchet, left-hand ratchet and rigid adjustments are quickly changed by sliding shifter. Polished blades and chrome ratchet case.

Cat. No.	Length of Blade	Length Overall	Weight per Doz.
10-3	3 in.	7⅞ in.	4 lbs.
10-4	4 in.	8⅞ in.	4⅞ lbs.
10-5	5 in.	9½ in.	4⅞ lbs.

Screw Driver, Ratchet



A strong, substantial screw driver with a short stub blade. Right and left hand and rigid.

Cat. No.	Length of Blade	Length Overall	Standard Package	Weight per Doz.
12	1 in.	5½ in.	6	3¾ lbs.

Screw Drivers, Spiral Ratchet



No. 30A

Simple, compact, strong, durable and easy to operate. Screws may be driven or drawn by pushing on the handle or by ratchet movement. The movement is changed instantly or the driver can be made rigid by a simple shift. Spindle can be locked closed. Three bits of different size are furnished with each driver. All exposed metal parts are chromium plated.

REGULAR STYLE

No. 35 is for small screws, it is lighter and more sensitive than No. 30-A.

Cat. No.	Description	Length with Bit Extended	Length with Bit Closed	Weight per Doz.
30-A	Standard Size	18¼ in.	13 in.	13½ lbs.
31-A	Heavy Pattern	25 in.	16¾ in.	21 lbs.
35	Light Pattern	12¾ in.	9⅞ in.	7½ lbs.

WITH QUICK RETURN

Spring in handle causes handle to come back automatically after each stroke of the driver.

Cat. No.	Description	Length with Bit Extended	Length with Bit Closed	Weight per Doz.
130-A	Standard Size	20 in.	14¾ in.	15 lbs.
131-A	Heavy Pattern	28 in.	19⅞ in.	24 lbs.
135	Light Pattern	13½ in.	10¼ in.	8¼ lbs.

Attachments for Spiral Screw Drivers



HALF ACTUAL SIZE

Drill Points



Countersink



Socket Bit

CHUCK AND DRILL SET

Consists of chuck and 8 drill points which fit into chuck adapter and the two together are then put into the chuck of spiral screw driver in the same manner as a regular bit. Set of points and a chuck in a wood box.

Cat. No.	Set	No. of Points	Range of Sizes	Wt. per Doz. Sets
30-A	Chuck & Drill Set	8	1/16 to 11/64 in.	1¼ lbs.
31-A	Chuck & Drill Set	8	1/16 to 11/64 in.	1¼ lbs.
35	Chuck & Drill Set	3	1/16 to 3/32 in.	½ lb.

COUNTERSINKS

For 30-A, 31-A and 35.

SOCKET BITS

Available in two styles: for square or hexagon nuts. Give style and width of nuts across flats and Number of Driver.

Screw Drivers, Ratchet



On the blade is a knurled washer by means of which the blade can be turned with a finger and the thumb.

Cat. No.	Length of Blade	Length Overall	Standard Package	Weight per Doz.
15-2	2 in.	4 ⁵ / ₈ in.	6	1 ⁵ / ₈ lbs.
15-3	3 in.	5 ⁷ / ₈ in.	6	1 ³ / ₄ lbs.
15-4	4 in.	6 ¹ / ₂ in.	6	1 ⁷ / ₈ lbs.
15-5	5 in.	7 ³ / ₄ in.	6	2 lbs.
15-6	6 in.	8 ³ / ₄ in.	6	2 ¹ / ₈ lbs.

Screw Drivers, Standard Blade



Blades are of carefully hardened, tempered, special analysis steel, fastened into the handle so that they simply cannot loosen. Handles are selected hardwood with durable black finish, shaped for grip and comfort.

Cat. No.	Length Blade	Length Overall	Weight per Doz.
90-3	3 in.	7 ¹ / ₂ in.	1 ⁷ / ₈ lbs.
90-4	4 in.	9 ¹ / ₄ in.	2 ⁷ / ₈ lbs.
90-5	5 in.	10 ¹ / ₂ in.	4 ¹ / ₄ lbs.
90-6	6 in.	11 ³ / ₄ in.	4 ¹ / ₂ lbs.
90-8	8 in.	14 in.	7 lbs.
90-10	10 in.	16 ³ / ₈ in.	10 ¹ / ₈ lbs.

Screw Eyes, Split Insulated



Convenient, small insulators that are easy to install. The porcelain ring has a 9/32-inch diagonal opening which allows the easy insertion of wires. The 1/4-inch steel screw eye is galvanized by the hot dip process.

Cat. No.	Diameter of Hole	Length of Shank	Weight per 100
1962-1776	5/8 in.	1 in.	9 lbs.
1961-1777	3/8 in.	2 in.	9 lbs.
1964-1778	1 in.	1 ¹ / ₈ in.	18 lbs.
1963-1779	1 in.	2 ¹ / ₈ in.	20 lbs.

Shackles, Dead End



Used for dead-ending. The shackle is made to clamp around a 3/4x4 1/4-inch cross arm and is held in position by a 3/8-inch lag screw. The glass insulator is cushioned from the metal of the bolt and yoke by a lead sleeve and lead washer.

Glass or porcelain insulator should be ordered separately.

Cat. No.	Description	Weight per 100
J-8290	Shackle Complete less Insulator	250 lbs.
J-109	Glass Insulator for No. J-8290	175 lbs.
J-0612	Porcelain Insulator	170 lbs.

Sheave and Shackle, No. PU-27 Cable



May be used in place of the pulling-in frame when it is possible or advisable to locate the rear of the truck directly over the manhole.

The device is attached to the manhole pulling iron and the winch line goes over a roller or sheave at the rear of the truck, then down and under the cable sheave and shackle and thus into the duct. The sheave is made of aluminum and has a groove large enough to take a 2 5/8-inch cable. Hook is drop forged.

Cat. No.	Diameter of Wheel	Weight
PU-27	20 in.	51 lbs.

Shields, Cable Duct



Protects cable sheaths at entrance to ducts—absorbs creepage wear due to the expansion and contraction of the sheaths. Made of 18-gauge steel, hot galvanized.

Diameter	Weight per 100
3 in.	25 lbs.
3 1/2 in.	40 lbs.

Shields, Lag Screw Expansion



Used to attach fixtures, cable, etc., to the surface of masonry. The problem of misfit threads has been solved by the improved formation of the interior threaded portion in these Lag Screw Shields. They will permit cut thread or rolled thread, cone point or gimlet point lag screws of good and poor quality to enter equally well with a free and uniform expansion and without binding.

Made of high grade ductile malleable iron, hot galvanized. Furnished less lag screws.

LONG STANDARD

Diameter Lag Screw	Drill Hole	Length of Shield	Standard Package	Weight per 100
1/4 in.	1/2 in.	1 1/2 in.	100	5 lbs.
5/16 in.	9/16 in.	1 3/4 in.	100	6 lbs.
3/8 in.	5/8 in.	2 1/4 in.	50	12 lbs.
1/2 in.	3/4 in.	3 1/2 in.	50	20 lbs.

SHORT STANDARD

Diameter Lag Screw	Drill Hole	Length of Shield	Standard Package	Weight per 100
1/4 in.	7/16 in.	1 in.	100	3 lbs.
5/16 in.	1/2 in.	1 in.	100	4 lbs.
3/8 in.	5/8 in.	2 in.	50	9 lbs.
1/2 in.	3/4 in.	2 in.	50	13 lbs.

FOR LAG SCREWS, SEE SCREWS

Shims, Pole

Six or more Guy Shims are required per pole, depending on its diameter. Prevents strand from cutting into wood. Has two 1/4-inch mounting holes for 10d nails.

Cat. No.	Size Inches	Std. Pkg. Quantity	Weight per 100
J-1035	1-7/32 x 7/32 x 8	200	43 lbs.
J-1036	1 1/4 x 1/4 x 8	200	54 lbs.

Shovels, Short Handled



Plain back, strap pattern, special high carbon steel blades. Handles of Northern White Ash, lacquer finish.

SQUARE POINT

Cat. No.	Length Handle	Size Blade	Wt. Each
T-841-1090S	4 1/2 ft.	9 3/4 x 11 1/4 in.	5 lbs.

ROUND POINT

T-843-1090R	5 ft.	9 x 12 in.	4 1/2 lbs.
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Shovels, Steel "D" Handled



The tubular, pressed metal "D" handle is strong and durable. The grip is wide, comfortable and held securely in place, it will not come loose. Heat treated, 14-gauge blades. Handles Northern White Ash, lacquer finished.

SQUARE POINT

Cat. No.	Length Handle	Size Blade	Wt. Each
T-840-1092S	30 in.	9 3/4 x 11 1/4 in.	4 lbs.

ROUND POINT

T-842-1092-R	26 in.	9 x 12 in.	4 1/2 lbs.
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STEEL "D" HANDLES ONLY

Strap Pattern, Double Bend, for plain back, round or square point.

Cat. No.	Length	Grade	Std. Pkg.	Wt. Each
T-75	26 in.	XX	6	2 lbs.
T-76	26 in.	X	6	2 lbs.
T-77	26 in.	No. 1	6	2 lbs.

Shovels, Joslyn

Plain Back, Strap Pattern

Heat treated 12 gauge blades. Strap is 22 inches long. Handles are lacquer finished.

SHOVELS WITH STRAIGHT HANDLES



MAPLE		HICKORY OR ASH		Length Feet	Size Blade Inches	Weight Each
Cat. No.	Cat. No.					
T-42	T-15	6	9 x 12	7 lbs.		
T-43	T-16	7	9 x 12	8 lbs.		
T-44	T-17	8	9 x 12	9 lbs.		
T-44-A	T-18	9	9 x 12	10 lbs.		
T-44B	T-19	10	9 x 12	11 lbs.		
---	T-20	12	9 x 12	13 lbs.		

Splints, Tie

These tie splints give better vibration dampening, a stronger grip on the line wire, and prevent contact between the line wire and insulators.

The core diameter of the spiral sections is slightly smaller than that of the line wire, thus producing increased vibration dampening. This greater grip holds the wire against slipping and tends to confine repair jobs for line breaks to only one span. Abrasion wear is practically eliminated as there is no contact between the insulator and line wire.

Supplied in sets with tie wires.

ORDER BY SIZE AND INSULATOR

S Length of Spiral portions

I Type of Insulator

D Diameter of Tie Wire

E Length overall

COPPERWELD WIRE

Size	A.W.G. No.	Diam. Line Wire	Splint			I	Tie Wire		Approx. Shpg. Wt. per 1000
			A	B	S		D	E	
080	12	.080	.081	16-5/16 in.	6 in.	DP	.080	26 in.	88 lbs.
080	12	.080	.081	16-5/16 in.	6 in.	Toll	.080	24 in.	84 lbs.
104	10	.104	.102	16-5/16 in.	6 in.	CSC	.104	24 in.	126 lbs.
104	10	.104	.102	16-5/16 in.	6 in.	DP & Toll	.104	28 1/2 in.	140 lbs.
128	8	.128	.128	17 1/4 in.	6 1/2 in.	CSC	.104	28 1/2 in.	169 lbs.
128	8	.128	.128	17 1/4 in.	6 1/2 in.	DP	.104	32 in.	180 lbs.
165	6	.165	.144	21 in.	8 1/2 in.	CSC	.104	28 1/2 in.	211 lbs.
165	6	.165	.144	21 in.	8 1/2 in.	DP	.104	32 in.	222 lbs.

GALVANIZED STEEL WIRE

Size	Diameter Line Wire	Splint			I	Tie Wire		Approx. Shpg. Wt. per 1000
		A	B	S		D	E	
083	.083	.109	16-5/16 in.	6 in.	DP & Toll	.083	26 in.	108 lbs.
109	.109 & .134	.134	17 1/4 in.	6 1/4 in.	DP & Toll	.109	30 in.	175 lbs.

SHOVELS, JOSLYN (Cont'd)
Solid Shank, Socket Pattern

Blade and shank are made of special analysis 13 gauge steel, forged in one piece. All blades are fully heat treated and guaranteed against splitting under the severest service. Socket is 22 inches long. Handles are lacquer finished.

SHOVELS WITH STRAIGHT SHANKS

MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size Blade Inches	Weight Each
T-706	T-700	6	9½ x 12	9 lbs.
T-707	T-701	7	9½ x 12	9½ lbs.
T-708	T-702	8	9½ x 12	10 lbs.
T-709	T-703	9	9½ x 12	10½ lbs.
T-709-A	T-704	10	9½ x 12	11½ lbs.
----	T-705	12	9½ x 12	12½ lbs.

SHOVELS WITH BENT SHANKS

MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size Blade Inches	Weight Each
T-716	T-710	6	9½ x 12	9 lbs.
T-717	T-711	7	9½ x 12	9½ lbs.
T-718	T-712	8	9½ x 12	10 lbs.
T-719	T-713	9	9½ x 12	10½ lbs.
T-719-A	T-714	10	9½ x 12	11½ lbs.
----	T-715	12	9½ x 12	12½ lbs.

Long Shovel Handles

Fit both straight and bent, solid shank type shovels and straight type, strap pattern shovels. Lacquer finish. Crooked handles for strap pattern shovels are shown in the next column.

STRAIGHT HANDLES ONLY

Length Feet	MAPLE		HICKORY OR ASH	
	For Strap Pattern Cat. No.	For Solid Shank Cat. No.	For Strap Pattern Cat. No.	For Solid Shank Cat. No.
6	-----	-----	T-27	T-27-A
7	T-74	T-74-G	T-28	T-28-A
8	T-74-A	T-74-H	T-29	T-29-A
9	T-74-B	T-74-I	T-30	T-30-A
10	T-74-F	T-74-J	T-31	T-31-A
12	-----	-----	T-32	T-32-A

SPOONS, JOSLYN
Plain Back, Strap Pattern

13 gauge blade with 22-inch straps. Handles lacquer finished.

EASTERN PATTERN



MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size Blade Inches	Weight Each
----	TA-55	6	9½ x 10½	7 lbs.
T-64-A	T-55	7	9½ x 10½	8 lbs.
T-64-B	T-56	8	9½ x 10½	9 lbs.
T-64-C	T-57	9	9½ x 10½	10 lbs.
T-64-D	T-58	10	9½ x 10½	11 lbs.
----	T-58-A	12	9½ x 10½	13 lbs.

SPOONS, JOSLYN (Cont'd)
WESTERN PATTERN



MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size Blade Inches	Weight Each
----	T-49	6	9½ x 9	7 lbs.
T-62	T-50	7	9½ x 9	8 lbs.
T-63	T-51	8	9½ x 9	9 lbs.
T-64	T-52	9	9½ x 9	10 lbs.
TA-64	T-53	10	9½ x 9	11 lbs.
----	T-54	12	9½ x 9	13 lbs.

Solid Shank, Socket Pattern

Blade and shank are forged in one piece. Blades are heat treated 13 gauge steel. Handle is lacquer finished.

EASTERN PATTERN

MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size of Blade Inches	Weight Each
T-736	T-724	6	9½ x 10¼	9 lbs.
T-737	T-725	7	9½ x 10¼	9½ lbs.
T-738	T-726	8	9½ x 10¼	10 lbs.
T-739	T-727	9	9½ x 10¼	10½ lbs.
T-739-A	T-728	10	9½ x 10¼	11½ lbs.
----	T-729	12	9½ x 10¼	12½ lbs.

WESTERN PATTERN

MAPLE		HICKORY OR ASH		
Cat. No.	Cat. No.	Length Feet	Size of Blade Inches	Weight Each
T-740	T-730	6	9½ x 9	9 lbs.
T-741	T-731	7	9½ x 9	9½ lbs.
T-742	T-732	8	9½ x 9	10 lbs.
T-743	T-733	9	9½ x 9	10½ lbs.
T-743-A	T-734	10	9½ x 9	11½ lbs.
----	T-735	12	9½ x 9	12½ lbs.

Long Spoon Handles

For Eastern or Western pattern spoons. Maple, lacquer finish.

FOR STRAP PATTERN		FOR SOLID SHANK		Length Feet	Weight Each
Cat. No.	Cat. No.	Cat. No.	Cat. No.		
T-65	T-65-A	T-65	T-65-A	6	4 lbs.
T-66	T-66-A	T-66	T-66-A	7	5 lbs.
T-67	T-67-A	T-67	T-67-A	8	6 lbs.
T-68	T-68-A	T-68	T-68-A	9	7 lbs.
T-69	T-69-A	T-69	T-69-A	10	8 lbs.
T-70	T-70-A	T-70	T-70-A	12	9 lbs.

Signals, Motor Driven



Clear and vibrant tone, ample power to make its calls heard in the most noisy industrial location. Ideal for coding. The high torque, series wound motor starts and stops instantly with the current impulses—no lag to blur the code. An accessible set screw gives instant adjustment of tone.

Entirely weatherproof—sembled throughout with rubber gaskets to exclude moisture. Housing tapped for 1/2-inch conduit. Supplied with 14-inch wire leads. Finish in battleship gray enamel (red enamel when specified). Power consumption is 55 watts.

WITH 8 1/2-INCH SINGLE BELL TYPE PROJECTOR

Cat. No.	Voltage	Current	Size of Signal		Weight Each
			Length	Height	
8175-110V	A.C.—60 cycles	14 1/8 in.	6-5/16 in.	15 3/4 lbs.	
8175-220V	A.C.—60 cycles	14 1/8 in.	6-5/16 in.	15 3/4 lbs.	
8176-110V	D.C.	14 1/8 in.	6-5/16 in.	15 3/4 lbs.	
8176-250V	D.C.	14 1/8 in.	6-5/16 in.	15 3/4 lbs.	

WITH 19 1/2-INCH DOUBLE BELL PROJECTOR

8180-110V	A.C.—60 cycles	19 1/2 in.	10 3/4 in.	15 1/4 lbs.
8180-220V	A.C.—60 cycles	19 1/2 in.	10 3/4 in.	15 1/4 lbs.
8181-110V	D.C.	19 1/2 in.	10 3/4 in.	15 1/4 lbs.
8181-250V	D.C.	19 1/2 in.	10 3/4 in.	15 1/4 lbs.

A.C. signals also operate on 50, 40, or 30 cycles.

D.C. signals also operate on 25 cycles A.C.

Signs, Pay Station

These double-faced signs are attractively made of porcelain enamel on 18 gauge steel plate and are guaranteed never to fade or tarnish from the effects of the weather.

Cat. No.	Color	Size	Weight Each
4	Blue and White	8 x 18 in.	3 lbs.

Sign, Warning

Designed to provide convenience and safety. The solid black 5 1/2-inch letters on the 20x20-inch background of brilliant traffic yellow flash a signal which no driver could possibly miss.

It is light in weight, yet extremely durable—legs are made of 1/2-inch high carbon steel which will not bend. The 1 1/4-inch flange around the edge of the sign not only acts as a reinforcement, but also protects the lettering from becoming marred when being transported. Lettering is on both sides.

Each sign is equipped with two convenient handles for adjusting the angle of the legs. These handles being hollow, also serve as flag sockets. Each handle is equipped with a handy lantern hook. The sign folds up into an easily portable bundle, 28x28x1 1/4 inches. Made of steel.

Height, Inches (Adjustable)	Width	Thickness	Color	Shipping Weight
20 to 43	28 in.	1 1/4 in.	Black and Yellow	23 lbs.



Sirens, Industrial

NON-CODING TYPE

A simple and powerful signal with unusual tone and noise-penetrating qualities. No gears or vibrating parts to get out of order and no adjustment to make. Sound is produced by a rotor fan turning at high speed within a port housing.

CODING TYPE

Can be coded at practically any speed and is operated by a push button or automatic calling device.



Both sirens are weatherproof—finished in red enamel, provided with a "BX" connector for wire entrance.

Power consumption of the non-coding siren is 150 watts and of the coding siren, 225 watts. The motor is of universal type—standard for 110 volts A.C. or D.C. The following special voltages can be furnished where specified. Non-coding from 6 to 250 volts, A.C. or D.C.; coding from 220 volts to 250 volts, A.C. or D.C.

Cat. No.	Description	Over-All Length	Weight Each
8195	Non-Coding	11 in.	15 lbs.
8196	Coding	13 in.	32 lbs.

Sleeves



Designed for fastening together the jointed handle section of the Nos. 1-W and 1-T Bartlett Tree Trimmers and the No. 44 Bartlett Pole Saw. When the pole is inserted into the sleeve a pin automatically drops into place preventing the two sections from pulling apart. Furnished complete less wood poles, or mounted on sections as preferred.

Cat. No.	Description	Weight Each
P-156	Quick-Change Sleeve complete	10 oz.
P-156-1	Sleeve Body on Pole Section	6 oz.
P-156-2	Sleeve Ferrule on Pole Sections	6 oz.

Sleeves, Paper

Used to insulate bare joints of cable construction where splices have been made. One sleeve used on each wire of each pair at junction makes a compact and reliable insulation.



Cat. No.	Diameter	Used for Straight Splices	Std. Pkg. Quantity	Weight per 1000
1833	1/8 x 3 in.	22 Ga.	200	1 lb.
1823	1/8 x 2 3/4 in.	22 Ga.	175	1 lb.
3163	3/16 x 3 in.	19 Ga.	110	1 lb.

Sleeves, Nicopress Offset Dead-End



The outstanding advantages secured through the use of the Nicopress method of dead-ending are—simplicity and speed of installation; maximum tightness and strength of completed dead ends; the remarkable degree to which they withstand vibration and the provision for a tail of any desired length.

No special tools are needed as work is done with the same tool used for making Nicopress line splices.

COPPER OFFSET DEAD-ENDS—FOR COPPER LINE WIRE

Cat. No.	Gauge B & S	Gauge NBS	For Use In Tool Groove	Weight per 100
91-080C	12	14	C	1½ lbs.
91-080D	*12 with 9 O.D.	14	D	1¾ lbs.
91-080E	*12 with 8 O.D.	14	E	2½ lbs.
91-102C	10	12	C	1½ lbs.
91-102D	*10 with 9 O.D.	12	D	1½ lbs.
91-102E	*10 with 8 O.D.	12	E	1¾ lbs.

*Indicates dead-end with outside diameter larger than standard for use in larger tool groove.

FOR "BB" AND HIGH TENSILE WIRE

Cat. No.	Gauge BWG	For Wire	Sleeve Material	For Use In Tool Groove	Weight per 100
95-083C	14	BB	Galv. Steel	C	1¾ lbs.
92-083C	14	BB	Galv. Copper	C	1½ lbs.
95-109C	12	BB	Galv. Steel	C	1½ lbs.
92-109D	12	BB	Galv. Copper	D	1¾ lbs.
94-109C	12	BB	Galv. Bronze	C	1½ lbs.
95-109D 85	12	85	Galv. Steel	D in No. 31 only	1¾ lbs.
95-109D 135	12	135	Galv. Steel	D in No. 31 only	2½ lbs.

Sleeves, Nicopress Repair



COPPER—FOR COPPER LINE WIRE

Cat. No.	Gauge B & S	Length	For Use In Tool Groove	Weight per 100
R1-080C	12	7 in.	C	6 lbs.
R1-080D	*12	7 in.	D	6 lbs.
R1-102C	10	7½ in.	C	5¼ lbs.
R1-102D	*10	7½ in.	D	5¼ lbs.
R1-114D	9	8 in.	D	7 lbs.
R1-114E	*9	8 in.	E	7 lbs.
R1-128E	8	8 in.	E	8½ lbs.
R1-162J	6	10 in.	J	15½ lbs.

GALVANIZED—FOR BB GALVANIZED WIRE

Except No. R4-109C which is Galvanized Bronze.

Cat. No.	Gauge BWG	Length	For Use In Tool Groove	Weight per 100
R2-083C	14	7 in.	C	6 lbs.
R4-109C	12	7½ in.	C	5½ lbs.
R2-109D	12	7½ in.	D	7 lbs.
R2-134J	10	8½ in.	J	16¾ lbs.
R2-148J	9	9 in.	J	16¼ lbs.
R2-165J	8	10 in.	J	16½ lbs.

*Indicates sleeve with larger than standard outside diameter for use in a larger tool groove.

Sleeves, Nicopress Reducing FOR COPPER LINE WIRE



Cat. No.	Gauge B&S	For Use In Tool Groove	Approx. Shp. Wt. per 100
1-064x045C	14 to 17, 18	C	1½ lbs.
1-080x036C	12 to 19, 20, 22	C	1½ lbs.
1-080x045C	12 to 17, 18	C	1½ lbs.
1-080x051C	12 to 16	C	1½ lbs.
1-080x064C	12 to 14	C	1½ lbs.
1-102x080C	10 to 12	C	1½ lbs.

Note—Information on Reducing Sleeves for galvanized wire on request.

Sleeves, Nicopress Splicing

COPPER—FOR HARD DRAWN COPPER WIRE

Cat. No.	Gauge B&S	Gauge NBS	For Use In Tool Groove	Weight per 100
1-064C	14	16	C	1½ lbs.
1-080C	12	14	C	1½ lbs.
1-080D	*12 with 9 O.D.	14	D	1½ lbs.
1-102C	10	12	C	1½ lbs.
1-102D	*10 with 9 O.D.	12	D	1½ lbs.
1-102E	*10 with 8 O.D.	12	E	2 lbs.
1-114D	9	11	D	1½ lbs.
1-114E	*9 with 8 O.D.	11	E	2 lbs.
1-128E	8	10	E	2 lbs.
1-128J	*8 with 6 O.D.	10	J	4 lbs.

FOR DROP, BRIDLE AND INSIDE WIRES

Right: Sleeve  Below: Completed Splice 



Cat. No.	For Wire	For Use In Tool No.	Weight per 200
3-036A	19-20-22 B&S Copper	17-2	½ lb.
3-045B	17-18 AWG Copperweld } 17 B&S Bronze } 17-18 B&S Copper }	17-1 or 17-2	1 lb.
3-051B	16 B&S Copper	17-1 or 17-2	1 lb.
3-064B	14 B&S Copper	17-1 or 17-2	1 lb.
4-049B	18-19 BWG Ironite	17-1 or 17-2	1 lb.

REDUCING SLEEVES—FOR DROP, BRIDLE AND INSIDE WIRES

2-045x036B	17 or 18 B&S to 19, 20 or 22 B&S	17-1 or 17-2	1 lb.
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FOR COPPERWELD WIRE Copper Splicing Sleeves

Cat. No.	Gauge AWG	For Use In Tool Groove	Weight per 100
1-080C	12	C	1½ lbs.
1-080D	12	D	1¾ lbs.
1-080E	*12	E	2 lbs.
1-080J	*12	J	5 lbs.

*Indicates sleeve with larger than standard outside diameter for use in a larger tool groove.

Sleeves, Nicopress Splicing

In making Nicopress joints, the sleeves, which are lined with a metal alloy harder than the metal of either sleeve or conductor, are pressed on to the conductors with the special Nicopress tool.

Splices made with Nicopress sleeves are stronger than the rated breaking strength of the wire and are so tight that the conductors cannot pull out. Further, the use of Nicopress sleeves assures high electrical conductivity. Made for use with copper, steel and copperweld in a wide variety of sizes.

Packed in boxes of 100.

**FOR "BB" GALVANIZED WIRE
Galvanized Steel Sleeves**

Cat. No.	Gauge B.W.G.	For Use in Tool Groove	Weight per 100
5-083C	14	C	2 lbs.
5-109C	12	C	1½ lbs.
5-109D	12	D in No. 31 only	2 lbs.
5-134Q	10	Q	2 lbs.
5-148G	9	G	3½ lbs.
5-165G	8	G	3 lbs.

Galvanized Copper Sleeves

Cat. No.	Gauge B.W.G.	For Use in Tool Groove	Weight per 100
2-083C	14	C	1½ lbs.
2-083D	*14	D	1¾ lbs.
2-109D	12	D	1½ lbs.
2-134J	10	J	3 lbs.
2-148J	9	J	3½ lbs.
2-165J	8	J	5 lbs.

*Indicates sleeve with larger than standard outside diameter for use in larger tool groove.

Galvanized Bronze Sleeve

4-109C	12	C	1½ lbs.
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**FOR "85" GALVANIZED WIRE
Galvanized Steel Sleeves**

Cat. No.	Gauge B.W.G.	For Use in Tool Groove	Weight per 100
5-083C	14	C	1½ lbs.
5-109D 85	12	D in No. 31 only	2 lbs.

Galvanized Copper Sleeves

2-134J 85	10	J	4½ lbs.
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**FOR "135" GALVANIZED WIRE
Galvanized Steel Sleeves**

Cat. No.	Gauge B.W.G.	For Use in Tool Groove	Weight per 100
5-109D 135	12	D in No. 31 only	2½ lbs.

FOR RUSTY IRON WIRE

Tinned Copper Sleeves

Cat. No.	Gauge B.W.G.	For Use in Tool Groove	Weight per 100
2-102C	12	C	1¾ lbs.

Sleeves, Nico-Tap



A new sleeve of special shape and design, manufactured to meet the demand for a Nicopress sleeve which would increase efficiency in making tap-off connections.

The Nico-Tap is split its entire length so there is no need of cutting the line to make the connection—just slip the sleeve over the line wire and compress.

Cat. No.	Gauge B & S	Tool Groove	Shpg. Wt. per 100
T2-045B	17, 18 to 17, 18	17-2	½ lb.
T1-080C	12 to 12	C	2 lbs.
T1-808x045C	12 to 17, 18	C	2 lbs.
T1-102D	10 to 10	D	2½ lbs.
T1-102x045D	10 to 17, 18	D	2½ lbs.
T1-102x051D	10 to 16	D	2½ lbs.
T1-102x064D	10 to 14	D	2½ lbs.
T1-102x080D	10 to 12	D	2½ lbs.
T2-083x045C	14 to 17, 18	C	2 lbs.
T2-083C	14 to 12	C	2 lbs.
T2-109x045D	12 to 17, 18	D	2½ lbs.
T2-109D	12 to 10	D	2½ lbs.
T2-083C	14 to 14	C	2 lbs.
T2-109D	12 to 12	D	2½ lbs.
T2-109x083D	12 to 14	D	2½ lbs.

Sleeves, Reliable Compression



These compression-type splicing sleeves develop the full strength of the wire in the line. Small particles of silicon carbide on the inner wall of the sleeve lock the sleeve tube to the wire when the sleeve is compressed. Joints are constant in low resistance because they have good contact and are sealed against penetration of corrosive gases and moisture.

Reliable compression tools can be supplied for all sleeves except the 14 to 18 AWG sizes. For these sleeves use Nicopress Tool No. 17-2. Groove size for each sleeve is indicated by the letter in the code number.

FOR BRIDLE, DROP, or INSIDE WIRES

Cat. No.	Wire Size	Standard Package	Shpg. Wt. per 100
17-18-B-3	17-18-AWG	100	½ lb.
16-B-3	16 AWG	100	½ lb.
14-B-3	14 AWG	100	½ lb.

FOR COPPER LINE WIRES

12-C-1	12 AWG	100	1½ lbs.
10-C-1	10 AWG	100	1½ lbs.

FOR GALVANIZED STEEL WIRES

14-C-2	12 BWG BB	100	1½ lbs.
14-C-5	14 BWG 85	100	1½ lbs.
12-C-4	12 BWG BB	100	1¼ lbs.
12-C-5	12 BWG BB	100	1½ lbs.
12-D-5	12 BWG 85	100	1½ lbs.
12-C-2	12 BWG BB	100	1¼ lbs.

Sleeves, Lead



Lead sleeves for making cable splices can be furnished in any size and length. The following are standard sizes for No. 22-gauge cable. Walls of sleeve are 1/8-inch thick. All sizes can be furnished in any length.

Size of Cable	Inside Diameter	Length Inches	Weight per Foot	Weight per Sleeve
10 & 15 Pair	1 1/4 in.	16 in.	2 1/2 lbs.	3 1/2 lbs.
25 Pair	1 1/2 in.	16 in.	3 lbs.	4 1/2 lbs.
50 & 100 Pair	2 in.	20 in.	4 lbs.	7 lbs.
150 Pair	2 1/2 in.	22 in.	5 lbs.	9 1/4 lbs.
200 Pair	3 in.	22 in.	6 lbs.	11 lbs.
300 Pair	3 1/2 in.	22 in.	7 lbs.	12 3/4 lbs.
400 Pair	4 in.	22 in.	8 lbs.	14 1/2 lbs.
600 Pair	4 1/2 in.	22 in.	9 lbs.	16 1/4 lbs.

Sleeves, Double Tube Splicing



Used for making straight line splices. Use copper sleeves for copper wire and tinned copper or tinned steel for iron wire. When twisted they draw snugly around the wire forming a solid joint which air and moisture cannot penetrate. When ordering copper sleeves use B. & S. gauge. When ordering tinned copper sleeves for iron wire use B.W.G. gauge. When ordering steel sleeves use B.W.G. gauge.

Standard size combination sleeves can also be furnished. Please specify kind and size of wire for which sleeves are intended.

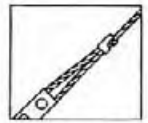
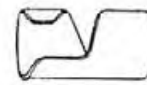
**DOUBLE TUBE TINNED STEEL SLEEVES
For Splicing Galvanized Iron Line Wire**

Cat. No.	Gauge B.W.G.	Full Length Inches	Shpg. Wt. per 100
5834	9	5 3/4	6 lbs.
5833	10	5 1/2	5 1/2 lbs.
5832	12	4 3/4	3 1/2 lbs.
5831*	14	4 1/2	3 lbs.

**DOUBLE TUBE PLAIN COPPER SLEEVES
For Splicing Copper Line Wire**

Cat. No.	Gauge B.&S.	Gauge B.W.C.	Gauge N.B.S.	Full Length Inches	Shpg. Wt. per 100
5818	6	8	--	6 3/4	9 lbs.
5817	7	9	--	5 3/4	7 1/2 lbs.
5816	8	10	--	5 1/4	7 lbs.
5815	9	11	--	5 1/4	5 lbs.
5814	10	12	12	4 3/4	3 lbs.
5813	12	14	14	4 1/2	3 lbs.
5812	14	16	--	4	2 lbs.
5811	16	--	--	4	1 3/4 lbs.
5810	17	--	--	4	1 1/2 lbs.

Sleeves, Guy Serving



Used to serve up strand ends—quickly installed by slipping the sleeve over the guy wire, belled end toward the clamp and driving it down over the loose end of the strand. Six inches of loose strand should be left extending beyond the clamp. Retains its original shape and maintains a rigid grip on the guy strand.

Cat. No.	Strand Size	Overall Length	Weight per 100
H-7451	3/16 in.	1 1/4 in.	2.2 lbs.
H-7452	1/4 in.	1 3/8 in.	3.4 lbs.
H-7453	5/16 in.	1 1/2 in.	5.5 lbs.
H-7454	3/8 in.	1 3/4 in.	7.8 lbs.
H-7455	7/16 in.	2 in.	11 lbs.
H-7456	1/2 in.	2 1/4 in.	14.3 lbs.

