



Kellogg

Kellogg Magneto Switchboards Bulletin No. 121

Circa 1926

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25 June 2010

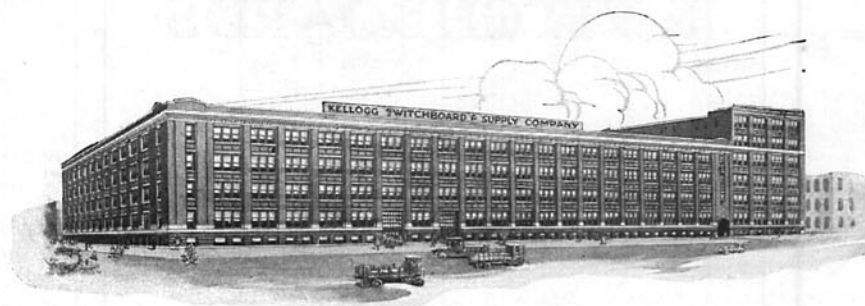
Kellogg

Magneto Switchboards



BULLETIN NO. 121

Kellogg
SWITCHBOARD & SUPPLY
Company
CHICAGO

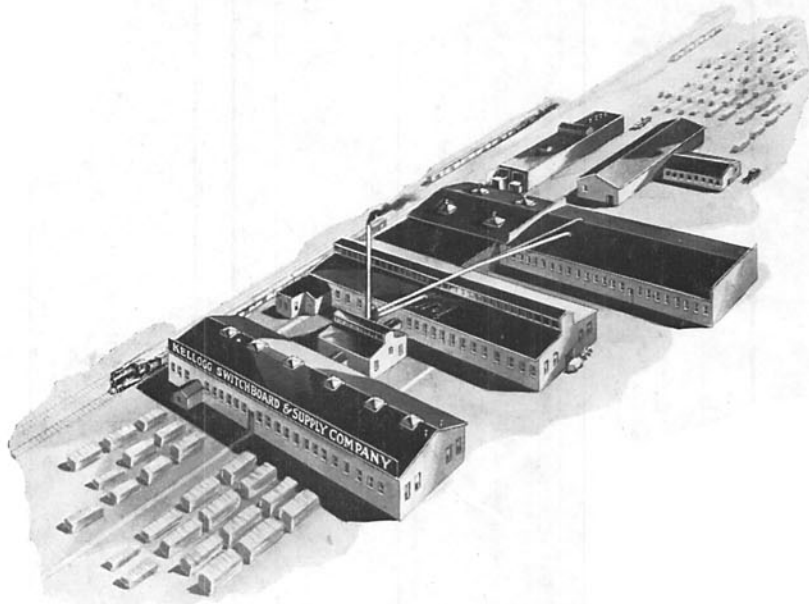


The fifteen acre plant of the

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

1020-1070 West Adams Street

CHICAGO, ILL., U. S. A.



Woodworking Plant where Kellogg Cabinets are made.

Kellogg Switchboard & Supply Company
CASSOPOLIS, MICHIGAN

KELLOGG

MAGNETO SWITCHBOARDS



Bulletin No. 121

KELLOGG SWITCHBOARD & SUPPLY COMPANY

1020-1070 West Adams Street

Chicago, Illinois

Branch Offices and Warehouses

COLUMBUS, OHIO
163 N. Fourth St.

KANSAS CITY, MISSOURI
308 W. 6th St.

SAN FRANCISCO, CALIFORNIA
1054 Mission St.

PORTLAND, OREGON
40-42 E. Seventh St.

What Kellogg Equipment Means To You

Your Problems Solved

The telephone man in the smaller town is up against a stiff problem. He must give good telephone service at all times, but he does not have at his call the highest class of telephone engineers or maintenance men to help him give it. He must therefore look to the manufacturer to provide equipment to meet his conditions and at the same time be practically trouble proof.

The Kellogg organization has been on the job for over thirty years making just that kind of equipment. In this time, thousands of Kellogg Magneto switchboards have been installed, not only in the United States but in every civilized country in the world.

There is a reason for this enormous popularity. That reason is the concentrated effort of the whole trained organization to make equipment which will give honest service economically for a long period. Kellogg products fairly treated will always make money for their owners. Just ask the nearest Kellogg owner.

So, the problem is easily solved. You can please your subscribers and make money with Kellogg.

A Trip Through Our Plant

We wish you could come over to see us and take a trip through our factories. You would soon understand what quality and workmanship mean.

First we might visit the twelve acre wood-working plant at Cassopolis, Michigan. There we would see huge truck loads of carefully selected hard wood rolled in and out of large kilns where the lumber is properly seasoned to prevent skinking, warping and cracking. You would see it cut and shaped by skilled cabinet makers. Then you would see the finishing. This finishing, which makes the Kellogg cabinets so distinctive, is equal to the work on the finest furniture.

At Chicago we would visit the scores of departments distributed over thirteen acres of

floor space. Your first inspection would be one of organized effort. The engineers would be glad to talk over your problems and tell you some of the things Kellogg is accomplishing in the telephone development field. The other departments would gladly discuss your telephone and outside plant requirements. Everywhere in the office you would find a friendliness and willingness to help you with *your* problems. That is the Kellogg spirit.

Then we would go into the plant. You would see dozens of screw machines turning out small parts automatically. You would see batteries of presses punching out other parts and forming some of the larger ones. You would see the finishing and plating of all kinds of parts. You would see the presses molding the receiver shells and caps. Each department would be making something, no matter how small, which would become a part of your equipment.

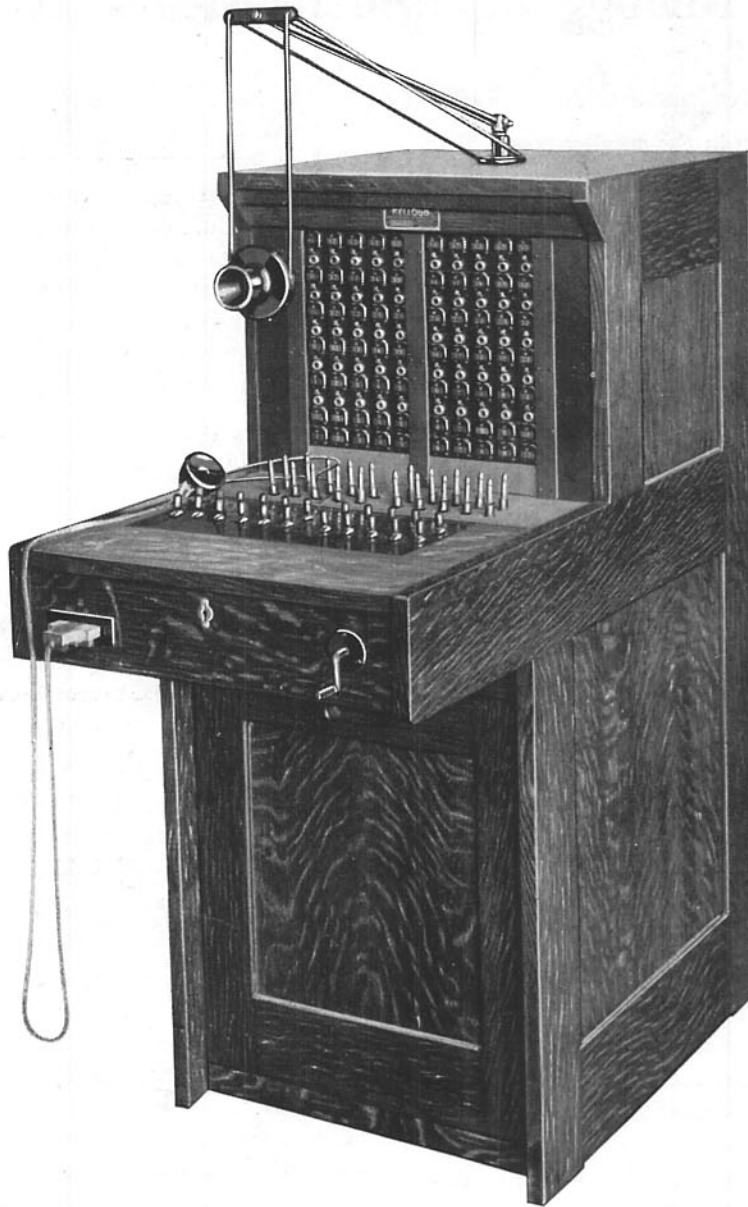
You would probably be impressed by the close inspections made of all operations. Everything must come up to the Kellogg standard or it is cast aside.

The assembling department would be restful after the whirr and roar of the other departments. Here you would see the carefully trained artisans constructing before your eyes the switchboard itself, their skilled hands rapidly putting together the various parts and assemblies. You would marvel at the amount of material that goes into the switchboard in so small a space, still leaving plenty of room for easy access. You would leave this department with a feeling of confidence and an understanding as to why Kellogg switchboards always make good.

The Kellogg Magneto Switchboard

In the following pages we will try to give you the information which will enable you to judge the type of board you need. We want to help you get the right equipment for your present and future needs. Do not hesitate to call on us.

No. 50 Magneto Switchboard



No. 50—Fifty Lines Capacity

One Position — Low Key Shelf — Drop Supervision Only
 Cabinet Code Lines Wired Cords Wired
 No. 50 50 10

Our No. 50 type is the smallest unit we build in floor type cabinets. For rural switching centers and other small exchanges where the demand is for not more than 50 lines, this switchboard has no equal. It is extremely fast and reliable in operation. It is so simple and durable in design that maintenance cost is practically nothing.

These switchboards are so arranged that the equipment is very easily installed. It is possible to purchase the cabinet fully wired but with only the required number of lines and cords equipped to meet the present requirements and add additional apparatus as needed. This enables you to avoid tying up money in idle equipment.

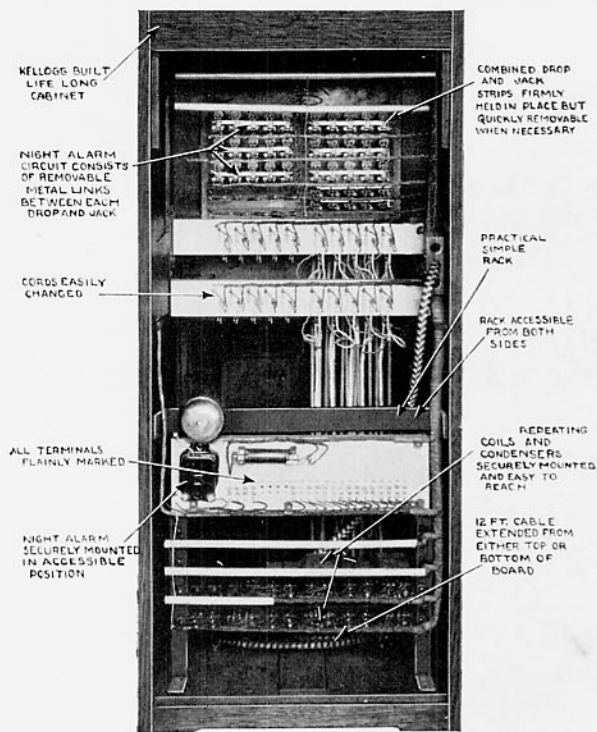
A suspended type operator's telephone will be equipped, unless otherwise requested; if desired, the breast plate type can be furnished, with no additional charge.

A heavy hand generator, generator switching key, a night alarm with control key, and 12 feet of extra switchboard cable extending from the upper or lower rear corner of the cabinet is standard. Unless otherwise specified by the customer, the cable will extend from the upper, rear, left hand corner.

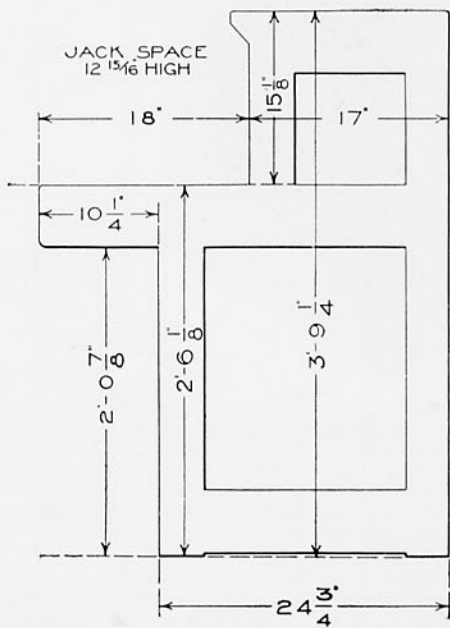
This job is finished in a beautiful dark golden oak, presenting a very attractive appearance. The cabinet is of a height suitable for the greatest comfort of the operator, permitting the use of a chair of ordinary height.

More complete and detailed information regarding the cabinet, circuits and apparatus used in the assembly of this switchboard is offered in other pages of this bulletin.

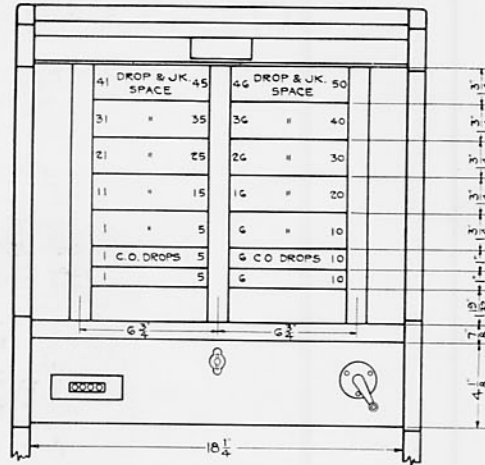
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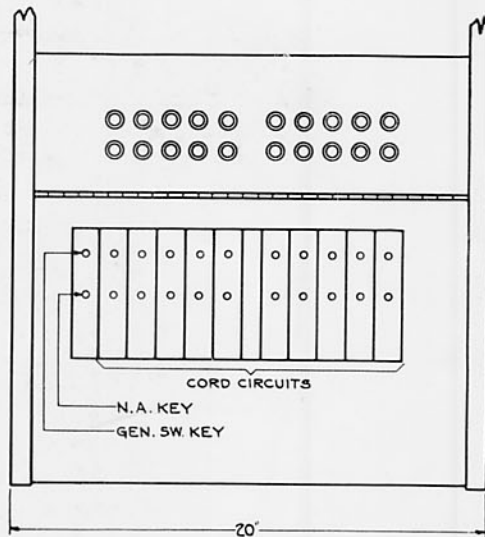
Rear view, 50 line board. Floor space occupied: Base, Depth, 24³/₄. Width, 18³/₄.



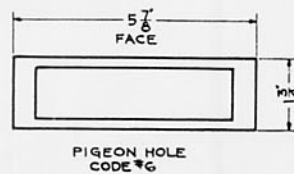
Side elevation 50 line cabinet.



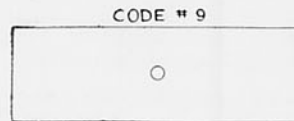
Front view of face equipment showing standard numbering arrangement of drops and jacks and front end of key shelf.



Top view of key shelf, showing keys and cord equipment.