Sleeves, Waxed Cotton

Used over all joints in conductors, exposed leads or wherever there is an exposed wire.

Prepared cotton sleeves are impervious to moisture, are cylindrical in form, permanent and ready for application. Packed in moisture-proof cartons.

SINGLE WALL

Cat. No.	Description	Diameter	Length	No. in Carton	Weight per Carton
4-SW Prepared Sleeves		1/8 in.	3 1/4 in.	700	15 1/2 oz.
5-SW Prepared Sleeves		5/32 in.	3 1/4 in.	400	15 oz.
6-SW Prepared Sleeves		1/4 in.	3 1/4 in.	200	13 oz.

DOUBLE WALL

5-DW Prepared Sleeves		5/32 in.	3 1/2 in.	300	15 oz.
6-DW Prepared Sleeves		1/4 in.	3 1/4 in.	150	15 oz.

Sleeve Tools, Reliable Compression

These tools are fitted with grooves which will accommodate all Reliable compression sleeves except the 14 to 18 AWG sizes. The handles have insulated grips. The tools are factory set and have no adjustments to get out of order. Tools are 12 inches long and weigh 3 1/4 pounds.

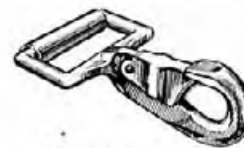


Cat. No.	Description	Groove Code
2	Compression Tool	D & D
2-CD	Compression Tool	C & D
2-CJ	Compression Tool	C & J
2-DJ	Compression Tool	D & J

Snaps, Klein

STANDARD

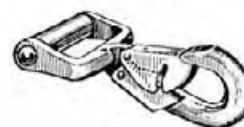
Has wide nose covering spring latch protecting it from accidentally twisting out of "D" ring. Can be used with any standard "D" ring.



Standard

KLEIN-LOK

Has a twin latch arrangement. Both latches must be pressed simultaneously to release. Full factor of safety. Can be used with any standard "D" ring.



Klein-Lok

Sleeve Tools, Nicopress

Nicopress Tools are ruggedly constructed of the finest materials obtainable, and from every angle they are practical, economical and highly efficient.

Nicopress tool grooves are lettered for your convenience. Any particular tool groove will accommodate all Nicopress sleeves having the same letter at the end of the stock number. For example, all Nicopress tools having a "C" groove will accommodate all Nicopress sleeves whose stock numbers end with a "C," such as 1-080C, 1-102C, etc. Example: A 12 B.&S. copper sleeve No. 1-080C may be compressed in the "C" groove of either the No. O-C or the No. 31-DC or No. 31-JC tool. The single exception to this is the sleeves for 12 B.W.G. HTL 85 or HTL 135 wire. These sleeves and dead ends must be compressed in the Type 31 tool and not in the No. O-D.

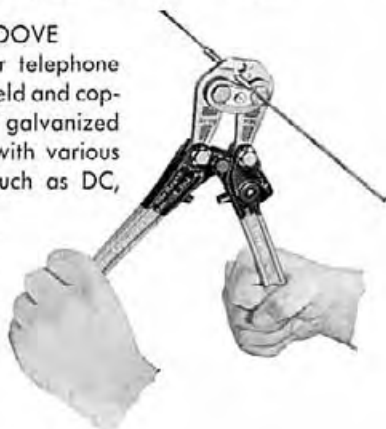


NO. 17-2

For drop, bridle and inside wires. For gauges 14 to 22 B.&S. or 18 to 19 B.W.G. Length is 8 inches and weight each is 9 ounces.

NO. 31 TWO GROOVE

A two groove tool for telephone line wire sizes of copperweld and copper, and BB, 85 and 135 galvanized wire. May be obtained with various 2-groove combinations such as DC, DJ or JC. Specify combination of grooves desired. Length is 11½ inches and weight each is 2¼ pounds.



TOOL HOLSTERS

A leather holster that may be carried on linemen's belts. Available for No. 31 Nicopress Tool.



Solder, Kester Acid Core

For general soldering. Used on both new and old work—also recommended for heavy outside electrical wiring. As heat is applied the flux flows onto the joint forming a permanent bond. The flux is contained in the solder which is a hollow wire.

Size No.	Description	Size Wire Inches	Length per Pound	Weight per Spool
3	Round 40/60	.123	30 ft.	1 lb.
5	Round 40/60	.092	51 ft.	1 or 5 lbs.

Solder, Plain Wire

Used for general line work in connection with some kind of flux. 50-50 grades. Supplied in 5-lb. spools.



Size of Wire Solder	Size Wire Inches	Feet per Pound	Weight per Spool
No. 6 B. & S.	3/16	7½	5 lbs.
No. 10 B. & S.	¼	16	5 lbs.
No. 12 B. & S.	5/64	30	5 lbs.

Solder, Kester Rosin Core



Kester Rosin Core solder is ideal for general soldering. Can be used for both old and new work. This solder is also recommended for heavy outside electrical wiring. It is two items in one—solder and flux. Solder is a hollow wire filled with plastic rosin flux that will not corrode; as solder melts flux flows out on the job insuring a perfect bond.

Cat. No.	Description	Size Wire Inches	Length per Pound	Weight per Spool
4	Flat 40/60	---	49 feet	1 lb.
5	Round 40/60	.092	50 feet	1 or 5 lbs.
6	Round 40/60	.081	78 feet	5 lbs.

Solder, Kellogg Special Wiping



Kellogg Special Wiping Solder is made to Kellogg's rigid specifications and because of its quality is recommended for all cable splicing. Length of bar, 13 in. Weight per bar, 1½ lbs.

NO. 111 BAR SOLDER

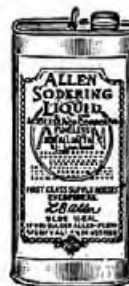
Ordinary bar solder, "Half and Half," also for cable splicing. Length of bar, 13 inches. Weight per bar, 1¼ lbs.

NO. 776 BAR SOLDER

40-60 wiping solder. Length of bar, 13 inches. Weight per bar, 1½ lbs.

Soldering Liquid, Allen

A safe, fluid form of flux—ready for use. Non-corrosive.



Description	Quantity	No. per Carton
Soldering Liquid	2 oz.	24
Soldering Liquid	4 oz.	12
Soldering Liquid	1 qt.	3
Soldering Liquid	1 gal.	1

Soldering Liquid, Kester

Will not evaporate. Adaptable to hand or machine work. Furnished in quart cans.

Soldering Paste, Allen

Soft form of flux for use with torch or soldering copper. Fumeless, will not corrode or injure surface to which it is applied.



Description	Size Cans	No. Cans per Carton
Soldering Paste	2 oz.	24
Soldering Paste	4 oz.	24
Soldering Paste	8 oz.	12
Soldering Paste	1 lb.	6

Soldering Paste, Kester

All flux ingredients are finely divided and uniformly distributed. Furnished in 1-pound cans.



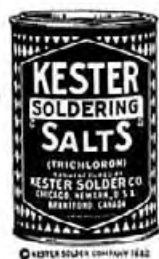
Soldering Salts, Allen

A combination of several of the most efficient soldering agents in a convenient soluble form. Acid free, non-corrosive, non-poisonous, and fumeless.

To make up a flux of sufficient strength to use on old metal add 3 parts of water to 1 part of salts; on new metal greater dilutions may be used.



Description	Quantity	No. per Carton
Soldering Salts	1/2 lb.	12
Soldering Salts	1 lb.	6
Soldering Salts	5 lbs.	1



Soldering Salts, Kester

Pure, active soldering salts for flux users. Furnished in 1-pound cans.

Soldering Stick, Allen

A convenient cylindrical form of soldering flux of the same

quality as Allen's paste. Easy to carry, easy to use—just apply to the heated joint. Non-corrosive.



Soldering Gun, Weller



This Weller Soldering Gun gives time-saving, job-shortening service with convenience and safety. The flexible wire tip heats to soldering temperature in only 5 seconds after the trigger-type switch on the pistol grip is pressed. The Model D207 gun provides dual temperatures for use where greater soldering temperatures or more heat is required.

A "Solderlite" mounted between the terminals of the tip illuminates the job, making easy repairs and installation in dark, out-of-the-way corners of equipment.

The gun operates on 115 volts, 60 cycle A.C. and is provided with a 6-foot cord for connection to power supply.

Cat. No.	Description	Watts
S-107	Soldering Gun, Single Heat	100
D-207	Soldering Gun, Dual Heat	100 or 135

Soldering Irons, Electric



These soldering irons are designed for efficient and lasting service. They are built on the unit system with vital parts, such as the heating unit, easily removable and replaceable. The core of the heating unit is made of steel rod, heat-treated to reduce oxidation and corrosion. A special baffleplate prevents free conduction of heat from the heating element to the wood handle.

Each iron is supplied with stand. The irons are made for operation on 110, 220, 55, or 32 volts and may be used with alternating or direct current.

American Beauty soldering irons may be equipped with a three conductor cord, one wire grounded, at slight additional cost.

Cat. No.	Watts	Diameter of Tip	Length Overall	Shipping Weight
3138	100	3/8 in.	12 7/8 in.	16 oz.
3158	200	5/8 in.	13 3/8 in.	28 oz.

Soldering Irons, Vulcan Electric



No. 30—Screw Tip



No. 35—Plug Type Tip

Correctly designed for the steady production and constant delivery of ample heat, and operates from either direct or alternating current. It is equipped with a perfectly "tinned" hand forged tip of purest copper, either screw type tip or plug-in type. The plug-in type is held by a set-screw.

The Vulcan construction is unique in the simplicity of its maintenance requirements, consisting of 5 complete, replaceable parts, a tip, a sealed heating head, a handle, a 6-ft. cord and a plug.

The No. 35 is recommended for telephone inspectors or linemen's tool kits, equal to 1 1/2 lbs. per pair coppers.

The No. 40 is for heavier work and suited for fast telephone work. Equal to 2 1/2 pounds per pair coppers.

No. 50 is for fast telephone work. Equal to 3 1/2 pounds per pair coppers.

Will operate from any light socket on either A.C. or D.C. Standard voltages are 110 and 120, 220-230 volts.

PLUG TYPE TIP

Cat. No.	Watts	Diameter Tip	Length	Weight Each
35	100	3/8 in.	14 in.	1 1/8 lbs.

SCREW TYPE TIP

30	60	1/2 in.	13 1/2 in.	3/4 lb.
40	90	---	13 1/2 in.	7/8 lb.
50	130	7/8 in.	13 1/2 in.	1 1/8 lbs.

Soldering Iron Tips, Vulcan

Cat. No.	Description	Tip Diameter
35-T	Plug Type for No. 35 Iron	3/8 in.
30-T	Screw Type for No. 30 Iron	1/2 in.
40-T	Screw Type for No. 40 Iron	1/2 in.
50-T	Screw Type for No. 50 Iron	7/8 in.

Soldering Iron Holders, Vulcan



Holds and guards soldering tool when not in use. Rubber feet will not mar or scratch a polished surface.

Cat. No.	Description
2100	Soldering Iron Holders

Soldering Iron Tips



3738 for Iron
3758 for Iron

Tip is held in place in core of heating unit by a recessed set-screw and is treated with a heavy coating of pure nickel to retard oxidation and corrosion. For No. 3138 iron a special long, semi-chisel shaped tip can be supplied for telephone and switchboard work.

Cat. No.	Description	For Soldering Iron
3738	Copper Tip	3138
3758	Copper Tip	3158

Soldering Coppers

Forged from highest grade pure copper bars. Uniformly made and perfectly balanced clincher type handle, positively will not loosen and will grip firmly as long as there is any copper left. Finished in red. Sizes from 1/2 pound to 10 pounds per pair.

Cat. No.	Weight Each	Weight per Pair	Cat. No.	Weight Each	Weight per Pair
1	1/2 lb.	1 lb.	4	2 lbs.	4 lbs.
2	1 lb.	2 lbs.	5	2 1/2 lbs.	5 lbs.
3	1 1/2 lbs.	3 lbs.	6	3 lbs.	6 lbs.

Temperature Regulating Stand for Soldering Irons



Thermostatically controlled for the regulation of the temperature of electric soldering irons. The thermostat may be set for the maintenance of any temperature from very low to full working temperature.

The body of the stand is of molded plastic. Soldering iron cradle proper is of metal. Stand is equipped with cord and attachment plug-cat for connection to current and with a receptacle for connection of the electric soldering iron. It is designed for use with electric soldering irons up to 660 watts capacity and on circuits up to 240 volts, A.C. only.

Cat. No.	Description
475	Temperature Regulating Stand

Slitter, Cable



This slitter is safe, simple, and easy to use. Cuts by hammer blows applied to either of forged lugs on head. Adaptable to right or left hand use. Adjusted slitting blade will not cut thin insulation inside sheath. Adjustable dog for spreading sheath. Spare bit and Allen wrench supplied.

Spinning Machine, Neale Model D Cable



The cable spinning method of placing new cable saves one-third the cost of placing new cable and does away with the need of grade clamps or ties which might cut or crush the cable. The cable is held rigid against the messenger, eliminating whipping in storms.

This machine lashes the cable tightly to the strand with .091 wire held at a tension of 35 pounds. In general, new cable is first placed in the usual manner except that aerial cable rings should be spaced at 10 to 15 foot intervals instead of the usual 18 inches. The Model D cable spinner is then towed along the cable and pre-formed coil of wire rotates about both strand and cable, lashing them tightly together.

The Model D spinner is designed for use by a construction crew to place and spin new cable or maintenance spinning of existing cable. Operates on ball bearing races with double drive mechanism which eliminates slipping. The machine is quickly adjustable to take cable for minimum size to a maximum of 2 1/4 inches. The spinning wire supply is always visible. A ratchet on the strand wheel makes it impossible for the spinning wire to slack off when pull on the tow line is released. The machine comes furnished with one lashing wire clamp, two adjustment wrenches, one screw driver, one open end wrench, and one tow rope, packed in spinner chest. Machine size: length, 24 inches; diameter, 10 inches. Machine weighs 42 pounds.

Spinning Machine, Model B Cable

This cable spinner is designed expressly for one-man operation in spinning new cable or maintenance spinning of existing cable. It may be operated either by a hand crank or pulled along the supporting strand by a man on the ground. A dead weight of 50 to 100 pounds may be substituted for a rider to prevent slippage when operated from the ground.

The two supporting trolley wheels are linked by means of a sprocket chain which insures positive driving action for both front and rear wheels. The machine is transferred easily at pole by removing gate in spinner head.

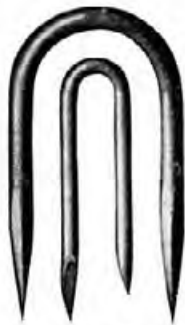
The cable car is constructed of steel and steel tubing through out with gearing of bronze and steel, all steel parts being cadmium plated. The spinning head is cast aluminum.

The spinner has compound gearing that eases the spinning operation on up grades. The hand crank has a positive snap action that can be changed from regular to compound drive.

The machine is shipped with the following equipment: spinner chest, seat, safety belt, one tube of grease, and one lashing wire clamp.

Staples, Galvanized

Used for moulding, conduit and grounding wires. Numbers J-127 and J-128 are used for standard 1 x 7/8-inch wood moulding. Standard package, 100 pound keg.



Rollled Point Cut Point

ROLLED POINT—MOULDING

Cat. No.	Length	Inside Width	Size Wire	Weight per 100
J-126	1"	3/8"	1/8"	.75 lb.
J-127	2"	1-1/16"	3/16"	3.5 lbs.
J-128	3"	1-1/16"	1/4"	7. lbs.

CUT POINT—FENCE

Cat. No.	Length	Inside	Size	No. per 100 lb. Keg
J-1672	1 1/2"	1/4"	.148"	7300
J-1673	1 3/4"	1/4"	.148"	5000

Staples, Copperweld

Used for moulding, conduit and grounding wires. Numbers J-6521 and J-6522 are designed for 1 x 7/8-inch wood moulding.

ROLLED POINT—MOULDING

Cat. No.	Length	Inside Width	Size Wire	Std. Pkg.	Weight per 100 Staples
J-6493	1 1/4 in.	1/4 in.	.114 in.	500	.7 lb.
J-6494	1 1/2 in.	5/16 in.	.144 in.	500	1.3 lbs.
J-6495	1 3/4 in.	3/8 in.	.144 in.	500	1.5 lbs.
J-6496	2 in.	1/2 in.	.162 in.	500	2.2 lbs.
J-6521	2 in.	1-1/16 in.	3/16 in.	100	3 lbs.
J-6522	3 in.	1 in.	1/4 in.	100	7.8 lbs.
J-6523	3 in.	3/4 in.	1/4 in.	100	7.3 lbs.
J-6524-C	3 in.	1 1/2 in.	1/4 in.	100	8.3 lbs.
J-6525	3 3/4 in.	1 3/4 in.	5/16 in.	50	15 lbs.

CUT POINT—FENCE

Cat. No.	Length	Inside Width	Wire Size	No. per 100 lb. Keg
J-6651	1 3/8 in.	1/2 in.	.162 in.	6100
J-6652	1 1/2 in.	3/8 in.	.162 in.	5700
J-6653	2 in.	1/4 in.	.162 in.	4400
J-6654	1 1/4 in.	3/16 in.	.114 in.	13400
J-6655	2 in.	1/2 in.	.162 in.	4300

Stapling Gun, Wire

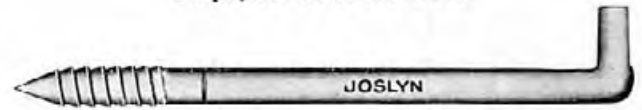


This automatic stapling gun is designed for stapling braided, rubber coated, single and double strand wire, and hollow tubelines to baseboards, plaster walls, window frames, door jambs, rafters, and around difficult angles or corners. Features a controlled power chamber to meet any predetermined drive without marring or injuring the wire.

This stapler uses a new type staple with great holding power and easy driving point. Has been tested to hold in hard woods 56 to 64 pounds and in soft woods from 28 to 34 pounds.

Staples are available in boxes of 5000 with either brown or ivory finish.

Steps, Hook Head Pole



Used for stepping large wood poles, especially where terminal is located. Made of the best grade of open hearth steel, hot dip galvanized.

Fetter drive, made with a ring 6 inches from the outer end to indicate the depth to which the step should be driven into the pole.

Cat. No.	Size	Standard Package	Weight per 100
J-1116	9/16 x 9 inches	100	73 lbs.
J-1117	5/8 x 9 inches	100	84 lbs.
J-1118	5/8 x 10 inches	100	95 lbs.

Steps, Wood Pole



Furnished in plain, painted or creosoted oak. Two 5/16-inch holes are provided for mounting with spikes. For galvanized steel steps see above.

Cat. No.	Size Inches	No. per Bundle	Weight per 1000
J-2662	1 3/4 x 2 5/8 x 7	20	700 lbs.

Strain Plates, Guy Hook



Serves the double function of preventing the guy strand from slipping down the pole and from biting into the pole. The guy hook is firmly welded to the plate. Has one 11/16-inch hole for 5/8-inch through bolt, two 7/16-inch holes for 3/8-inch lag screws and four 7/32-inch holes for 10d nails.

Cat. No.	Size	Standard Package	Weight per 100
J-6577	4 x 8 in., No. 14 Ga.	100	139 lbs.

Strain Plates, Galvanized Moulding



Used to prevent the guy strand from cutting or crushing the ground wire moulding. This plate is formed to fit over standard one-inch ground wire moulding. Has four 7/32-inch mounting holes for 10d nails.

Cat. No.	Size Inches	Std. Pkg. Quantity	Weight per 100
J-6576	4 x 8, No. 14 Ga.	100	83 lbs.

Strain Plates, Galvanized Standard



Used for the same purpose as guy shims but give better protection to the pole, cost less and are cheaper to install than shims. From two to four plates are required per pole, depending on its diameter. Has four 7/32-inch mounting holes for 10d nails.

Cat. No.	Size Inches	Std. Pkg. Quantity	Weight per 100
J-1034	4 x 8, No. 14 Ga.	100	83 lbs.

Straps, Galvanized Conduit



Used for attaching 2 or 3-inch vertical conduit or pipe to wood poles. They are made of 1/4 x 1-inch steel, and have 7/16-inch holes for 3/8-inch lag screws. Hot galvanized after forming. Order by piece.

Cat. No.	For Conduit Size	Weight per 100
8925-7925	2 inches	89 lbs.
8926-7926	3 inches	107 lbs.

Straps, Galvanized Pipe



Accurately stamped to size from galvanized sheet metal—used to support BX and rigid conduit. Sold by the pound—when ordering please specify pounds and not pieces.

Packed in standard bags of 50 pounds each.

Cat. No.	Size	No. per lb.	Cat. No.	Size	No. per lb.
J-1650	1/4 in.	80	J-1656	1 1/4 in.	11
J-1651	BX	77	J-1657	1 1/2 in.	8
J-1652	3/8 in.	50	J-1658	2 in.	7
J-1653	1/2 in.	38	J-1659	2 1/2 in.	3
J-1654	3/4 in.	23	J-1660	3 in.	2 1/2
J-1655	1 in.	16			

Galvanized Reinforcing and Safety Straps for Suspension Clamps



No. J-7905 is used to support the messenger bolt at points of extreme stress, such as long spans.

No. J-7906 is a safety strap which will prevent the cable from falling should the messenger give way. The upper hole fits over the messenger bolt, and the lower end is fastened to the pole by a 1/2-inch lag screw.

No. J-7907 is a combination of Nos. J-7905 and J-7906.

J-7906 J-7905 J-7907

Cat. No.	Description	Size Steel	Standard Package	Weight per 100
J-7905	Reinforcing Strap	1 1/2 x 1/8 in.	200	32 lbs.
J-7906	Safety Strap	1 3/4 x 1/8 in.	25	64 lbs.
J-7907	Combination Strap	1 3/4 x 1/8 in.	25	100 lbs.

Straps, Galvanized Bracket Reinforcing

Made of hot galvanized, 14-gauge steel, 1-inch wide. Three 5/16-inch holes are provided for nailing to wood bracket. The bottom strap is used on an outside bracket and the top strap on an inside bracket.

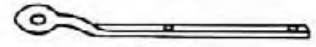


Cat. No.	Description	Weight per 100
J-2562	Bottom Strap	18 lbs.
J-2563	Top Strap	28 lbs.

Straps, Wall



Loop Type



Guyeye Type

Used for dead ending messenger or span wires on buildings or walls—mounted with 1/2-inch lag screws or bolts through 9/16-inch holes.

Cat. No.	Type	Length Overall	Width	Thickness	Weight per 100
H-8892	Loop	8 in.	1 1/4 in.	1/4 in.	105 lbs.
H-8895	Guyeye	16 7/8 in.	1 1/2 in.	1/4 in.	264 lbs.
H-8896	Guyeye	24 3/8 in.	1 1/2 in.	1/4 in.	351 lbs.

Straps, Klein Leather Extension



Worn permanently attached to one "D" ring on body belt. Brought into use when a large pole makes it necessary to extend the regular safety strap.

Cat. No.	Type "D" Ring	Width	Length	Weight per Doz.
5215	Standard	1 3/4 in.	15 in.	15 1/2 lbs.

Straps, Klein Leather Safety



Standard type for general use. These straps are cut from first quality harness leather, back or center stock only.

All rivets solid copper, hand set with burrs. Snaps and buckles are solid steel drop forgings, galvanized and tested to 1500 pounds. Snaps may be lengthened or shortened by adjusting buckle.

WITH LEATHER WEAR PAD AT BUCKLE

Cat. No.	Snaps	Width	Length	Weight per Doz.
KL-5251	Klein-Lok	1 3/4 in.	5 ft. 8 in.	32 1/2 lbs.
5251	Standard	1 3/4 in.	5 ft. 8 in.	32 1/2 lbs.

WITH ENDS REINFORCED WITH STAINLESS STEEL CLIPS

Cat. No.	Snaps	Width	Length	Weight per Doz.
KL-5250	Klein-Lok	1 3/4 in.	5 ft. 8 in.	32 1/2 lbs.
5250	Standard	1 3/4 in.	5 ft. 8 in.	32 1/2 lbs.

Straps, Klein No. 5253 Leather Safety



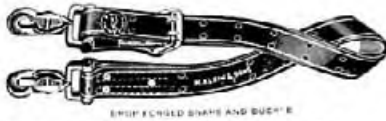
Cut from first quality harness leather, back or center stock only. All rivets are solid copper, set with burrs. Drop forged roller snaps and buckles are tested individually to 1500 pounds, and are galvanized finish.

Straps may be lengthened or shortened by adjusting buckle. Reinforced both ends with stainless steel safety clips riveted through double thickness of leather.

For leather wear pad instead of stainless steel clip, add letter "T" after catalog number selected below.

Cat. No.	Type Snaps	Type Clips	Size Width	Length	Weight per Doz.
5253	Standard	Stainless	2 in.	5 ft. 8 in.	40 lbs.
KL-5253	Klein-Lok	Stainless	2 in.	5 ft. 8 in.	40 lbs.

Straps, Klein No. 5257 Leather Safety



A heavy duty strap, similar to the No. 5253 but has a double tongue buckle to conform to "Bell System" (A.T.&T.

Co.) specifications. One end reinforced with stainless steel safety clip. The single end is returned through roller of snap and securely sewed and riveted.

Cat. No.	Description	Width	Length	Weight per Doz.
5257-S	Bell System Type	2 in.	5 ft. 1 1/2 in.	39 lbs.
5257-L	Bell System Type	2 in.	5 ft. 1 1/2 in.	41 lbs.

Strips, Cook Distributing



A molded bakelite strip of high insulating value and great strength. The studs, nuts and washers are of non-corrosive metal, securely held in the bakelite.

Maple fanning strip, same length as bakelite, is furnished when specified.

The KS strip is similar to the K strip except it has a row of solder clips under the nuts.

Mounted with No. 8, 3/4-inch RHL cadmium plated screws through 7/32-inch holes in the strip.

When ordering please specify number of pairs.

Cat. No.	Description	Length per Pair Inches	Width Inches	Depth Inches	Weight per 100 Pairs
485-5000	K Strip	5/8	1 1/4	1 1/8	5 lbs.
485-6000	KS Strip	5/8	1 1/4	1 1/8	6 lbs.
485-7000	Fanning Strip	5/8	1 1/4	1 1/8	2 lbs.

Stripper, Braid



Diamond braid strippers are used for removing the braided covering from parallel drop wire and for holding bridging connectors while they are being installed or removed.

Consists of an aluminum handle with an enlarged end into which is clamped two circular steel cutting blades, projecting into three wire grooves. These grooves are .270, .330, and .375 inches wide and make cuts .060, .080, and .110 inches deep, respectively.

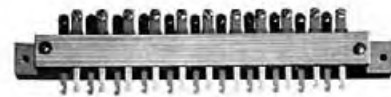
A sliding guard protects the thumb while forcing wire down on cutting blade. Blade can be rotated to new position when used section becomes dull.

Handle is provided with steel wrench plate. Hexagonal opening of 3/8 x 7/16, and 5/8 inches for bridging connectors, nuts, or heads.

Cat. No.	Description	Standard Package	Weight Each
779	Stripper, Braid	12	1/4 lb.

Strips, Reliable Terminal

TYPE E



Screw binding posts with soldering terminals embedded in hard maple, mounted on maple back strip.

Cat. No.	Capacity	Inches Length	Width Lbs.
E 11 PR	11 Pair	9-15/16	1/2
E 13 PR	13 Pair	10-9/16	5/8
E 16 PR	16 Pair	11-13/16	3/4
E 22 PR	22 Pair	17 1/8	1
E 26 PR	26 Pair	19 5/8	1
E 32 PR	32 Pair	22 3/8	1 1/2
E 52 PR	52 Pair	37 3/4	2

TYPE L



Twin screw binding posts with one soldering washer, mounted on hard rubber, with maple back strip.

Cat. No.	Capacity	Length Inches	Weight Lbs.
L 5 1/2 PR	5 1/2 Pair	8 3/4	1/2
L 8 PR	8 Pair	11 1/2	3/4
L 11 PR	11 Pair	15 1/4	1
L 13 PR	13 Pair	17 3/4	1 1/4
L 16 PR	16 Pair	21 1/2	1 1/2
L 26 PR	26 Pair	34	2 1/2

TYPE T



Soldering terminals embedded in hard rubber and mounted on maple back strip. Made with 1, 2, 3, 5 or 6 rows of terminals of 20 or 26 terminals per row. Please specify number of rows and number of terminals when ordering.

Stripper, Ideal Wire and Braid



This tool is used for stripping both twisted pair and parallel telephone drop wire. Strips tough insulation without cutting or nicking the wire. The wire is clamped and the insulation stripped in one operation. Length overall is 7 1/4 inches and weight each is 1 1/2 lbs.

Stripper, Taca Cable



This stripper was developed especially to meet stripping problems of telephone men. Will strip cable up to 7/8 inches in diameter and special attachments are available for larger cable. Adjustable screw to set blade at exact cutting edge needed. Furnished with K-type yoke and guide for various widths of drop wire. The body of the stripper is made of cast aluminum and all operating parts of tempered steel.

Struts, Pole



Used where it is impossible to secure space sufficient for normal guying. Where the angle is not too great or the pull not overly strong the pole can be made self-supporting with pole struts.

Slack spans should be used on both sides of poles trussed in this manner and the poles should be set in concrete, 1 foot deeper than standard. Two struts are required for each pole. Braces are 1 x 1/2 x 1/8 inch channels. Fastened to the pole by 1/2-inch lag screws.

Cat. No.	Size of Pole	Extension from Pole	Size Channel Horizontal Legs	Weight per 100
J-0501	7 in.	11 in.	2 x 1/2 x 1/8 in.	580 lbs.
J-0500	11 in.	11 in.	2 x 1/2 x 1/8 in.	580 lbs.
J-0502	14 in.	15 in.	2 x 1/2 x 1/8 in.	840 lbs.

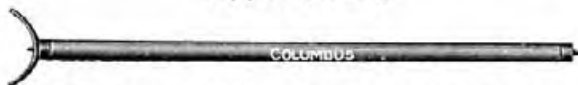
Supports, Jenney



The best selected hardwood is used in this support. The fork is of crucible steel; heavy braces and bolts make it very serviceable. Spikes are bolted to each leg to prevent slipping. This support is shipped knocked down.

Cat. No.	Size of Supports, Inches	Height Feet	Weight Each
T-301-842	1 3/4 x 3 1/2	6	52 lbs.
T-302-843	1 3/4 x 3 1/2	7	57 lbs.
T-303-844	1 3/4 x 3 1/2	8	62 lbs.

Supports, Mule



Made of selected Fir, round shape, reinforced with strong steel bands at each end. Heavy crucible steel fork and spikes.

Cat. No.	Diameter	Length	Weight Each
T-303-845	4 inches	6 feet	38 lbs.
T-304-846	4 inches	7 feet	42 lbs.
T-305-847	4 inches	8 feet	46 lbs.

Tag, Metal Rim



For tagging cable or wires as a means of identification after they have been tested out and assembled in groups. Made of thin, tough cardboard and bound with metal. Can be used over and over for the same purpose. One inch in diameter.

Cat. No.	Description	No. per Box
S-16-MR	Box of 1-inch metal rim tags	500

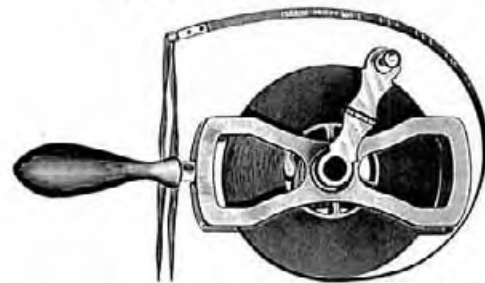
Tag, Embossed Aluminum



Easy to attach, permanent in service embossed aluminum tags offer the simplest, cheapest and most practical identification of poles and other properties.

Letter is sharply and cleanly embossed or raised on pure aluminum strip. Furnished with 7/16, 1/2, 7/8, or 1 1/4-inch letters, plate width from 3/4 to 2 1/4 inches.

Tapes, Surveyors' Chain



A chain tape that will stand up to telephone, railroad and other rough work. This line is 5/16-inch wide and made of heavy, extra tough steel, coated with white metal to resist rust. Graduations and figures are deeply stamped into babbitt metal.

Line is detachable from reel, has heavy brass end clips and is furnished with a pair of leather thongs.

Has sturdy metal reel of improved pattern, nickel plated, with polished hardwood handle and long, folding, winding handle.

Regular markings—feet only with end feet in tenths. Tapes over 100 ft. long have 4-arm reel with "D" handle and spike end.

Cat. No.	Description	Length	Weight Each
3100	Surveyor's Chain Tape	100 ft.	3 1/2 lbs.
3150	Surveyor's Chain Tape	150 ft.	5 lbs.

Tape, Scotch Electrical



This vinyl plastic electrical tape is especially suited for telephone work and all jobs where space-saving is a factor. This tape is only .007 inch thick but has a 10,000 volt breakdown strength. It is resistant to flame, water, oils, acid, alkalis, and corrosive chemicals.

Highly flexible, this material will mold snugly to irregular surfaces and will remain flexible even at low temperatures. Size 3/4 inches by 66 feet.

Cat. No.	Description
33	Tape, Scotch Electrical

Tape, Manson Friction



A moisture resistant, strongly adhesive tape packed in 1/2-pound tins. A 1/2-pound roll of 3/4-inch tape averages 78 feet in length. 1/2 to 2-inch widths are also available.

Description	Standard Width	Weight
Manson Friction Tape	3/4 in.	1/2 lb.

Tape, Black Friction



A quality insulating tape with high adhesive qualities. It lies smooth, holds tight, has high dielectric strength, and stays fresh in the roll. This tape retains its adhesive qualities through all seasons. Standard width is 3/4 inch.

Cat. No.	Width	Length per Roll	Weight per Roll
8-3/4	3/4 in.	60 ft.	8 oz.
8-2	2 in.	60 ft.	16 oz.

Tape, Okonite Rubber



A rubber tape impervious to moisture, put up in 1/2 pound tins. It is suitable for all telephone or electrical purposes.

Description	Standard Width	Length per Roll	Weight per Roll
Okonite Rubber Tape	3/4 in.	30 ft.	1/2 lb.

Tape, Adhesive Joint

Used for wrapping clay conduit joints before mortaring or pouring compound.

Width	Length per Roll	Wt. per 1000 Yds.
4 in.	25 yards	54 lbs.
6 in.	25 yards	81 lbs.