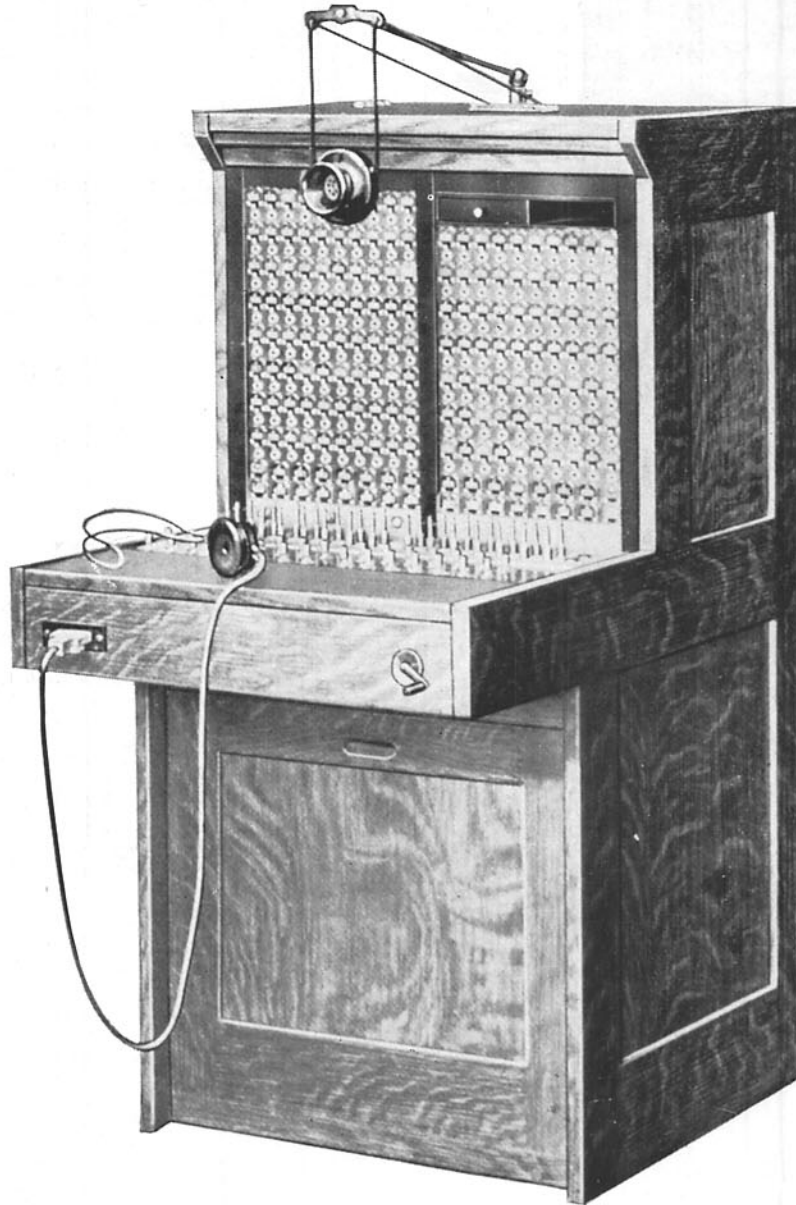
Occupies space of 5 combined drops and jacks, and will take a No. 9 cash drawer.



Cash Drawer to Fit No. 6 Pigeon Hole.

Shipping weight approximately 350 lbs.

No. 150 Magneto Switchboard



No. 150—One Hundred Fifty Lines Capacity

One Position —	Low Key Shelf —	Drop Supervision
Cabinet Code	Lines Wired	Cords Wired
No. 150-A	100	15
No. 150-B	150	15

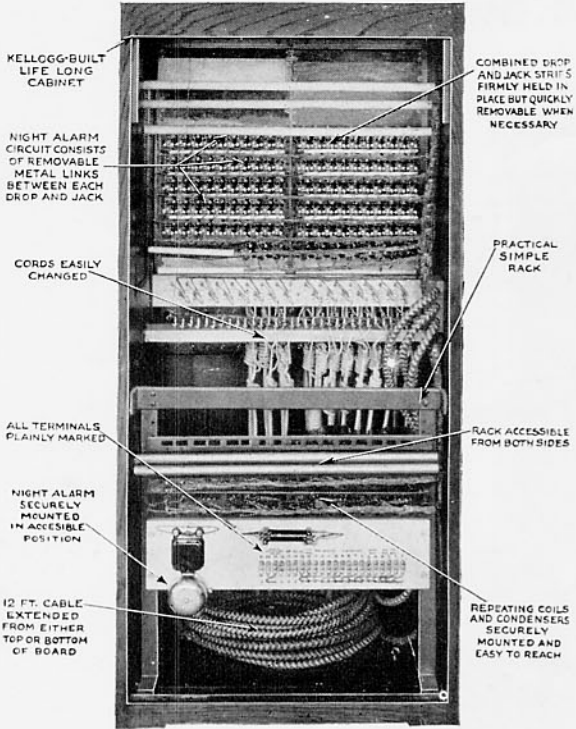
This switchboard is unequalled for speed, reliability and accuracy in operating, as well as for the indefinite wearing quality of its mechanical construction. The maintenance cost of any Kellogg Magneto switchboard is practically nothing.

This switchboard is furnished with either double lamp or drop supervision. It has two wired capacities of 100 and 150 lines each, known as our Code No. 150-A and No. 150-B, respectively, when drop supervision is used, or Code No. 150-AL and No. 150-BL when lamp supervision is used. (see page 10)

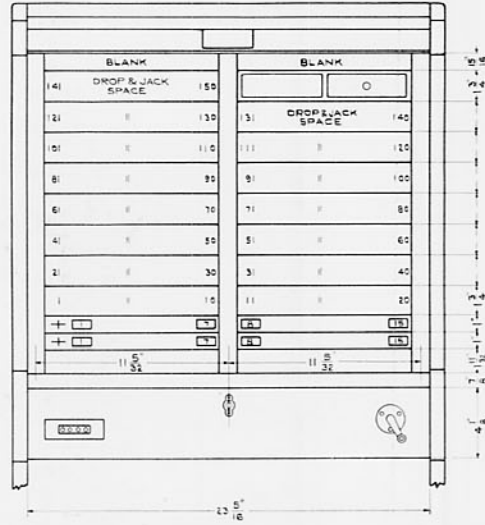
The cabinets are sturdily constructed of heavy quarter-sawn oak, so designed to provide the most equipment in a minimum of space. They can be equipped with any given number of lines and cord circuits up to the capacity in the factory and additional equipment added as required, as drops and jacks are easily installed in a Kellogg board. This eliminates the necessity of having money invested in idle switchboard equipment.

The height of the key shelf provides for easy operation from a chair of ordinary height, insuring the greatest comfort to the operator. When the growth of the exchange demands additional line space or another operator's position, a second complete cabinet can be installed adjacent to the first one, making a complete two-position switchboard of 300 lines capacity, inter-connecting the operators' sets with an operator's key provided for that purpose.

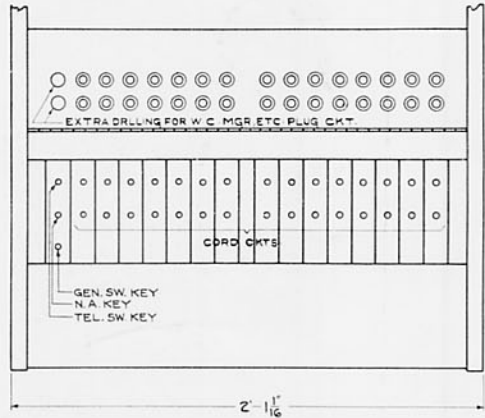
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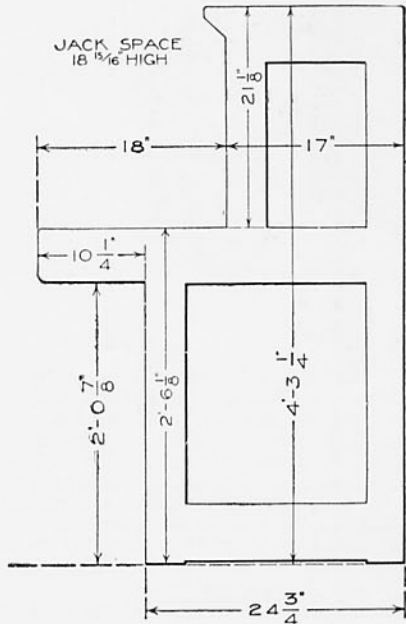
Rear view, 150 line board. Floor space occupied: Base, depth, $24\frac{3}{4}$ ". Width, $25\frac{1}{16}$ ".



Front view of face equipment, showing standard numbering arrangement of drops and jacks and front end of key shelf.



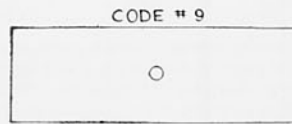
Top view of key shelf, showing keys and cord equipment.



Side elevation 150 line cabinet.



Occupies space of 10 combined drops and jacks, with compartments for cash drawers.



Cash Drawer To Fit "A"

Shipping weight, packed, approximately 500 lbs.

No. 200 Magneto Switchboard



No. 200—Two Hundred Lines Capacity

One Position — Low Key Shelf — Drop Supervision

Cabinet Code	Lines Wired	Cords Wired
No. 200-A	100	15
No. 200-B	150	15
No. 200-C	200	15

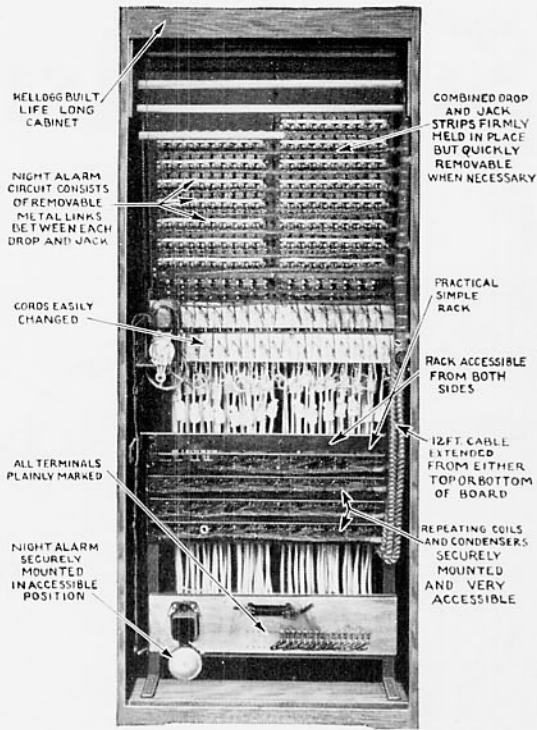
To meet a growing demand we have recently designed a cabinet having a greater flexibility than any similar equipment and incorporating all of the latest features to be had in a magneto central office. This cabinet is coded as our No. 200-A, No. 200-B and No. 200-C, each having an ultimate line space of 200 lines and wired at present for 100, 150 and 200 lines respectively.

Each cabinet is also wired for 15 double drop supervisory cord circuits and can be equipped as desired up to this number. We also furnish this switchboard with double lamp supervision under our codes No. 200-AL, No. 200-BL and No. 200-CL. (see page 12)

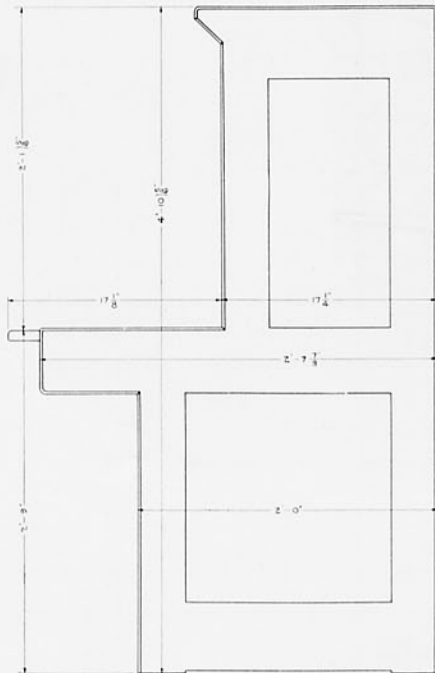
This cabinet is especially adapted to meet the needs of an exchange where the present or future requirements demand more than one position as the positional units match perfectly, and where more than two positions are used, provision is made for transfer trunks. The key shelf height provides maximum cord reach, yet insures the greatest operating comfort, as a medium height chair is used. If at a future date an installation composed of two or more sections of this switchboard is replaced by common battery, this board may be separated into single position units and used in other smaller exchanges.

An operator's telephone of either the breast plate or suspended type, a hand generator, generator switching key, night alarm and control key, also 12 feet of line cables extending from the cabinet is standard equipment furnished with each board.

For dimensions of cabinets, description of equipment, circuits, etc., study the following pages.

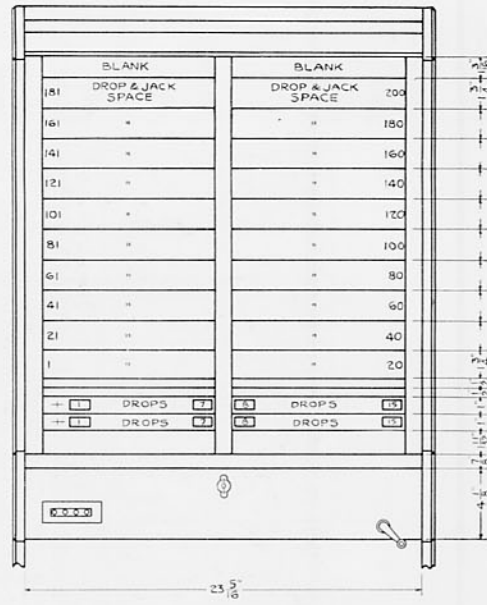


Rear view of 200line board.

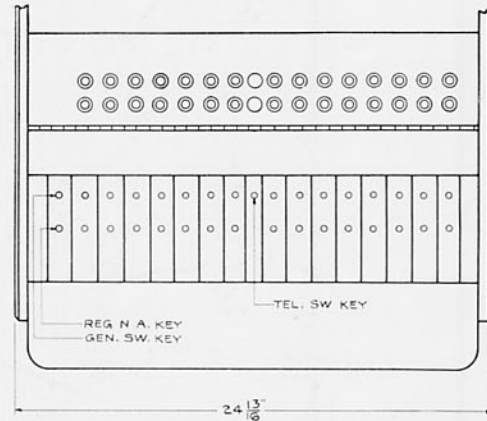


Side elevation, 200 line cabinet.

Floor space occupied: Base, depth, 24 3/4 in.; width, 24 13/16 in.



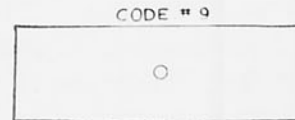
Front view of face equipment, showing standard numbering arrangement of drops and jacks and front end of key shelf.



Top view of key shelf, showing keys and cord equipment.