Tape, Ruberoid Insulating



A waterproof insulating tape adapted for wire connections, conduit joints, overhead and underground joints, overhead and underground cables and telephone lines. Exceeds A.S.T.M. specifications for adhesiveness and dielectric strength.

Description	Width	Length per Roll	Weight per Roll
P.&B. Insulating Tape	3/4 in.	60 ft.	1/2 lb.
P.&B. Insulating Tape	2 in.	42 ft.	1 lb.

Tapes, Sterling Linen



A strictly high grade tape especially popular with telephone and telegraph companies for ordinary work. The serviceable linen tape is 3/8-inch wide with reinforced leather ends. Markings are clear and figures are prominent. Case is of genuine russet leather, metal lined, with folding flush handle and nickel plated trimmings.

Cat. No.	Markings	Length	Weight Each
403	Feet, inches and half inches	50 ft.	12 oz.
406	Feet, inches and half inches	100 ft.	19 oz.
403-D	Feet, 10ths and half-10ths	50 ft.	12 oz.
406-D	Feet, 10ths and half-10ths	100 ft.	19 oz.

Tapes, Challenge Steel

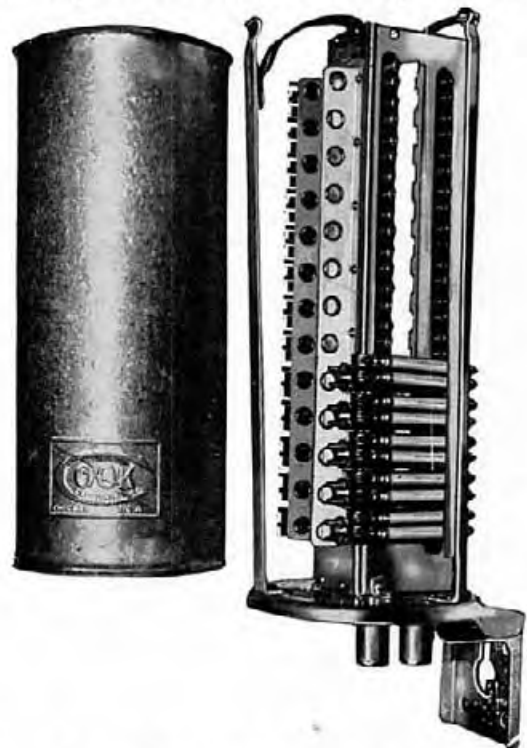


Particularly recommended for all kinds of general measuring. Line is 3/8-inch wide, made of highest grade tape steel with distinct markings on one side only. Case of genuine russet leather hand stitched and with substantial plated steel liner. Folding flush steel handle is opened by pressing pin on opposite side. Measurements guaranteed accurate.

Cat. No.	Markings	Length	Weight Each
263	Feet, inches and 8ths	50 ft.	11 oz.
266	Feet, inches and 8ths	100 ft.	21 oz.
263-D	Feet, 10ths and 100ths	50 ft.	11 oz.
266-D	Feet, 10ths and 100ths	100 ft.	21 oz.

FOR TELEHEIGHTS, TEMPEROMETERS, AND TENTS
SEE PAGES 248 AND 249

Terminal, UA-20 Aerial to Underground Cable



Provides method of taking out subscriber drops without disturbing the protection and testing features. Equipped with two entering nozzles and the cable chamber is equipped with terminating stubs for each cable. Protection provided by the H-20 protector unit which connects each aerial cable pair with its adjacent underground pair.

Cat. No. Less Stubs & Protector	Cat. No. with Stub Less Protector	Number of Pairs	Shipping Weight (with Stub)	Shipping Weight (less Stub)
506-1900	506-1901	11	31 lbs.	17 lbs.
506-1902	506-1903	16	35 lbs.	22 lbs.
506-1904	506-1905	26	42 lbs.	28 lbs.
506-1906	506-1907	51	84 lbs.	50 lbs.
506-1866	H-20-20 Protector Mounting with A-7 Fuse for above terminal			

Terminal, XB Cable



Used for subscriber distribution out of rural cable. Has close-fitting welded zinc cover; a non-corrosive Monel face plate on which are mounted insulated terminal studs, and a flanged entrance for drop wires. Tube can be completely sealed after drop wires are installed.

Cat. No.	Description	Dimensions (Inches)			Shipping Weight
		Height	Width	Depth	
452-3580	3 pr., less stub	8	2	3	2 lbs.
452-3581	3 pr., with 6 ft. stub	14	2	6	6 lbs.
452-3502	6 pr., less stub	9	6	3½	5 lbs.
452-3506	6 pr., with 6 ft. stub	9	6	3½	8 lbs.
452-3503	11 pr., less stub	12½	7	3½	7 lbs.
452-3509	11 pr., with 6 ft. stub	12½	7	3½	15 lbs.
452-3504	16 pr., less stub	12½	7	3½	7 lbs.
452-3512	16 pr., with 6 ft. stub	12½	7	3½	15 lbs.
452-3505	26 pr., less stub	15¼	7¾	3½	11 lbs.
452-3515	26 pr., with 6 ft. stub	15¼	7¾	3½	22 lbs.

Terminals, Cook XB Cable



Strong, yet light in weight—mounts close to the pole or wall with cable out either top or bottom as the cover will slip on over either end. Unprotected type.

The cable chamber is heavy hot galvanized steel. The cable enters through a wall in the chamber into which solder is puddled so that a strong and moisture-proof connection is made. A patented metal strap on the mounting bracket clamps the cable to prevent injury at the joint

between the cable and terminal. The face plate and fanning strips are made of a single piece of molded bakelite. Studs, nuts and washers are of Everdur. Ample room is provided on both sides of the face plate for jumper wires which are taken through to openings at the bottom of the terminal.

The zinc hood is attached with a heavy chain. The mounting bracket is heavy steel, hot galvanized. When desired a detachable mounting bracket has ¾-inch holes for 5/16 x 3½-inch lag screws which are shipped with the terminal when the detachable bracket is requested.

Can be furnished with or without a 6-foot, 22 B&S gauge cable stub attached. Please order by catalog number.

Cat. No.	Capacity	Cable Stub	Height Inches	Width Inches	Weight Each
3502	6 pr.	Less Stub	9	6	5 lbs.
3506	6 pr.	With Stub	9	6	8 lbs.
3503	11 pr.	Less Stub	12½	7	7 lbs.
3509	11 pr.	With Stub	12½	7	15 lbs.
3504	16 pr.	Less Stub	12½	7	7 lbs.
3512	16 pr.	With Stub	12½	7	15 lbs.
3505	26 pr.	Less Stub	15¼	7¾	11 lbs.
3515	26 pr.	With Stub	15¼	7¾	22 lbs.

Terminals, Cook No. 5-6 Cable



The Cook 5-6 Terminal is all steel, thoroughly galvanized. All metal parts are grounded. Insulation is of hard rubber and springs are phosphor bronze. The moisture-proof cable chamber has a removable zinc face plate and is equipped with a self-soldering nozzle. Protected type.

Non-grounding lightning arresters are in front where they can easily be taken out, inspected and replaced. Protection consists of two No. A-7, 5-ampere wood fuses, two No. 4500 True Gap Dischargers and two No. 2081 grooved carbons

per pair. The cable and drop facilities are on a pair basis. Any broken or damaged pair can be replaced without disturbing any other pair. Cable wires are carried from the inside of cable chamber through hollow brass studs and soldered to the tinned end of the stud.

The hood is made of sheet steel, formed, assembled and then hot galvanized.

A separate mounting bracket simplifies installation. It has four ¾-inch holes for 5/16-inch lag screws, 3½ inches long. Four lag screws are supplied with the terminal. If ground is necessary, use a No. 6 B&S. gauge copper wire or larger.

Can be furnished with a 7-foot, 22 B&S. gauge cable stub attached. Please order by catalog number.

Cat. No.	Type	Capacity	Cable Stub	Height Inches	Diameter Inches	Weight Each
112-1700	S-6	11 pr.	Less Stub	14	9	16 lbs.
112-1706	S-6	11 pr.	With Stub	14	9	27 lbs.
112-1701	S-6	16 pr.	Less Stub	17½	9	19 lbs.
112-1709	S-6	16 pr.	With Stub	17½	9	30 lbs.
112-1702	S-6	26 pr.	Less Stub	26½	9	27 lbs.
112-1712	S-6	26 pr.	With Stub	26½	9	38 lbs.
112-1703	S-6	51 pr.	Less Stub	39½	9	65 lbs.
112-1715	S-6	51 pr.	With Stub	39½	9	82 lbs.

Terminals, Cook SX Cable



A protected type terminal for use where the maximum distribution is only four to six pairs and where protection is required.

The cable chamber and bracket are made of steel, formed, assembled and hot galvanized. The hood is of zinc, fastened to the terminal with a strong chain.

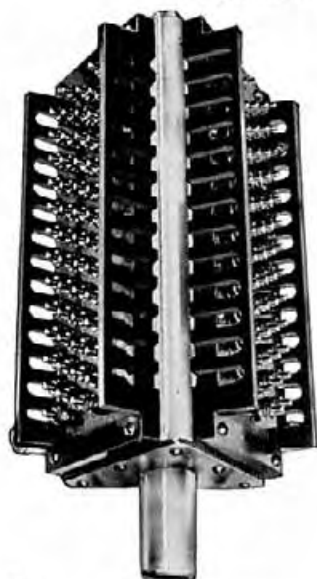
Protection consists of two No. A-7, 5-ampere, snap-in type, wood fuses, two No. 4500 non-grounding True Gap Dischargers and two No. 2081 grooved carbons per pair.

When desired, a detachable mounting bracket will be furnished at no extra charge.

Can be furnished with or without a 6-foot, 22 B&S gauge cable stub attached. Please order by catalog number.

Cat. No.	Type	Capacity	Cable Stub	Height Inches	Diameter Inches	Weight
492-9002	SX	6 pr.	Complete	15¼	7¾	11 lbs.

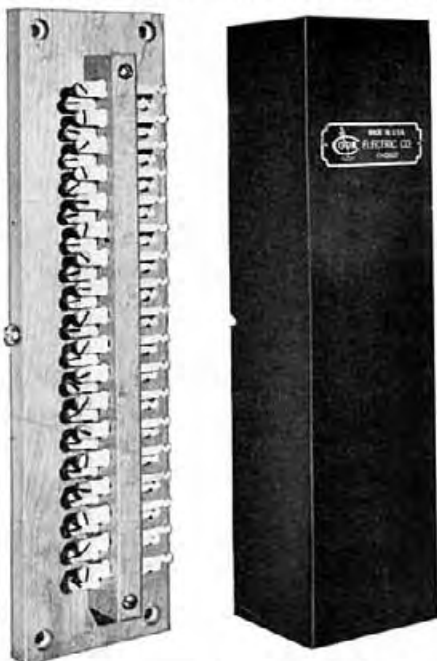
Terminals, Uniflex Cable



Uniflex cable terminals are made of standard units which are combined to produce unprotected cable terminals for pole mounting in wood or metal pole house or in terminal vaults. Each unit consists of a triangular cable chamber made of heavy steel, hot galvanized, providing interior space for cable forming and connecting. Bakelite face plates in which non-corrosive studs are embedded are clamped and gasket-sealed on one or more sides of the cable chamber.

Cat. No.	Description	Dimensions (Inches)			Weight
		Height	Width	Depth	
520-7001	51 pr. less stub	15¾	9¼	5½	11½ lbs.
520-7011	51 pr. with 7' stub	15¾	9¼	5½	20 lbs.
520-7003	101 pr. less stub	27	9¼	5½	22 lbs.
520-7013	101 pr. with 7' stub	27	9¼	5½	36 lbs.

Terminal, Type 54 Interior Junction



The type 54 interior junction terminal is for use in PBX installations, small unattended exchanges and floor distribution of cables in factories, offices, and stores where screw connections for drop wires are desired. The box consists of a wooden base and enameled metal cover. Terminals providing solder clips on cable side and screw connections on drop side are mounted on a terminal strip.

Cat. No.	No. Pairs	Cat. No.	No. Pairs
490-5406	6	490-5413	13
490-5410	10	490-5426	26

Terminals, Cook UX-Underground



A watertight terminal for mounting in a manhole or handhole for the termination and distribution of underground cable systems. Unprotected type.

The cable chamber and cover are made of cast red brass. The mounting bracket is of Everdur metal. The method of terminating the lateral cable is the same as described in Cook XB. The terminal provides for service, outlets. These outlets in the sides of the terminal are sealed with a brass pipe plug having a ¾-inch pipe thread. Instrument distribution cables are terminated in heavy brass stuffing boxes set in the service outlets.

Stuffing boxes are made to accommodate lead cable of ¾-inch diameter and are sold separate from the terminal. The number required should be stated.

Insulation and drop wire connections are the same as used in Cook XB terminals.

The terminal is ordinarily furnished with a 6-foot, 22 B&S gauge cable stub out of top or bottom. Please order by catalog number.

Cat. No.	Description	Height Inches	Width Inches	Depth Inches	Shipping Weight
512-3702	UX- 6 pair, less stub	7¾	6	3½	12 lbs.
512-3703	UX- 6 pair, with stub	7¾	6	3½	20 lbs.
512-3700	UX-11 pair, less stub	11½	6½	5½	20 lbs.
512-3701	UX-11 pair, with stub	11½	6½	5½	30 lbs.
512-3705	UX-16 pair, less stub	11½	6½	5½	22 lbs.
512-3706	UX-16 pair, with stub	11½	6½	5½	31 lbs.

Terminals, Reliable RP-27 Cable



The RP is a reversible, protected cable terminal, compactly designed and made of corrosion resistant aluminum alloy throughout, resulting in a very lightweight but substantial structure. Insulation is molded bakelite. Protected type.

The cable chamber is a durable casting and will out-last the cable. A sliding cover is provided, making the terminal reversible and eliminating the bother of handling separate types for installation with stub at top and bottom.

Protection consists of two No. 27L, 5-ampere ceramic fuses, two No. P-495 sawtooth discharge blocks and two No. P-197 carbons

per pair.

The mounting bracket is detachable for easy installation, and has four 7/16-inch holes for ¾-inch lag screws which are shipped with each terminal.

This terminal is shipped with a 6-foot, 22 B.&S. gauge cable stub attached.

Cat. No.	Capacity	Height	Weight With Stub
RP-27	6 pair	11¾ in.	9½ lbs.

Terminals, Reliable RP-56 Cable

Same as No. RP-27 except equipped with No. 56, 5-ampere fibre fuses. Protected type.

Cat. No.	Capacity	Height	Weight With Stub
RP-56	6 pair	11¾ in.	9½ lbs.

Terminals, Reliable GR Cable



Reliable GR is a cast unprotected cable terminal provided with a gravity cover that is balanced to shut tight. Unprotected type. Equipped with a porcelain face plate grooved in back to prevent turning of the binding posts. These binding posts are treated to prevent season cracking and are provided with beveled washers. The sides of the terminal are shaped to guide bridle wires and prevent them from getting in the way of the cover.

Can be furnished with or without 6-foot 22 B. & S. gauge cable stub. Orders not specifying will be shipped with stub.

Cat. No.	Capacity	Height	Weight Less Stub	Weight With Stub
GR-11	11 pair	8½ in.	7 lbs.	10 lbs.
GR-16	16 pair	11 in.	9 lbs.	13 lbs.
GR-26	26 pair	15 in.	15 lbs.	20 lbs.

Terminals, Reliable RU Cable



A reversible, unprotected type cable terminal—the cable chamber is made of aluminum. Unprotected type. It will outlast the cable. The face plate is molded bakelite and the terminal binding posts are seated in back to prevent turning. Binding posts are treated for protection against season cracking. Beveled washers simplify the placing of jumpers.

Jumper wires enter through guide rings at the base and are fanned to the terminal binding posts over a flat surface giving ample finger room and convenience.

The design of this terminal with its perfectly sealed cable nozzle and the indirect openings for the jumper wires creates an unusually weather-proof box.

The rigid cover is made of aluminum alloy. Gravity catches are provided on the fanning plate to hold the cover in a raised position. The terminal is equipped with a detachable mounting bracket for easy installation. The bracket has four 7/16-inch holes for mounting and is secured to the terminal with a chain.

This terminal can be furnished with or without a 6-foot, 22 B. & S. gauge cable stub attached. When ordering please be sure to specify with or without stub. Orders not specifying will be shipped less stub.

Cat. No.	Capacity	Height	Weight Less Stub	Weight With Stub
RU-6	6 pair	11 in.	6½ lbs.	8½ lbs.
RU-11	11 pair	11 in.	7 lbs.	10 lbs.
RU-16	16 pair	12½ in.	9 lbs.	12½ lbs.
RU-26	26 pair	17 in.	16 lbs.	25 lbs.

Terminals, Reliable No. B-27 Cable



B-27 provides a perfect means of terminating lead covered cable and gives high grade protection and excellent facilities for drop wire distribution. It is all metal yet is light in weight. Protected type.

Protection consists of two No. 27L, 5-ampere ceramic fuses of the snap-in type, two No. P-495 saw-tooth discharge blocks and two No. P-1384 carbons per pair.

The cable chamber is on the pole side and if necessary is easily accessible by removing the terminal from the bracket for work on the platform. The cable chamber is air-tight with a flat rubber gasket

to thoroughly seal it. Cable wires are terminated in hollow studs and can be soldered outside of the cable chamber.

All drop wiring is done on the side away from the pole, giving perfect visibility and convenience. There are individual clips for carbons and fuses to prevent the blocks from crossing when removing fuses. It is unnecessary to remove fuses when installing jumper wires as all binding posts are at right angles to the fuses. These heavy binding posts are treated to prevent season cracking. They are mounted in molded Bakelite and cannot short or turn. Fuse clips and all other metal parts are rounded to prevent scratches to linemen. Beveled washers on the binding posts make it easy for the linemen to insert wires. Jumper wires enter the terminal through a heavy fibre fanning hole in the bottom plate.

The can top is square with aluminum cover which acts as protection against bending or puncturing by linemen working near the terminal. It is guided from three points to prevent contact with live parts during raising or lowering.

A detachable mounting bracket simplifies installation—it has four 7/16-inch holes for 3/8-inch lag screws. Four lag screws are shipped with the terminal.

This terminal can be furnished with a 7-foot, 22 B. & S. gauge, double paper wrapped cable stub attached. When ordering please be sure to specify with or without stub. Orders not specifying will be shipped less stub.

Capacity	Height Overall	Weight Less Stub	Weight With Stub
11 pair	14½ in.	11 lbs.	16 lbs.
16 pair	17½ in.	17 lbs.	19 lbs.
26 pair	23¾ in.	19 lbs.	24 lbs.

Terminals, B-55 Cable

Same as B-27, except equipped with No. 55, 7 ampere, screw type fibre fuses. Protected type.

Capacity	Height Overall	Weight Less Stub	Weight With Stub
11 pair	14¼ in.	11 lbs.	16 lbs.
16 pair	17½ in.	17 lbs.	19 lbs.
26 pair	23¾ in.	19 lbs.	24 lbs.

Terminals, B-56 Cable

Same as B-27, except equipped with No. 56, 5 ampere, screw type fibre fuses. Protected type.

Capacity	Height Overall	Weight Less Stub	Weight With Stub
11 pair	14¼ in.	11 lbs.	16 lbs.
16 pair	17½ in.	17 lbs.	19 lbs.
26 pair	23¾ in.	19 lbs.	24 lbs.

Terminals, Reliable RUG Underground



To be mounted in a manhole for the termination and distribution of underground cable systems. Unprotected type.

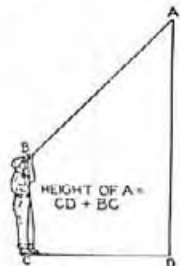
The rugged, cast iron housing is thoroughly hot galvanized. The binding posts, set in a bakelite face plate are treated to prevent season cracking and are provided with beveled washers to facilitate wiring.

Brass plugs on the outside of RUG terminals are removed to insert solder dipped stuffing boxes which accommodate entering instrument cables. Each stuffing box will accommodate one or two pair, lead covered cable and form a gas tight entrance for the cable. They are rugged in construction, yet easy to install. When ordering please specify the number of stuffing boxes required. Orders not specifying will be shipped less stuffing boxes.

This terminal is furnished with a cable stub attached. When ordering please specify whether 6 ft. or 15 ft. stub is required.

Cat. No.	Length of Stub	Capacity	Height	Wt. Ea. with Stub
RUG-6	6 feet	11 pair	8¼ in.	22 lbs.
RUG-15	15 feet	11 pair	8¼ in.	24 lbs.
Stuffing Boxes for RUG Terminal				6 ozs.

Teleheight, Type CW Matthews



Simply and accurately gives height of poles, trees, wires, buildings, etc. Only 5 inches in length and can be easily carried in vest pocket. Furnished with leather carrying case.

To find height of "A" on the sketch stand away from "A" until the bubble and line of the teleheight cross each other. Then measure the distance from C to D and add to it the distance from C to B. The sum will equal the height of the point A.

Cat. No.	Description	Length	Weight
CW	Matthews Teleheight	5 in.	8 oz.

Terminal Box, Cook WXB Building



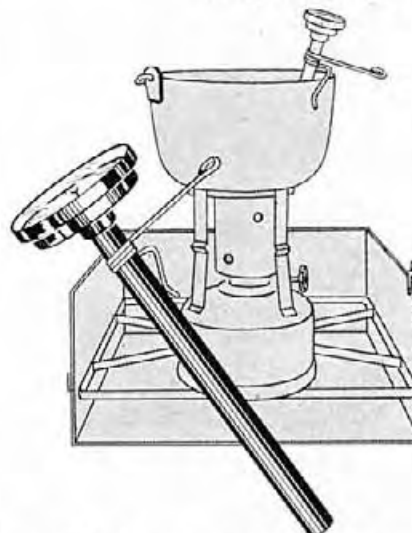
For terminating and distributing lead covered cable inside of buildings.

The face plate and fanning strips are of a single piece of molded bakelite. Studs are made of Everdur metal and inserted into the bakelite insulation so they cannot turn. This cable chamber contains a compression coupling which permits a moistureproof connection to be made by a few turns of the compression nut on either lead covered or loom cable.

This terminal can be furnished with or without a 6-foot, 22 B.&S. gauge cable stub attached. When ordering please be sure to specify with or without stub. Orders not specifying will be shipped less stub.

Cat. No.	Description	Capacity	Height Inches	Width Inches	Depth Inches	Weight Less Stub
452-8016	Surface Type	6 pairs	10	8	3	6 lbs.
452-8001	Surface Type	11 pairs	10	8	3	6 lbs.
452-8002	Surface Type	16 pairs	10	8	3	6 lbs.
452-8003	Surface Type	26 pairs	15	8	3	9 lbs.
452-7100	Flush Type	6 pairs	10	8	3	7 lbs.
452-7101	Flush Type	11 pairs	10	8	3	7 lbs.
452-7102	Flush Type	16 pairs	10	8	3	7 lbs.
452-7103	Flush Type	26 pairs	15	8	3	11 lbs.

Temperometer, Dillon



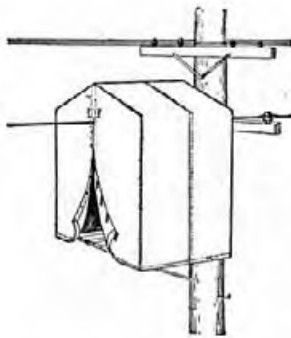
Cableman's unbreakable thermometer registers the correct temperature of cable tanning and impregnation waxes, paraffin, compounds, and wiping solder. The dial of the Temperometer also shows the temperature to which these materials should be heated for best results. Eliminates guesswork; makes for better workmanship.

Taking a temperature reading with the Temperometer is accomplished in a few seconds by dipping the tube two or three times in succession into the material being heated and holding it in the last time while reading the dial.

All working parts are spot welded. The Temperometer retains its accuracy under severe field usage.

Description	Diameter of Dial	Length Overall	Weight Each
Dillon Temperometer	2½ in.	9 in.	1 lb.

Tent, Cable Splicer's



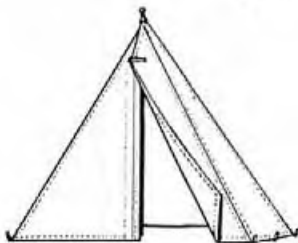
For use of aerial cable splicers during cold and stormy weather. Made of 10 oz. Army cotton duck. The roof is spread and supported by means of a collapsible three-ribbed galvanized metal framework which fastens to the cable suspension strand. On each of two opposite sides of the tent there is an opening which can be laced from the inside after the tent is erected.

Furnished in two sizes: Type "S" for general splicing uses. Type "L"

for splicing work where more room is required. Frame is included with these tents.

Cat. No.	Length	Width	Height	Weight
S	3 ft. 2 in.	4 ft. 6½ in.	8 ft. 8 in.	42 lbs.
L	4 ft. 6 in.	4 ft. 6½ in.	8 ft. 8 in.	48 lbs.

Tent, Miner's



To protect underground splicers during inclement weather. Made of 12 oz. white duck. Supported in center by means of wooden center-pole and staked down around bottom. Center-pole and stakes not included with tent. Single entrance.

Cat. No.	Width	Depth	Center Height	Weight
U-99	9 ft.	9 ft.	9 ft.	19 lbs.

Terminals

FOR TERMINALS, SEE PAGES 245-248

Test Boards, Splicer's Fibre



Used for classifying pairs when testing out cable. Numbers are easy to read and will not wash off. Standard numbering.

Cat. No.	Numbered	Cat. No.	Numbered
810	1- 51	822	607- 657
811	51-101	823	657- 707
812	102-152	824	707- 758
813	152-202	825	758- 808
814	203-253	826	809- 859
815	253-303	827	859- 909
816	304-354	828	910- 960
817	354-404	829	960-1010
818	405-455	830	1011-1061
819	455-505	831	1061-1111
820	506-556	832	1112-1162
821	556-606	833	1162-1212

Test Clips, Mueller Universal



Test clips save time in electrical work requiring quick temporary connections. May be used over and over again.

Rubber insulators are a convenient protection against electric shocks and prevent clips from shorting on each other. Half the insulators are furnished in red and half in black to indicate polarity.

WITH SCREW CONNECTION

Cat. No.	Description	Spread of Jaws	Weight per 100
45	Pee Wee Clip Only, Cadmium Plated	¾ in.	2 lbs.
47	Rubber Insulator for No. 45 Clip	----	2 lbs.
48-B	Clip Only, Cadmium Plated	½ in.	2 lbs.
49	Rubber Insulator for No. 48-B Clip	----	3 lbs.
27	Clip Only, Cadmium Plated	⅝ in.	4 lbs.
29	Rubber Insulator for No. 27 Clip	----	5 lbs.
24-A	25-Amp. Clip Only, Lead Plated	1 in.	7 lbs.
24	50-Amp. Clip Only, Solid Copper	1 in.	7 lbs.
26	Rubber Insulator for No. 24 or 24-A Clip	----	8 lbs.
21-A	50-Amp. Clip Only, Lead Plated	1¼ in.	15 lbs.
85	Crocodile Clip Only, Cadmium Plated	½ in.	2 lbs.
87	Rubber Insulator for No. 85 Clip	----	1 lb.

Test Connectors, Fahnestock

NO. 30



Consists of two large copper spring metal clips riveted together. Both snap over the line. Made for different sizes of wire. Used for test poles or for party line work. Length overall, 1-5/16 inches. Width, ⅝-inch.

In ordering state kind and size of wires to be connected.

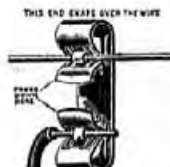
NO. 31



Consists of one large and one small clip riveted together. The large clip snaps over the line wire. The small clip does not snap over and will take up to and including No. 10 B.&S. Used for attaching drop or jumper wires to line on junction poles or party lines. Length overall, 1-5/16 inches. Width, ⅝-inch.

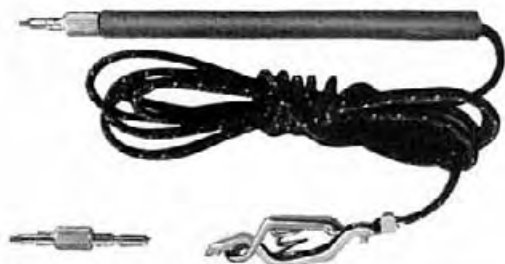
In ordering state kind and size of wires to be connected.

NO. 34



One end snaps over the line. Made in only one size. Snaps over a No. 12 B.W.G. wire. Other end does not snap over wire but will take any size wire up to No. 9 B.W.G. Length overall, 2¾ inches. Width, ⅝-inch. Bronze.

Test Pick, Needle Point



These picks are designed for all uses when a test prod or connection must be used. Especially suited for getting through insulation without having to strip the wire and for cutting through weather and moisture-proofing in terminal boxes and other equipment. Extra needle points are available by ordering Detail No. 2, Needle Point Test Pick.

Test Sets, Heavy Duty

This test set enables the operator to determine which way trouble is on a wire without cutting it and exactly how far the trouble is. Consists of a high grade magneto in special circuit with trouble lamp, receiver, and detector coil. Housed in wood cabinet with leather cover.

The set has a talking circuit with transmitter and receiver. Arranged for use as common battery or local battery tester. By pressing button, operator can supply battery to man at other end of wire.

Furnished complete with cords, clips, coil, receiver, shoulder strap and battery. Weight: 12 lbs.

Test Set, West



Handy, portable unit which the lineman can take out on the job to quickly find faults without opening lines or interfering with circuits and without any help from the operator.

The set is equally useful on iron or copper wire, bare or insulated and on grounded or metallic circuits.

Also a convenient portable telephone with handset which can be folded into the case and headband which frees both hands for testing. Three flashlight batteries are mounted in the case and the telephone equipment is connected to the line by operating a lever key. The telephone circuit is a high-efficiency circuit—transmission is excellent and ringing signals carry distinctly over long and heavily loaded lines.

Contained in a carrying case that is weatherproof and cannot accidentally become grounded. Adjustable carrying strap allows set to be carried in the hand or slung over the shoulder. Instruction folder shows how to make the various tests.

Furnished with three National Carbon No. 950 or three Ray-O-Vac No. 2 dry cells.

Cat. No.	Description	Size Inches	Weight Each
TA-21	Test set with leather case	7 x 9 x 5	18 lbs.

Tester Cable



Locates high resistance water leaks, wet spots, shorts, crosses, and grounds. Locates the cable trouble to the inch. Equipped with exploring coil that will not pick up the tone on the sheath of the cable due to its patented circuit that balances out the tone that carries past the trouble. Operates on two No. 6 dry cells.

Cat. No.	Description	Size	Weight Each
L	Cable Tester	4 x 10½ x 11 in.	18 lbs.

Tester and Locator, Cable



Locates crosses, shorts, grounds, wet spots and is equipped with neutral exploring coil. Also is a cable locator—tells exactly where and how deep a cable is buried. Equipped with a lamp to tell when all connections are correct and when trouble is still in. Uses four No. 6 dry cells.

Cat. No.	Size	Shpg. Wt. Each
10	7½ x 11½ x 13 in.	12½ lbs.

Thimbleyes

Used under the head or nut of machine bolts.



Cat. No.	Bolt Size	Maximum Strand Size	Std. Pkg.	Weight per 100
J-6550-C	5/8"	5/8"	100	124 lbs.
J-6551	3/4"	5/8"	100	124 lbs.

Thimbleyes, Angle

Used with through bolts for down guys—eliminates the use of strain plates, guy hooks, guy thimbles, nails and lag screws and saves from 3 to 5 feet of guy strand.



Cat. No.	Diameter Bolt	Maximum Strand Size	Standard Package	Weight per 100
J-6500	5/8 in.	1/2 in.	100	118 lbs.
J-6501	3/4 in.	1/2 in.	100	118 lbs.



Thimbleye Nuts, Single

Used on the threaded end of cross arm bolts, eye bolts, double arming bolts, straight and angle thimbleye bolts and other attachments where it is desired to convert a standard threaded bolt to a thimbleye bolt.

THIMBLEYE NUTS

Cat. No.	Bolt Size	Maximum Strand Size	Standard Package	Weight per 100
J-6509	1/2 in.	1/2 in.	100	80 lbs.
J-6510	5/8 in.	1/2 in.	100	80 lbs.
J-6511	3/4 in.	1/2 in.	100	77 lbs.



TWINEYE NUTS

Cat. No.	Bolt Size	Maximum Strand Size	Std. Pkg.	Weight per 100
J-6515	5/8"	5/8"	100	145 lbs.
J-6516	3/4"	5/8"	100	144 lbs.

Tool, Lineman's, Klein "Chicago"



A combination of Chicago Grip No. 1613-30 and Howe's Wire Tool, No. 1702-20.

Cat. No.	For Wire Size	Weight Each
1700-30	No. 6 to No. 13	4 lbs.

Tool Bag, Klein Inspector's



This bag offers a combination of good features. It is made of harness leather and will stand rough and hard usage and still always look well. The shoulder strap is combined with a pad and hand strap. The bottom is

three-ply and is studded with steel studs. Retaining straps pass clear round the bag so that it may be loaded to the limit of its capacity and be securely held intact. All seams are sewed with hot waxed linen thread, lock stitched. The leather used does not absorb moisture.

Cat. No.	Size Inches	Weight Each	Cat. No.	Size Inches	Weight Each
5108-14	14 x 8	5 lbs.	5108-20	20 x 8	6 1/2 lbs.
5108-16	16 x 8	5 3/4 lbs.	5108-22	22 x 8	7 lbs.
5108-18	18 x 8	6 lbs.	5108-24	24 x 8	7 1/4 lbs.

Tool Buckets

Collapsible buckets for raising tools, supplies and materials to the pole top. Round tops are held open by non-metallic rings.

Made of No. 6, 18-ounce duck. The heavy leather bottom extends 2 1/2 inches up the sides. A 3/8-inch rope handle is firmly spliced to the bag through leather reinforcements.

Cat. No.	Diameter	Height	Weight Each
40	8 in.	14 in.	1 3/4 lbs.

Tool Bag, Klein Lineman's



Made of one-piece white duck reinforced all around the bottom with heavy bag leather, 3 1/4 inches up on the 5102 series and 8 inches up on the 5105 series. The bottom is made of heavy leather outside with duck inside, lock stitched all around. This lock stitch forms an

independent knot in each stitch, making it impossible to rip. The bottom is studded with strong steel studs. Bottoms and sides are joined together with lock-stitched leather welt seams. Mouth of the bag is formed by a 12-gauge steel frame; the canvas is clinched between this frame and an inside secondary steel frame. Has harness leather handles and two retaining straps with buckles.