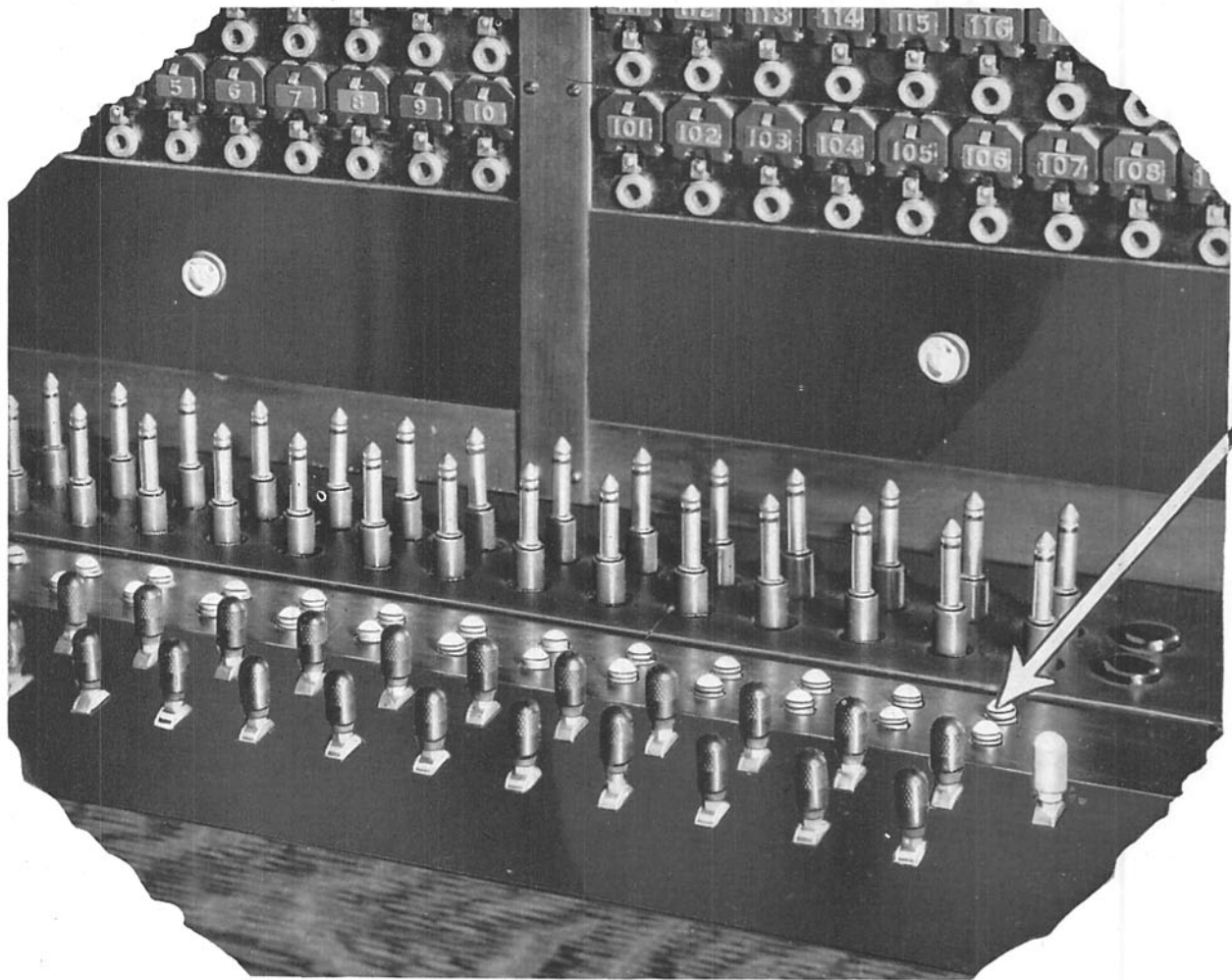
Occupies space of 10 combined drops and jacks, with compartments for cash drawers.



Cash Drawer to Fit "A."

Shipping weight packed approximately 500 lbs.

The Ideal Supervision



Kellogg double lamp supervision is the accepted standard keyshelf supervision on Magneto Switchboards because it is correct in principle. There are no trick spring combinations to get out of order, become clogged or otherwise refuse to operate. Double lamp supervision is electrically perfect, reliable, accurate, and positive in

operation. The brilliant glow of lighted lamps attracts and compels the operator's attention.

The battery cost and maintenance is practically no greater than on any other type of magneto switchboard. Ask the many companies who are now using this feature.

F
O
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Magneto Switchboards

DOUBLE LAMP SUPERVISION

Is the Ideal Supervision for Magneto Switchboards
because:

It is Accurate in Construction

It is Mechanically Correct

It is Simple in Design

It Attracts and Directs Attention



Positive

Reliable

Fast

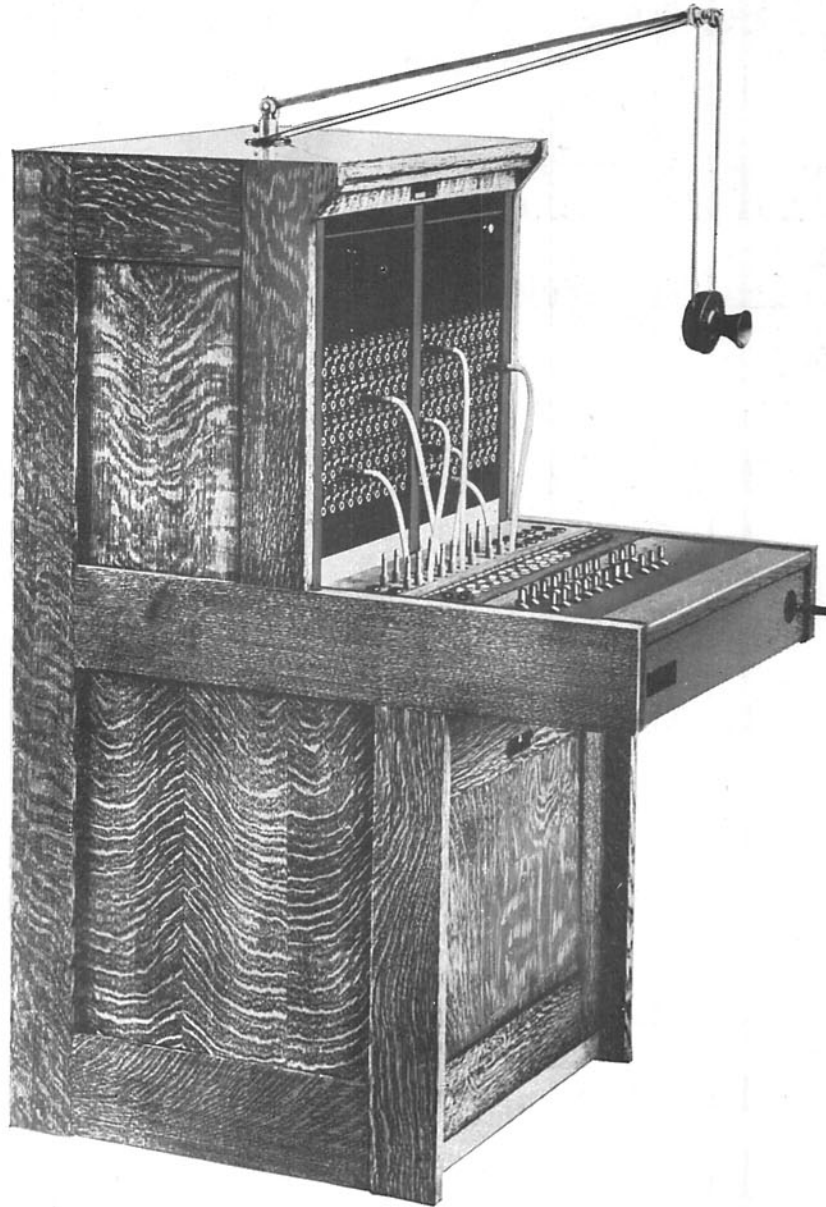
Inexpensive

In Operation

*See following pages for further details about
this valuable feature.*

Kellogg

No. 150-L Magneto Switchboard



No. 150-L—One Hundred Fifty Lines Capacity

Low Key Shelf — One Position — Lamp Supervision

Cabinet Code	Lines Wired	Cords Wired
No. 150-AL	100	15
No. 150-BL	150	15

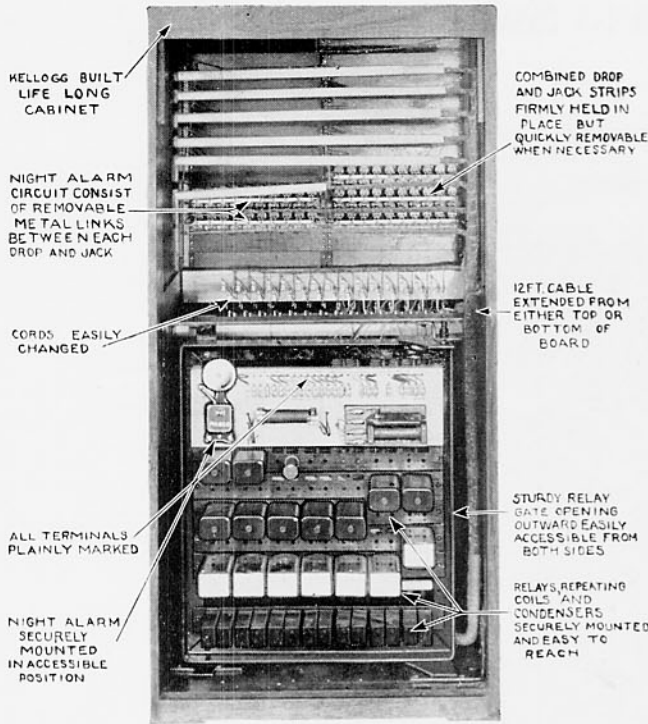
The Kellogg No. 150-L is exactly the same as the No. 150 with the exception of having lamp supervision instead of drop.

The simplicity of circuit and apparatus design, combined with perfect mechanical construction, insures continued, positive, reliable and accurate operation. This feature, added to a brilliant glow of light when operated and a large pilot lamp in the face of the switchboard which operates in unison with the supervisory lamps, commands immediate attention from the operator. The operation of the

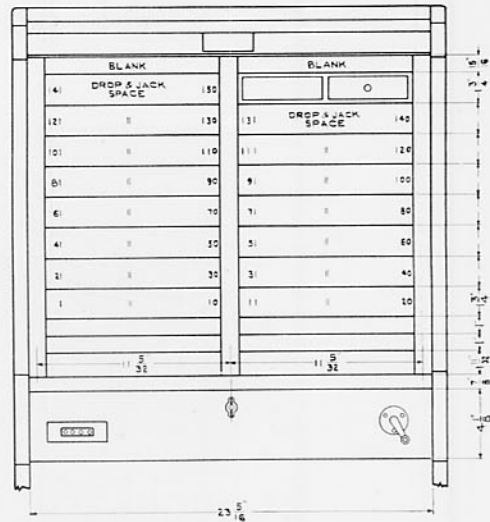
listening key automatically extinguishes the lighted lamp, which is another salient feature greatly speeding up operation.

As stated in the description of the No. 150 type on page 4, any amount of apparatus up to the given capacity can be installed at the factory, additional equipment being purchased and added as needed.

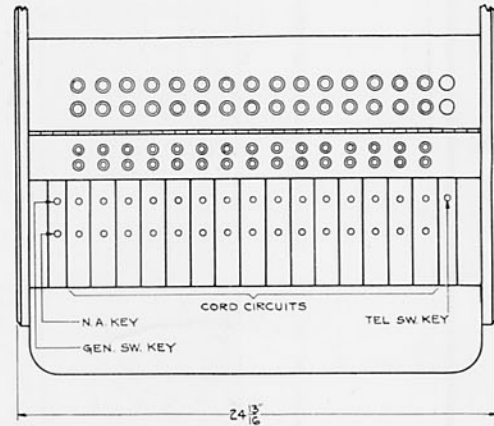
These cabinets match up in such a manner that two or more positions may be operated together as positional units of the same switchboard, increasing the line capacity to 300 lines or more. When two positions are operated together and maximum cord reach is desired, it is necessary to add a pedestal as the cords located in the extreme left end of the first position will not reach the lines in the extreme upper corner of the opposite side of Position No. 2 and vice versa.



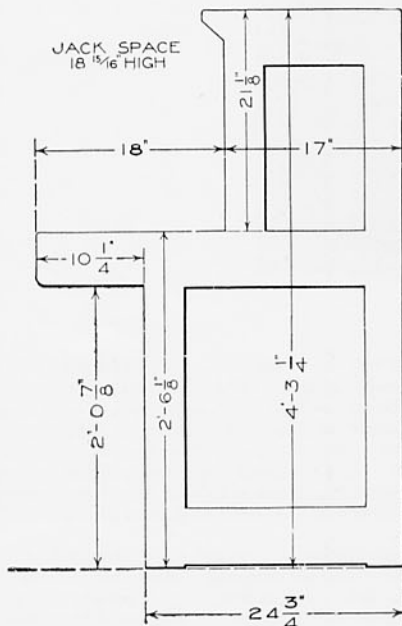
Rear view of 150 type lamp supervision, Magneto Switchboard.



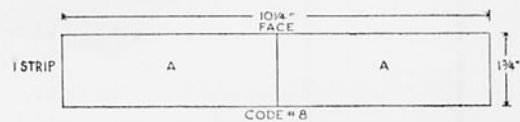
Front view of face equipment, showing standard numbering arrangement of drops and jacks and front end of key shelf, with operator's jack.



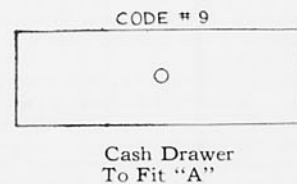
Top view of key shelf, showing keys, lamp and cord equipment.



Side elevation 150 line cabinet. Floor space occupied: Base, depth, 24 3/4. Width, 25 1/16.

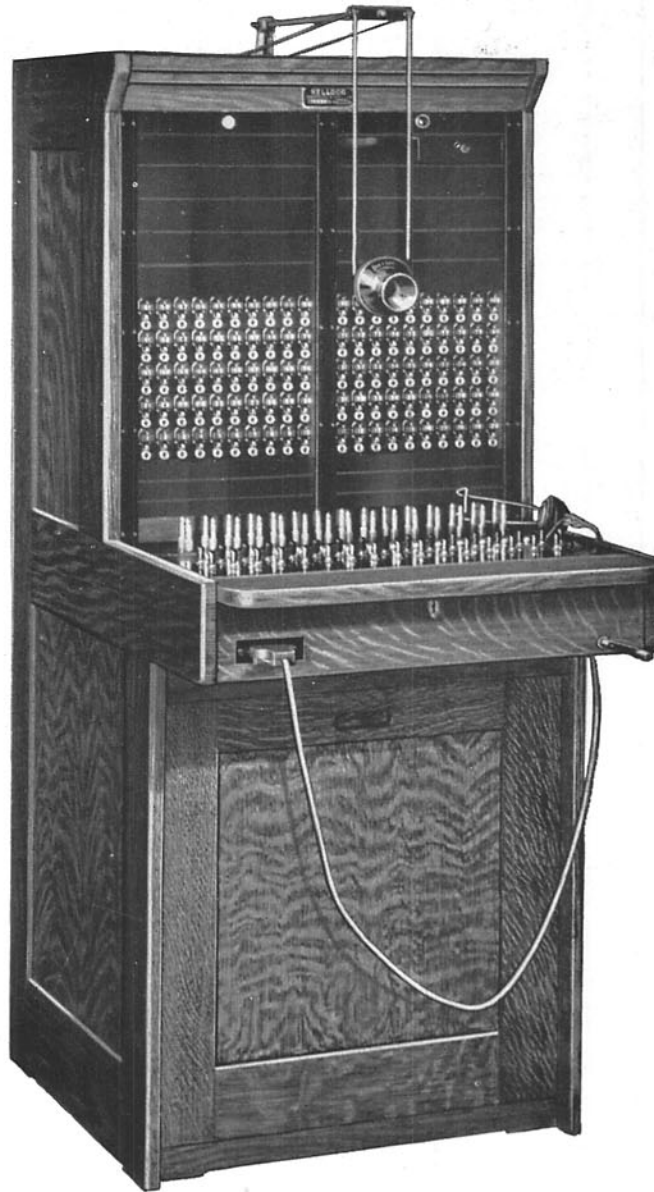


Occupies space of 10 combined drops and jacks, with compartments for cash drawers.



Shipping weight packed approximately 600 lbs.