Cat. No.	Size Inches	Weight Each	Cat. No.	Size Inches	Weight Each
5102-12	12 in.	2 1/4 lbs.	5102-24	24 in.	4 lbs.
5102-14	14 in.	2 1/2 lbs.	5105-16	16 in.	3 lbs.
5102-16	16 in.	3 lbs.	5105-18	18 in.	3 1/2 lbs.
5102-18	18 in.	3 1/4 lbs.	5105-20	20 in.	3 3/4 lbs.
5102-20	20 in.	3 1/2 lbs.	5105-22	22 in.	4 lbs.
5102-22	22 in.	3 3/4 lbs.	5105-24	24 in.	4 1/4 lbs.

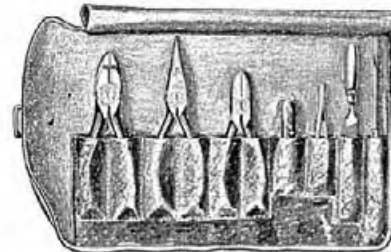
Tool Case, Klein Hip Pocket



For carrying pliers or other tools in hip pocket. Prevents cutting of clothes or possible injury to the person. Made of black leather.

Cat. No.	Size	Weight Doz.
5111	5 x 7 inches	5 1/2 lbs.

Tool Roll, Klein Pocket



Roll with strap and buckle, complete with tools. Available less tools on special order.

CONSISTS OF:

- No. 201-6 N.E. Side Cutting Plier
- No. 301-6 Long Nose Plier
- No. 202-5-A Oblique Cutting Plier
- No. 1550-2 Electrician's Knife
- Electrician's Tweezers
- Insulated Screwdriver
- File

Cat. No.	Description	Weight Each
1305-33-A	Pocket Tool Roll Complete	1 1/2 lbs.

Tool Kit, Klein Inspector's Pocket

A very handy assortment that fits the pocket. Consists of tools in a black leather folding case, strongly reinforced.

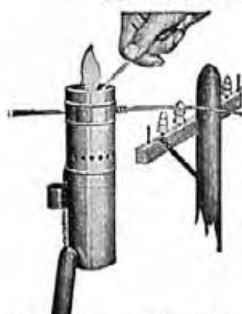


CONSISTS OF:

- No. 201-6 Side Cutting Plier
- No. 301-5 Long Nose Plier
- No. 1550-2 Electrician's Knife
- Electrician's Tweezers
- Insulated Screwdriver
- Special File

Cat. No.	Description	Size Closed	Weight
1305-2	Complete Tool Kit	6½ x 3½ x 1½ in.	1¼ lbs.

Torch, Alcohol Staysalite Lineman's



Showing Torch suspended on the line

The Staysalite torch is the invention of a practical, experienced telephone man. It stays lighted in the wind; it can be lighted and extinguished in a moment; it burns alcohol without odor or noise; it has no adjusting parts; therefore cannot get out of order; it can be carried on linemen's belt. Can be hung on wire under joint to be soldered.

Cat. No.	Description	Weight Each
3420	Staysalite Lineman's Torch	1¼ lbs.

Torch, C. & L. No. 32-A Blow



Designed for all around service, either indoors or outdoors. For gasoline or kerosene. It produces an intensely hot blue blast 7 inches long which may be regulated for lighter work. The gas orifice is automatically cleaned out but never enlarged by the control needle cleaner tip.

Regularly supplied for gasoline but can be furnished for kerosene if specified when ordering.

Cat. No.	Capacity	Size Overall	Weight Each
32-A	1 quart	10½ in.	5 lbs.

Torch, C. & L. No. 144-A Blow



Similar to the No. 32-A C. & L. torch but has smaller burner and flame. For gasoline only.

Cat. No.	Capacity	Weight Each
144-A	1 quart	4¾ lbs.

Torch, C. & L. No. 308 Blow



A quick generating unit of the No. 32-A C. & L. type which includes a sub-burner which pre-heats the gas generator. For gasoline only.

Cat. No.	Capacity	Size Overall	Weight Each
308	1 quart	10½ in.	5½ lbs.

Torch, C. & L. No. 99 Blow



A pint size torch with a small mouthed burner which will burn in any position. For gasoline only. The flame may be regulated from 5/8 x 5 inches to 5/8 x 1¾ inches. Because of its small size it will go into close quarters. While designed for soldering fittings on small sizes of copper tubing this torch has many other uses.

Cat. No.	Capacity	Weight Each
99	1 pint	4¼ lbs.

Torch, Turner No. 206A Blow



Designed for continuous service. Has automatic cleaning needle and replaceable jet-block insuring a constant blue-blast flame. Over-size fuel passages prevent clogging. Carburetor adjustment permits quick adjustment of gas and air mixture to meet varying fuel and job conditions.

Cat. No.	Description	Capacity	Weight
206A	Blow Torch	1 quart	4¾ lbs.

Torch, Turner No. 30AT Blow



For general use. Has one piece cast bronze burner with jam proof taper needle. Top fill with windshield.

Cat. No.	Description	Capacity	Weight
30AT	Blow Torch	1 quart	4½ lbs.
25AT	Blow Torch	1 pint	4½ lbs.

Torch, Turner No. 92A Blow



Designed for precision work. Has double burner, the lower jet used to keep the torch generated for instant use. Equipped with a protecting windshield. For gasoline.

Cat. No.	Description	Capacity	Weight
92A	Blow Torch	1 quart	4½ lbs.
95A	Blow Torch	1 pint	4½ lbs.

Torches, Gas

PREST-O-LITE EQUIPMENT

The use of Prest-O-Lite Gas as a fuel saves delays and interruptions. It furnishes an intense heat in a concentrated, easily controlled flame. No preheating, pumping-up or generating required. Just turn on the gas and light the torch. This, together with the lightness and balance of the torches, makes possible neater and stronger connections that are solid through and through. Experienced linemen require no special training to use Prest-O-Lite equipment. Gas tanks are ordered separately.

No. 0-6119 Lineman's Outfit
FURNISHED LESS TANK

Developed especially for telephone use. Includes a soldering copper and open flame torch stem with an interchangeable handle and a handle for carrying an MC tank. It will take care of the brazing, splicing and similar operations on wire, cable, transformers, switchboards, generators and lighting fixtures. The torch handle has two interchangeable heads so that two distinct torches may be assembled—one an open-flame torch, the other a soldering iron.



No. 0-6119 Lineman's Outfit weighs 4 pounds and consists of the following, any one of which may be ordered separately. (The tank is not included.) Shipping weight of the outfit is 4½ pounds.

Cat. No.	Description
A-6300	No. 2 Handle
10-R-87	No. 8 Soldering Iron Stem
A-6086	No. 3 Torch Stem
A-3321	MC Handle Assembly
A-3881	Straight Union for MC Tank
A-963	Hose Clamps (two supplied)
Z-54	6 feet, ¼-inch Hose

No. 0-6120 Lineman's Outfit

FURNISHED LESS TANK

Ideal for use where open flame work only will be encountered. Particularly suitable for wire splicing. In addition it may also be used for light brazing.

No. 0-6120 Prest-O-Lite Lineman's Outfit weighs 3½ pounds and consists of the following, any one of which may be ordered separately. (The tank is not included.) Shipping weight of the outfit is 4 pounds.



Cat. No.	Description
A-6103	Torch (with No. 2 Handle, No. 3 Stem)
A-3321	MC Handle Assembly
A-3881	Straight Union for MC Tank
A-963	Hose Clamps (two supplied)
Z-54	6 feet, ¼-inch Hose

Pressure Gauge Adaptor



This adaptor is mounted between a pressure regulator and the tank valve. It provides a quick means of determining the amount of gas remaining in the Prest-O-Lite tank. Fits MC tanks and MC couplings.

Cat. No.	Description
18-R-93	Pressure Gauge Adaptor

No. 0-6343—4 in 1 Outfit



Has the same torch handle and open flame torch stems as the 5 in 1 Outfit but omits the soldering copper. It is used for the same range of operations as the 5 in 1—very fine, light, medium and heavy soldering, brazing and heating. Packed in a

waterproof carrying case. The No. 0-6343 Prest-O-Lite Outfit weighs 3¼ pounds and consists of the following, any one of which may be ordered separately.

Cat. No.	Description
07-R-05	Stem for very fine soldering and brazing
A-6086	Stem for light soldering and brazing
A-6083	Stem for medium soldering and brazing
A-6089	Stem for heavy soldering and brazing
A-6058	Handle
A-3879	Union for B Tank
A-3881	Union for MC Tank
L-6081	Wrench
Z-54	6 feet, ¼-inch Hose
A-963	Hose Clamps

Waterproof Carrying Case.

This outfit also is available in a precision type unit. This outfit includes a pressure regulator in place of the B and MC tank unions. A No. 1 handle, with needle control valve, is included instead of the No. 2, straight type, handle.

Prest-O-Lite Gas Tanks



Steel cylinders, charged with pure dry Acetylene which is ready for instant use at the turn of a valve. The flow of Acetylene is controlled by a key operated valve and can be turned on and off readily. A gauge indicates the portion of gas supply remaining. Any Prest-O-Lite station will exchange a full gas tank for an empty one. There will be a charge for the gas only.

Style	Rated Capacity	Length	Diameter	Weight Each
MC	10 cu. ft.	13½ in.	4 in.	10 lbs.

PREST-O-LITE EQUIPMENT (Cont'd)
No. 0-6109—5 in 1 Outfit



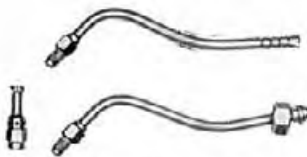
Includes four interchangeable open-flame stems and one soldering copper so that five distinct units may be assembled. This wide assortment enables the user to apply the proper flame and the right temperature to obtain the best results for a large variety of soldering, brazing and other heating operations. Comes packed in a neat, durable metal box with snap lock and fitted

with spring clips to protect parts from loss or damage.

No. 0-6109 Prest-O-Lite 5-in-1 Outfit weighs 5½ pounds and consists of the following, any of which may be ordered separately.

Cat. No.	Description
A-6058	Handle
07-R-05	Stem for very fine soldering and brazing
A-6086	Stem for light soldering and brazing
A-6083	Stem for medium soldering and brazing
A-6089	Stem for heavy soldering and brazing
10-R-87	Soldering Iron Stem, Sleeve, Mixer, and Copper
23-S-32	Copper for Soldering Iron
A-3879	Union for B Tank
L-6081	Wrench
A-3881	Straight Union for MC Tank
Z-54	6 feet, ¼-inch Hose
A-963	Hose Clamps (two)
09-R-76	Metal Case for "5-in-1" Outfit

No. 0-6102 Torch Combination Set



The Prest-O-Lite 0-6102 Torch Combination Set has two stems—one for connecting to a Prest-O-Lite Gas Tank with rubber hose, and the other with MC Union for attaching direct to

Prest-O-Lite MC Tank. Convenient and efficient for light brazing and soldering. Easy to operate.

No. 0-6102 Prest-O-Lite Torch Combination weighs 1 pound and consists of the following, any of which can be ordered separately; No. L-6014, Torch Tip, No. L-6015, Stem for use with hose, and No. L-6016, Stem with MC Union.

Prest-O-Lite Regulators

This device provides exact flame desired and holds flame without intermittent readjustment of the tank valve to comment of the tank valve to compensate for reduced tank pressure. It saves time and gas. Each regulator is adjusted at the factory to deliver gas at a definite pressure which is plainly stamped on the regulator cap. This delivery pressure may be reduced by adjustment of the needle valve in the regulator outlet.



Cat. No.	Description
05-P-92	10 lb. Regulator for MCTanks
05-P-91	5 lb. Regulator for MCTanks

Prest-O-Lite Hose and Hose Clamp



The highest grade rubber hose obtainable. Prest-O-Lite Hose Clamps prevent the hose from slipping off the hose nipples. They will not cut the rubber.

Cat. No.	Description
Z-54	¼ in. 1-ply Red Fabric Hose
A-963	Hose Clamp

Prest-O-Lite Friction Lighter

Cat. No.	Description
A-3710	Friction Lighter
L-3711	Renewal Tip

Torches, Unique Blow



No. 3



No. 0

FOR GASOLINE OR KEROSENE—1 QUART AND 1 PINT CAPACITIES

May be used in cold and windy weather. It is simple in design and of sturdy construction. The long horizontal generating veins are placed parallel with and directly under the flame, insuring the complete and thorough vaporizing of the fuel and producing an even, forceful, blue flame of intense heat, which can be throttled down fine.

The orifice is kept clear of dirt and foreign particles by means of a steel needle which works in and out as the flame regulating valve is opened and closed.

The orifice is located ⅝-inch forward of the fuel control valve seat—a separate threaded block which is easily replaced.

The tanks are of 18-gauge steel with brazed fittings and welded bottom with funnel filler.

The Unique Kerosene torch starts quickly on its own fuel, produces a clean blue blast flame and will operate efficiently in zero weather. It is preferred by many users because kerosene is a safer fuel to store and handle and is easier to obtain than clear white untreated gasoline.

Cat. No.	Fuel	Capacity	Flame Size	Weight Each
2	Gasoline	1 pint	7 x 1 in.	3½ lbs.
3	Gasoline	1 quart	7 x 1 in.	4 lbs.
3-K	Kerosene	1 quart	7 x 1 in.	4¼ lbs.
7	Gasoline	2 quarts	10 x 1 in.	5 lbs.
0	Gasoline	1 pint	6 x 1 in.	3 lbs.

No. 0 is similar in construction to No. 3 except it has a lighter generator and no shield.

Torch, Unique



A powerful flame for burning weeds and brush from around poles to prevent pole fires. An all purpose torch for maintenance and repair jobs requiring a large concentrated flame. Can be used for preheating, thawing, bleeding creosote from poles, etc. Burns kerosene or distillate.

Burner is fitted with combustion tube; starts in 5 minutes; flame 3x30 inches—2000° F. Fuel consumption 1½ G.P.H. Welded steel tank; powerful pump, pressure gauge, fuel funnel filler; snap-on shoulder strap for easy carrying; 7 feet oil resisting hose and fuel regulating valve. Burner weight, 5 pounds.

Cat. No.	Description	Fuel Capacity	Weight Each
500-C	Weed Burner	4 gallons	21 lbs.

Torches, Highway Flare



These torches are made of heavy steel with weighted bottoms. They will right themselves if knocked over. Have a capacity of three quarts of kerosene or light fuel oil and will burn for 36 hours. Have licensed "All-Weather" burner.

Cat. No.	Height	Diameter	Standard Package	Weight Each
96	7½ in.	8 in.	3	7 lbs.

Trimmers, Tree

This tree trimmer has the same cutting head as the No. 1-W but is operated by a rope fastened to a lever on the side of the pole and does not have a pulley.

Cat. No.	Description	Weight Each
1-T	Head Complete (less pole)	2 lbs.
1-T-6	Complete with 6-ft. Pole and P-156-2 Ferrule	5 lbs.
1-T-8	With 8-ft. Pole and P-156-2 Ferrule	5½ lbs.
1-T-10	With 10-ft. Pole and P-156-2 Ferrule	6 lbs.
1-T-12	With 12-ft. Pole less Ferrule	6½ lbs.
1-T-14	With 14-ft. Pole less Ferrule	7 lbs.
1-T-16	With 16-ft. Pole less Ferrule	7½ lbs.

Trimmers, Bantam Weight Tree

Similar to the No. 900 Trimmer except designed for lighter work. Will cut limbs up to 1-inch diameter. Has same type cutting mechanism and compound action as the No. 900 trimmer. Uses 1¼-inch diameter handles.

Cat. No.	Description	Weight
800	Bantam Weight Tree Trimmer, complete	5½ lbs.
875	Center Extension Handle, 5 feet long	1¾ lbs.
750	Replacement Blade	¾ lb.
885	End Extension Handle, 5 feet long	1¾ lbs.

Trimmers, Featherweight Tree

Designed for lighter work than either the No. 900 or No. 800 trimmers. A light weight tool but will make a 1-inch cut. This trimmer has single action pulley design. Uses 1¼-inch diameter handles.

Cat. No.	Description	Weight
700	Featherweight Tree Trimmer, complete	4¾ lbs.
875	Center Extension Handle, 2 feet long	1¾ lbs.
750	Replacement Blade	¾ lb.
885	End Extension Handle, 5 feet long	1¾ lbs.

Trimmers, Heavy Duty Tree



A heavy duty tree trimmer employing a cutting mechanism which cuts the limb from the top down. The cutting motion is cyclic—point first, then heel. The trimmer has compound leverage with a pulley arrangement featuring ball bearing pulleys.

Makes full 1½-inch cut. All handles 1½ inches in diameter, 5 feet long.

Cat. No.	Description	Weight
900	Heavy Duty Tree Trimmer, complete	6½ lbs.
975	Center Extension Handle, 5 feet long	2 lbs.
950	Replacement Blade	½ lb.
985	End Extension Handle, 5 feet long	2 lbs.

Trimmers, Pulley Type Tree



A powerful cutting tool, this tree trimmer will easily sever any branch up to 1¼-inch diameter. In addition to the compound lever on the blade itself this trimmer has double leverage due to the pulley which is attached to the curved lever. The pulley allows the operator to pull the rope from any angle and efficiently work the knife without changing the position of the hand when cutting. A special coil spring returns the blade to a full cutting position.

The No. 1-W Tree Trimmer is furnished with 1¼-inch by 1½-inch one-piece rectangular poles in lengths from 6 to 16 feet, or in short sections, 4, 6, or 8 feet long, joined together with No. 156 rectangular brass sleeves which have a positive locking device.

When more than one section is ordered for each head the intermediate sections are fitted with ferrules on one end and sleeve body on the other; however, one section will be fitted with sleeve body only to be used for handle.

Cat. No.	Description	Weight Each
1-W	Head complete with Pulley (less pole)	1¾ lbs.
1-W-4	With 4-ft. Pole and P-156-2 Ferrule	4 lbs.
1-W-6	With 6-ft. Pole and P-156-2 Ferrule	4½ lbs.
1-W-8	With 8-ft. Pole and P-156-2 Ferrule	5 lbs.
1-W-10	With 10-ft. Pole and P-156-2 Ferrule	5½ lbs.
1-W-12	With 12-ft. Pole less Ferrule	6 lbs.
1-W-14	With 14-ft. Pole less Ferrule	6½ lbs.
1-W-16	With 16-ft. Pole less Ferrule	7 lbs.

Trailers, Pole



This Model AP-30 Pole Trailer is equipped with an adjustable tubular tongue which can be attached directly to the towing vehicle thus eliminating the necessity of a drawbar. The spring suspension and axle mounting are designed to carry maximum loads and to take care of added stress during power brake application. Tires are furnished with each unit.

Cab controlled electric or hydraulic brakes are available for this trailer. Each bolster is equipped with two stanchions as standard equipment. These stanchions are adjustable and are held in place by a cam operated locking device making it impossible for the stanchions to move when locked. Disc type stud wheels are furnished. Drawbars and load binders are available if desired.

Truck Bodies, Holan Line Construction



The design of the CLC-138 Line construction body stresses time and labor-saving features that reduce on the job costs. Frequently used tool and material storage on the "curbside" avoids delays and reduces traffic hazards by keeping the men away from the street. Drawers and compartments, arranged for quick accessibility and full visibility, minimize mixing of small parts in the tool trays. Self sealing, slam type doors of double panel construction keep tools in good working condition in all weather. Adjustable mirror arrangement allows the driver to see the winch in operation. Flush type door handles provide an additional safety feature.

This body will fit all makes of chassis with 84 to 88 inch C.A. dimension. Basic weight is 2650 pounds.

Crew compartment is large enough for four men. Shoulder width of 75 inches and seat width of 68 inches.

This body features low derrick tunnel height. Telescoping derricks permit use of left side cab door. A low, short sheave bar assembly clears working platform space.

Three winch enclosures are available on this body. Normal winch capacity is 18,000 pounds.

Truck Bodies, Holan Telephone Installation and Maintenance



This Model TS-75 body is adapted for both rural and city use. It features side loading compartments and is suitable for installation on any 1/2-ton chassis having a 38 to 40 inch cab to rear axle dimension. Width of the body is 74 1/2 inches. Width of compartments is 14 1/2 inches. No rear fenders are required and the chassis should be furnished with short running boards.

Adequate provisions are provided for carrying desk sets, subsets, testing equipment, wire, and many other items.

Overhead or side angle mounted ladder racks are suitable for 24 foot extension ladders. The stepladder carrier, used only with the overhead racks, has extra provision for carrying tree trimmers and ground rods.

Usual optional items are the overhead ladder racks, stepladder carriers with tree trimmer and ground rod carrier, P.R. reel, rear bumper with non-skid step, and tire carrier. The low sliding roof for keeping wire and other material and tools out of the weather is optional equipment. The tail gate enclosure fits under the rear portion of the sliding roof and the complete assembly slides forward, allowing a full opening for half of the body length.

Truck Bodies, Holan Cable Splicer



This Model CS-90 body is a highly specialized design for cable splicing and maintenance work. It is suitable for installation on any 3/4 or 1-ton chassis having a 44 to 52 inch cab to rear axle dimension. No rear fenders are required and the chassis should be furnished with short running boards. The width of the body is 74 1/2 inches and the width of the wide compartments is 14 1/2 inches.

Adequate space is provided for carrying testing equipment, wire, tools, and other items, including double floor for carrying aerial platform.

Usual optional equipment for Model CS-90 body includes tent carrier, single or double overhead ladder racks, sleeve compartments, low roof enclosure, revolving aerial ladder, side mounting ladder racks, rear bumper, tire carrier, and pintle hook.

Important features of this body are flush type door handles, large-weatherproof compartments, box channel type rub rails, and non-skid steel plate floors.

Truck Bodies, McCabe-Powers Line Construction



The series 500 construction body is equipped with one vertical and three horizontal compartments on each side of its large compartment. Storage facilities provide ample room for all equipment, including pike poles and extension ladders.

A large vertical compartment is provided on each side, one of which is equipped to carry ropes and blocks and the other is used for carrying climber's tools and equipment.

The horizontal compartments are used to carry necessary construction and maintenance supplies as well as lineman's tools and equipment. An insulated and ventilated rubber goods compartment may be provided.

The derrick is carried in the superstructure on the left side in such a way that it does not interfere with opening of the cab door. Extension ladders can be placed in the superstructure on the left side just inside the derrick. The right side of the superstructure is equipped with full length ribbed troughs for tamps, shovels, tree pruning, and other long tools. It also provides a special compartment for pike poles, complete with guard fasteners.

Truck Bodies, McCabe-Powers Telephone Installation



Compartment partitions and shelving on the series 25T body are adjustable. Large load carrying compartment can be fitted with wire reel and other equipment to provide a well-balanced all-purpose unit.

The horizontal compartment in the right side is equipped with individual bins for the accommodation of small items. The right side vertical compartment is provided with material hooks for hanging ropes and climbers' equipment. The left side horizontal compartment contains a full-length shelf with a 3-inch retainer and partitions. The vertical compartment on the left side has adjustable shelves padded with sponge rubber and equipped with hold-down straps for securing telephone sets and other delicate instruments. Access to the lower compartment space behind the wheels is obtained by lowering the full width end-gate.

The rear fenders are constructed as an integral part of the body, eliminating the need of fenders on the chassis. The Series 25T body is 74½ inches long and is designed for mounting on any standard ½-ton truck chassis.

The Series 35T body is similar in construction but is 84½ inches long and will mount on any standard ¾- or 1-ton chassis. Compartment space and body floor area are proportionately larger.

Tubes, Unglazed Porcelain



Length Under Head	Inside Diameter	Outside Diameter	No. per Barrel	Wt. per Barrel	Weight per 1000
3 in.	5/16 in.	9/16 in.	4500	285 lbs.	65 lbs.
4 in.	5/16 in.	9/16 in.	3600	290 lbs.	80 lbs.
6 in.	5/16 in.	9/16 in.	2000	235 lbs.	120 lbs.
4 in.	¾ in.	1 1/16 in.	2000	270 lbs.	117 lbs.
6 in.	¾ in.	1 1/16 in.	1500	280 lbs.	180 lbs.
8 in.	¾ in.	1 1/16 in.	1200	250 lbs.	225 lbs.
10 in.	¾ in.	1 1/16 in.	1000	265 lbs.	275 lbs.
12 in.	¾ in.	1 1/16 in.	800	290 lbs.	350 lbs.

Tube Cutters, Porcelain



Severs porcelain tubes without crushing them, leaving a straight clean edge. Tubes may be cut into ¼-inch lengths and less when necessary. Weight each is 14 ounces.

Turnbuckles



Used to take up the slack in guy lines. The body is a single piece forging. Hot galvanized turnbuckles are furnished with either two eyes or one eye and one hook.

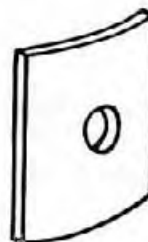
Cat. No.	Type	Size Bolt & Openings, In.	Over-all Closed, In.	Length Open, In.	Weight per 100
J-1021	Hook and Eye	½x9	14	20	168 lbs.
J-1022	Hook and Eye	½x9	17	26	190 lbs.
J-1023	Hook and Eye	½x12	20	32	320 lbs.
J-1231	Eye and Eye	¾x9	19	28	320 lbs.
J-1232	Eye and Eye	¾x12	22	34	395 lbs.
J-1234	Eye and Eye	¾x12	23	35	550 lbs.

Twine, Marline



Cat. No.	Description	Weight per Ball
415	2-Ply Marline Twine	1 lb.
416	3-Ply Marline Twine	1 lb.

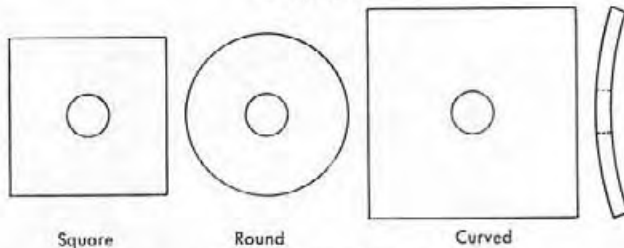
Washers, Stubbing



Used in securing a pole, rotted off at the butt, to a new stub. A washer is used on each end of a through bolt bolted through the pole and stub; also on each end of the bolt used for drawing together the wire wrapped around the pole and stub. Size of washer is 3¼ x 3¼ x ¼ inches.

Cat. No.	Diam. Hole	Bolt Size	Weight per 100
J-133	13/16	⅝ or ¾ in.	76 lbs.

Washers



SQUARE WASHERS

Cat. No.	Size Inches	Size Hole Inches	Size Bolt Inches	Weight per 100
J-1073	2x2x1/8	9/16	1/2	14 1/2 lbs.
J-1074	2x2x1/8	11/16	5/8	14 1/2 lbs.
J-1075	2 1/4 x 2 1/4 x 3/16	11/16	5/8	25 lbs.
J-1076	2 1/4 x 2 1/4 x 3/16	13/16	3/4	25 lbs.
J-1078	3x3x3/16	7/8	5/8 & 3/4	46 1/2 lbs.
J-1077	3 1/2 x 3 1/2 x 3/8	7/8	5/8 & 3/4	118 lbs.
J-1080	4x4x3/16	7/8	5/8 & 3/4	85 lbs.
J-1437	4x4x3/16	7/8	5/8 & 3/4	218 lbs.

ROUND WASHERS

J-1085	1 1/4	9/16	3/8 & 1/2	2 1/4 lbs.
J-1086	1 3/8	9/16	1/2	4 1/2 lbs.
J-1088	1 3/4	11/16	5/8	8 1/2 lbs.
J-1089	2	13/16	3/4	11 1/2 lbs.

SQUARE CURVED WASHERS

J-6822	2 1/2 x 2 1/2 x 3/16	11/16	5/8	33 lbs.
J-113	3x3x1/4	11/16	5/8	76 lbs.
J-6823	3x3x1/4	13/16	3/4	63 lbs.
J-133	3 1/4 x 3 1/4 x 1/4	13/16	3/4	63 lbs.
J-6829	4x4x1/4	7/8	3/4	115 lbs.

Windshields, Safety Folding



Shields the furnace from wind and the public from danger and affords an excellent storage spot for solder pot, tools, etc. Folds flat for carrying with welded grate hanging upright.

Made of 22-gauge galvanized iron. Edges are reinforced by rolling 1/4-inch wire. Size overall is 22 1/2 x 17 1/2 x 17 1/2 inches.

Cat. No.	Description	Weight
50	4-sided, with grate	28 lbs.
50-A	4-sided, no grate	22 1/2 lbs.
50-C	3-sided, no grate	16 lbs.

Wire Tool, Klein Howe's

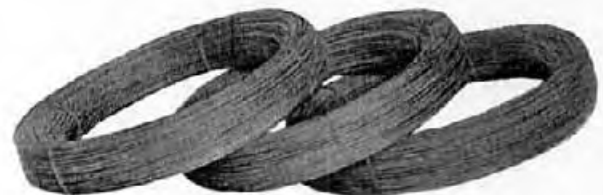


Consists of a harness leather strap, 1 1/4 inches wide and 7 feet long. At one end is a forged steel swivel hook with opening to permit an anchoring around insulator pin. Forward end has a locking device to hold load at any distance and is so arranged that a wire grip can be readily attached. Metal parts are galvanized.

Cat. No.	Description	Width	Size of Strap Length	Weight
1702-20	Single Purchase	1 1/4 in.	7 ft.	2 1/2 lbs.

WIRE, IRON LINE

Crapo Extra Galvanized Telephone and Telegraph Wire



Crapo Galvanized Telephone and Telegraph Wire is manufactured from start to finish in accordance with specifications based on sound research and years of actual experience. Each grade is drawn from iron, or steel, of specific analysis, processed under laboratory supervision, extra galvanized by the Crapo Process and rigidly inspected. The care and precision followed in manufacture guarantees to users line wire which meets rigid specifications for electrical conductivity, tensile strength, elongation, galvanizing and ductility.

"BB" is slightly higher in resistance than EBB but combines conductivity with tensile strength, having a maximum electrical resistance of 4,850 to 5,000 mile ohms.

"Steel" is designed for short-line service where electrical conductivity can be sacrificed for tensile strength. Maximum resistance, 6,500 mile ohms.

BB GRADE

Size B.W.G.	Nominal Diameter	Weight per Mile	Coil Length	Minimum Breaking Strength	Maximum Resistance per Mile
4	0.238"	811 lbs.	1/4 mile	2,271 lbs.	7.15 Ohms
5	0.203"	590 lbs.	1/3 mile	1,652 lbs.	9.83 Ohms
8	0.165"	390 lbs.	1/2 mile	1,092 lbs.	14.87 Ohms
9	0.148"	314 lbs.	1/2 mile	879 lbs.	18.47 Ohms
10	0.134"	258 lbs.	1/2 mile	722 lbs.	22.48 Ohms
11	0.120"	206 lbs.	1/2 mile	577 lbs.	28.16 Ohms
12	0.109"	170 lbs.	1/2 mile	476 lbs.	34.12 Ohms
14	0.083"	99 lbs.	1/2 mile	277 lbs.	58.59 Ohms

EXTRA BB GRADE

4	0.238"	811 lbs.	1/4 mile	2,028 lbs.	5.98 Ohms
6	0.203"	590 lbs.	1/3 mile	1,475 lbs.	8.22 Ohms
8	0.165"	390 lbs.	1/2 mile	975 lbs.	12.43 Ohms
9	0.148"	314 lbs.	1/2 mile	785 lbs.	15.44 Ohms
10	0.134"	258 lbs.	1/2 mile	645 lbs.	18.79 Ohms
11	0.120"	206 lbs.	1/2 mile	515 lbs.	23.54 Ohms
12	0.109"	170 lbs.	1/2 mile	425 lbs.	28.52 Ohms
14	0.083"	99 lbs.	1/2 mile	247 lbs.	48.98 Ohms

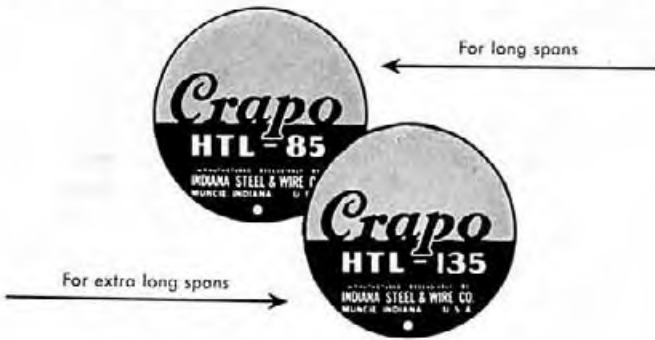
STEEL GRADE

4	0.238"	811 lbs.	1/4 mile	2,433 lbs.	8.32 Ohms
6	0.203"	590 lbs.	1/3 mile	1,770 lbs.	11.44 Ohms
8	0.165"	390 lbs.	1/2 mile	1,170 lbs.	17.31 Ohms
9	0.148"	314 lbs.	1/2 mile	942 lbs.	21.50 Ohms
10	0.134"	258 lbs.	1/2 mile	774 lbs.	26.16 Ohms
11	0.120"	206 lbs.	1/2 mile	618 lbs.	32.77 Ohms
12	0.109"	170 lbs.	1/2 mile	510 lbs.	39.71 Ohms
14	0.083"	99 lbs.	1/2 mile	297 lbs.	68.18 Ohms

WIRE, IRON LINE

Crapo High-Tensile, Low-Resistance Telephone Wire

A high tensile, low-resistance telephone line wire that makes possible longer-span, lower cost construction on new lines; provides stronger spans, with lower maintenance expense on present lines. Development of Indiana Steel and Wire Company.



Crapo HTL-85 High Tensile

Provides for spans of 225 feet in heavy loading districts, 325 feet in medium loading districts and 375 feet in light loading districts. Used on existing pole structures, it tends to increase strength of line, lessen hazards of ice and wind, minimize service interruptions, reduce maintenance costs. Affords improved transmission at voice frequency with currents of voice frequency magnitude.

It is extra galvanized by the Crapo Process.

Furnished in continuous lengths without splices and joints. Galvanizing steel compression-type sleeves are recommended for splicing this wire.

Size B.W.G.	Nominal Diameter	Weight per Mile	Coil Length	Minimum Breaking Strength	Maximum Resistance per Mile
9	0.148"	314 lbs.	½ mile	1,462 lbs.	18.47 Ohms
10	0.134"	258 lbs.	½ mile	1,199 lbs.	22.48 Ohms
12	0.109"	170 lbs.	½ mile	793 lbs.	34.12 Ohms
14	0.083"	99 lbs.	½ mile	460 lbs.	58.59 Ohms

Copyright 1939 by Indiana Steel & Wire Co.