No. 200-L Magneto Switchboard



No. 200-L—Two Hundred Lines Capacity

Single Position — Low Key Shelf — Lamp Supervision

Cabinet Code	Lines Wired	Cords Wired
No. 200-AL	100	15
No. 200-BL	150	15
No. 200-CL	200	15

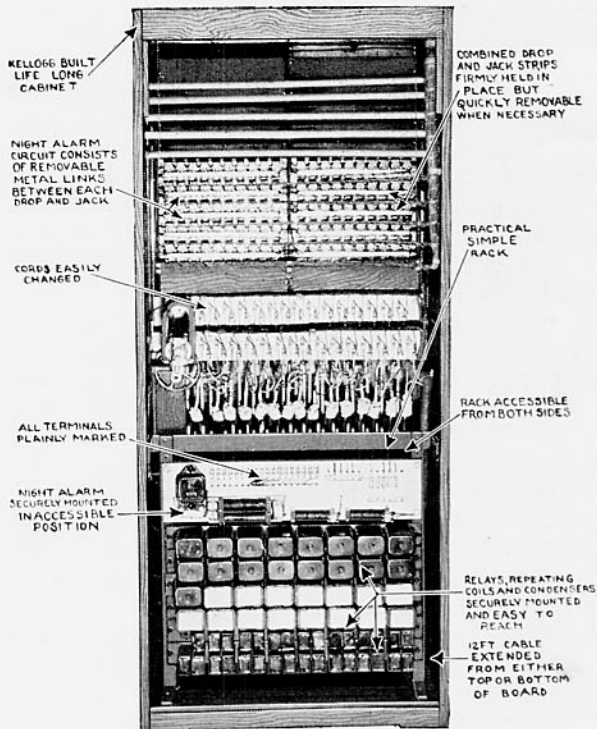
For the last word in efficient, inexpensive magneto switching equipment, you will equip your exchange with one or more positions of this switchboard.

The Kellogg No. 200-L is the same in every respect as the No. 200 except that lamp supervision has been substituted for drop. Mounting the lamps just in rear of the keys and in front of the plugs, providing a short key box with an extended shelf, and many other refinements make this the most advanced piece of equipment available.

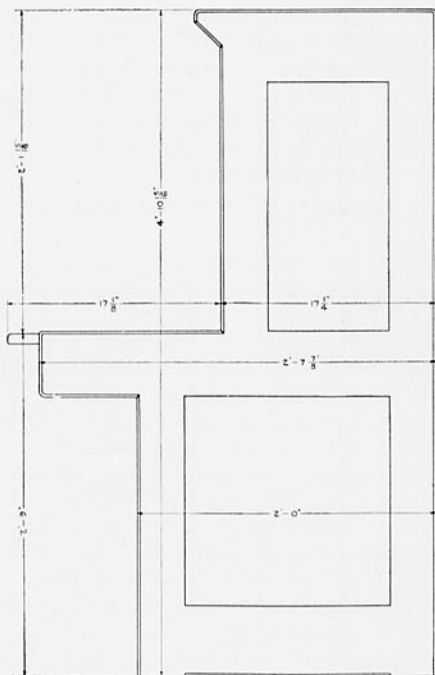
The design of these cabinets, providing low keyshelf with full or maximum cord reach when two positions are placed

together as individual units of a two-position 400-line switchboard and with space in the lower panels for transfer trunks in case a third position may be added, makes this switchboard especially attractive to the larger Magneto exchanges who for any reason cannot well consider common battery equipment. If at a later date the service is changed to common battery, these sections may be separated into single position switchboards and used in other and smaller exchanges.

Other interesting information regarding lamp supervision will be found on Pages 8, 9 and 10, also 18, 19 and 23 of this booklet. Our factory representative in your territory would also be pleased to answer any questions that might not have been entirely cleared up herein. The many companies who are today operating lamp supervision will be glad to tell you why this feature increases the value of the switchboard many times over the slight additional cost.

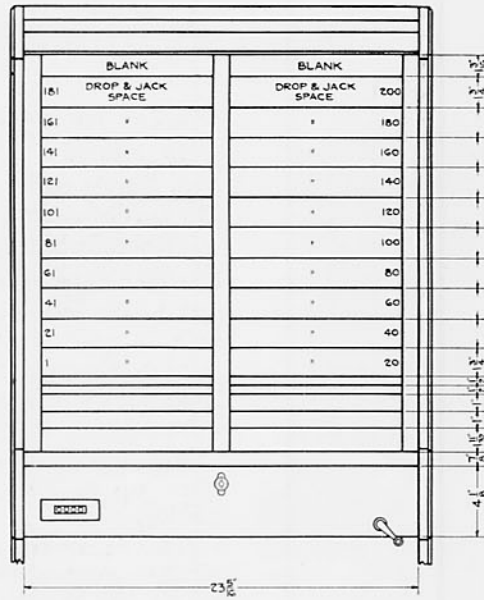


Rear view of 200 type lamp supervision, Magneto Switch-board.

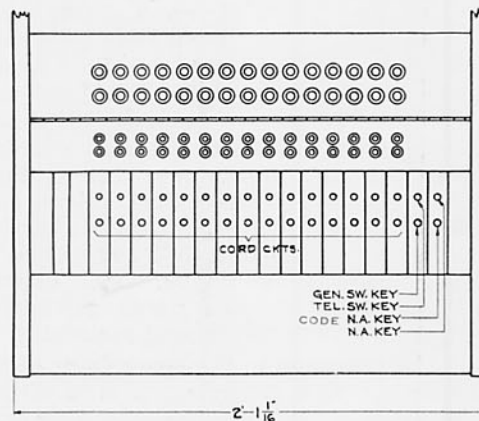


Side elevation, 200 line cabinet.

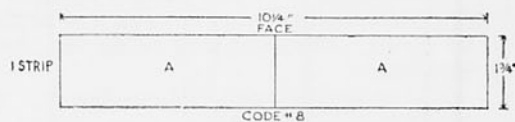
Floor space occupied: Base, depth, $24\frac{3}{4}$ in.; width, $24\frac{13}{16}$ in.



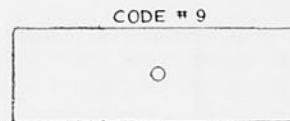
Front view of face equipment, showing standard numbering arrangement of drops and jacks and front end of key shelf.



Top view of key shelf, showing keys, lamps and cord equipment.



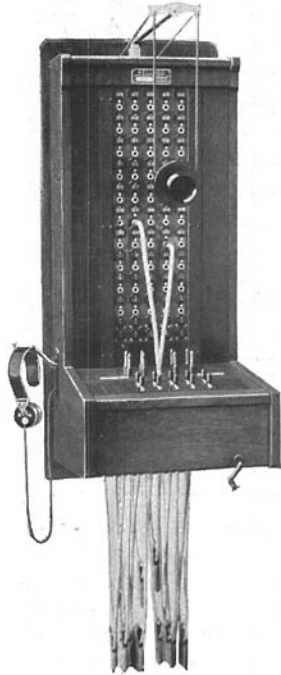
Occupies space of 10 combined drops and jacks with compartments for cash drawers.



Cash Drawer to Fit "A."

Shipping weight approximately 500 lbs. packed.

No. 7-A Magneto Wall Switchboard



7A. Wall Type With Suspended Transmitter and Receiver

No. 7-A Wired for:

- 50 lines.
- 5 Single supervisory cord circuits.
- 1 Operator's circuit.
- 1 Hand Generator.
- 1 Night alarm circuit.
- 12 feet extra cable.
- Shipping weight approximately 250 lbs.
- Equipped as desired up to the capacity.

This is a very desirable switchboard where the growth of the telephone system will not exceed 50 lines and where there is no available space for a floor type cabinet, or where a wall type board is preferred.

This equipment is furnished in a very durable, quarter sawed oak cabinet, very sturdily built and finished in an attractive dark golden oak, dull rubbed varnish. The equipment is mounted to the wall by means of a full size panel, to which the cabinet is hinged. The cabinet swings outward from this panel permitting easy access to all line wiring and apparatus.

A key box arranged in the lower front of the cabinet houses and protects the cord circuit keys and wiring. This key box extending from the front of the cabinet provides a nice keyshelf arrangement, permitting the operator maximum operating comfort. The key shelf is hinged to the plug shelf which permits easy access to the keys and wiring. A spring lock holds this shelf firmly in place.

The face of this cabinet has space for 50 combined drops and jacks and the ring off drops associated with the cord circuits, mounted 5 per strip. Each equipped line includes a standard Kellogg combined drop and jack having a 500 ohm drop coil unless otherwise specified. On request we can furnish 1,000 ohm coils at a slightly increased cost.

Line wiring is formed from a 50 pair braid covered wax core switchboard cable. This cable consists of 51 pair of No. 22-B and S gauge copper conductors well insulated and closely woven, with reverse over all paper wrappings over which is knitted a heavy wax

impregnated braid covering. This cabling extends 12 feet from the upper rear left corner, of the switchboard. A uniform color scheme used in wrapping the conductors makes the fanning out and attaching this cable to the protector terminals a very simple and easy job.

All circuits are arranged for connecting to either metallic or grounded lines.

The cord circuit capacity of this switchboard is 5 single drop supervisory cord circuits. Each equipped cord circuit includes a listening key and a single party combined ringing and ring back key and a ring off drop.

Standard operators equipment consists of a suspended type transmitter and head receiver, however either a breastplate or grabphone can be furnished in place of the above if desired.

A heavy five bar hand generator is furnished wired to a generator switching key.

Standard equipment includes a regular night alarm with a control key. Code night alarm can be also furnished on request.

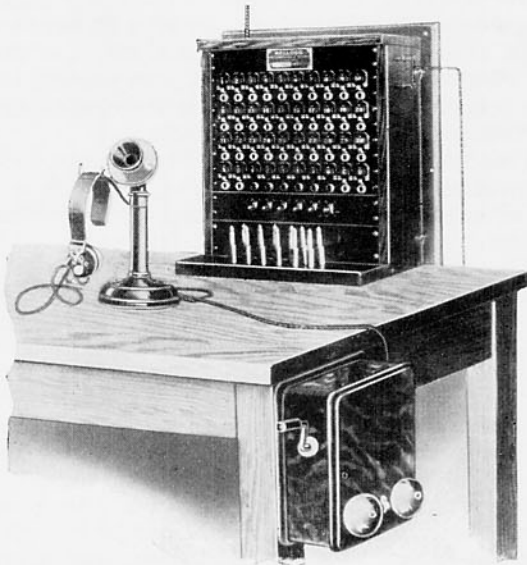
Code night alarm is very desirable for rural and other communities with heavily loaded party lines using code ringing as it enables the operator to go about other duties and be able to tell whether a calling subscriber is trying to signal her or some one else on the same line with him. When code night alarm feature is furnished a separate signal and control key is equipped providing two separate signals one for code and one for regular.

The operation of the switchboard is as follows:

A subscriber operating the generator crank of his telephone throws the drop signals connected to his line at the switchboard. The attendant will answer by inserting the answering (back) plug of a pair of the idle cords into the jack associated with this line drop and operating the listening key associated with this cord. She is then connected with the calling party and, after ascertaining the number desired, completes the connection by inserting the calling (front) plug of the cord pair into the jack of the line called for, and rings by operating the key of the cord circuit in the ringing direction and at the same time turning the crank of the hand generator. The operator can supervise the connection by operating the listening key.

When the subscribers are through talking, either one ringing off by giving the generator handle of their telephone a short turn will operate the ring-off drop of the cord pair, signifying to the operator that the parties are either through or recalling for another number.

No. 17 Type Magneto Wall Switchboard



No. 17-B wired for:

34 lines
6 cord circuits
1 night alarm

Shipping weight approximately 60 pounds.

No. 17-C wired for:

34 lines
6 cord circuits
1 night alarm
1 operator's telephone

The No. 17-B is a very desirable switchboard for communities where the growth will not exceed 34 lines. It is furnished in an oak or walnut finished cabinet, hinging outward from a solid panel and permitting easy access to all vital parts.

It can be equipped with as many drops and jacks as desired up to the wired capacity of 34 magneto lines. Each equipped line will include one of our standard combined drops and jacks, which can be furnished with either a 500-ohm or 1,000-ohm drop coil, but unless otherwise specified on order, 500-ohm coils will be furnished. All circuits are arranged to operate with either full metallic or grounded lines.

The line wiring is made up of No. 22 B & S gauge copper wires having enamel, silk and cotton, wax impregnated insulation, encased in a reverse paper wrapped, heavy braid covered machine-made cable extending eight feet from the upper or lower, rear, left hand corner of the cabinet.

This switchboard can be mounted on the wall or on a flat top desk or table similar to the arrangement shown herewith, using any standard magneto telephone for the operator's equipment.

Wiring will be provided for a total of 6 single drop supervisory cord circuits, of which number

as many as desired may be equipped. Full equipment includes a pair of cords, plugs, a single supervisory drop and a combined listening and one-way ringing key. Wiring is provided in these cord circuits for introducing repeating coils, if desired. This wiring terminates on binding posts suitably located, to which the repeating coils may be wired as it is necessary to mount these coils outside of the switchboard cabinet.

A night alarm circuit is wired to a control key in the face of the cabinet, with terminal binding posts in the rear of the cabinet. A night alarm bell is furnished separate from the cabinet and should be wired to these binding posts in series with two dry cells of battery.

Code night alarm can be furnished when desired, which will enable the operator to tell when some one ringing on a heavily loaded party line is trying to signal her or someone else on the same line.

The operators equipment is not a part of this switchboard and may consist of any standard magneto telephone of either the wall or desk type.

Installing:

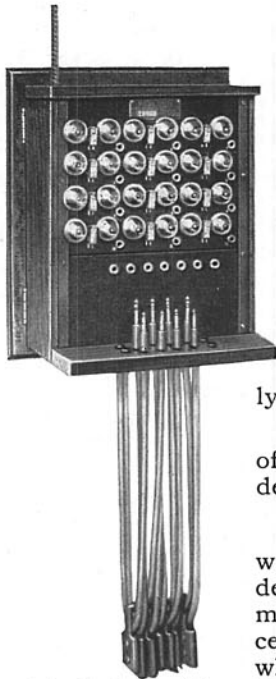
After securely mounting this switchboard to a table, desk or wall and the operators telephone is securely mounted in place, the telephone should be connected by running a pair of wires from the line terminals of the telephone to the terminals in the switchboard marked "operator's set." The ringers and hand generator should be disconnected from the wiring of the telephone, and a separate pair of wires should be run from the generator to the terminals in the switchboard marked "Generator."

The night alarm signal should then be mounted in a desirable location running one wire direct from this bell or buzzer to terminals No. 1 under "Night Alarm" in the switchboard. A second wire connecting to the other binding post of the signal should be wired thru a series of two dry cells and connect to binding post No. 2 of the switchboard.

After connecting up dry cells to the operators telephone you are then ready to fan out and attach the line cable to the protector terminals. This operation is very simple and easy when following the uniform color code provided in the insulation wrappings of the conductors. With this completed the switchboard is ready to operate.

The No. 17-C is the same as the No. 17-B except that it is equipped with a suspended type operator's set, and a hand generator is furnished mounted in a separate cabinet.

No. 29-B Magneto Wall Switchboard



No. 29-B Magneto Wall Switchboards Wired for:

- 15—Magneto lines.
- 5—Connecting cord circuits.
- 1—Night alarm.
- 1—Operator's instrument cord.

Shipping weight fully equipped approximately 55 pounds.

Equipped with as much of the above apparatus as desired.

The Kellogg No. 29-B wall type switchboard is designed to meet the demand of rural switching centers and other exchanges where an audible line signal is desired. The advantage this switchboard offers as compared with other small boards is that a bell is wired across the line and operates similar to a telephone bell. This enables the operator to tell at a distance whether a party line subscriber is trying to signal her or someone else on the same line.

It is furnished in either a walnut or quarter-sawed oak cabinet, beautifully finished, and has a wiring capacity of fifteen lines. A back panel holds the switchboard securely to the wall from which the cabinet hinges outward, permitting easy access to all vital parts. The line wiring is formed into a braid covered cable extending eight feet from the top of the cabinet. The line equipment consists of a combined jack, drop and bell and is arranged for either grounded or metallic systems. The lines are equipped in units of three; that is, a cabinet can be purchased with 3, 6, 9, 12 or 15 lines equipped, as desired. Additional units can be purchased and added as required, as they are easily installed.

There is wiring capacity for five (5) connecting cord circuits and as many as desired can be equipped up to the wired capacity. A listening-in jack is associated with each cord circuit, permitting the operator to listen in and supervise connections without interfering with the conversation.

The installation of this switchboard is a very simple matter. After securely mounting the cabinet to the wall, the line cable should be fanned out and formed to the switchboard side of the lightning arrester. The uniform colored

tracer wrapping of the wires in the cable make this a very easy operation. Be sure all connections are well soldered. This completes the installation of the switchboard. In putting up the telephone be sure it is near enough to the switchboard to permit easy reach.

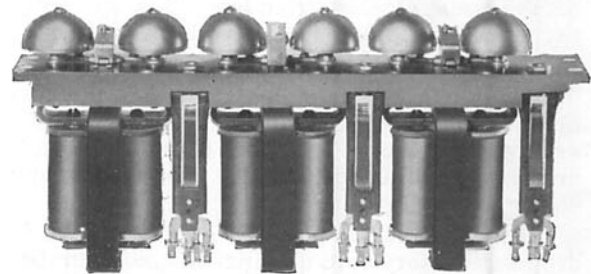
This switchboard is arranged to operate with any standard magneto telephone, to which will be attached the operator's cord which is furnished, the operation being as follows:

The subscriber signals the operator in the usual manner, which rings the bell and throws the drop connected to his line at the switchboard, giving the operator both a visual and audible signal. To answer the call, the attendant will insert the plug of the operator's cord attached to the telephone into the jack of the calling line. After securing the necessary information from the calling party through the operator's telephone, she removes the plug from this jack and places it in the jack of the line she desires to ring. She then signals the called party by operating the generator of her telephone.

When the called party answers, she completes the connection by removing the operator's plug and inserting the back plug of any vacant cord pair into the jack of the calling line and the front plug of this same cord pair into the jack of the line called. The parties are then ready to talk.

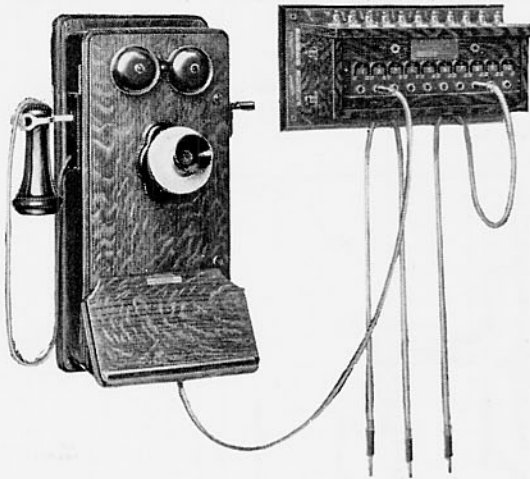
The operator can listen in and supervise the connection by inserting the operator's plug into the listening-in jack associated with, and just above, the cord pair being used for this connection. A short turn of the generator crank at either telephone will ring the bells and throw the drop of any of the lines connected, notifying the attendant that the conversation has been completed.

Night alarm equipment is furnished, consisting of a buzzer and switch, and can be located at any point desired near or apart from the switchboard. To connect the night alarm, wire the switch and buzzer in series with two cells of dry battery, connecting the leads to the two binding posts in the cabinet marked N. A. By closing the switch the buzzer will be set off when any drop shutter falls on the switchboard.



Combined Drops, Jacks and Ringers Mounted 3 Per Strip

No. 9-B Magneto Wall Switchboards



- ← Line Connectors and Lightning Arresters
- ← Listening-In Jacks
- ← Combined Drops and Jacks

No. 9-B Magneto Wall Switchboards Wired and Equipped with:

10—Magneto lines (equipped with lightning arresters).

2—Connecting cords with associated listening jacks.

1—Night alarm circuit consisting of switch and buzzer.

1—Operator's instrument cord.

Shipping weight approximately 25 pounds.

The Kellogg No. 9-B Magneto Wall switchboard is very desirable where the demand of the system will not exceed 10 lines. The cabinet can be furnished in either oak or walnut.

Each equipped line consists of a 500-ohm combined drop and jack, wired to saw-tooth spark gap lightning arresters and binding posts, which are mounted on top of the cabinet and are easily and conveniently located for inspection and testing. The outside lines are to be connected to these binding posts.

All circuits are arranged to be used with either grounded or metallic lines.

Any standard magneto telephone, either desk or wall type, may be used for an operator's telephone instrument with this switchboard.

Two cord circuits and a separate operator's telephone instrument cord and plug make it possible to have two complete connections set up at the same time and the operator can also answer calls on other lines without interfering.

A listening-in jack is associated with each pair of cords, enabling the operator to listen in without interfering with the connection. The plugs are so connected that one drop on each connection will vibrate and the drop shutter fall when either of the connected subscribers rings off or makes a recall.

To operate this switchboard, the operator is signalled by the falling of the drop shutter, which is thrown by operating a telephone generator on the line connected to this drop. The attendant will answer by inserting the operator's telephone instrument plug into the jack associated with this drop, which places the operator in communication with the subscriber and restores the drop shutter. When the operator ascertains the number of the line

desired, she removes the operator's instrument plug and inserts it into the jack of the line called for and rings the called party by turning the crank of her operator's instrument. As soon as this party answers, she removes the operator's instrument plug and takes either one of the two pairs of connecting plugs and inserts it into the jack of the line calling; the other plug of this same pair is inserted into the jack of the line called for, placing the two subscribers in communication.

The night alarm contacts of the drops and wired to a pair of binding posts mounted on the side of the cabinet and there is furnished with the switchboard a switch and buzzer which can be mounted wherever convenient. This switch and buzzer are wired in series with two dry batteries to the night alarm binding posts on the side of the cabinet, arranged so that when the switch is closed, the buzzer will operate every time a drop on the switchboard falls.

Code ringing night alarm can be furnished on request. This feature, when used with party lines using code ringing, permits the attendant to go about other duties and be able to distinguish between calls for the operator and calls for some one else on the same line.

Oil, Gas and Electric Companies find this little switchboard very efficient in their dispatching service. The arrangement is such that the central station can connect with remote stations individually or connect remote stations thru for conversations with each other.

This switchboard is stocked with full equipment consisting of ten (10) Kellogg No. 301-E combined drops and jacks which have 500 ohm wound coils and a single cut off jack arrangement. Complete equipment for a regular night alarm is furnished but no operators telephone is included.

*** Kellogg ***

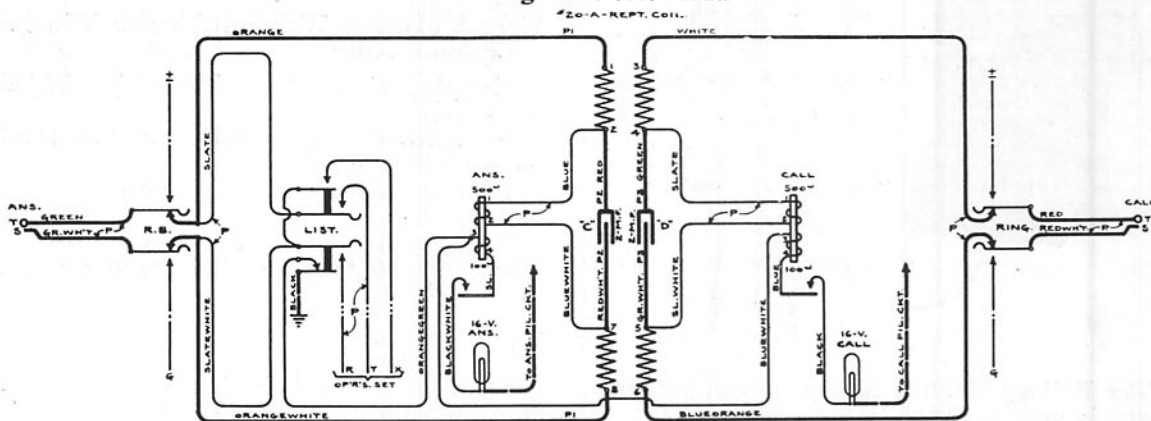
Cord Circuits

Following are the various types of cord circuits commonly used in Kellogg Magneto switchboards and are listed in the order of our preference and recommendations based on our experience. Your attention is called to the

simple design and operation of these circuits, keeping in mind their accuracy, dependability and transmission efficiency.

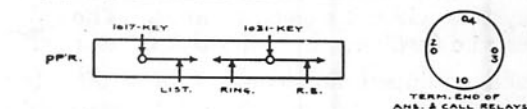
Magneto Cord Circuit With Double Lamp Supervision and Repeating Coil

Drawing No. 34007 L. R.



This is the cord circuit we highly recommend as being the most efficient, serviceable and satisfactory under all conditions for Magneto switchboards. The drops are replaced with double wound relays of the major type, the ringoff winding of which is connected across the condensers. The act of ringing off energizes the relay and pulls the relay armature up, closing the contact springs. This connects the battery from the lamp through the relay spring contacts, through the second winding on the relay and from there through a break contact on the listening key, which is always closed except when the operator is listening on the cord pair.

When the relay is energized by a subscriber ringing off, it locks up through its own winding and spring contacts and keeps the supervisory lamp lit until the operator throws the listening key and cuts in on the connection. This opens the circuits which hold the relay up and puts out the supervisory lamp. The operation of the relays on both the answering and calling cords is exactly the same and either party ringing off will light the supervisory lamp on the cord which is connected to his line. With this



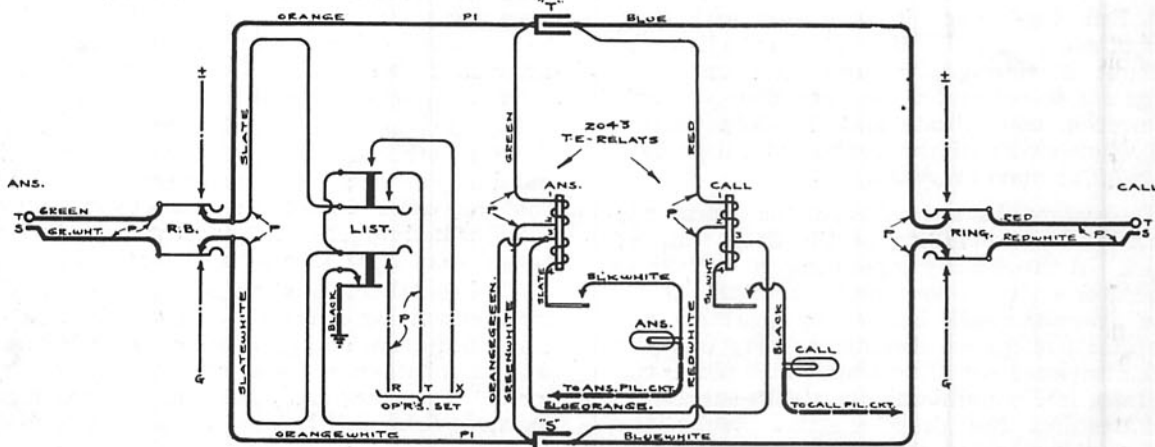
operation the operator gets a positive ringoff or recall lamp signal every time any party turns the generator crank on any line in which there is a cord connected.

This assures the subscriber of the very best possible service obtainable on a magneto switchboard.

The relays are very simple in design and construction; they are positive in operation and perfectly reliable; the signal is distinct and dependable and the cord circuit is practically non-ring thru. It is simple to operate, has a low maintenance cost and will give the very best results obtainable. It is equipped for ringing on both the answering and calling cords and can be provided with any type of recognized ringing scheme desired using master keys or individual party ringing keys for each cord circuit.

Magneto Cord Circuit With Double Lamp Supervision With Condensers

Drawing No. 32577 L.



See Page 19 for description.

Cord Circuits

Magneto Cord Circuit with Double Lamp Supervision with Condensers

Drawing No. 32577 L.—(Continued)

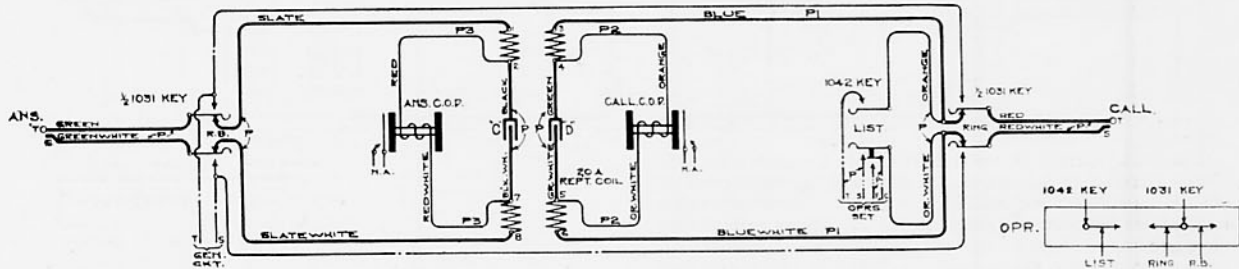
This cord circuit was designed primarily as a non-ring through cord circuit and although not entirely a positive non-ring through circuit, it is very successful in preventing this annoying feature. It has the advantage of being cheaper than a cord circuit equipped with repeating coils; however, cord circuits equipped with condensers in the talking circuit are not as efficient for transmission as those in which repeating coils are used. Transmission efficiency in the condenser used in this type of cord circuit is sacrificed to make them function as non-ring through circuits. Also, a cord circuit of this type does not have the balancing qualities between circuits that a repeating coil cord circuit has.

The transmission qualities of this cord circuit are very satisfactory; the loss is not objectionable; it has positive ring off lamp supervision on both cords. It is equipped for ringing on both the calling and answering cords and can be equipped with any type of selective ringing circuit desired, using either master keys or individual party ringing keys for each cord circuit. It is very simple to operate, has a very low maintenance cost and will meet all reasonable requirements.

The operation of this circuit is similar to that of Circuit 34007-LR described on page 18.

Magneto Cord Circuit with Double Drop Supervision and Repeating Coil

Drawing No. 20237 T. R. (Fig. A)



This cord circuit is the most common type of cord circuit in use today and is second only to our double lamp supervisory type with repeating coils as described in Drawing No. 34007-LR, Page 18.

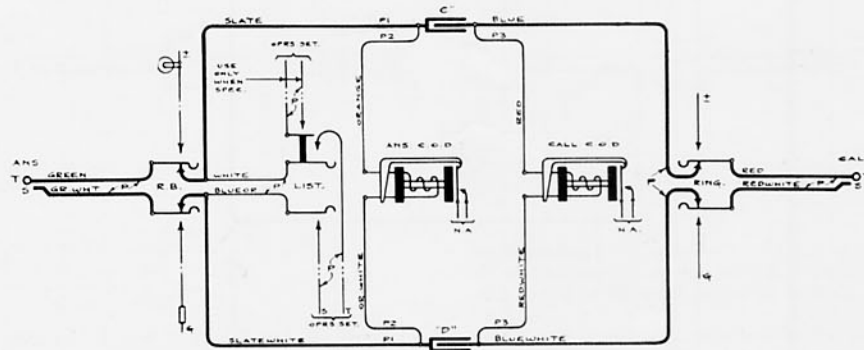
The Kellogg No. 20-A non-ring through repeating coils used in these cord circuits serve three very useful purposes. One is to separate ground and metallic lines, thereby maintaining the normal balance between these types of lines. Another purpose is, when ringing off, to prevent ringing the opposite cord, which would create confusion and annoyance both to the party ringing off and to the party whose bell is being rung. Lastly, they assure at all times a positive ringoff signal to the operator and also a positive signal in case of recall.