Crapo HTL-135 Extra High Tensile

For extra long spans of 350 feet in heavy loading districts, 450 feet in medium loading districts and 500 feet in light loading districts. Has a minimum tensile strength approximately two and one-half times that of standard B.B. wire. Affords improved transmission of voice frequencies with currents of voice frequency magnitude.

Galvanized by time-tested Crapo Process to insure a uniform, tightly adherent zinc coating which provides lasting protection against corrosion.

Regularly furnished in No. 12 B.W.G. and in continuous lengths without splices or joints. Galvanizing steel compression type sleeves are recommended for splicing.

Size B.W.G.	Nominal Diameter	Weight per Mile	Coil Length	Weight per Coil	Minimum Breaking Strength	Maximum Resistance per Mile
12	0.109"	170 lbs.	4659 ft.	150 lbs.	1,213 lbs.	38.23

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Crapo Galvanized Tie Wire

Manufactured specially to facilitate tying in telephone line wire at the supports. Galvanized by the Crapo Process. Furnished in coils or straightened and cut to length. Specify Horseshoe or Armor Ties, as desired.

Unless otherwise specified tie wires for Horseshoe Ties are fully wrapped in burlap and Armor Ties are packed with the ends only burlapped.

Size B.W.G.	Coil Length	Weight per Coil	Straightened and Cut to Length					
			Horseshoe Ties			Armor Ties		
			Length Each	Standard Pkgs. Pieces	Weight	Length Each	Standard Pkg. Pieces	Weight
9	1700 ft.	100 lbs.	13"	395	25 lbs.	---	---	---
10	2040 ft.	100 lbs.	18"	350	25 lbs.	48"	260	50 lbs.
10	2040 ft.	100 lbs.	16"	390	25 lbs.	46"	270	50 lbs.
12	3100 ft.	100 lbs.	14"	675	25 lbs.	44"	430	50 lbs.
14	2650 ft.	50 lbs.	14"	1150	25 lbs.	40"	810	50 lbs.

STRAND

Crapo Galvanized Steel Guy and Messenger Wire

Crapo Galvanized Steel Strand is furnished in the following standard lengths: ¾-inch diameter and smaller in 250, 500, and 1,000-foot coils and 2500 and 500-foot reels; 7/16-inch diameter and larger in 250 and 500-foot coils and 1000, 2500, and 5000-foot reels. When ordering specify size and grade, method of packing (coils or reels), and number of feet per coil or reel.



7 Wire, Standard Grade—Single Galvanized

Nominal Diameter of Strand	Nominal Diameter of Wire	Approximate Weight per 1000 feet	Minimum Breaking Strength
3/16 in.	0.062 in.	72.9 lbs.	1,150 lbs.
¼ in.	0.080 in.	121 lbs.	1,900 lbs.
5/16 in.	0.104 in.	205 lbs.	3,200 lbs.
¾ in.	0.120 in.	273 lbs.	4,250 lbs.
7/16 in.	0.145 in.	399 lbs.	5,700 lbs.
½ in.	0.165 in.	517 lbs.	7,400 lbs.

7 Wire, Standard Grade—Extra Galvanized

Nominal Diameter of Strand	Nominal Diameter of Wire	Approximate Weight per 1000 feet	Minimum Breaking Strength
3/16 in.	0.062 in.	72.9 lbs.	1,150 lbs.
¼ in.	0.080 in.	121 lbs.	1,900 lbs.
5/16 in.	0.104 in.	205 lbs.	3,200 lbs.
¾ in.	0.120 in.	273 lbs.	4,250 lbs.
7/16 in.	0.145 in.	399 lbs.	5,700 lbs.
½ in.	0.165 in.	517 lbs.	7,400 lbs.

7 Wire, Siemens-Martin Grade—Extra Galvanized

Nominal Diameter of Strand	Nominal Diameter of Wire	Approximate Weight per 1000 feet	Minimum Breaking Strength
3/16 in.	0.062 in.	72.9 lbs.	1,900 lbs.
¼ in.	0.080 in.	121 lbs.	3,150 lbs.
5/16 in.	0.104 in.	205 lbs.	5,350 lbs.
¾ in.	0.120 in.	273 lbs.	6,950 lbs.
7/16 in.	0.145 in.	399 lbs.	9,350 lbs.
½ in.	0.165 in.	517 lbs.	12,100 lbs.

STRAND (Cont'd)

7 Wire, A.T.&T. Specification—Extra Galvanized

Trade Designation	Nominal Strand Diameter	Nominal Wire Diameter	Weight per 1000 feet	Minimum Breaking Strength
2200-pound	3/16 in.	0.065 in.	80.3 lbs.	2,400 lbs.
4000-pound	9/32 in.	0.093 in.	164 lbs.	4,600 lbs.
6000-pound	5/16 in.	0.109 in.	225 lbs.	6,000 lbs.
10000-pound	3/8 in.	0.120 in.	273 lbs.	11,500 lbs.
16000-pound	7/16 in.	0.145 in.	399 lbs.	18,000 lbs.
25000-pound	1/2 in.	0.165 in.	517 lbs.	25,000 lbs.

7 Wire, High Strength—Extra Galvanized

Nominal Strand Diameter	Nominal Wire Diameter	Weight per 1000 feet	Minimum Breaking Strength
3/16 in.	0.062 in.	72.9 lbs.	2,850 lbs.
1/4 in.	0.080 in.	121 lbs.	4,750 lbs.
5/16 in.	0.104 in.	205 lbs.	8,000 lbs.
3/8 in.	0.120 in.	273 lbs.	10,800 lbs.
7/16 in.	0.145 in.	399 lbs.	14,500 lbs.
1/2 in.	0.165 in.	517 lbs.	18,800 lbs.

7 Wire, Extra High Strength—Extra Galvanized

3/16 in.	0.062 in.	72.9 lbs.	3,990 lbs.
1/4 in.	0.080 in.	121 lbs.	6,650 lbs.
5/16 in.	0.104 in.	205 lbs.	11,200 lbs.
3/8 in.	0.120 in.	273 lbs.	15,400 lbs.
7/16 in.	0.145 in.	399 lbs.	20,800 lbs.
1/2 in.	0.165 in.	517 lbs.	26,900 lbs.

3 Wire, Utilities Grade—Extra Galvanized

1/4 in.	0.120 in.	116.7 lbs.	3,150 lbs.
5/16 in.	0.145 in.	170.6 lbs.	6,500 lbs.
3/8 in.	0.165 in.	220.3 lbs.	8,500 lbs.

The zinc coating applied by the patented Crapo Galvanizing Process is so adherent and so ductile that wire to which it is applied can be wrapped tightly around its own diameter and subjected to sharp bending and twisting without the galvanizing cracking, flaking or peeling.

Wire, Flameproof Jumper and Switchboard



Used in building conduit systems, damp locations, and for cross wiring in cable terminals.

Conductors are soft copper, heavily tinned. Insulated with thermoplastic material which is flexible, moistureproof, flameproof, and makes an ideal insulator. Twisted pair furnished in black and red; triple furnished in black, red, and cream. Shipped in coils of approximately 500 feet with 9-inch eye. Specify twisted pair or triple when ordering.

Cat. No.	Size	Inside Diameter	Approx. Wt. 1000 ft. Pair
4622 DJ	22	.056 in.	8 lbs.
4619 DJ	19	.065 in.	12 lbs.

Wire, "Endur-Prene" Drop



This wire is used as a drop wire where greater length of service is a prime factor. The use of Neoprene as an outer covering insures greater resistance to abrasion, flexibility at all temperatures, and due to its exceptional resistance to sunlight, ageing, and heat, guarantees complete freedom from decay and rot.

Conductors are tinned bronze, insulated with an inner covering of natural rubber and an outer jacket of Neoprene synthetic rubber. The parallel construction has an added braid between the inner and outer insulations for greater adhesion. Available in twisted pair or parallel. Shipped in coils of approximately 1000 feet with 15-inch eye. Specify twisted or parallel when ordering.

Cat. No.	Size	Inside Diameter	Approx. Wt. 1000 Ft. Pair
4617 ND	17	.110 in.	40 lbs.
4617 NBPR	17	.110 in.	44 lbs.

Wire, Outside (Bridle and Drop)



Conductors are soft, hard drawn tinned copper, or tinned bronze, insulated with rubber and covered with close cotton braid, saturated with asphalt and finished with stearine pitch and mica. Used in ring wiring, bridling, and to connect open lines to cable terminals. Available in twisted pair, triple; 4617 D is available in twisted pair or parallel. Drop wire is shipped in coils of approximately 1000 feet with 15-inch eye. Bridle is shipped in coils of approximately 500 feet with 9-inch eye. Specify type (twisted pair, triple, etc.) when ordering.

Cat. No.	Size	Type	Inside Diameter	Approx. Wt. 1000 ft. Pair
4620 B	20	Bridle	.063 in.	18 lbs.
4618 B	18	Bridle	.105 in.	31 lbs.
4617 D	17	Drop	.110 in.	33 lbs.
4616 E*	16	Drop	.125 in.	42 lbs.
4614 E**	14	Drop	.156 in.	60 lbs.
4617 CD***	17	Drop	.110 in.	33 lbs.

*Available in bridle, Catalog No. 4616B.
 **Available in bridle, Catalog No. 4614B.
 ***Copperweld.

Wire, Pothead (Rubber)



Used for interior wiring and pothead work when terminating a paper insulated telephone cable.

Conductors are soft copper heavily tinned, insulated with a covering of natural rubber. Polarity marking indicated by raised ridge on one conductor.

Cat. No.	Size	Inside Diameter	Approx. Wt. 1000 ft. Pair
4620 P	20	.094 in.	16 lbs.

Wire, Inside and Duct (Dry Braid)



Inside used in extending telephone circuits from arrestors and other terminating fixtures of outside lines to station sets. Duct used in building conduit systems, for interior wiring in damp locations and for cross wiring in cable terminals.

Conductors are solid soft tinned copper, insulated with rubber and covered with close dry glazed cotton yarn. Inside wires are coded for easy polarity identification. Duct furnished in black weatherproofed cotton braid only. Available in twisted pair or triple. Inside available in brown, ivory, and olive green. Specify colors required. Shipped in coils of approximately 500 feet with 9-inch eye. Specify twisted pair or parallel when ordering.

Cat. No.	Size	Inside Diameter	Approx. Wt. 1000 ft. Pair
4622 I	22	.056 in.	15 lbs.
4619 I	29	.094 in.	22 lbs.
4622 D	22	.056 in.	16 lbs.

Wire, Inside and Duct (Thermoplastic)



Used in extending telephone circuits from arrestors and other terminating fixtures of outside lines to station sets.

Conductors are soft copper, heavily tinned. Insulated with thermoplastic compound which is flexible, moisture-proof, flame-proof, and makes an ideal insulator. Inside wire: polarity marking indicated by raised ridge on one conductor. Duct wire: color coded for polarity. Inside wire furnished in brown or ivory only. Duct wire furnished in red and green or red, green, and yellow. Available in twisted pair or triple. Shipped in coils of approximately 500 feet with 9-inch eye. Specify twisted pair or triple, and color when ordering.

Cat. No.	Size	Inside Diameter	Approx. Wt. 1000 ft. Pair
4622 IP	22	.075 in.	10 lbs.
4619 IP	19	.086 in.	14 lbs.
4622 DP	22	.075 in.	10 lbs.

Wire, Special Iron Tree



This special tree wire was designed to replace the ordinary two and three braid weatherproof iron tree wires. It is low in cost and has triple the life of ordinary tree wire.

Conductor is "Crapo" double galvanized iron wire. Rubber insulated and covered with saturated cotton braid, this is followed with an extra heavy cotton braid, saturated with asphalt and finished with stearine pitch and mica. Available in single conductor only. Shipped in coils of approximately 1000 feet with 15-inch eye. Specify BWG gauge when ordering.

Cat. No.	Size	Conductor	Inside Diameter	Approx. Wt. 1000 ft.
4618 KST	18	Single	.125 in.	28 lbs.
4616 KST	16	Single	.156 in.	39 lbs.
4614 KST	14	Single	.177 in.	49 lbs.
4612 KST	12	Single	.203 in.	65 lbs.

Wire, Outside Iron



Conductors are "Crapo" double galvanized iron wire, insulated with rubber and covered with cotton braid, saturated with asphalt and finished with stearine pitch and mica. Available in twisted pair or parallel. Shipped in coils of approximately 1000 feet with 15-inch eye. Specify BWG gauge and twisted pair or parallel when ordering.

Cat. No.	Size	Type	Inside Diameter	Approx. Wt. 1000 ft. Pair
4619 DI	19	Drop	.111 in.	29 lbs.
4618 DI	18	Drop	.125 in.	39 lbs.
4616 DI	16	Drop	.156 in.	60 lbs.
4614 DI	14	Drop	.177 in.	75 lbs.

Wire, Weatherproof Iron Tree



This wire is especially adapted for runs through trees or moist locations. Prevents grounding that might be caused by dampness.

Conductor is double galvanized iron; insulated with double or triple close cotton braid, saturated with asphalt and finished with stearine pitch and mica. Available in double or triple braid. Shipped in approximate half-mile coils. Specify BWG gauge and whether double or triple braid is desired when ordering.

Cat. No.	Size	Insulation	Approx. Wt. 1000 ft.
4616 WIT	16	Double Braid	17 lbs.
4614 WIT	14	Double Braid	28 lbs.
4612 WIT	12	Double Braid	43 lbs.
4616 WIT	16	Triple Braid	23 lbs.
4614 WIT	14	Triple Braid	33 lbs.
4612 WIT	12	Triple Braid	50 lbs.

Wrenches, Klein Linemen's



BELL SYSTEM TYPE

Forged of select bar steel heat treated and is of the open end type with two openings of different size at each end.

No. 3146 is for 3/8-inch through bolts, 1/2-inch lag screws, 3/8-inch carriage bolts, 1/2 and 5/8-inch guy clamps.

No. 3146-A is for 3/4 and 5/8-inch through bolts, 1/2-inch lag screws, 3/8-inch carriage bolts, 1/2 and 5/8-inch guy clamps.

Cat. No.	Used for	Size Openings—Inches	Lgth. In.	Weight per Doz.
3146	5/8 in. Hardware	1 1/8 & 15/16	13 13/16 & 5/8	23 lbs.
3146 A	3/4 in. Hardware	1-5/16 & 15/16	7/8 & 5/8	23 lbs.

Wrenches, Chance Lineman's Socket



Fits all the standard nuts and lags used in pole line construction. It takes the

place of a hammer, or hand axe, in driving lags, pins, bolts, steps, etc.

Cat. No.	For Nut Size	Weight Each
153	3/4 inch and smaller	2 1/4 lbs.
155	5/8 inch and smaller	2 1/4 lbs.

Wrenches, Chance Screw Anchor



This wrench can be used with square shank, socket type or combination shank and socket type screw anchors. A drop-forged steel adapter is furnished for use with socket type anchors. This adapter slips into the end of the wrench and into the anchor socket.

The handle can be raised or lowered by adjusting the spring catch and the cross bar may be slipped from end to end. Handle and square pipe are steel

tubing. Connecting casting is "Duramel."

Cat. No.	Description	Weight
600	Screw Anchor Wrench	36 lbs.
77	Adapter	1 lb.

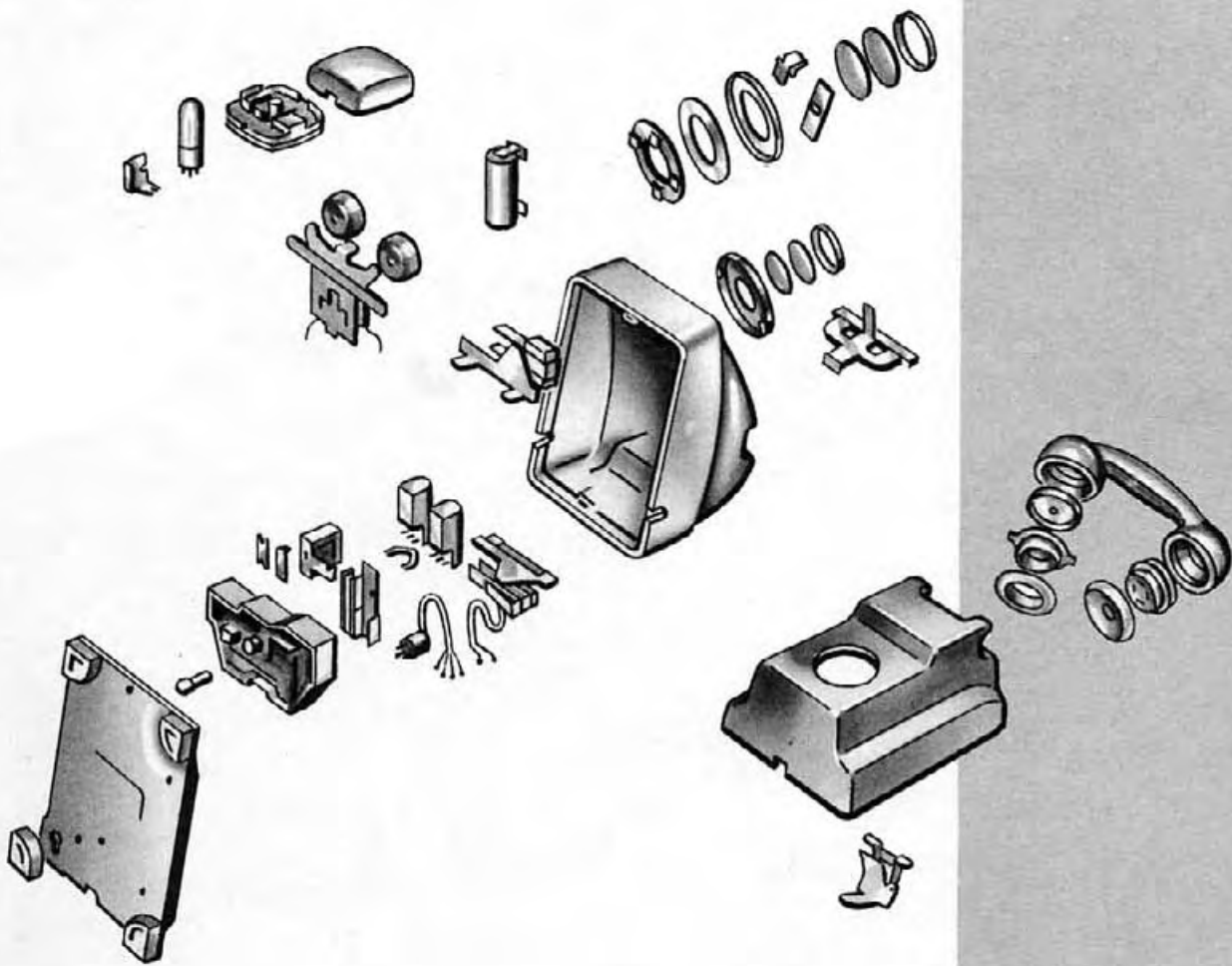
Wrenches, Socket



No. 313-1599 Single Socket Wrench, with $\frac{3}{8}$ -inch socket for cable terminals and lightning arresters.

Kellogg

PARTS



PIECE PARTS

In this section are shown piece parts for commonly used items of Kellogg apparatus. Every effort has been made to include in this material information on the most commonly needed Kellogg components and piece parts required by telephone companies.

Not all items of coded apparatus will be found in this section as in many cases these units are complete in themselves or do not permit replacement outside the Kellogg factory.

Only non-coded piece parts which make up coded items are shown in this section. For the components of coded items made up of several other coded items, as in the case of telephones, desk set boxes, etc., consult the Apparatus Section of this catalog.

Space does not permit furnishing detailed information for components and piece parts for all Kellogg equipment which may be in service but is not of current manufacture. This informa-

tion may be obtained from previous Kellogg catalogs. If these catalogs are not available the piece parts or components desired can, in most cases, be furnished if adequate descriptive information is provided with the order as indicated below.

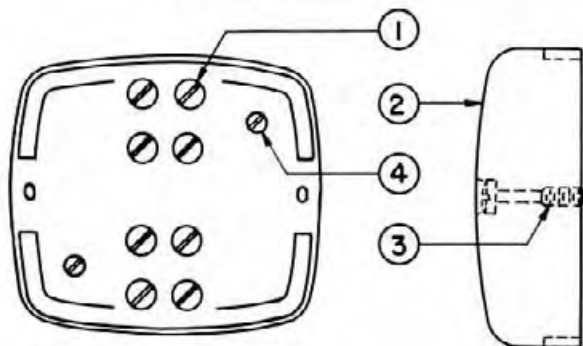
Ordering Information

Orders for piece parts should include the piece part number or code number when available.

When piece part numbers are not available orders should include the following information:

1. Description of the part desired and of the component on which the part is used.
2. Code number of the component on which the part is used.
3. A sample of the part desired, or a sketch, should be furnished if necessary.

BLOCK, CONNECTING



NO. 27

Item No.	Part No.	Description
1	69117	Screw
2	69112	Cover
3	69113	Screw
4	60409	Screw (Mounting)

BOXES, KEY

NOS. 11, 11-13, 23 AND 23-B
General Replaceable Parts

Item No.	Part No.	Description
1	59864	Celluloid
2	59865	Paper
3	58227	Button (Black)
4	58228	Button (Green)
5	58229	Button (Red)

DIALS

Shown below are piece parts for code numbers 10-D, 10-G, 10-DO, 12-D, 12-G, 13-D, and 13-G Dials.

COMMON PARTS

Description	Part No.
Number Card	64972
Protector	64969
Retaining Ring	69011
Finger Ring	70102

DIALS (Cont'd)
SPECIALIZED PARTS



Dial Type
D
G
DO



Description
Numeral Ring
Numeral Ring
Numeral Ring



Piece No.
68985
69056
70336

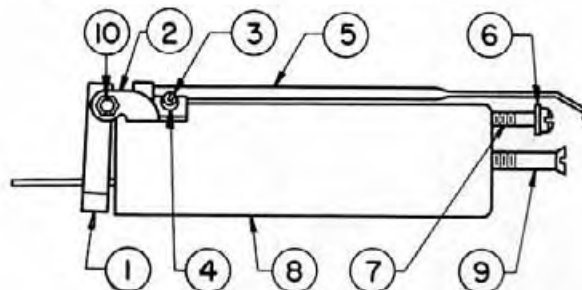
DROPS AND JACKS, COMBINED

500 Type—with Regular Night Alarm Contacts Only
(Replaces 300 Type)

JACK ASSEMBLIES AND DROP ASSEMBLIES

Code No.	Jack Assembly	Drop Assembly
500	P-68336	P-68323
502	P-68589	P-68323
503	P-68604	P-68323
505	P-68607	P-68323
506	P-68723	P-68323
509	P-68337	P-68323
513	P-70395	P-68323

Shown below is an itemized drawing of a No. 500 type combined drop and jack with N.A. contacts only. For piece parts corresponding to the item numbers see the table shown on page 268.



DROPS AND JACKS COMBINED (Cont'd)
PIECE PARTS FOR N.A. CONTACT ONLY TYPE

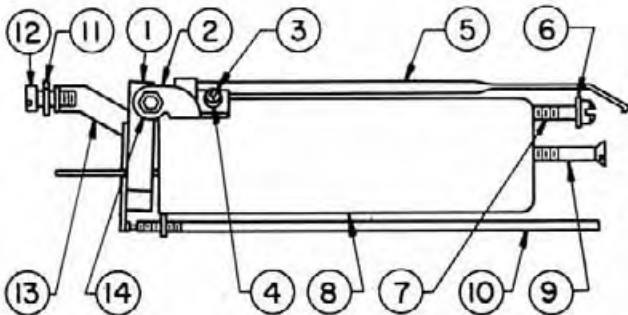
Item No.	Piece No.	Description
1	1086	Armature
2	62503	Armature Support
3	63970	R.H. Mach. Screw
4	59312	Lock Washer
5	2233	Hook
6	54370	Spring Washer
7	68253	Fil. H.M. Screw
8	64025	Shell
9	68102	Spec. F.H. Mach. Screw
10	62502	Pivot Screw Assembly

500 Type—With Code and Regular Night Alarm Contacts

JACK ASSEMBLIES AND DROP ASSEMBLIES

Code No.	Jack Assembly	Drop Assembly
504	P-68607	P-68560
508	P-68337	P-68560

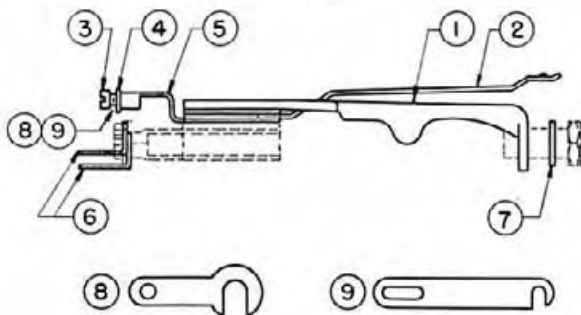
PIECE PARTS FOR CODE AND N.A. CONTACT TYPE



Item No.	Piece No.	Description
1	4813	Armature
2	62503	Armature Support
3	63970	R. Hd. Mach. Screw
4	59312	Lock Washer
5	2233	Hook
6	54370	Spring Washer
7	68253	Fil. H.M. Screw
8	64057	Shell
9	68102	Spec. Fl. Hd. M. Screw
10	68326	Contact Screw Assembly
11	64015	Lock Washer
12	68303	Flat Fil. Hd. M. Screw
13	64058	Terminal
14	62502	Pivot Screw Assembly

Parts Common to All Jack Assemblies

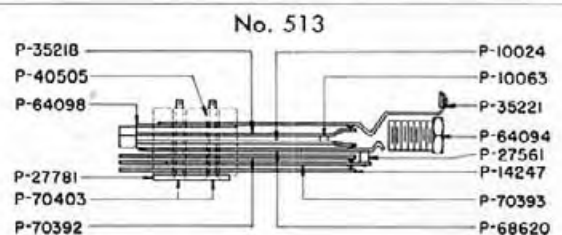
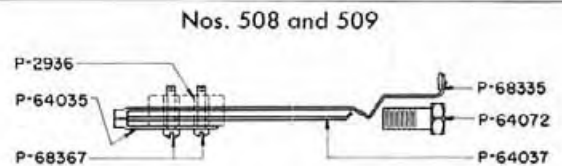
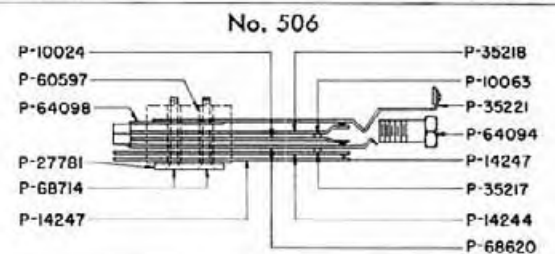
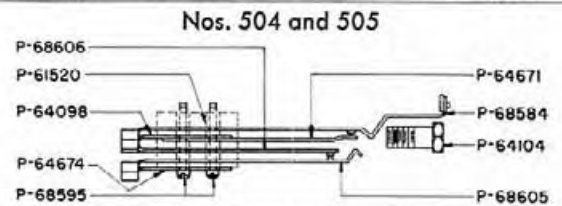
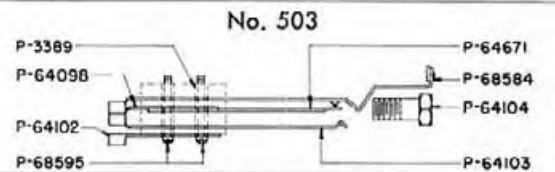
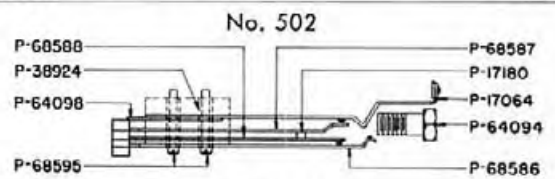
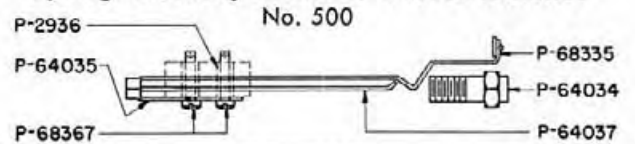
For parts list see next column.



Parts Common to All Jack Assemblies

Item No.	Piece No.	Description
1	64039	Frame
2	39474	Contact Spring Assembly
3	68303	Fil. H.M. Screw
4	64015	Lock Washer
5	64036	Terminal
6	66961	Terminal
7	10001	Washer
8	14154	Terminal
9	30336	Connector

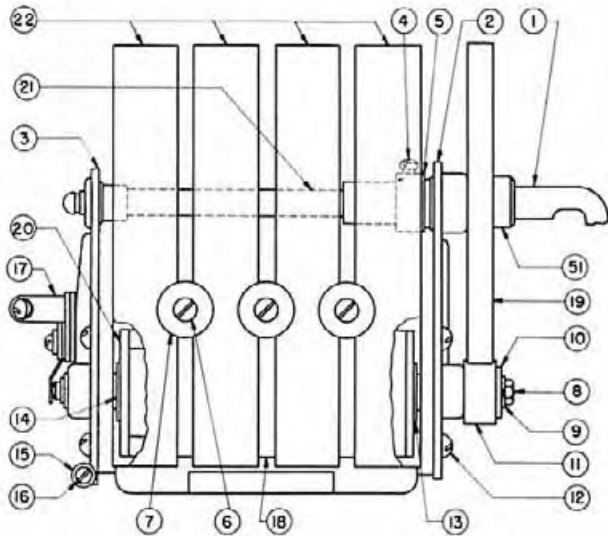
Spring Assembly Parts for Jack Assemblies



GENERATORS

Switchboard Operator's Type

NOS. 63 AND 72



Parts Common to Nos. 63 and 72 Generators

Item No.	Pc. No.	Description
1	15911	Crank Assem.
2	12172	End Bracket Assembly
3	12175	End Bracket Assembly
4	6021	Fil. H. Mach. Screw
5	3264	Collar
6	3668	R. H. Mach. Screw
7	64049	Washer
8	28670	Hex. Hd. Mach. Screw
9	54369	Spg. Washer
10	3274	Washer Assembly
11	3273	Pinion
12	14078	R. H. Mach. Screw
13	9893	Washer
14	38400	Washer
15	5019	Washer
16	5026	R. H. Mach. Screw
17	42679	Spring Assembly
18	13458	Pole Piece Assembly
19	27899	Gear
20	12974	Armature Assembly
21	27900	Shaft Assembly
22	57856	Magnet
	57857	Magnet
	59223	Magnet
51	4630	Stop Collar

NOTE

Parts for the No. 63 generator are the same as those for the No. 72. The No. 63 generator is the same as the No. 72 except the gear wheels are inverted on the No. 63.

Telephone Subscriber's Type

NOS. 15, 53, AND 75
No. 15

All parts for the No. 15 generator are the same as those shown for the No. 72 except those special parts shown below:

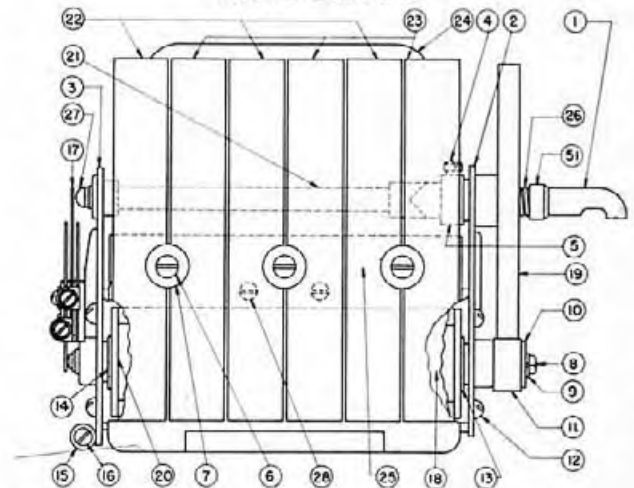
Item No.	Pc. No.	Description
17	42687	Spring Assembly
51	3272	Stop Collar
18	4415	Pole Pieces
20	12973	Armature Assembly
21	51527	Shaft Assembly
23	7732	Shaft Insulation
24	3266	Spring
25	4748	Mounting

No. 53

All parts for the No. 53 generator are the same as those shown for the No. 72 except those special parts shown below:

Item No.	Pc. No.	Description
17	42687	Spring Assembly
51	3272	Stop Collar
19	3267	Gear Assembly
21	51515	Shaft Assembly
25	13461	Mounting Bracket

No. 75 Generator



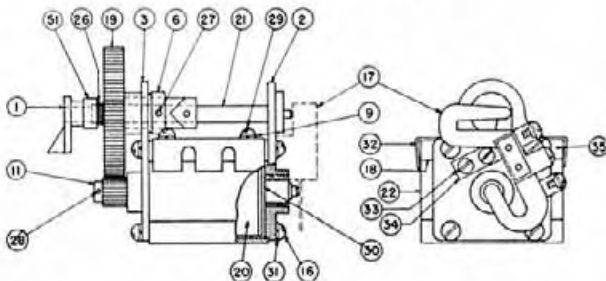
Item No.	Pc. No.	Description
1	15911	Crank Assembly
2	12172	End Bracket Assembly
3	12175	End Bracket Assembly
4	6021	Fil. H. Mach. Screw
5	3264	Collar
6	16165	F.H.M. Screw
7	39922	Washer
8	28670	Hex. Hd. Mach. Screw
9	54369	Spg. Washer
10	3274	Washer Assembly
11	3273	Pinion
12	14078	R. H. Mach. Screw
13	9893	Washer
14	38400	Washer
15	5019	Washer
16	5026	R. H. Mach. Screw
17	42687	Spring Assembly
51	4630	Stop Collar

Listings continued on page 270

Generators (Cont'd)
No. 75 (Cont'd)

Item No.	Pc. No.	Description
18	39915	Pole Piece Assembly
20	53965	Armature Assembly
21	51525	Shaft Assembly
22	57856	Magnet
23	57857	Magnet
24	39918	Mtg. Bracket
25	39919	Mounting
26	3266	Spring
27	7732	Shaft Insulator
28	15531	F.H.M. Screw

No. GN-38-B (Small Type)



Item No.	Pc. No.	Description
1	GC-9	Crank
2	63695	Bearing Plate Assembly
3	63696	Bearing Plate Assembly
6	63700	Collar
9	54368	Spring Washer
11	63702	Pinion
16	56649	R.H.M. Screw
17	63704	Spring Assembly
51	63699	Spring Retainer
18	63690	Pole Piece
19	63701	Gear
20	63694	Armature Assembly
21	63697	Shaft Assembly
22	63692	Magnet
26	63698	Spring
27	66041	Headless Set Screw
28	63705	Pin
29	66001	R.H.M. Screw
30	63703	Thrust Washer
31	54368	Washer
32	63693	Angle
33	63587	R.H.M. Screw
34	54369	Spring Washer
35	63691	Pole Piece

Handsets

Nos. F-27-C, F-39-C, and F-40-C

Description	Part No.
Mouthpiece	62505
Mouthpiece Ring	55369
Screw (Transmitter)	60788
Handset Body	55367
Ear Cap	58028
Transmitter Assembly	66521
Receiver Assembly	55919
Diaphragm	58015

Handsets (Cont'd)
Nos. 46-C and 47-C

Description	Part No.
Mouthpiece	62505
Mouthpiece Ring	55369
Screw (Transmitter)	60788
Handset Body (46-C, 47-C)	64888
Ear Cap (46-C, 47-C)	69426
Trans. Assembly (46-C, 47-C)	66521
Receiver Assembly (46-C, 47-C)	89-A

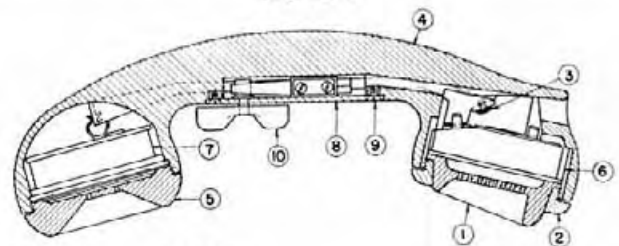
Parts Common to Nos. 32-C and 32-L

Description	Part No.
Handle	44310
Screw	36189
Transmitter Front	36261
Insulator	36262
Transmitter Back Assembly	44407
Transmitter Cup Ins.	36230
Head	44321
Body	44320
Tip	44314
Receiver Assembly	44405

Parts Not Common

Description	Part No.
Transmitter (32-C)	66525
Transmitter (32-L)	66526

No. TS-9



Item No.	Part No.	Description
1	63848	Mouthpiece
2	63849	Ring
3	63850	Screw
4	60942	Handset Body
5	67276	Cap, Ear
6	66523	Transmitter
7	83-B	Receiver
8	67817	Switch Assembly
9	62653	Screw
10	60948	Lever

PIECE PARTS

Every effort has been made to include in this Piece Part Section all piece parts normally required by operating companies. Not all parts available are shown in this section, and these parts are in two groups.

Not shown are components of coded items which are themselves coded items. In other words the code numbers of condensers, handsets, induction coils, etc., used in telephones are not listed but will be found in the Apparatus Section.

Also not shown here are parts which ordinarily are not replaced by operating companies. Included in this group are parts such as rollers, cam assemblies, and frames for cam keys, etc.

KEYS, CAM
NO. 1000 TYPE

Replaceable parts for No. 1000 type cam keys which are common to all keys of this type are shown in the list below.

Description	Piece No.
Cam Handle (Black—Standard)	15171
Cam Handle (Red)	17078
Cam Handle (White)	62607
Cam Handle (Yellow)	63980
Dust Protector Washer (Felt)	32690
Dust Protector Washer (Brass)	47557
Cam Stop	46221
Mounting Screw (long—for cam stop side)	49726
Mounting Screw (short)	49724
Nut (for long mtg. screw)	28872
Nut (for short mtg. screw)	28871
Washer (for spring stack-up nut)	29184
Nut (for spring stack-up)	28985

SPECIAL PARTS FOR MISCELLANEOUS NO. 1000 TYPE KEYS

Due to the large quantity of No. 1000 type cam keys of various spring combinations not commonly used, detailed breakdown of parts has been made. Piece parts for these miscellaneous keys should be ordered as follows.

HEAD SIDE

- 19 ——— 9
- 18 ——— 8
- 17 ——— 7
- 16 ——— 6
- 15 ——— 5
- 14 ——— 4
- 13 ——— 3
- 12 ——— 2
- 11 ——— 1

FRAME

- 31 ——— 21
- 32 ——— 22
- 33 ——— 23
- 34 ——— 24
- 35 ——— 25
- 36 ——— 26
- 37 ——— 27
- 38 ——— 28
- 39 ——— 29

SPRINGS

To order replacement springs locate the desired spring on the drawing at the left and order as follows: "Spring No. for key No." It is important that both the item number of the spring and the code number of the key be specified in ordering spring for these keys.

INSULATORS AND SEPARATORS

To order replacement insulators and separators locate the desired part on the drawing and order as follows: "Insulator (Separator) between Springs No. and for key No."

OTHER PARTS

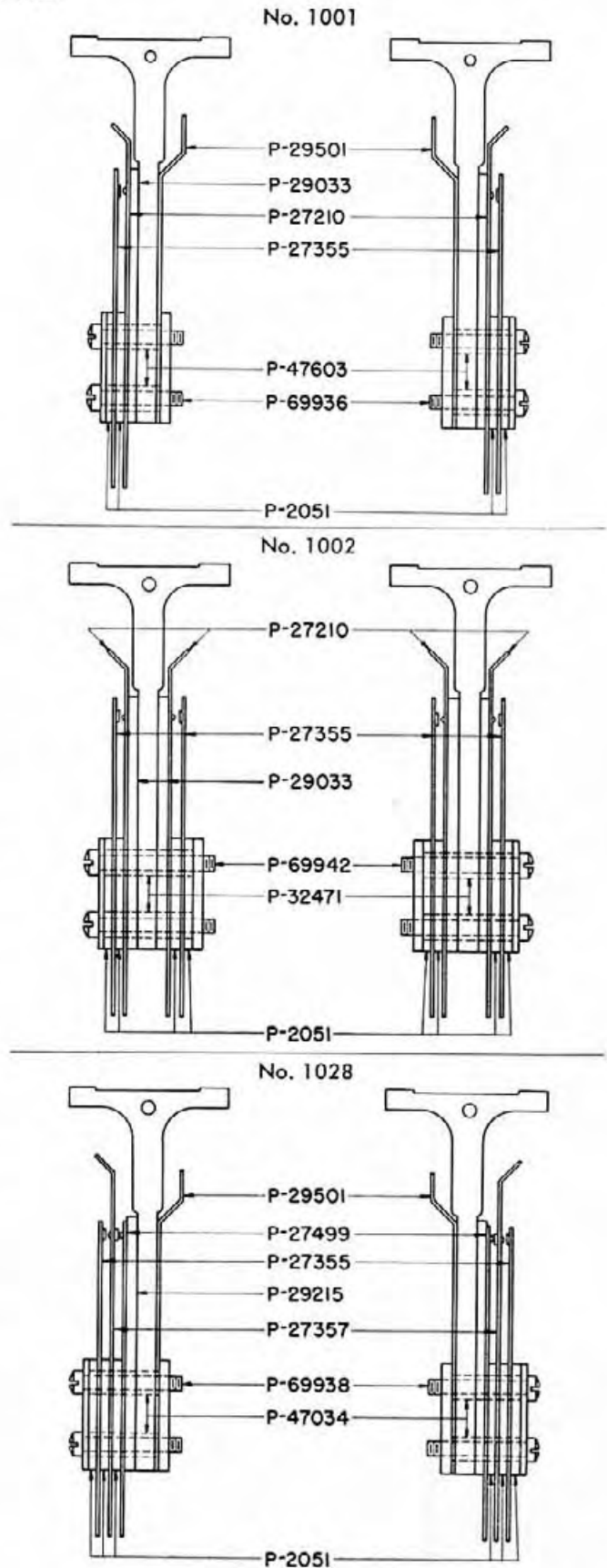
In ordering other parts for these keys specify the code number of the key for which the part is required and give a complete description of the part.

NOTE

NUT SIDE When referring to cam keys "Head Side" indicates the side of the key on which the head of the screw which secures the spring stack-ups appears. The "Nut Side" is the side on which the nut, usually oval or square-shaped, appears.

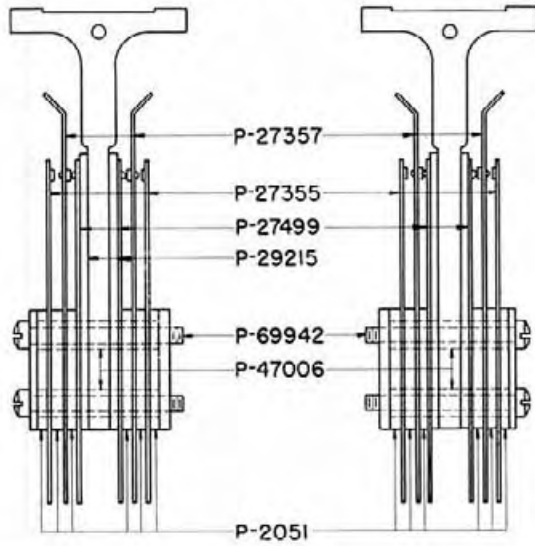
SPECIAL PARTS FOR NO. 1000 TYPE KEYS

Special piece parts for No. 1000 type cam keys most commonly used are shown in the drawings following. For parts for keys not shown in these drawings, see the drawing and description above.

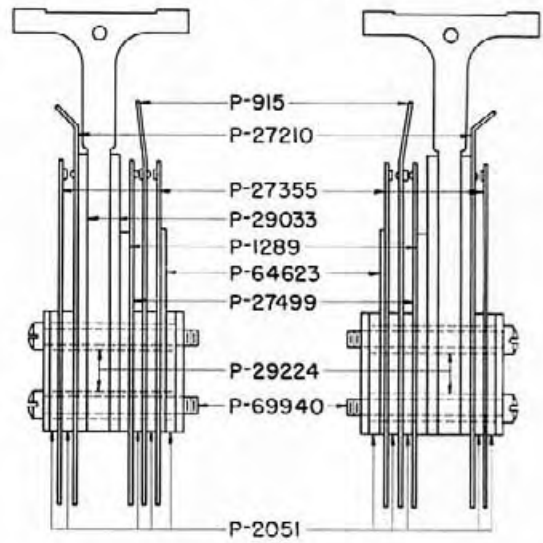


KEYS, CAM (Cont'd)

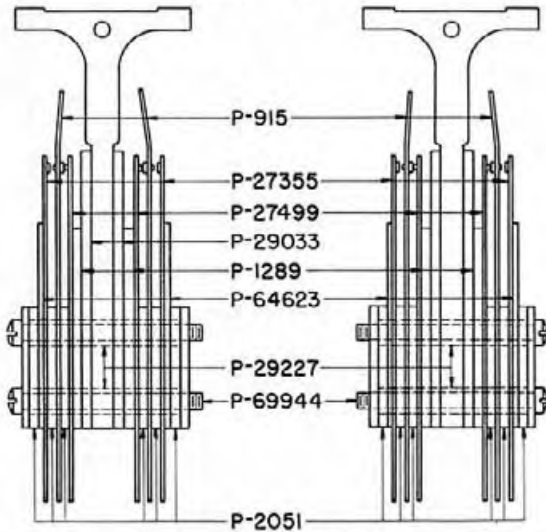
No. 1030



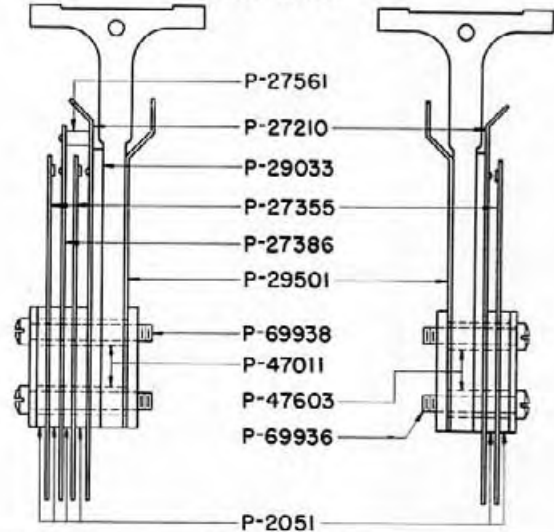
No. 1041



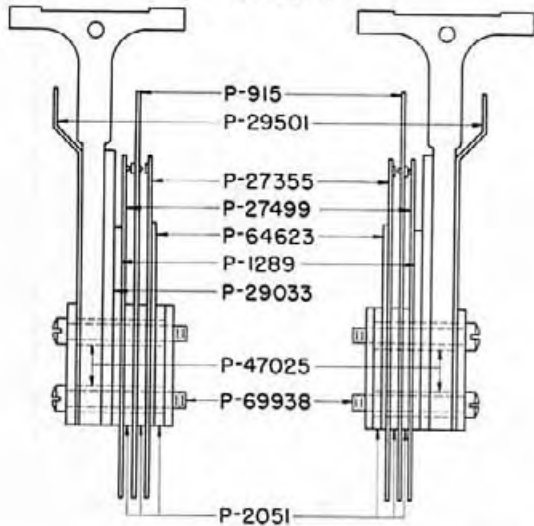
No. 1031



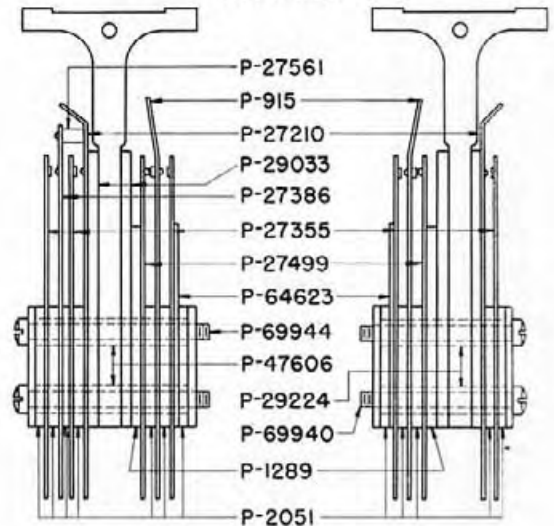
No. 1042



No. 1033



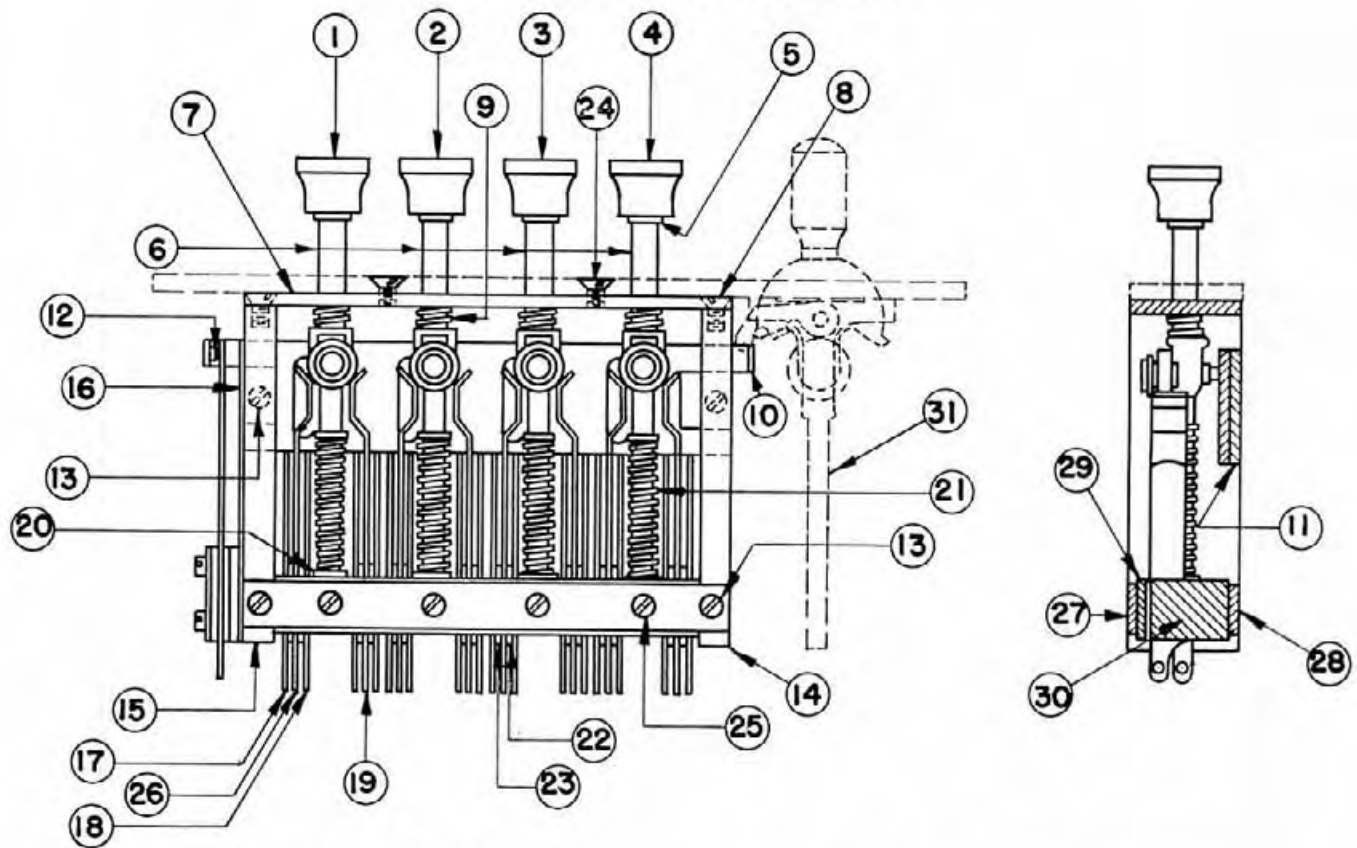
No. 1043



KEYS, PARTY TYPE

Four Party Keys

Code Nos. 265-A, 267-A, and 355-A



**COMMON PARTS FOR KEYS
NOS. 265-A, 267-A, AND 355-A**

**PARTS NOT COMMON FOR KEYS
NOS. 265-A, 267-A, AND 355-A**

Item No.	Piece No.	Description
1	3992	Button (Black)
2	3993	Button (Green)
3	3994	Button (Red)
4	3995	Button (Blue)
5	55624	Spring Washers
6	27075	Plunger Assembly
7	28769	Mounting Plate
8	6545	Special Screws
9	27052	Spring
10	49757	Release Strip
11	27056	Guide
12	27106	Insulator
13	13238	Special Screw
14	27062	Upright (right)
15	27064	Upright (left)
16	33437	Insulation
17	27079	Spring with Contact
18	27077	Spring with Contact
19	34034	Spring with Contact
20	32275	Washers
21	32276	Springs
22	10200	Insulations
23	3204	Insulations
24	29023	Mounting Screws

Item No.	For Key Code No.	Piece No.	Description
25	355-A	47169	Special Screw
25	265-A, 267-A	27123	Special Screw
26	355-A	27087	Spring with Contact
27	355-A	34037	Strip (front)
27	265-A, 267-A	27066	Strip (front)
28	355-A	34037	Strip (rear)
28	265-A, 267-A	27068	Strip (rear)
29	355-A	47167	Insulator
29	265-A, 267-A	27069	Insulator
30	355-A	47166	Mounting Block
30	265-A, 267-A	27070	Mounting Block
31			Release key. For parts for these release keys see parts list for cam keys Nos. 1000-A, 1015-A, 1045-A, 1053-A, 1062-A, 1125-A, and 1162-A on pages 275 and 276.

**COMMON PARTS FOR KEYS
CODE NOS. 265, 267, AND 355**

Common parts for keys Code Nos. 265, 267, and 355 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below.

Item No.	Piece No.	Description
10	32365	Release Strip

Listing Continued on page 274.

KEYS, PARTY TYPE (Cont'd)

**PARTS NOT COMMON FOR KEYS
CODE NOS. 265, 267, AND 355**

Special parts for keys Code Nos. 265, 267, and 355 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below. See Listing, Page 273.

Item No.	Description
31	Release key. For parts for these release keys see parts list for cam keys Nos. 1000, 1044, 1045, 1053, 1062, and 1162 in section following.

**COMMON PARTS FOR KEYS
CODE NOS. 266 AND 310**

Common parts for keys Code Nos. 266 and 310 are the same as those for keys Code Nos. 265-A, 267-A, and 355-A above except as shown below.

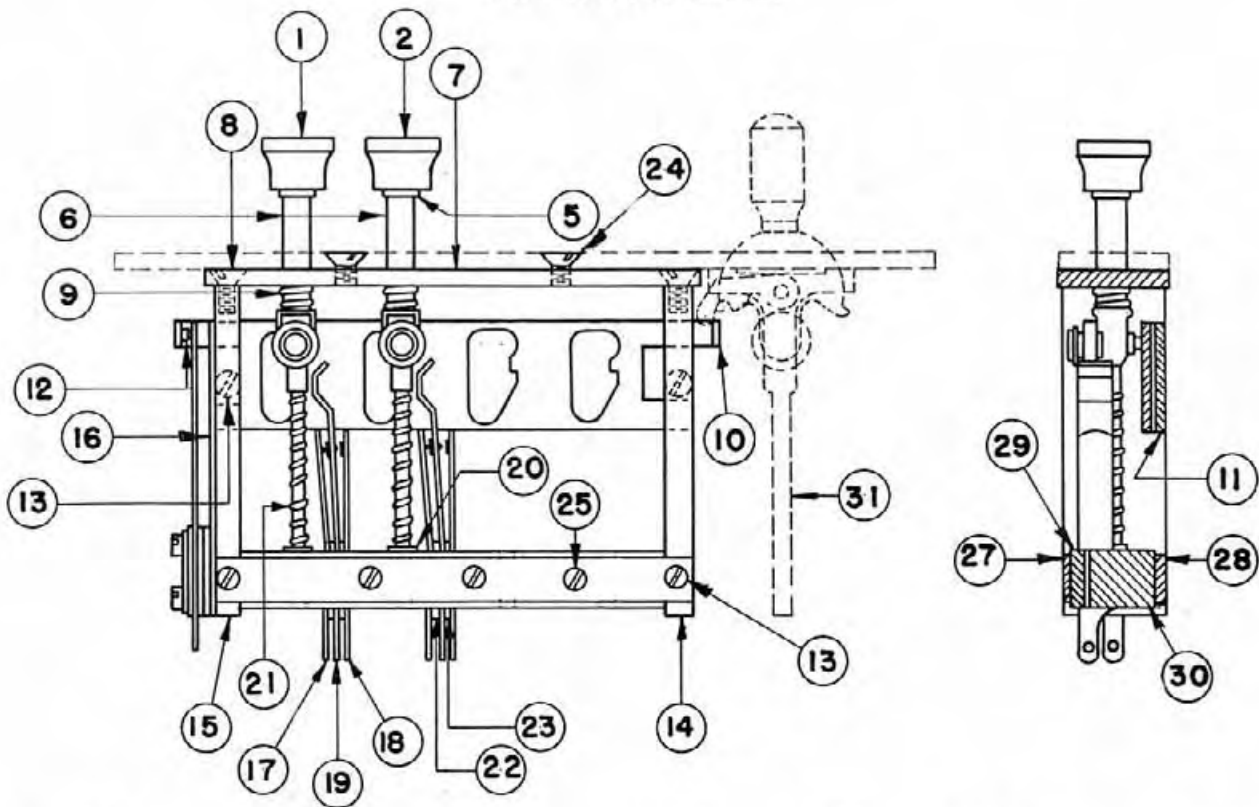
Item No.	Piece No.	Description
10	27126	Release Strip

PARTS NOT COMMON

Special parts for keys Code Nos. 266 and 310 are the same as those for keys Code Nos. 265-A and 267-A listed on page 273 except as shown below.

Item No.	Description
31	Cam key not included

**Two Party Keys
Code Nos. 358-A and 328**



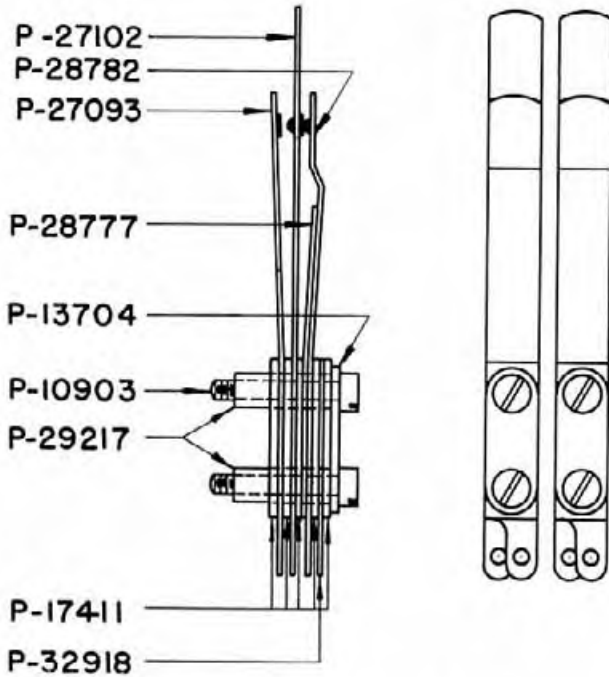
Item No.	For Key Code No.	Piece No.	Description	Item No.	For Key Code No.	Piece No.	Description
1	358-A, 328	3992	Button (Black)	17	358-A, 328	27079	Spring with Contact
2	358-A, 328	3994	Button (Red)	18	358-A, 328	27077	Spring with Contact
5	358-A, 328	55624	Spring Washer	19	358-A, 328	34034	Spring with Contact
6	358-A, 328	27075	Plunger Assembly	20	358-A, 328	32275	Washer
7	358-A, 328	28769	Mounting Plate	21	358-A, 328	32276	Spring
8	358-A, 328	6545	Special Screw	22	358-A, 328	10200	Insulators
9	358-A, 328	27052	Spring	23	358-A, 328	3204	Insulators
10	358-A	49757	Release Strip	24	358-A, 328	29023	Mounting Screws
10	328	27126	Release Strip	25	358-A, 328	27123	Screws
11	358-A, 328	27056	Guide	27	358-A, 328	27066	Strip (front)
12	358-A, 328	27106	Insulator	28	358-A, 328	27068	Strip (rear)
13	358-A, 328	13238	Special Screw	29	358-A, 328	27069	Insulator
14	358-A, 328	27062	Upright (right)	30	358-A, 328	27070	Mounting Block
15	358-A, 328	27064	Upright (left)	31	358-A		All "A" type restoring cam keys.
16	358-A, 328	33437	Insulator	31	328		Not restored by cam key.

KEYS, PARTY TYPE (Cont'd)

End Springs

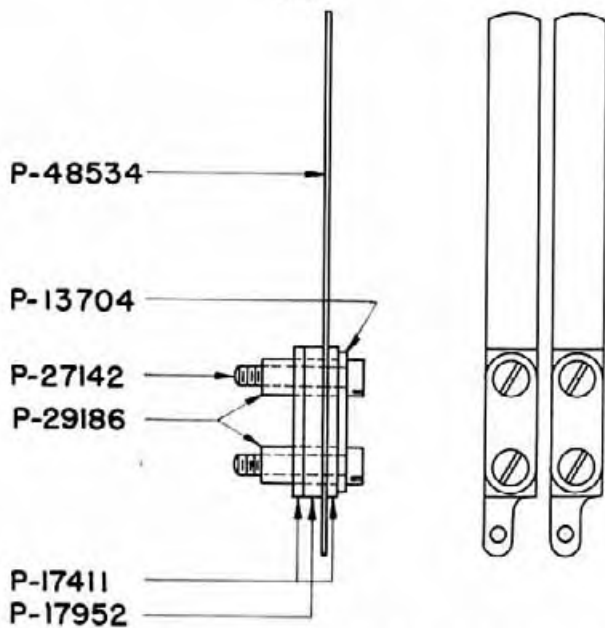
The drawing below shows the piece parts for end springs of the following party type keys.

Code No.	Code No.
265	355
265-A	355-A
266	358-A
328	



The drawing below shows the piece parts for end springs of the following party type keys.

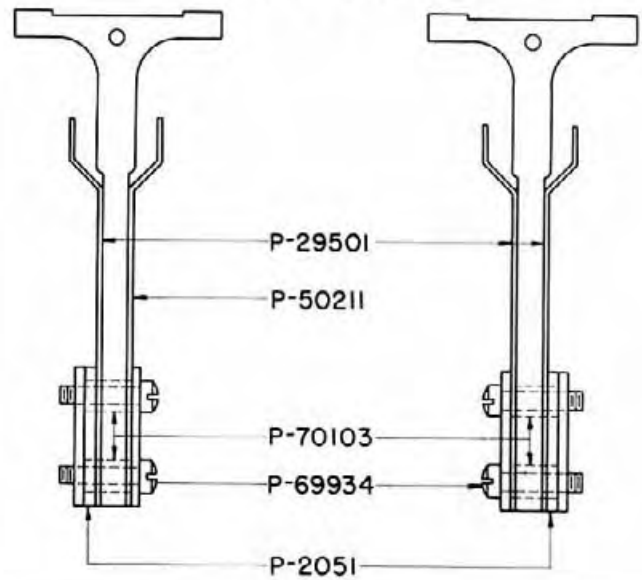
Code No.
267
267-A
310



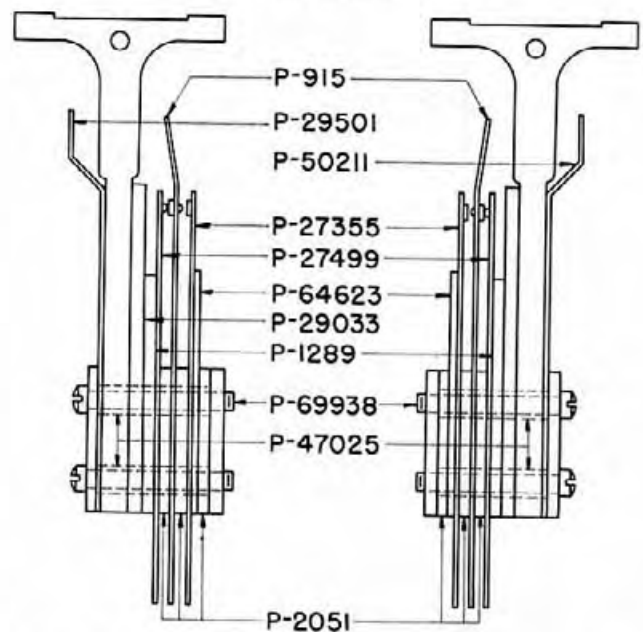
Restoring Cam Keys for Common Parts

Piece No.	Description
15171	Handle
46221	Cam Stop
28871	Nut (for short mounting screws)
49724	Mounting Screw (short)
49726	Mounting Screw (long—for cam stop side)
32690	Dust Protector Washer (felt)
47557	Dust Protector Washer (brass)
28872	Nut (for long mounting screws)

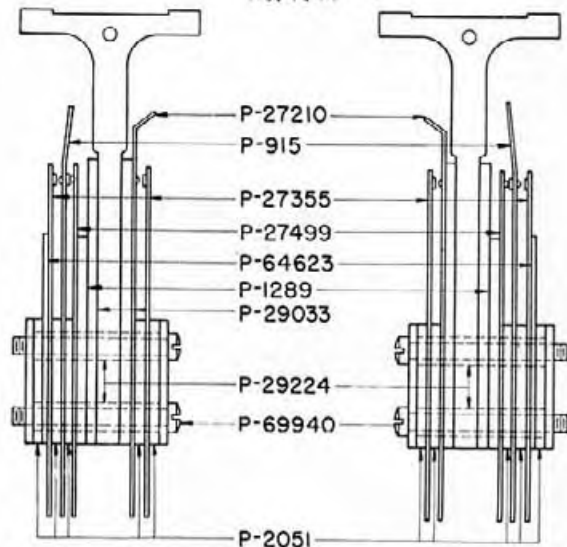
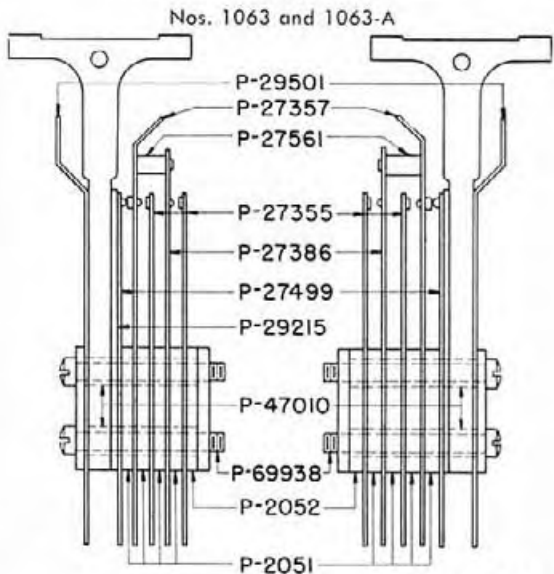
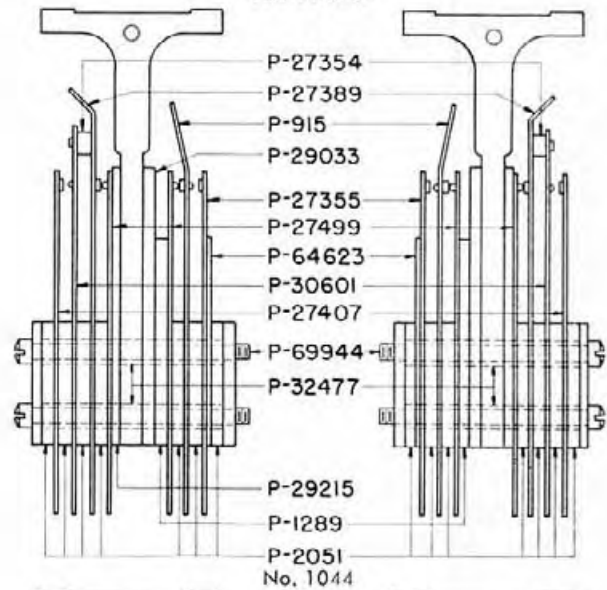
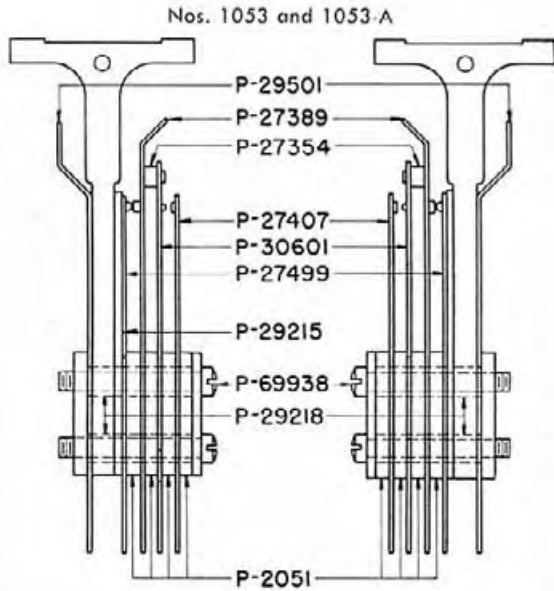
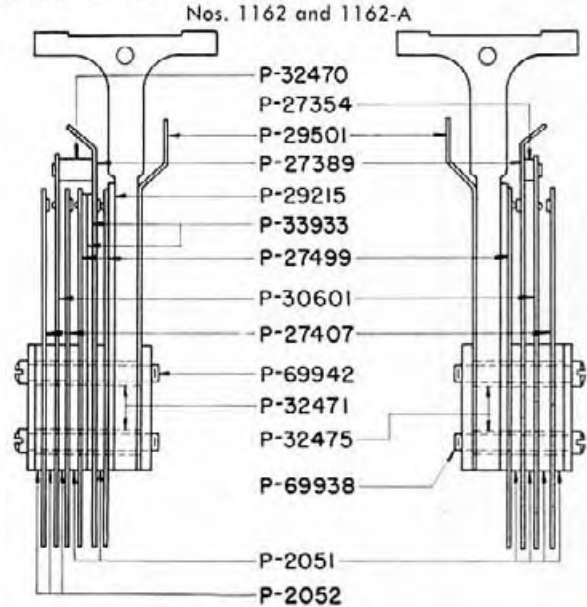
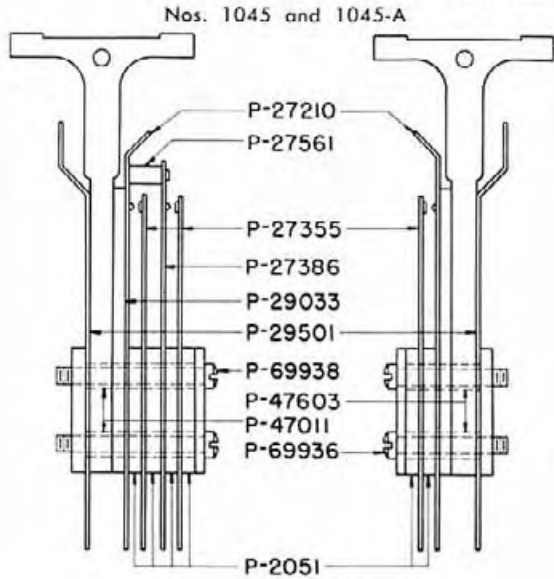
Nos. 1000 and 1000-A