The condensers in this circuit are connected to the center of the repeating coil windings and provide a path for voice currents with a minimum of transmission loss and maximum of ringing-off efficiency.

Cord Circuit No. 20237-TR and Cord Circuit No. 34007-LR illustrate these repeating coils. They have a transmission loss of less than one half mile, which is negligible. These cord circuits are equipped for ringing on both the calling and answering cords and can be equipped with any type of recognized ringing schemes desired, using either master keys or individual party ringing keys per cord circuit.

Magneto Cord Circuit with Double Drop Supervision with Condensers

Drawing No. 19050 T



See Page 20 for description.

Kellogg

Cord Circuits

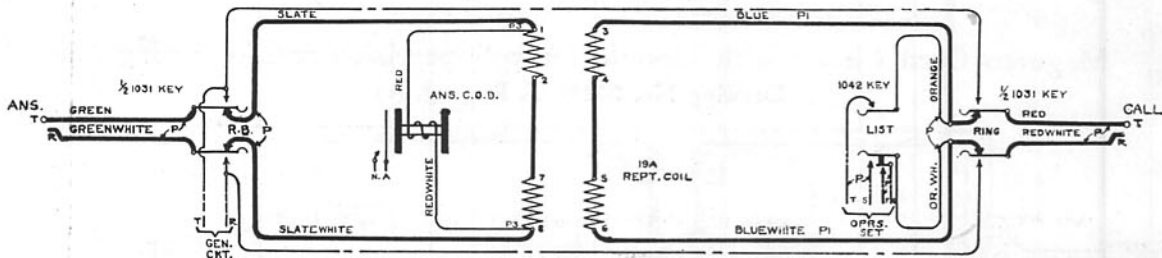
Magneto Cord Circuit with Double Drop Supervision with Condensers Drawing No. 19050 T.

This cord circuit is the same as Circuit No. 32577-L described on Pages 18 and 19 except that it has double drop supervisory signals which operate mechanically, instead of lamps operating from battery.

This makes a very efficient cord circuit with extremely low transmission loss. Although it is not absolutely non-ring-through, it is very satisfactory in preventing this annoying feature. It has positive ring-off supervision on

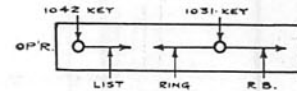
both cords and can be equipped with any type of recognized ringing schemes or circuits desired, having a master key for selecting the proper frequency, type of current, etc. It is simple to operate, has a low maintenance cost and will take care of the most exacting customer's requirements, but it is not to be confused with our Circuit No. 20237-TR which is of the repeating coil type.

Magneto Cord Circuit with Single Drop Supervision and Repeating Coil Drawing No. 20260 S. R. (Fig. A)



This cord circuit is not recommended where high efficiency, double supervision or a non-ring through type of cord circuit is desired and is to be used only where maximum transmission efficiency is placed above everything else, such as a toll position or connection, also in very small exchanges where conditions do not warrant the added cost of the double drop type.

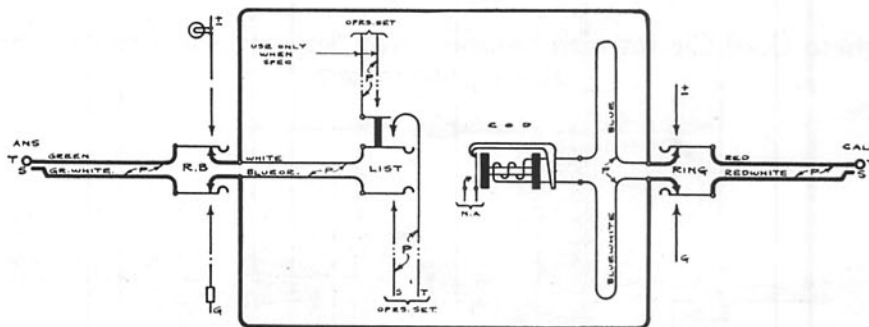
The repeating coil used in this circuit is known as our No. 19-A and is a combination talk and ring-through coil. There is but one ring-off drop in the cord circuit and this drop is operated by a ring from the subscriber on either the answering or calling cord. This cord circuit must not be confused with our non-ring through type, as it is known as a ring-through circuit and either party on either the calling or answering cord can ring across the cord and not only operate the ring-off drop but can ring all bells connected on the cord pair.



This cord circuit insures good transmission and a single ring-off from either or both cords. It is equipped for ringing on both the calling and answering cords and can be equipped with any type of selective ringing circuit desired, using either master keys or individual party ringing keys per cord circuit.

This makes a very satisfactory cord circuit of the single supervision ring-through type. The transmission loss is less than one-half mile. The circuit is simple to operate and has a low maintenance cost.

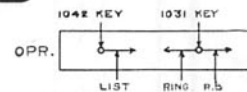
Magneto Cord Circuit with Single Drop Supervision Drawing No. 19055 S.



This is recommended as a very efficient cord circuit from a transmission standpoint, but is not to be confused with the high efficient talk and non-ring through types of circuits previously described.

The talking efficiency of this circuit is the very highest and for toll connections is the best, but when used to connect local subscribers, it has the very great disadvantage of ringing through from one cord circuit to the other on a

ringoff or recall. Nor will it balance a metallic and grounded circuit when connected together or eliminate other noises caused by unbalanced line connections, as can be expected from the repeating coil types.



Miscellaneous Circuits

Magneto Line Circuit

Drawing No. 18558

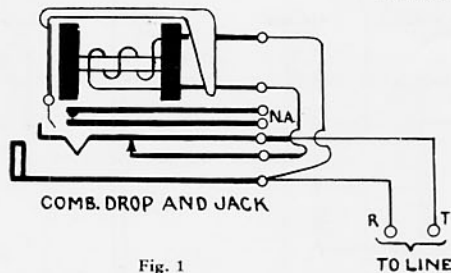


Fig. 1

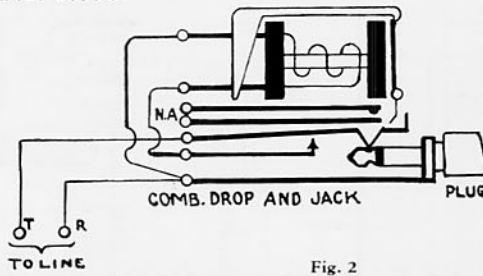


Fig. 2

This circuit uses the Kellogg 2-conductor combined drop and jack, having an inside spring contact that cuts one side of the drop off the line when the plug is inserted in the jack, see Figure No. 2.

We manufacture drop coils having various resistance capacities. However, 500 ohm coils are recommended for local and rural lines and 1000 ohm coils for toll lines.

This circuit is simple and easy to maintain, the spring jack being connected direct to the two line conductors,

which are of No. 22 B & S gauge copper wire well insulated with wrappings of silk and cotton impregnated. This wiring is formed into a wax core machine-made cable having 50 pair of wires, firmly encased in reverse wrappings of paper over which a heavy braid covering is woven, the entire cable then being thoroughly saturated with beeswax.

For further information regarding the drops and jacks, see detailed description on following pages.

Night Alarm Circuit on Switchboards Having Drop Supervision

Drawing No. 18559

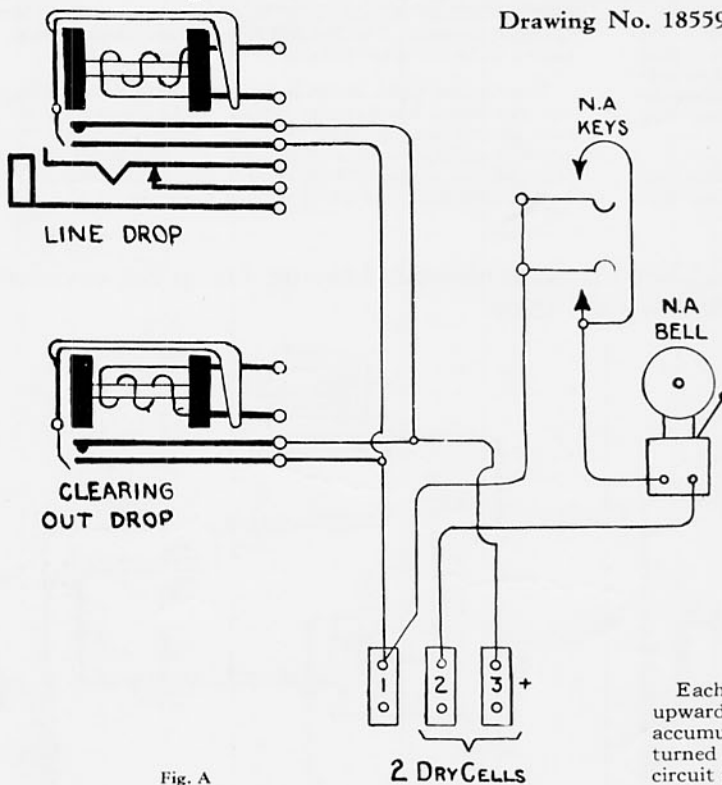


Fig. A

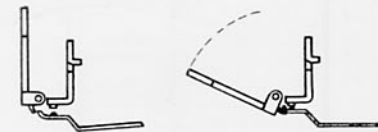


Fig. B.

View of night alarm contact used with Kellogg combined drop and jacks.

Dependability of the night alarm circuit is an absolute necessity in every magneto exchange. Its reliability is exceedingly important as it is urgent that the operator answer all night calls. The Kellogg night alarm is the result of our endeavor to produce a system that is infallible. It is positive in its operation, requires no adjustment and contains the fewest possible number of parts, and such parts are of the very best construction.

Each night alarm spring has its contact point turned upward, making a contact that cannot be effected by accumulated dust since dust does not settle on sharp, up-turned points nor on the underside of flat surfaces. The circuit is completed when the control key is thrown.

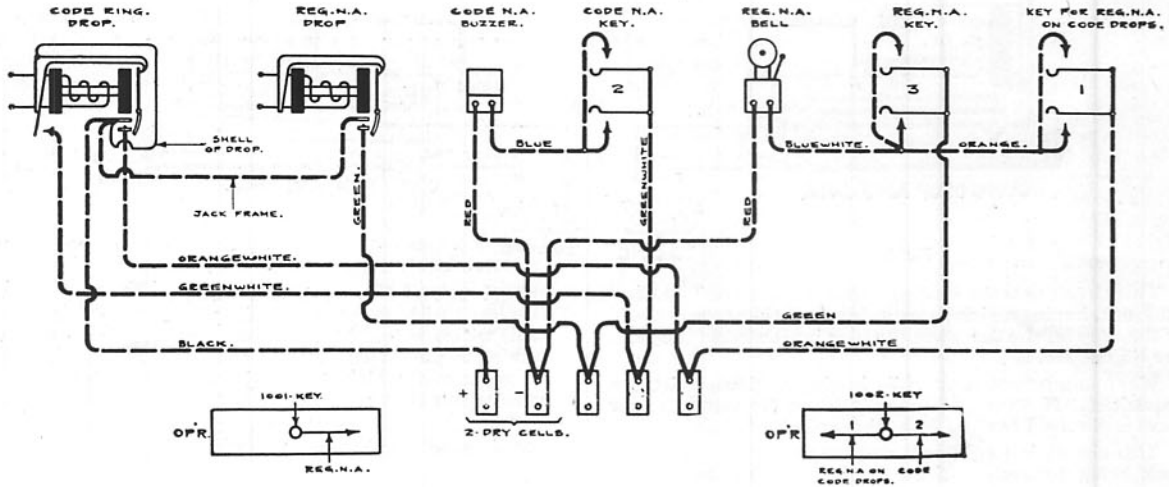
The night alarm has a three-inch vibrating bell as a signal, operating on two cells of dry battery, unless storage battery current is available, in which case it can be arranged to operate from the storage battery.

The alarm circuit is controlled by a cam type key of the locking type, located in a convenient position on the key-shelf of all floor type boards and the No. 7-A wall board; the No. 29-B, No. 17-B and No. 17-C types have locking type push button keys located in the face of the cabinet and the No. 9-B has a separate switch mounted outside the cabinet.

Kellogg

Code and Regular Night Alarm Circuit Used on Switchboards Having Drop Supervision

Drawing No. 29591



In addition to a regular night alarm, such drops as desired can be equipped with the code alarm attachment as shown on the armature end of the left hand drop of the above circuit. The advantage of this code alarm is that the operator or attendant, when not at the board, is able to distinguish between code rings on party lines when the parties on the line are calling each other and when they calling central.

Both alarms are controlled by separate locking cam type keys on all cabinets except the No. 29-B, No. 17-B and No.

17-C which have push button type keys. These keys are conveniently mounted and can be switched on or off, as the operator desires. The No. 9-B switchboard has a separate switch to be mounted outside of the cabinet.

The regular night alarm is equipped with a bell, while the code alarm has a buzzer signal. Both the regular and code alarms are operated from dry batteries unless the board is equipped with a storage battery, in which case the night alarms, operator's instrument and ringing should all be operated from one set of storage batteries.

Pilot Lamp Circuit and Night Alarm Used on Switchboards Having Lamp Supervision

Drawing No. 32678

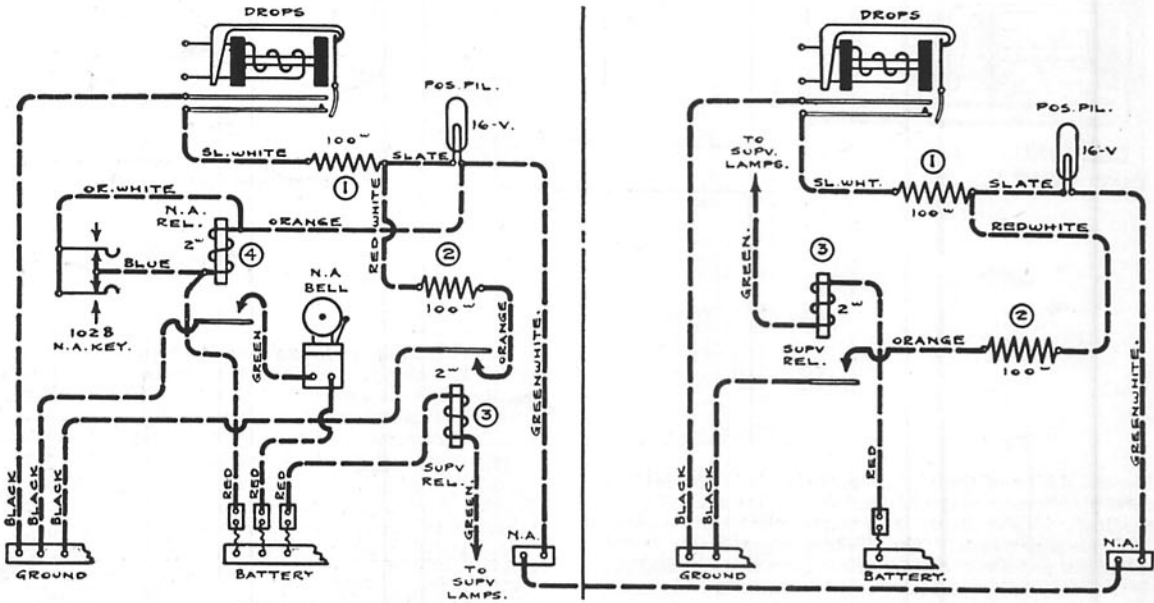


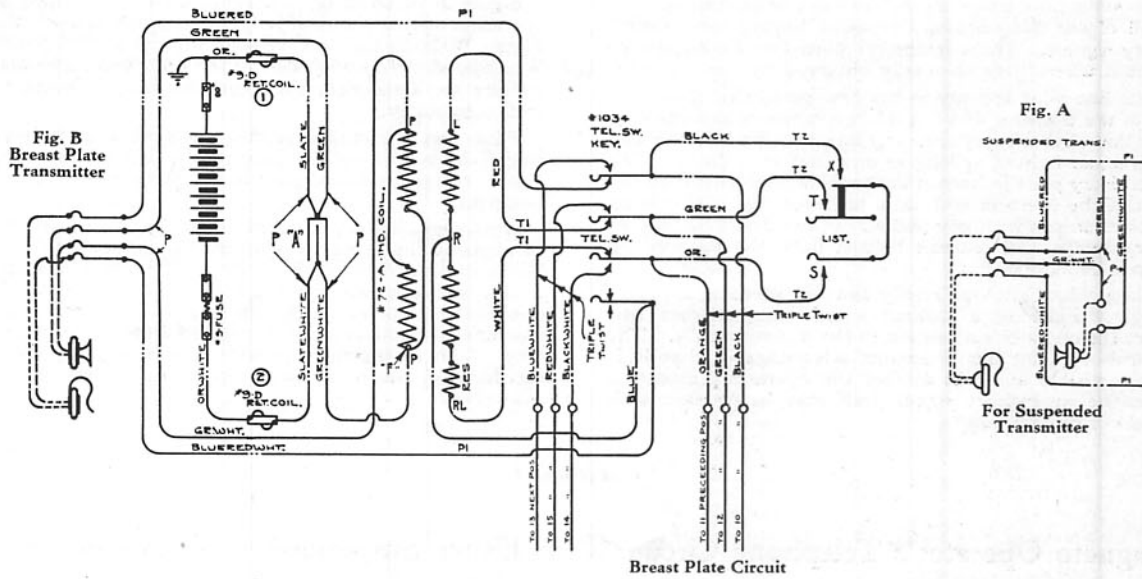
Fig. A

Fig. B

See Page 23 for description.

Magneto Operator's Telephone Circuit With Either Suspended (Fig. A) or Breast Plate Type Transmitter (Fig. B). Circuit Operated From Storage Batteries.

Drawing No. 32579



This circuit is used on all magneto switchboards where a 24-volt storage battery supplies transmitter current and is highly efficient for both transmitting and receiving.

Where more than one position is used, or when additional positions are installed at a later date, an operator's position switching key can be inserted in this circuit, permitting one operator to handle all cord circuits on the entire switchboard.

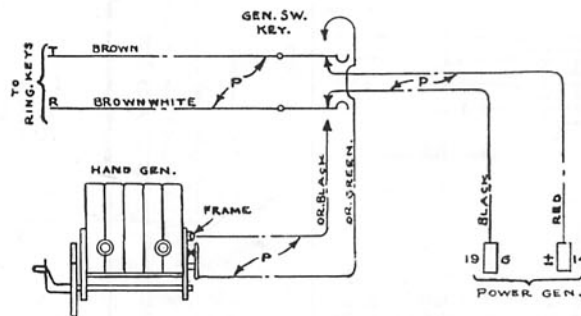
This circuit can be easily changed from suspended to breast plate type instruments, or reverse, by the changing

of wires as shown in the different figures of each circuit. Also, Circuit No. 20153 can be changed to 24-volt battery operation as described in the circuit note.

It is sometimes desired that the operator be able to listen in on toll connections without disturbing the conversation with side tone from the operator's set and with a minimum transmission loss. For this purpose we have designed a repeating coil type operator's circuit, slightly more expensive than the above, which will be substituted for our Circuit No. 32579 when requested.

Generator Circuit

Drawing No. 20284



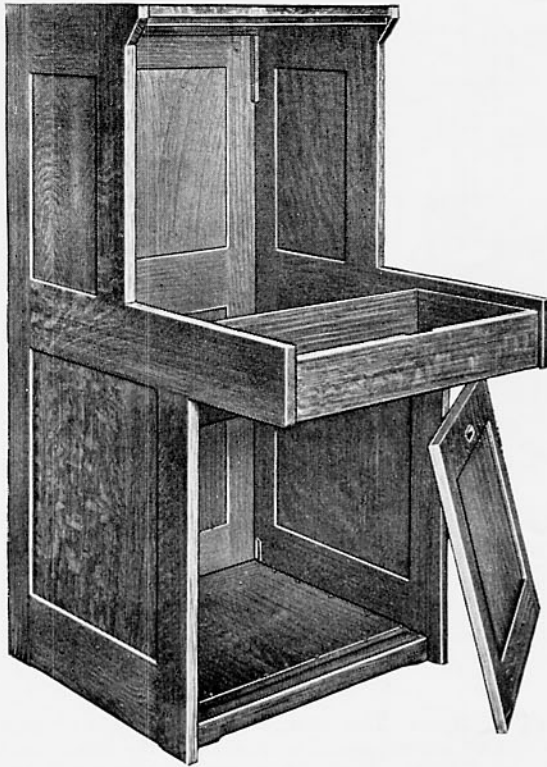
The No. 7-A and all floor type Kellogg Magneto switchboards are equipped with the well-known highly efficient Kellogg hand generators, which are wired to a generator circuit that is to be commended for its simplicity and completeness. This circuit provides for either power or hand ringing, the ringing leads being wired to a switching key which will connect either to the cord circuit ringing key leads.

While the accompanying sketch shows wiring for single frequency ringing, harmonic or party line ringing can easily be installed by adding the proper master key in the leads for selecting the proper frequency or for reversing the ringing circuit, etc.

The No. 17-B and No. 17-C types have ringing leads wired through a switching key to binding posts for connecting either hand or power ringing.

Equipment

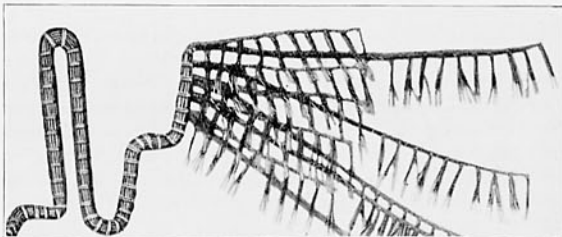
Cabinets



Kellogg Magneto switchboard cabinets are cut and sturdily constructed of carefully selected, kiln dried, quarter-sawed oak. Besides being tongued and grooved, they are reinforced with angle ironwork. The jack frame is of heavy steel and iron, treated to prevent rust, having bakelite finished stile strips. Lift type front and rear panels and hinged keyshelves permit easy access to all parts for inspection.

The inside is given a heavy coating of shellac and the outside exposed woodwork is dull rubbed and hand finished in a beautiful dark golden oak especially treated to prevent cracking, peeling, fading or marring. These cabinets are built to withstand the most severe usage and present an appearance pleasing to the eye of the most fastidious.

Cabling



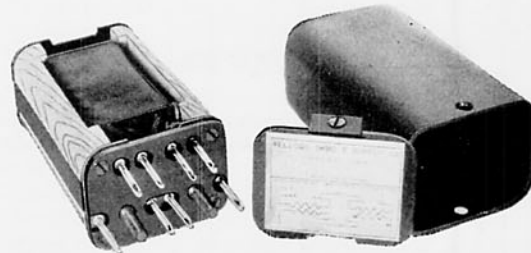
All line wiring is formed from machine-made cables composed of No. 22 B & S gauge tinned copper conductors having silk and cotton impregnated wrapping insulation. Where the climate is damp we can furnish enameled conductors instead of tinned, which is an added insulation protection. These cables are encased in reverse wrappings of impregnated paper over which is woven a heavy braid covering. The entire cable is then thoroughly impregnated in wax.

All forming is done by hand and the skinner lengths are uniform in length and arrangement, being carefully sewed with full ply, wax impregnated, linen lacing twine.

The key cables are hand made from suitable tinned copper (except where climatic conditions require enameled) conductors, having silk and cotton wax impregnated wrapping insulation. They are firmly sewed with full ply, waxed, linen lacing twine and have uniform skinner lengths.

Kellogg wiring or cable is shellacked at the skinner ends only, which insures easy working and neat jobs at all times with no danger of breaking the wires, fraying insulation or any of the other disadvantages experienced in handling shellacked cable.

Repeating Coils



No. 20-A Repeating Coil

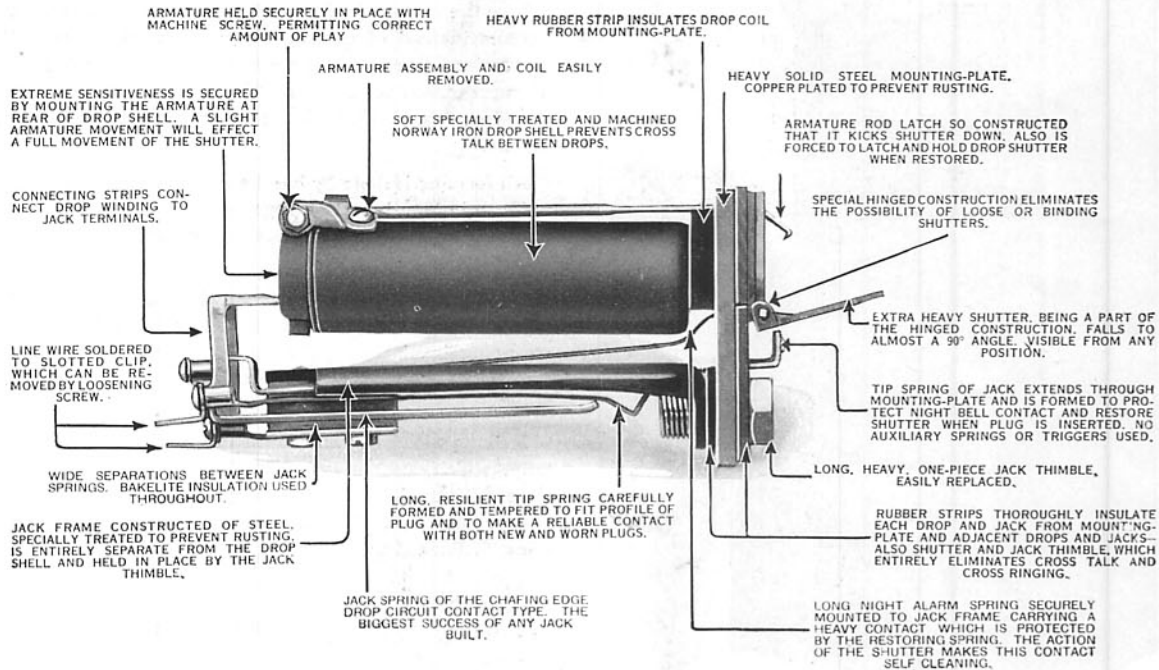
The repeating coil usually used in our Magneto switchboards is known as our No. 20-A type and is a talk-through coil only. This means the windings will not permit the low frequency currents, used for ringing, to pass through, thereby preventing one subscriber from ringing through the switchboard on a connection and annoying the other party, in case the operator fails to take down the connection before either party attempts a recall. This action also materially improves supervision as it diverts the ringoff current into the drop coil instead of permitting it through to the other line, insuring positive ringoffs.

The No. 19-A coil, which is a ring and talk-through type, is used on single supervision cord circuits.

These coils are very compact and efficient, showing less than a half-mile transmission loss. They are enclosed in a pressed steel, heavy finished shell with suitable lugs for mounting, the terminals extending out in a manner that permits connections to be readily made. A regular relay mounting strip is used for mounting purposes.

Equipment

Drops and Jacks



Combined Drops and Jacks

The Kellogg combined drop and jack such as is used in the assembly of a Kellogg Magneto switchboard is complete in every detail. It is famous the world over for simplicity of design and reliability of operation, as well as for resisting qualities against lightning and sneak currents.

This perfection is attained by winding enameled copper wire around a Norwegian iron core, giving the greatest magnetic efficiency in a minimum of space. Encasing these coils in a heavy Norwegian iron shell and separating them from the mounting plate with heavy hard rubber provides the best insulation and protection. By placing the armature at the rear of the coil, allowing the lever to run the full length of the coil, a full movement at the shutter is assured on the slightest impulse, thus giving effective results on the weakest current supply.

Drop shutters are held firmly in place with a hinged arrangement, eliminating pins which work loose and fall out. Shutters are designed to fall by gravity; however, a special slot into which the armature lever fits causes this lever to force the shutter down and prevents "sticking."

The Kellogg jack is of simple design and rugged construction, only one spring coming in contact with the plug. This spring is of heavy German silver with long, resilient action, placing the heaviest wear on an inexpensive and easily removed jack thimble. This spring serves the triple purpose of completing the tip side of the connection, removing the drop coil from across the line and restoring the drop shutter to its normal position.

The night alarm circuit is completed (when the N. A. key is closed) by the action of the drop shutter against a long German silver spring especially designed and placed

for this purpose. This spring is protected and so arranged as to give perfect operation throughout the entire life of the switchboard. Study the above cut of the combined drop and jack for other important details.

Clearing Out Drops

The Kellogg clearing out or "ringoff" drops, are of the same careful design and feature the same sensitive and reliable operation as our line drops. Being especially wound and tested for supervisory purposes, Kellogg "ringoff" drops offer the most accurate and reliable mechanical supervision to be had.

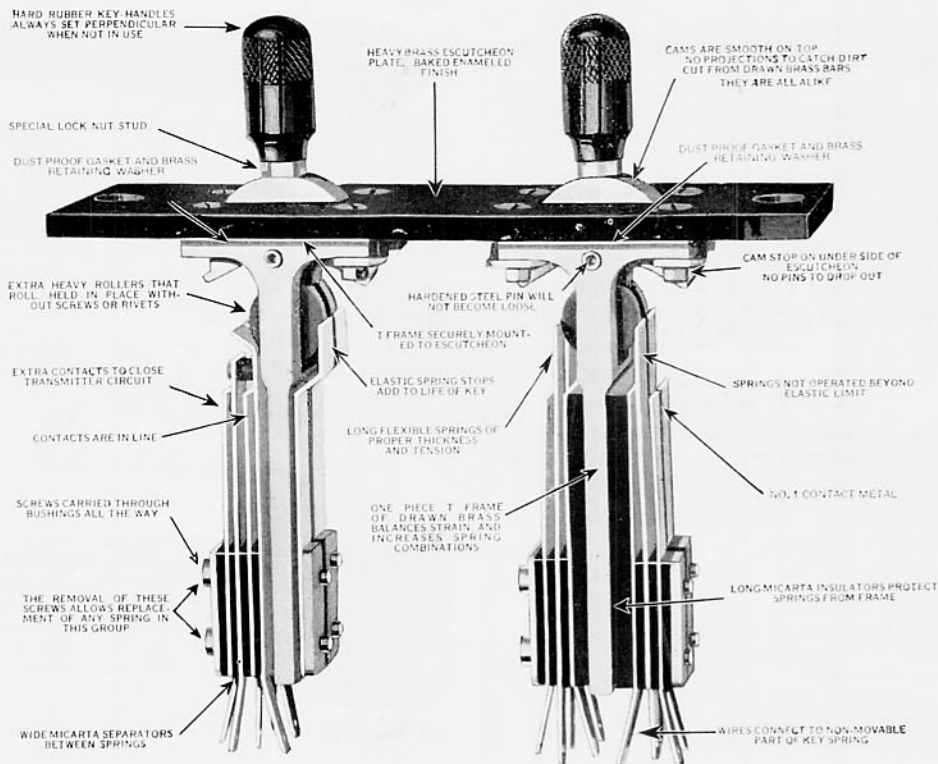
Condensers



The condensers used in Kellogg Magneto switchboards have been especially designed for this service. They are wound from the best grade of tinfoil and linen paper. This is an expensive construction but is absolutely reliable and free from trouble. They effectively hold back ringing current, preventing (but not entirely eliminating) "ringing through," and are well mounted on metal strips with the terminals well exposed for easy connections. High insulation resistance prevents short circuits or other trouble.