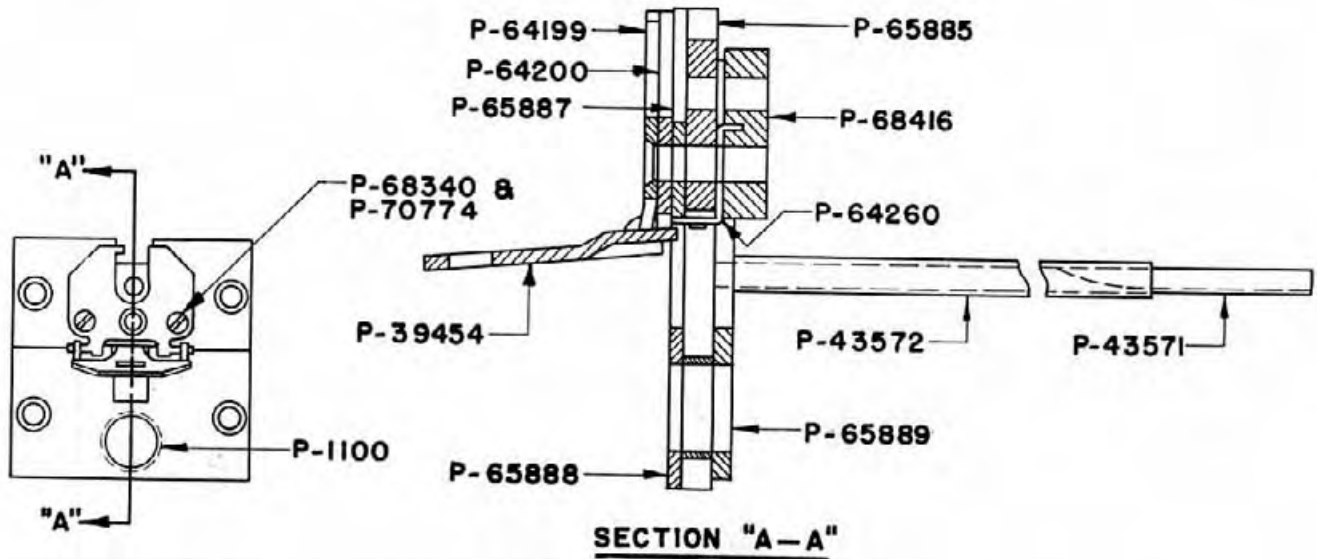
No. 1015-A



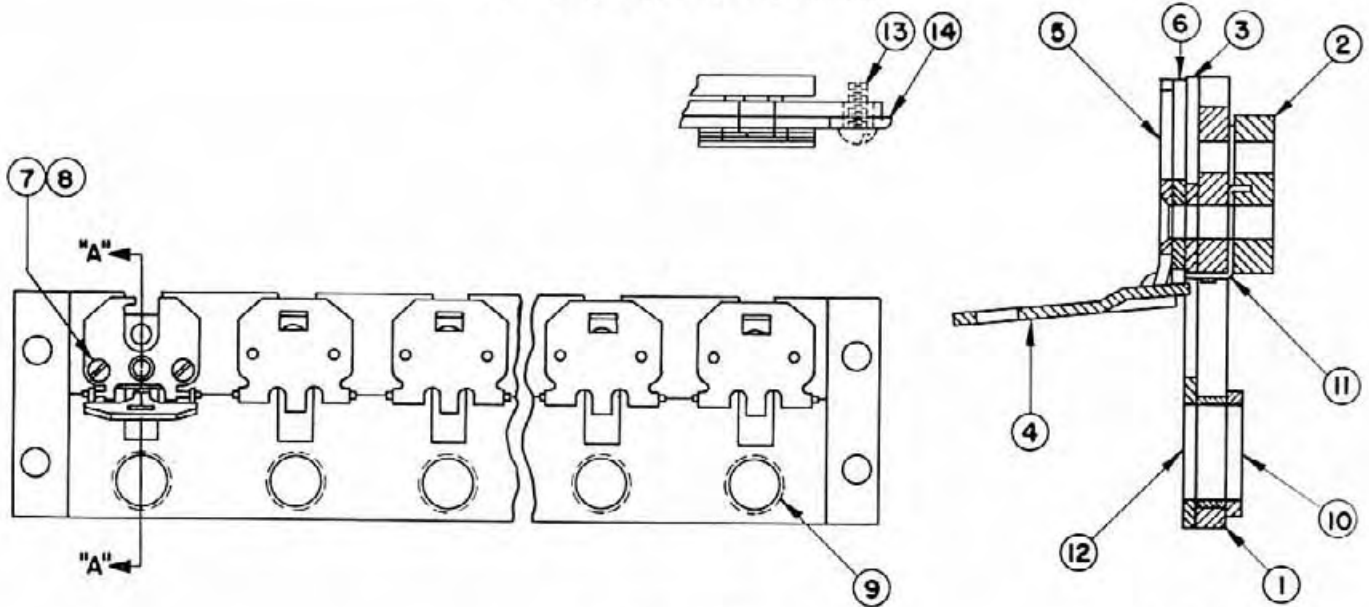
KEYS, PARTY TYPE (Cont'd)
RESTORING CAM KEYS FOR



MOUNTINGS
For Drops and Combined Drops and Jacks
No. 552



Nos. 495, 497, 499, 500, and 502



COMMON PARTS

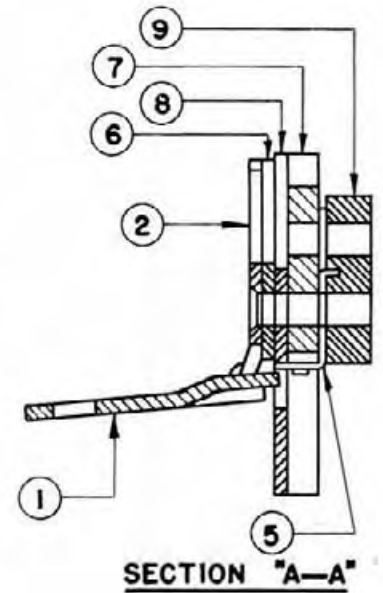
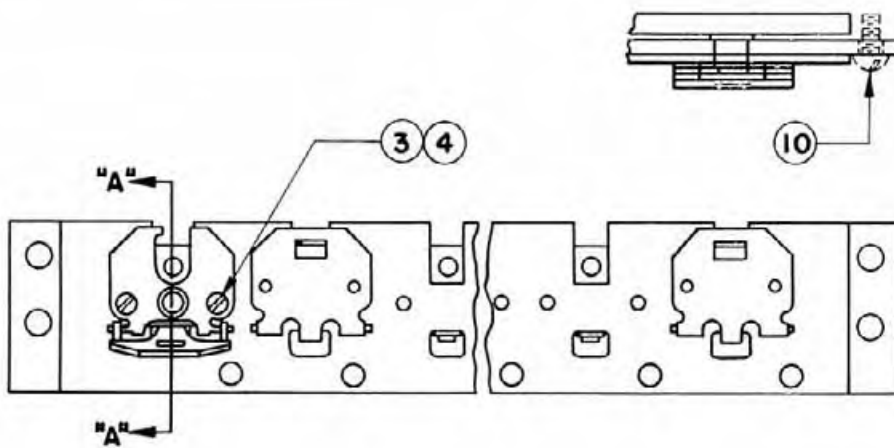
Item No.	Piece No.	Description	Item No.	Piece No.	Description
4	39454	Shutter	8	68341	F. H. M. Screw
5	64199	Support	9	1100	Bushing
6	64200	Insulator	10	12907	Rear Insulator
7	70774	Nut	11	64260	Contact Terminal Assembly

PARTS NOT COMMON

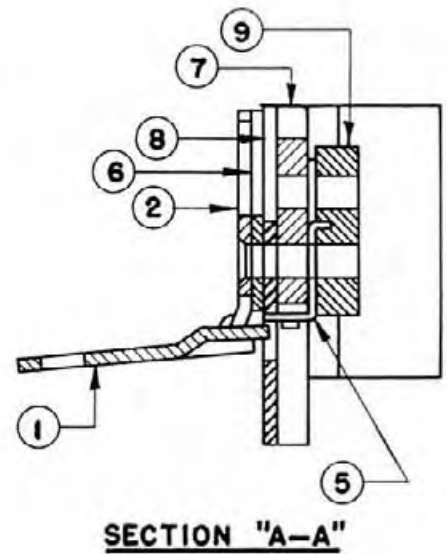
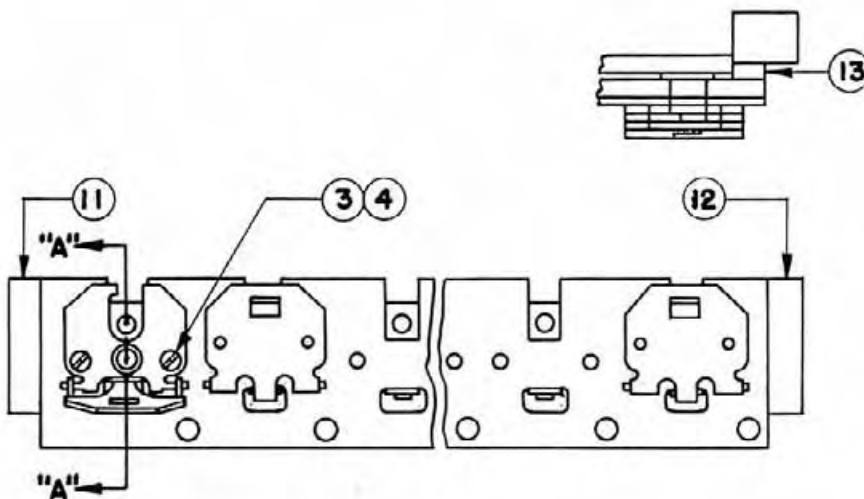
Item No.	Piece No.	Description	Mounting Code No.	Item No.	Piece No.	Description	Mounting Code No.
1	68003	Mounting Strip	495, 502	12	12928	Front Insulator	495
1	68327	Mounting Strip	497, 499, 500	12	29350	Front Insulator	502
2	68004	Rear Insulator	495, 502	12	12905	Front Insulator	497, 500
2	68328	Rear Insulator	497, 499, 500	12	25858	Front Insulator	499
3	64201	Front Insulator	495, 502	13	37883	R. H. Mach. Screw	500
3	64198	Front Insulator	497, 499, 500	13	58650	R. H. Mach. Screw	495, 497, 499, 502
10	12919	Rear Insulator	495, 502	14	28241	Adapter	500

MOUNTINGS (Cont'd)

No. 496



No. 509



Nos. 496 and 509

COMMON PARTS

Item No.	Piece No.	Description	Item No.	Piece No.	Description
1	39454	Shutter	4	68341	F. H. M. Screw
2	64199	Support	5	64260	Contact Terminal Assembly
3	70774	Nut	6	64200	Insulator

PARTS NOT COMMON

Item No.	Piece No.	Mounting Code No.	Description	Item No.	Piece No.	Mounting Code No.	Description
7	67478	496	Mounting Strip	9	67472	509	Rear Insulator
7	67473	509	Mounting Strip	10	58650	496, 509	R. H. M. Screw
8	64202	496	Front Insulator	11	29336	509	Lug
8	64204	509	Front Insulator	12	29337	509	Lug
9	68379	496	Rear Insulator	13	29177	509	Separator

PLUGS

SWITCHBOARD TYPE			
Code No.	Cover	Cover Screw	Terminal Screw
42	7960	899	1998
55	7960	899	1998
70	7960	899	1998
109	7960	899	1998
112	7960	899	1998
130	7960	899	1998
144	30109	899	1998
187	32156	899	1998
247	59769	59790	59791
255	66236	---	62235
106*	1807	899	27043 & 899
106**	71310	71312	8924
137	1807	899	27043
152	1807	899	27043
185	59944	59887	62235
199	27603	27115	27043
201*	27603	27115	27043

Code No.	Cover	Cover Screw	Terminal Screw
201**	71311	71312	27043
233	59881	59885	59884
235	61872	61874	61873
268	62266	---	62235

* Old Type
**New Type (has over-all shell)

OPERATORS' TYPE				
Code No.	Cover	Cover Screw	Terminal Screw	Washer
107	3240	1464	8924	
136	6209	1464	899	
139	29849	14955	29032	
145			4069	5019
146			4069	5019
182			7025	12582
236	67209	67239	67229	67211
240	49675	14955	27043	
245			56957	5019

POLE CHANGERS

Vibrator assembly piece numbers and contact stud and spring assembly piece numbers are shown below for all Kellogg pole changers shown in the Apparatus Section. For parts other than those listed consult the Kellogg sales department.

Pole Changer Code Number	Position	Frequency	Vibrator Assembly No.
39	1	16 $\frac{2}{3}$ cycles	59267
	2	33 $\frac{1}{3}$ cycles	59266
	4	50 cycles	59264
	5	66 $\frac{2}{3}$ cycles	59265
41	-	20 cycles	59267
42	1	16 cycles	59267
	2	30 cycles	59266
	3	42 cycles	59265
	4	54 cycles	59264
	5	66 cycles	59263
43	-	60 cycles	59263
44	1	16 cycles	61884
&	2	30 cycles	69541
45	3	42 cycles	69542
	4	54 cycles	69543
	5	66 cycles	69544
46	-	16 cycles	61884

**Vibrator Assembly Parts
Piece No. 59263**

Piece No.	No. of Pieces	Description
59253	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59256	2	Coil assembly
59280	1	Weight
53881	1	Screw (weight)
59281	1	Weight (nut)

Piece No. 59264

Piece No.	No. of Pieces	Description
59253	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59257	2	Coil assembly
59282	1	Weight
13241	1	Screw (weight)
59283	1	Weight (nut)

POLE CHANGERS (Cont'd)

Piece No. 59265

Piece No.	No. of Pieces	Description
60274	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	1	Spring assembly (transformer contact)
59257	2	Coil assembly
59282	2	Weight
8782	1	Screw (weight)
59283	1	Weight (nut)

Piece No. 59266

Piece No.	No. of Pieces	Description
59255	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59258	2	Coil assembly
8807	1	Weight
13699	1	Screw (weight)
8809	1	Weight (nut)

Piece No. 59267

Piece No.	No. of Pieces	Description
59254	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
59259	2	Coil assembly
31124	5	Washer (weight)
31126	3	Washer (weight)
31128	5	Washer (weight)
7410	1	Washer (weight)
8807	1	Weight
13699	1	Screw (weight)
48948	1	Weight (nut)

Piece No. 61884

Piece No.	No. of Pieces	Description
59254	1	Armature assembly
11962	1	Motor contact stud
67686	1	Transformer contact stud
7437	1	Spring assembly (motor contact)
66604	2	Spring assembly (transformer contact)
70769	2	Coil assembly
8807	1	Weight
13699	1	Screw (weight)
7409	1	Weight (nut)

RACKS, CONNECTING

Nos. 25-A and 25-B



COMMON PARTS

Description	Part No.
Screw	58885
Clip	58884

PARTS NOT COMMON

For No. 25-A	
Block	58881
Cover	58887
For No. 25-B	
Block	58889
Cover	58882

RECEIVERS

No. F-41-A

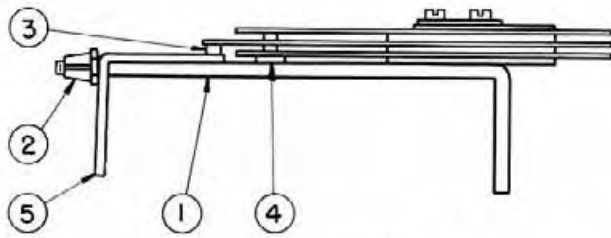


Description	Piece No.
Diaphragm	58015
Shell	27944
Cap	32307
Coil Assembly	45210
Coil Assembly	45211
Cord	F-644-TR

No. 87-A

Description	Piece No.
Cap	59891
Diaphragm	59918
Coil Assembly	66597
Shell Assembly	66290
Screw	59913

RELAYS
2000 Type



Parts Common to All 2000 Type Relays

Item No.	Piece No.	Description
1	28368	Frame Assembly
2	1287	Armature Nut
Special Parts		
Item No.	Description	
3	Armature Tip Bushing	
4	Spring Stop Bushing	
5	Armatures (see armature ordering information below)	

How to Order

To order special parts for 2000 type relays the order should read as follows:

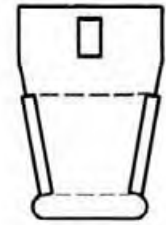
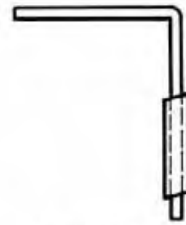
Item 3 (2091 relay)—when armature tip bushing for 2091 relay is desired.

Item 4 (2091 relay)—when spring stop bushing for 2091 relay is desired.

Armature Ordering Information

The armatures shown at the right are interchangeable for all 2000 type relays to conform with various circuit conditions. In ordering specify the type desired.

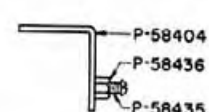
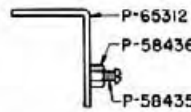
Armature Types
STANDARD, A, B, AND C ARMATURES



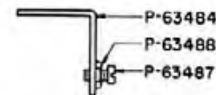
Residual Clip	Thickness	Piece No.
Standard	.010 in.	65319
A	.006 in.	65320
B	.003 in.	65321
C	None	65311

P-65314

P-61364



P-63484



RINGERS

No. 120-Type

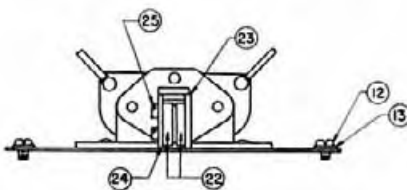
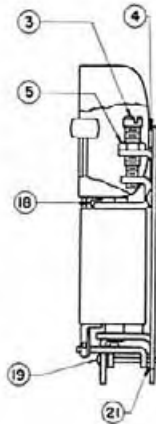
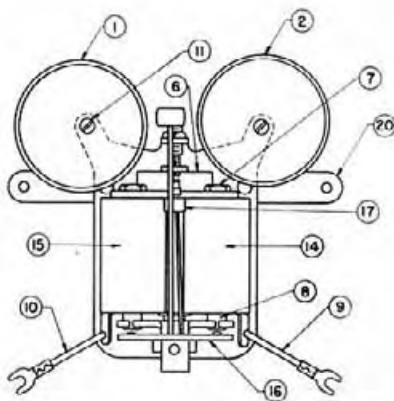
Nos. 120, 122 and 123

PARTS COMMON TO ALL 120-TYPE RINGERS

Item No.	Piece No.	Description
1	64935	Gong
2	64934	Gong
3	64936	Adjusting Screw
4	70893	Lock Washer
5	64953	Hex. Nut
6	64919	Magnet & Bracket Assembly
7	70301	Locknut
8	64923	Core
9	64964	Wire Assembly
10	64963	Wire Assembly
11	70892	R.H.M. Screw
12	64871	Screws
13	64965	Lock Washers

OTHER PARTS FOR NO. 120-TYPE BIASED RINGERS

Item No.	Code No.	Piece No.	Description
14	120-BA	64945	Coil Assembly
	120-BB	68841	Coil Assembly
	120-BC	68843	Coil Assembly
15	120-BA	64944	Coil Assembly
	120-BB	68840	Coil Assembly
	120-BC	68842	Coil Assembly
16	120-BA, BB, BC	64927	Armature & Clapper Assembly
17	120-BA, BB, BC	64925	Bias Spring Stud
18	120-BA, BB, BC	64924	Bias Stud Retaining Spring
19	120-BA, BB, BC	64937	Pin
20	120-BA, BB, BC	70487	Base Assembly
21	120-BA, BB, BC	64952	Washer



RINGERS (Cont'd)
120 TYPE (Cont'd)
 For drawing see page 283.

STRAIGHT LINE RINGERS

ARMATURE WITH WEIGHT

Item No.	Code No.	Piece No.	Description
14	123-SA	64945	Coil Assembly
	123-SB	68841	Coil Assembly
	123-SC	68843	Coil Assembly
15	123-SA	64944	Coil Assembly
	123-SB	68840	Coil Assembly
	123-SC	68842	Coil Assembly
16	123-SA, SB & SC	68930	Armature & Clapper Assembly
20	123-SA, SB & SC	70487	Base Assembly
21	123-SA, SB & SC	64952	Washer

Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
16	HA-1	71720	HB-1	71725	HC-1	71730
	HA-2	71721	HB-2	71726	HC-2	71731
	HA-3	71722	HB-3	71727	HC-3	71732
	HA-4	71723	HB-4	71728	HC-4	71733
	HA-5	71724	HB-5	71729	HC-5	71734

HARMONIC, SYNCHROMONIC & DECIMONIC RINGERS

Item No.	Code No.	Piece No.	Description
14	122-HA-1, HA-2, HA-3, HB-2, HB-3, HA-4, HC-2	68843	Coil Assembly
	122-HB-5, HA-4	68841	Coil Assembly
	HA-5, HB-1, HC-1		
	122-HA-1, HA-2, HA-3, HB-2, HB-3, HA-4, HC-2	68841	Coil Assembly
15	122-HB-5, HA-4, HA-5, HB-1, HC-1	68840	Coil Assembly

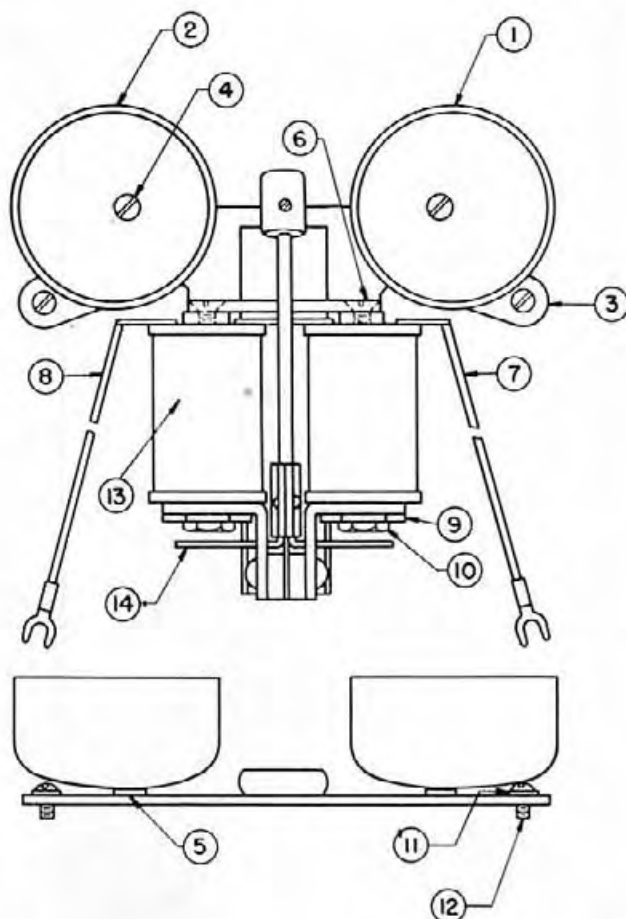
Item No.	Code No.	Piece No.	Description
20	122-HA, HB & HC	64916	Base Assemb.
22	122-HA, HB & HC	65920	Spacer
23	122-HA, HB & HC	65928	Clamping Plate
24	122-HA, HB & HC	65919	Washer
25	122-HA, HB & HC	65935	Spec. Fl. Fil. H.M. Screw

NO. 124 TYPE (with Adjustable Armature)

HARMONIC, SYNCHROMONIC AND DECIMONIC

No. 124

PARTS COMMON TO ALL 124-TYPE RINGERS



Item No.	Piece No.	Description
1	64934	Gong
2	64935	Gong
3	71163	Magnet and Bracket Assembly
4	70892	R.H.M. Screw
5	70893	Lock Washer
6	56557	F.H.M. Screws
7	71167	Wire Assembly
8	71166	Wire Assembly
9	71129	Spec. Hex. Nut
10	71127	Spec. Hex. H.M. Screw
11	64965	Lock Washers
12	71165	Screws

SPECIAL PARTS FOR 124-TYPE RINGERS

Item No.	Code No.	Piece No.	Description
13	124-HA-1, HA-2, HA-3	71158	Coil Assembly
	124-HB-2, HB-3, HB-4		
	HC-2		
	124-HB-5, HA-5, HB-1, and HC-1	71159	Coil Assembly

PARTS FOR ARMATURE WITH WEIGHT

Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
14	HA-1	71383	HB-1	71388	HC-1	71393
	HA-2	71384	HB-2	71389	HC-2	71394
	HA-3	71385	HB-3	71390	HC-3	71395
	HA-4	71386	HB-4	71391	HC-4	71396
	HA-5	71387	HB-5	71392	HC-5	71397

RINGERS (Cont'd)

NO. 125 TYPE (with Adjustable Armatures)

The 125 type ringer is designed to substitute for Stromberg-Carlson and Western Electric ringers. The S-125 ringer is for Stromberg-Carlson ringers in Stromberg-Carlson telephones and the W-125 ringer is for Western Electric No. 302 type ringers in Western Electric telephones.

PARTS COMMON TO ALL 125-TYPE RINGERS

Item No.	Piece No.	Description
1	64934	Gong
2	64935	Gong
3	71238	Magneto and Bracket Assembly
4	70892	R.H.M. Screw
5	70893	Lock Washer
6	71379	F.H.M. Screw
7	71243	Wire Assembly
8	71244	Wire Assembly
9	71129	Spec. Hex. Screw
10	71127	Spec. Hex. H.M. Screw

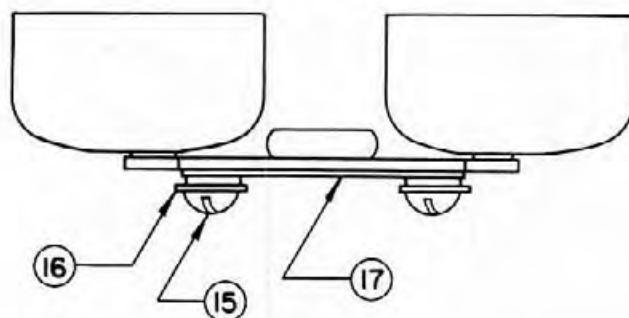
OTHER PARTS FOR S-125 & W-125 RINGER

Item No.	Code No.	Piece No.	Description
13	125-HA-1, HA-2, HA-3 125-HB-2, HB-3, HB-4 HC-2	71158	Coil Assembly
	125-HB-5, HA-5 HB-1, HC-1	71159	Coil Assembly

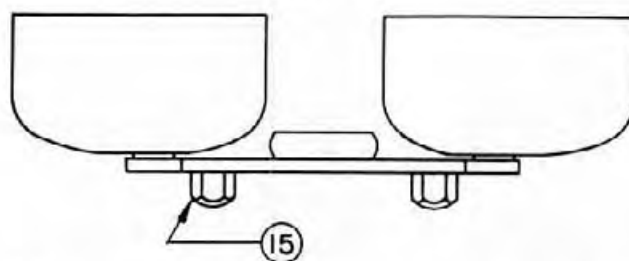
Armature with Weight

Part numbers for armature and weight assemblies for the W-125 ringer are the same as those shown for the 124 ringer on page 284.

No. S-125

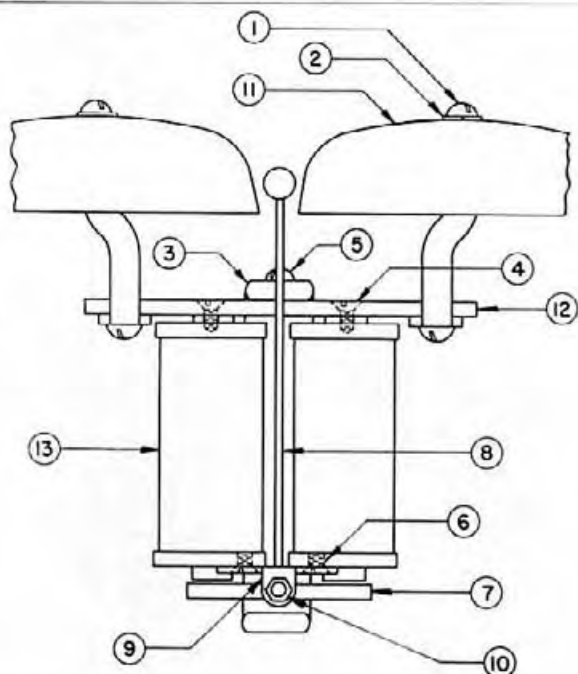


No. W-125



Item No.	Code No.	Piece No.	Code No.	Piece No.	Code No.	Piece No.
14	HA-1	71409	HB-1	71414	HC-1	71419
	HA-2	71410	HB-2	71415	HC-2	71420
	HA-3	71411	HB-3	71416	HC-3	71421
	HA-4	71412	HB-4	71417	HC-4	71422
	HA-5	71413	HB-5	71418	HC-5	71423

Item No.	Code No.	Piece No.	Description
15	W-125	71235	Spec. Hex. Hd. M. Screw
15	S-125	56744	R.H.M. Screw
16	S-125	71232	Ext.-Int. Tooth Lockwasher
17	S-125	71233	Adapter



NO. 78 TYPE (with Non-Adjustable Armature)
Nos. 55, 78, and 109

PARTS COMMON TO ALL NO. 78-TYPE RINGERS

Item No.	Piece No.	Description
1	39400	R.H. Machine Screws
2	46936	Washers
3	12154	Magnet
4	58573	F.H. Machine Screw
5	58572	R.H. Machine Screw
6	12161	F.H. Machine Screw
7	12157	Armature Assembly
8	12195	Clapper Assembly
9	12160	Armature Support Assembly
10	10065	Screw and Nut Assembly

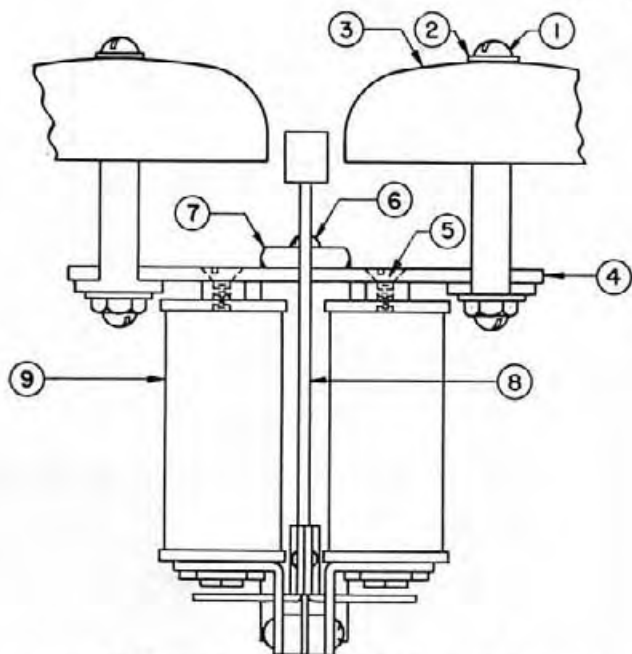
Other parts are shown on page 286.

RINGERS (Cont'd)
No. 78 Type

OTHER PARTS FOR NO. 78 TYPE RINGERS

Item No.	Code No.	Piece No.	Description	Item No.	Code No.	Piece No.	Description
11	55-G	53299	Gongs	13	78-A	51098	Coil Assembly
12	55-G	45123	Heel Iron Assembly	13	78-D	51156	Coil Assembly
13	55-G	51140	Coil Assembly	13	78-G	51140	Coil Assembly
11	78-A, 78-D, 78-G	30488	Gongs	11	109-G	2894	Gongs
12	78-A, 78-D, 78-G	50411	Heel Iron Assembly	12	109-G	50412	Heel Iron Assembly
				13	109-G	51140	Coil Assembly

NO. 72 TYPE
Nos. 72, 73, 74, and 101



OTHER PARTS FOR NO. 72 TYPE RINGERS

Item No.	Code No.	Piece No.	Description
7	72-A-1, 72-A-4 73-A-1, 73-A-2 73-A-3, 74-A-1 101-A	6705	Magnet
	72-A, 73-A-4 74-A-2	49194	Magnet
8	72-A-1 72-A-2 72-A-3 72-A-4 73-A-1 73-A-2 73-A-3 73-A-4 74-A-1 74-A-2 101-A	6498 6718 6719 6720 15193 15194 15195 15196 15191 15192 43475	Armature Armature Armature Armature Armature Armature Armature Armature Armature Armature Armature
9	72-A-1, 72-A-2 72-A-3, 74-A-2 72-A-4, 74-A-1 101-A 73-A-1, 73-A-2 73-A-3, 73-A-4	61328 61329 51081 51198	Coil Assembly Coil Assembly Coil Assembly Coil Assembly

PARTS COMMON TO ALL NO. 72 TYPE RINGERS

Item No.	Piece No.	Description
1	39400	R.H. Machine Screws
2	46936	Lock Washer
3	30488	Gong
4	42291	Heel Iron Assembly
5	58573	F.H. Machine Screws
6	58572	R.H. Machine Screws



NO. 120 TYPE



NO. 124 TYPE

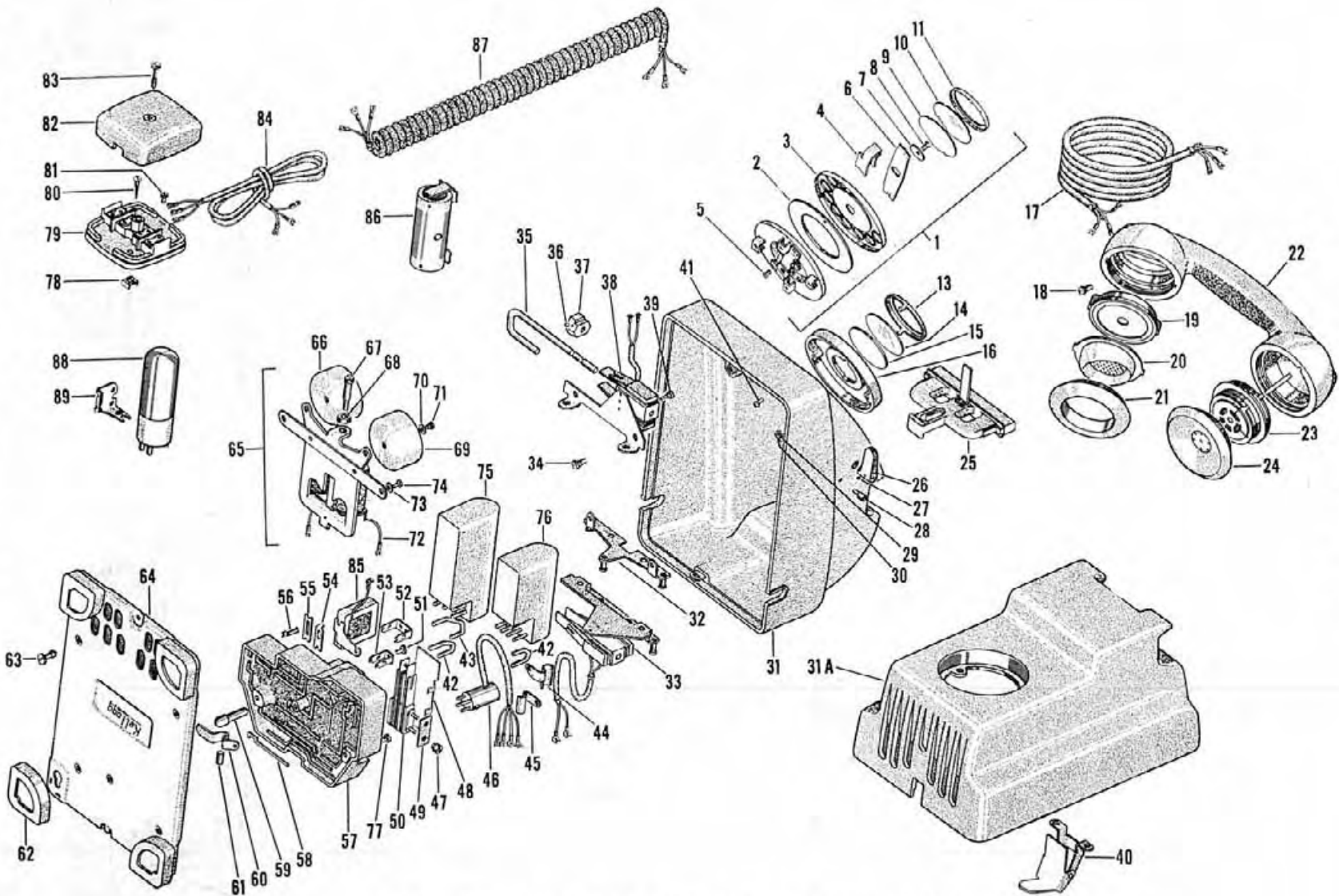


NO. 78 TYPE



NO. 72 TYPE

TELEPHONES
1000 SERIES MASTERPHONES



PARTS LISTINGS SHOWN ON PAGES 288, 289, 290, AND 291.

1000 SERIES MASTERPHONES

How to Order

Piece parts for the 1000 Series Masterphone should be ordered by piece number.

To determine the piece number of any part for these telephones first identify the part by item number from the drawing on page 287. Refer to the charts on the following pages and from the part number lists associated with each item number determine the part number of the part for the particular telephone for which the replacement is required.

Do not order parts by item number. If the piece part number cannot be determined from the following charts the part can be ordered by specifying the item number from the drawing on page 287 and the code number of the telephone for which the part is required. For example, to order a sub-base assembly for a D-1004 Masterphone order as follows: Item No. 57, for D-1004 Masterphone—Sub-Base Assembly.

(The chart below gives the piece number for this item—in this case Piece No. 70720.)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS	
1-11	Dials	On all Dial Masterphones	10-D, 10-DO, 10-G	For replaceable parts refer to "Dials" in this section.	
12-16	Dummy Plug		64967	Item 13 Retaining Ring Item 14 Protector for Number Card Item 15 Number Card Item 16 Dummy Plug Item 41 Mounting Screw	
17	Handset Cord, Fabric		770-MFP	For information on fabric and neoprene jacketed cords refer to "Cords" in Apparatus Section.	
17	Handset Cord, Neoprene		3000		
18-24	Handset		46-C	For replaceable parts refer to "Handsets" in this section.	
25	Plunger Bar			For Piece Part Ordering Information refer to "Desk Housing" below.	
26	Thumb Lever		69519		
27	Screw		69521		
28	Stud		69868		
29	Lockwasher		63766		
30	Nut		63952		
31	Desk Housing (Common Battery)	1000 1040 1004 1042 1005 1043 1007 1050 1008 1060 1020 1062 And dial Master- phones with above numbers	64892	Item 25 Plunger Bar Assembly Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Screw	64819 71302 64810 64820
31	Desk Housing (Common Battery with Press-to-Talk Switch)	1001 D-1001 1041 D-1041 1061 D-1061 1063 D-1063	69535	Item 25 Plunger Bar Assembly Item 26 Thumb Lever Item 27 Screw Item 28 Stud Item 29 Lockwasher Item 30 Nut Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Special Screw Item 35 Actuating Arm Item 36 Screw Item 37 Cam Item 38 Switch Assembly Item 39 Screw	69518 69519 69521 69868 63766 63952 70878 69514 64820 69510 69521 69511 69509 69512
31	Desk Housing (Magneto)	1070	70747	Item 25 Plunger Bar Assembly Item 31 Desk Housing Item 32 Support Bracket Assembly Item 34 Special Screw	64819 70726 64810 64820

1000 SERIES MASTERPHONES (Cont'd)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
31	Desk Housing (Magneto with Press-to-Talk Switch)	1071	71113	Note: This housing same as Housing 69535 except for Item 31 Desk Housing specify 71114 instead of 70878.
31	Desk Housing	D-1081	70350	Note: Housing same as Housing 69535 except Item 38 Switch Assembly for 70350 to be 70344.
31	Desk Housing	1081	70351	Item 38 Switch Assembly for Pc. 70351 to be Pc. 70345.
31	Desk Housing	1021	71189	Item 38 Switch Assembly for Pc. 71189 to be Pc. 71190.
31-A	Wall Housing (Common Battery)	1100 1142 1104 1150 1105 1160 1120 1162 1140	64805	Item 25 Plunger Bar Assembly 64819 Item 31A Wall Housing 70879 Item 32 Support Bracket Assembly 64810 Item 34 Screw 64820 Item 40 Switch Arm Assembly 64814
31-A	Wall Housing (Common battery with Press-to-Talk Switch)	1101 D-1101 1141 D-1141 1161 D-1161 1163 D-1163	69536	Item 25 Plunger Bar Assembly 64819 Item 26 Thumb Lever 69519 Item 27 Screw 69521 Item 28 Stud 69868 Item 29 Lockwasher 63766 Item 30 Nut 63952 Item 31A Wall Housing 70880 Item 33 Switch & Support Bracket Assembly 69530 Item 34 Special Screw 64820 Item 35 Actuating Arm 69510 Item 36 Screw 69521 Item 37 Cam 69511 Item 39 Screw 69512 Item 40 Switch Arm Assembly 64814
31-A	Wall Housing (Magneto)	1170	70748	Same as Wall Housing Pc. 64805 except Item 31-A to be Pc. 70881 instead of Pc. 70879.
31-A	Wall Housing (Magneto with Press-to-Talk Switch)	1171	71153	Same as Wall Housing Pc. 69536 except Item 31-A to be Pc. 71154 instead of Pc. 70880.
31-A	Wall Housing	1121	71192	Item 33 switch and support bracket assembly for Piece No. 71192 is Piece No. 71193.
31-A	Wall Housing	1181	70349	Item 33 switch and support bracket for Piece No. 70349 is Piece No. 70347.
31-A	Wall Housing	D-1181	70348	Item 33 switch and support bracket assembly for Piece No. 70348 is Piece No. 70346.
32	Support Bracket Assembly		64810	For Housings Piece Nos. 64892, 70747, and 64805.
32	Support Bracket Assembly		69514	For Housings Pc. Nos. 69535, 71113, 71192, 70349, and 70348.
33	Support Bracket and Switch Assembly		69530	For Housings Pc. Nos. 69536, 71153, 71192, 70349, and 70348.
34	Screw		64820	
35	Actuating Arm		69510	
36	Screw		69521	

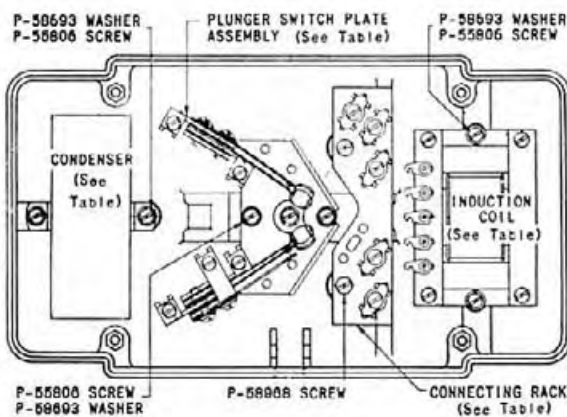
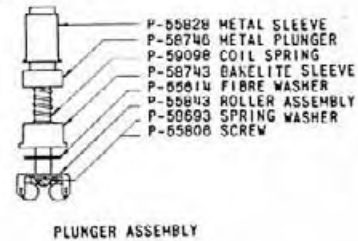
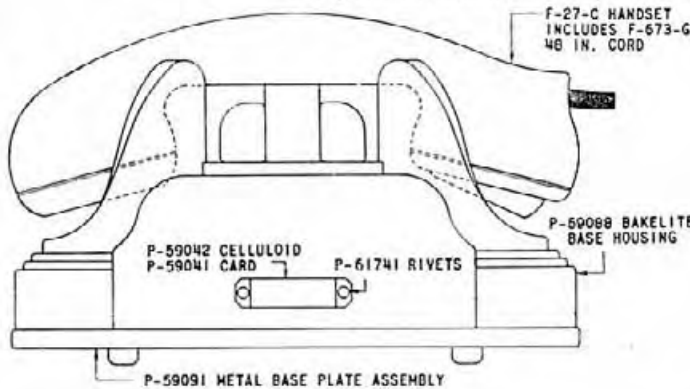
1000 SERIES MASTERPHONES (Cont'd)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
37	Cam		69511	
38	Switch Assembly		69509	For Piece Part Ordering Information refer to Desk and Wall Housings above.
39	Screw		69512	
40	Switch Arm Assembly		64814	
41	Screw (Dial and Dummy Plug)		64867		Refer to "Dials" above for application of this screw.
42	Strap		64865	Strap for dial jacks, 2-4, and for stripped telephones.
43	Strap		69559	Strap, used when condenser is not used.
44	Clamp		69585	For holding "Press-to-Talk" switch cord against Desk Housing.
45	Clamp		64864	For holding dial cord against housing. Also for "Press-to-Talk" on wall housing.
46	Dial Cord and Plug	All dial Master-phones except —81	64984	
46	Dial Cord and Plug	D-1081, D-1181	70353	
47	Nut, Spring Assembly		64853	Part of Sub-Base Assembly.
48	Cover, Spring Assembly		64856	Part of Sub-Base Assembly.
49	Plate, Spring Assembly		65890	Part of Sub-Base Assembly.
50	Spring Assembly		64833	Part of Sub-Base Assembly.
51	Screw, Terminal		63262	
52	Terminals, Double Screw		64911	
53	Terminals, Single Screw		64912	
54	Link, Induction Coil		64915	
55	Link, Condenser		64914	
56	Terminal, Pin Plug			Not furnished separately.
				Includes:
				Item 42, Strap
				Item 43, Strap
		1000 1140		Item 47, Nut, Spring Assembly
		1001 1141		Item 48, Cover, Spring Assembly
		1050 1142		Item 49, Plate, Spring Assembly
		1060 1150		Item 50, Spring Assembly
		1061 1160		Item 51, Screw Terminal
57	Sub-Base Assembly	1062 1161	64910	Item 52, Terminal, Double Screw
		1063 1162		Item 53, Terminal, Single Screw
		1070 1163		Item 54, Link, Induction Coil
		1100 1170		Item 55, Link, Condenser
		1101 D-1021		Item 56, Terminal, Pin Plug (not furnished separately)
		1120 D-1104		Item 58, Wire (not furnished separately)
		1121 D-1107		Item 59, Plunger, Switch Hook (not furnished separately)
				Item 60, Switch, Lever Assembly (not furnished separately)
				Item 61, Pivot Pin (not furnished separately)
				Item 77, Screw for Handset Cord

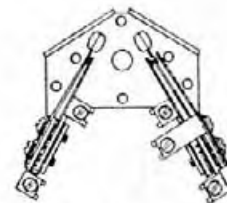
1000 SERIES MASTERPHONES (Cont'd)

ITEM	DESCRIPTION	USED ON MASTERPHONE CODE NO.	COMPLETE ASSEMBLY NUMBER	REMARKS AND PIECE PART NUMBERS
57	Sub-Base Assembly	1004 1042 1005 1104 1020 1105 1021 D-1004 1040 D-1007 1041 D-1020	70720	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	1043	71171	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	1071 D-1181 1081 D-1081 1171 D-1181	70337	See note for Piece No. 64910, Item 57 above.
57	Sub-Base Assembly	D-1008	70722	See note for Piece No. 64910, Item 57 above.
58	Wire			Not furnished separately.
59	Plunger, Switch Hook			Not furnished separately.
60	Switch, Lever Assembly			Not furnished separately.
61	Pivot Pin			Not furnished separately.
62	Rubber Foot Assembly		64882	For Desk Base Plate, Piece No. 64880.
63	Lock Screw, Desk Housing		64868	For Desk Base Plate, Piece No. 64880.
64	Base Plate with Rubber Feet	All Desk Masterphones	64880	
64	Base Plate less Rubber Feet	All Wall Masterphones	64879	
65-74	Ringers		122-124 types	For replaceable parts refer to "Ringers" in this section.
75	Condenser	All Master-phones	No. 225	
76	Induction Coil, Common Battery	All C. B. Masterphones	No. 113-A	
76	Induction Coil, Local Battery	All L. B. Masterphones	No. 114-A	
77	Screw for Handset Cord		64870	See note for Item 57, Piece No. 57, above.
78-83	Line Connecting Block		No. 27	For replaceable parts see "Connecting Blocks" in this section.
84	Base Cord, Fabric Covered		No. 769-MFP	Three Conductor Type.
84	Base Cord, Neoprene Jacketed		No. 3000	Three Conductor Type.
84	Base Cord, Fabric Covered		No. 771-MFP	Four Conductor Type.
85	Retard Coil		No. 64-A	For 1020-1120 Masterphones with or without dial.
85	Retard Coil		No. 64-B	For 1081-1181 Masterphones with or without dial.
86	Vincent Rare Gas Relay		No. RTC-2	For reducing line induction on divided ringing circuits.
87	Koiled Cord		No. 1000	Can be furnished instead of straight cord if desired.
88	Western Electric Tube		No. 333-A	For polarity selective ringing with biased ringers.
89	Bracket		64979	For mounting Gas Relays and Western Electric tubes in Kellogg 1000 Series Masterphones.

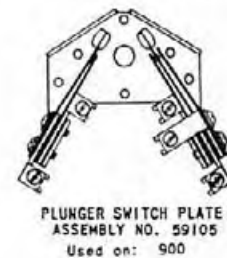
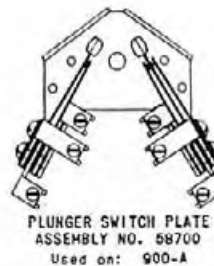
No. 900 Type Masterphones
For parts list for these telephones see page 293.



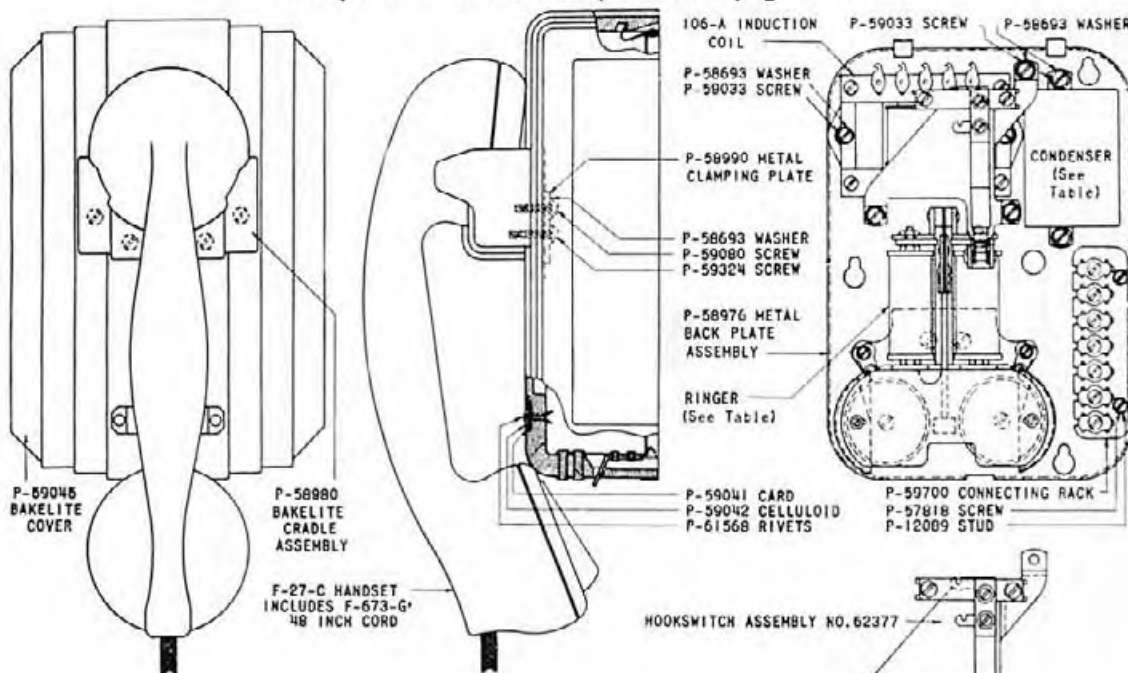
PLUNGER SWITCH PLATE
ASSEMBLY NO. 61211
Used on: 950-LR and
950-C-LR
Same as No. 59105 ex-
cept for stamping of
terminal designations.



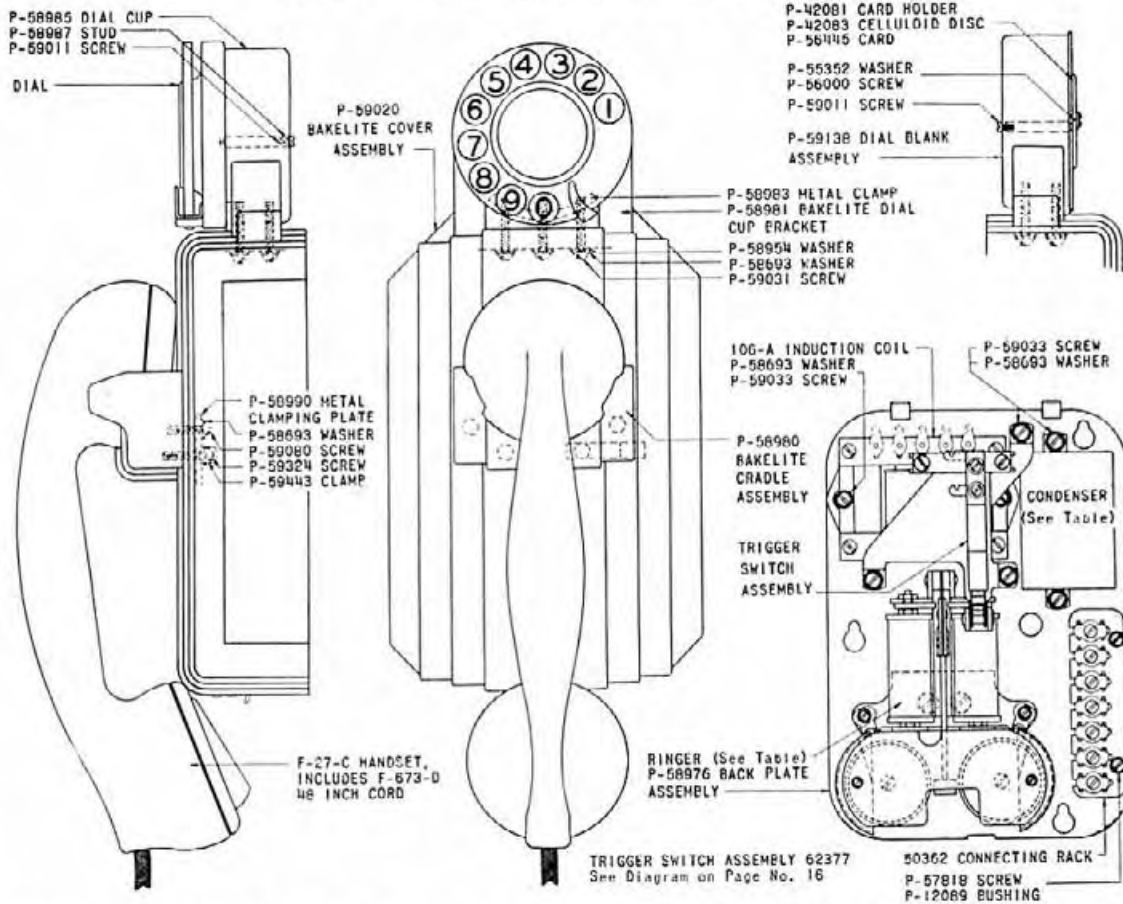
PLUNGER SWITCH PLATE
ASSEMBLY NO. 62370
Used on:
900-BAX B-900-HBX
900-BAX 900-HCX
900-HAX B-900-HCX
900-HAX 900-LRX
900-HBX B-900-LRX



No. 9900 Type Masterphones
For parts list for these telephones see page 293.



No. 9917 Type Masterphones
For parts list for these telephones see page 294.



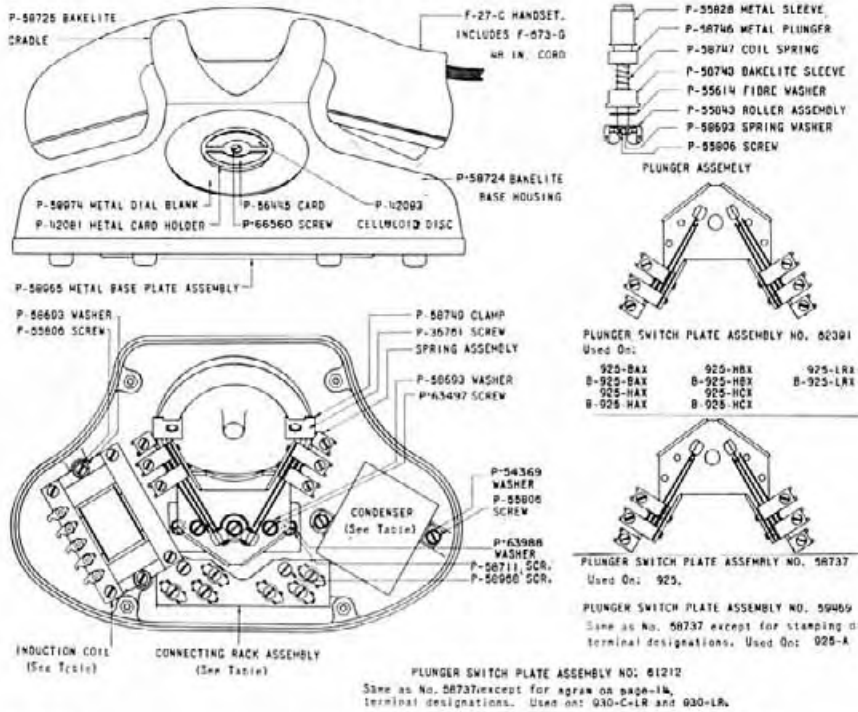
Parts Used in All 900 Type Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones.	1
59088	Bakelite Base Housing.	1
59091	Metal Base Plate Assembly with Rubber Feel.	1
58964	Base Plate Retaining Screw.	4
Number Plate Parts		
59042	Celluloid	1
59041	Card	1
61741	Rivet	2
Plunger Switch Parts		
59097	Chromed Metal Plunger.	1
55828	Chromed Metal Sleeve.	1
59098	Coil Spring	1
58743	Bakelite Sleeve	1
55843	Roller Assembly	1
55806	Roller Assembly Screw.	1
55614	Fibre Washer	1
58693	Spring Washer	1
Miscellaneous Mounting Screws and Washers		
55806	Screw to Mount Plunger Switch Assembly.	2
58693	Washer	2
55806	Screw to Mount Condenser.	2
58693	Washer	2
55806	Screw to Mount Induction Coil.	2
58693	Washer	2
58968	Screw to Mount Connecting Rack.	2

Parts Used in All 9900 Type Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones.	1
58980	Bakelite Cradle Assembly.	1
59045	Bakelite Cover	1
58976	Back Plate	1
106-A	Induction Coil	1
62377	Trigger Switch Assembly.	1
59700	Connecting Rack	1
Cradle Mounting Parts		
58990	Metal Clamping Plate.	1
59080	Cradle Mounting Screw.	2
59324	Cradle Mounting Screw.	2
58693	Spring Washers	4
Number Plate Parts		
59041	Card	1
59042	Celluloid	1
61568	Rivets	2
Miscellaneous Mounting Screws and Parts		
59033	Screw for Mounting Trigger Switch.	3
58693	Washer	3
59033	Screw for Mounting Condenser.	2
58693	Washer	2
59033	Screw for Mounting Induction Coil.	2
58693	Washer	2
57818	Screw for Mounting Connecting Rack.	2
12089	Connecting Rack Bushing.	2

No. 925 Masterphones



Parts for No. 9917 Masterphones

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset used with all Masterphones	1
58976	Base Plate	1
50362	Connecting Rack	1
106-A	Induction Coil	1
62377	Trigger Switch Assembly	1
59020	Bakelite Cover	1
58980	Bakelite Cradle Assembly	1

Cradle Mounting Parts

58990	Metal Clamping Plate	1
59080	Cradle Mounting Screw	2
59324	Cradle Mounting Screw	2
58693	Spring Washer	4
59443	Clamp for Dial Wires	1

Dial Bracket and Number Plate

58981	Bakelite Dial Cup Bracket	1
58985	Dial Cup	1
58983	Metal Clamp	1
59031	Screw	3
58954	Washer	3
58693	Spring Washer	3

Piece Part or Code No.	Description	Quantity Used
F-27-C	Handset, used with all Masterphones	1
58724	Bakelite Base Housing	1
58725	Bakelite Cradle	1
58965	Metal Base Plate Assembly, Rubber Feet	1
58964	Base Plate Retaining Screws	4

Dial Blank Number Plate

58974	Metal Dial Blank	1
42081	Metal Card Holder	1
56445	Round Card	1
42083	Round Celluloid Disc	1
66560	Screw	1
55352	Washer	1

Dial Mounting Parts

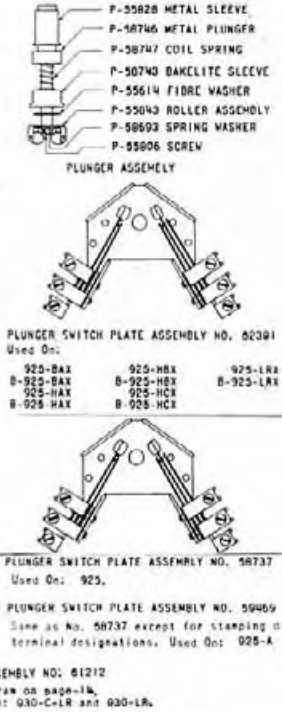
58749	Clamp	2
64867	Screw	2
69659	Adapter Ring (for mounting No. 10 type dial)	1

Plunger Switch Parts

58746	Chromed Metal Plunger	1
55828	Chromed Metal Sleeve	1
58747	Coil Spring	1
58743	Bakelite Sleeve	1
55843	Roller Assembly	1
55806	Roller Assembly Screw	1
55614	Fiber Washer	1
58693	Spring Washer	1

Miscellaneous Mounting Screws and Washers

58711	Screw to Fasten Cradle to Housing	2
63988	Washer	2
63479	Screw to Mount Plunger Switch Assembly	2
58693	Washer	2
55806	Screw to Mount Condenser	2
54369	Washer	2
55806	Screw to Mount Induction Coil	2
58693	Washer	2
58968	Screw to Mount Connecting Rack	2



Piece Part or Code No.	Description	Quantity Used
59138	Metal Dial Blank	1
56445	Round Card	1
42083	Round Celluloid Disc	1
42081	Metal Card Holder	1
56000	Screw	1
55352	Spring Washer	1

Dial Mounting Parts

59011	Screw	2
58987	Dial Mounting Stud	2

Miscellaneous Mounting Screws and Washers

59033	Screw for Trigger Switch	3
58693	Washer	3
59033	Screw for Mounting Condenser	2
58693	Washer	2
59033	Screw for Induction Coil	2
58693	Washer	2
57818	Screw for Connecting Rack	2
12089	Connecting Rack Bushing	2

TRANSMITTERS

**Nos. 121-C and 121-L
COMMON PARTS**

Part No.	Description
62178	Front
60416	Terminal
55806	Screw (Terminal)
59032	Screw
45545	Washer
5396	Screw (Trans. Back)
66521	Transmitter (121-C)
66522	Transmitter (121-L)

OTHER PARTS

**Nos. 157-C and 157-L
COMMON PARTS**

Part No.	Description
62178	Front
60416	Terminal
55806	Screw (Terminal)
59032	Screw
45545	Washer
35623	Screw
39911	Back
1916	Weight
2875	Nut
4187	Washer

OTHER PARTS

66521	Transmitter (157-C)
66522	Transmitter (157-L)

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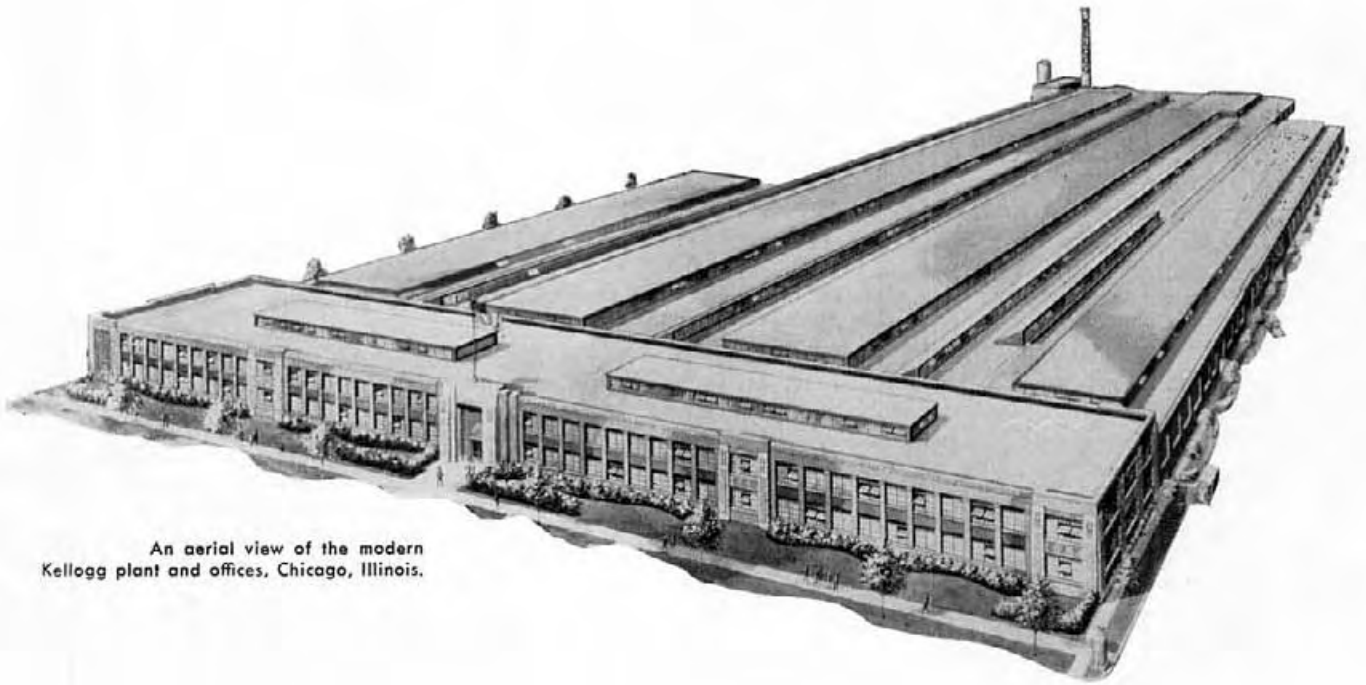
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An aerial view of the modern
Kellogg plant and offices, Chicago, Illinois.