Equipment

Switchboard Keys



Keys

The Kellogg switchboard keys, such as are used on our Magneto switchboards, represent a perfection of design and construction unequalled. The springs used in these keys are of heavy German silver having long, even shaped vamps properly tempered, providing for long service and positive action at all times. These springs are rigidly mounted to a heavy "T" shaped brass frame securely held to heavy, black enameled, metal escutcheons.

The springs are operated by a smooth acting cam equipped with pivoted rollers. The rollers come in contact with the springs and insure practically no wear on these vital parts. The springs and contacts are protected from dust with a felt cushion placed between the frame and escutcheon. All springs are separated by heavy micarta and Kellite insulation and withstand the most severe breakdown test of any switchboard key on the market.

Kellogg keys are simple in design and arrangement, care being taken at all times to avoid any untried or trick designs and assemblies. There are no intricate springs, levers, etc., requiring minute adjustments, to get out of order and otherwise cause trouble.

One has only to count the number of times a single key is operated in one day and multiply this figure by 365 (days) to realize the amount of work a key is called on to do in a year's time. Considering further the severe shocks of lightning and other abuses, together with the fact that a key must perform at all times or the entire outside and inside plant is valueless, one can appreciate why Kellogg gives so much time and study to keys.

Miscellaneous Keys

The night alarm key, the generator switching key, the operator's switching key (when furnished) and the secondary cutout key (when furnished) are mounted on the key-shelf of floor type cabinets in the line up with the cord circuit keys. They are of the same general type as the cord circuit keys, properly designated with stencil markings on the escutcheons to distinguish them.

Push button type keys are used for night alarm and generator keys in the wall type cabinets, being mounted in a handy location in the face of the cabinet.

Night Alarm



Bell



Buzzer

The night alarm equipment consists of a vibrating bell with a three-inch nickel plated gong, wired in series with a control key and common to the night alarm contacts on all lines and supervisory signals.

If the operator's telephone is arranged to operate from dry battery, this night alarm will also be arranged to operate from 3 volts (2 cells) of dry battery. If the switchboard is equipped with lamp supervision or the operator's telephone is to operate from storage battery, the night alarm will also be arranged to operate from the same storage battery.

When code ringing night alarm service is desired, a separate direct current buzzer is wired to a separate control key and common to all the armature contacts on the drops. It also operates from the same kind of battery supply as the regular night alarm.

Equipment

Switchboard Cords



The cords used on Kellogg Magneto switchboards are of the steel tinsel type being constructed by braiding copper tinsel over a cotton core. A steel conductor is then wound over this braid and protected by two woven cotton braids. This process is then repeated for the second conductor. This cord is unbeatable for the Magneto exchange as the steel gives strength and long life while the tinsel affords low transmission loss.

Kellogg steel-tinsel cords are free from noise and are easy to cut back when frayed or worn, which features make them popular with the operator and maintenance man.

Cord Weights



Many good cords do not serve their full life due to poorly improvised weights. Kellogg weights have a box-wood roller firmly pivoted in a steel shell which is filled with lead, furnishing a weight operating smoothly at all times with no wear or damage to the cords.

Cord Racks

The cords swing from a maple cord rack located in the rear of the cabinet just behind the keybox. This rack is equipped with heavily tin coated cord fasteners properly spaced to give easy working conditions and prevent tangling of cords.



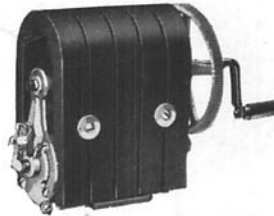
Switchboard Plugs



The Kellogg No. 42 switchboard plug is of the same simplicity in design and durable construction as will be found in the remainder of our apparatus. It is of the two-conductors type, the "tip" conductors being formed by firmly screwing a cone shaped point to a metal core, around which heavy hard rubber insulation is shaped, separating the "tip" from the "sleeve." The cone shaped tip makes it easy to insert the plug in the jack while the shoulders, being of the same diameter as the sleeve, give full spring displacement.

The plug is protected with a heavy fibre handle securely held in place with a brass screw. Carefully selected metals insure long plug life and low replacement costs, with minimum wear to jack springs and thimbles.

Hand Generators



The ringing current is controlled by a switching key which is permanently wired through a ringing common to all cord circuit keys. One side of this key is wired to the ringing leads for power ringing, while the opposite side is wired to one of Kellogg's famous 5-bar hand generators capable of

furnishing 80 to 100 volts of 20 cycle ringing current.

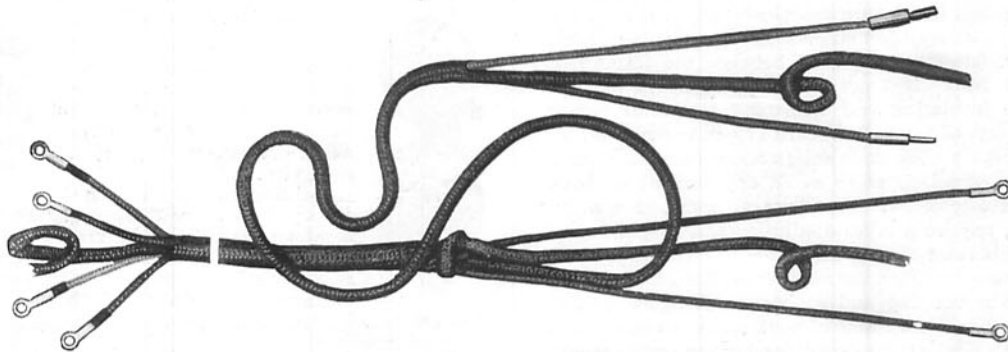
Plug Seats



The plug seats are of the full length type, shaped from durable fibre. A supply of extra strips, drilled ready for use, is furnished with each new switchboard. The plug

drillings are also fitted with heavy, removable fibre bushings for protecting the cords and plug shelf.

Operator's Cords

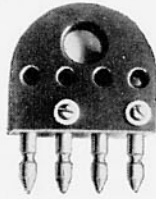


Kellogg operator's cords are formed of copper tinsel conductors, each conductor being composed of three ropes of six strands each enclosed in a wrapping of plain white cotton thoroughly impregnated with moisture proof com-

pound. A braid of plain green cotton with a tracer is then woven over this. The various conductors are then well wrapped in a green silk overall braid.

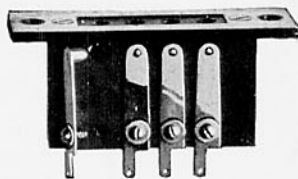
Equipment

Operator's Plugs



The Kellogg operator's plug is of the four prong type, the prongs or conductors being securely mounted in heavy, black fibre or hard rubber, molded and shaped to eliminate sharp corners and edges. The cord conductor terminals are connected to the plugs with nickel plated brass screws. The terminals are relieved of all strain by means of a special loop cord woven into the silk overall covering of the cord.

Operator's Jacks



The operator's jack is mounted in the lower left hand corner in front of the key box, making a very neat job. The springs are firmly mounted in a black fibre plate and are so constructed and arranged as to always insure positive contact with the plug.

Receivers



Kellogg operator's receivers are universally approved by operators everywhere. They are compact, light in weight, durable in construction and efficient in operation, accurately reproducing every vibration registered by the transmitter.

The electro magnets, of high grade wire wound on cores of special soft magneto iron surrounded by sold horseshoe magnets, are encased in a durable, light and compact Kellite shell. The steel wire feather-weight headband is easily adjusted to the wearer's head and holds the receiver firmly in place without tiring the wearer. The entire weight of the receiver and band is 3.9 ounces.

Transmitters



Breast Plate Transmitter



Suspended Transmitter

Kellogg transmitters enjoy a pre-eminent position in Telephony. They are as yet unparalleled in transmission efficiency and are unsurpassed in low maintenance cost.

They are unique in design and are original in principle, being of the solid back reverse type. The diaphragm is of hard drawn aluminum with the carbon cup or "button" formed in the center. Great care is used in selecting and preparing the carbon. The granules are extremely hard and are of uniform size with highly polished surfaces. The (electrodes)

are made from a special grade of dense carbon with copper plates on one face, which is carefully soldered to backing discs.

The large number of our transmitters that are giving good, uninterrupted service after over twenty years of constant use proves the design and method of manufacture of Kellogg transmitters to be correct.

Tools and Blueprints



Cord Pliers

To make our equipments complete in every detail, we furnish a complete set of small maintenance tools with each of our floor type switchboards. We also provide a complete set of drawings of the cabinet and circuits entering into the assembly of each switchboard.

Kellogg Central Office Test Set

For Magneto Exchanges



The problem of adequate, reliable testing apparatus for the magneto exchange, at a reasonable cost, has been facing the telephone managers for some time. The rapidly increasing demand for fast uninterrupted service combined with steadily increasing labor costs makes it very important that every case of trouble be located and cleared as quickly and with as little labor expense as possible.

In addition to saving hours of valuable time each day to the trouble man and at the same time enabling him to get the telephone back in good working order promptly, a test set prevents trouble and saves in general maintenance by reducing splices and poorly made joints which are the result of "opening" the line. No matter how well made any hand made joint may be, it always weakens the transmission efficiency of the circuit. To find out just how much damage these joints do to a circuit, select some samples and measure their resistance with a voltmeter, comparing the readings with that of a piece of wire the same length.

In providing a set suitable for magneto exchange use the Kellogg Company has anticipated practically every requirement. This set is simple, compact, easy and reliable in operation and sufficiently flexible to

meet the needs of practically any magneto exchange.

The cabinet is of beautiful quarter-sawed oak in a beautiful dark finish, cut from kiln dried hardwood, measuring 13½ inches high, 10 inches wide and 6 inches deep. It is suitable for mounting on a table or desk having a removable rear panel and is equipped with a voltmeter of the Weston type, which is mounted to the face or front. These voltmeters are furnished with a scale of 0 to 30 volts, however, if desired, a double scale can be furnished at a small additional cost.

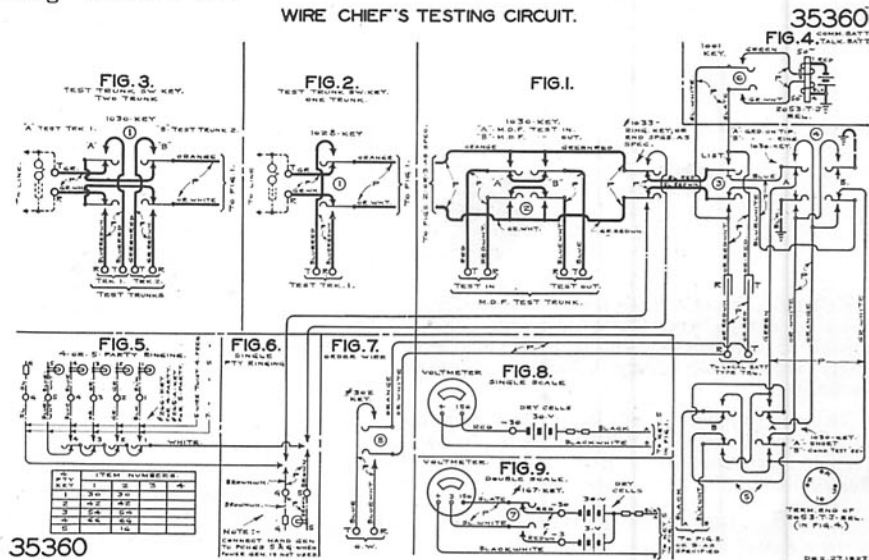
In usual practice one test trunk is provided, however, two trunks can be furnished if desired; also any kind of standard or accepted ringing schemes can be furnished. The test circuit will test for ground on either side of the line or for a short. Tests can also be made either direction from the main frame when a test shoe is used.

Operator's telephone, testing and talking battery and extension bell for incoming line is not part of the equipment and must be furnished separately.

Ask our factory representative in your territory for more information or write us direct for prices and further detail on this nice equipment.

When writing for information or ordering a Kellogg Magneto testing cabinet, state whether two testing trunks are desired (one trunk for test shoe and one trunk for test plug at switchboard) and if a test shoe for protector is desired, state what type and make of protector it will work with. It is also necessary to advise what kind of ringing scheme is in use on the main switchboard.

WIRE CHIEF'S TESTING CIRCUIT.

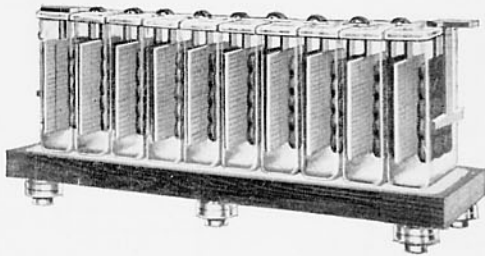


Power Equipment

for Magneto Switchboards

Recent power developments have placed facilities for supplying adequate central office current for talking and ringing purposes at the convenience of practically every telephone exchange in the country. Storage battery is unquestionably and by far the most satisfactory and least expensive method of furnishing current for the operator's equipment, night alarm, cord circuit supervision and ringing purposes in any magneto exchange.

Storage Batteries



☞ We recommend and furnish storage batteries manufactured by the Electric Storage Battery Company of Philadelphia, Pennsylvania. This company hardly needs any introduction to anyone familiar with storage batteries as they have been leaders in the field since 1888 and their products standard with telephone companies for many years.

For the usual magneto exchange we offer two sizes of the two plate, chloride accumulator, couple type storage battery. These batteries consist of eleven cells of unsealed glass jars complete with couples, electrolyte, of especially pure dilute sulphuric acid approximately 1.210 specific gravity, glass covers, bolt connectors, positive and negative terminal plates, hydrometer and syringe. These batteries are known as the C.T. and P.T. type having a 12-ampere hour and 24-ampere hour capacity with a normal charging rate of $1\frac{1}{2}$ amperes and 3 amperes respectively. Batteries of greater capacity can be furnished when necessary or desired. Sand trays for the 2 plate batteries are not included with the batteries, but must be ordered separate.

Rectifier

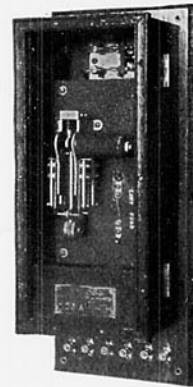


For battery charging purposes we recommend and offer a rectigon rectifier having a charging rate of 3 amperes and arranged to operate from 110 volt, 60 cycle, single phase,

alternating current. This instrument is built by the Westinghouse Electric Company to meet the requirements of the Kellogg Company and is a very compact, efficient piece of workmanship.

It consists of a transformer and two argon filled hot cathode bulbs sturdily mounted to a heavy base and protected by a metal cover having an overall measurement of $10'' \times 6\frac{3}{4}'' \times 8\frac{3}{4}''$. There are no moving parts; hence, none of the maintenance or trouble induced by vibrations. This machine can be mounted to the wall (however, a solid base is preferable) and can be used to charge either the C.T. or P.T. type battery. If used to charge a C.T. size, it will be necessary to reduce the charging rate by installing a Kellogg No. 35-A resistance coil in one side of the alternating current leads. We have had an occasional case where, due to some local condition, the rectigon rectifier has caused a slight hum in the batteries. In these cases we recommend the installation of a No. 23-A retard coil in the charging circuit between the rectifier and the batteries.

Ringing Equipment



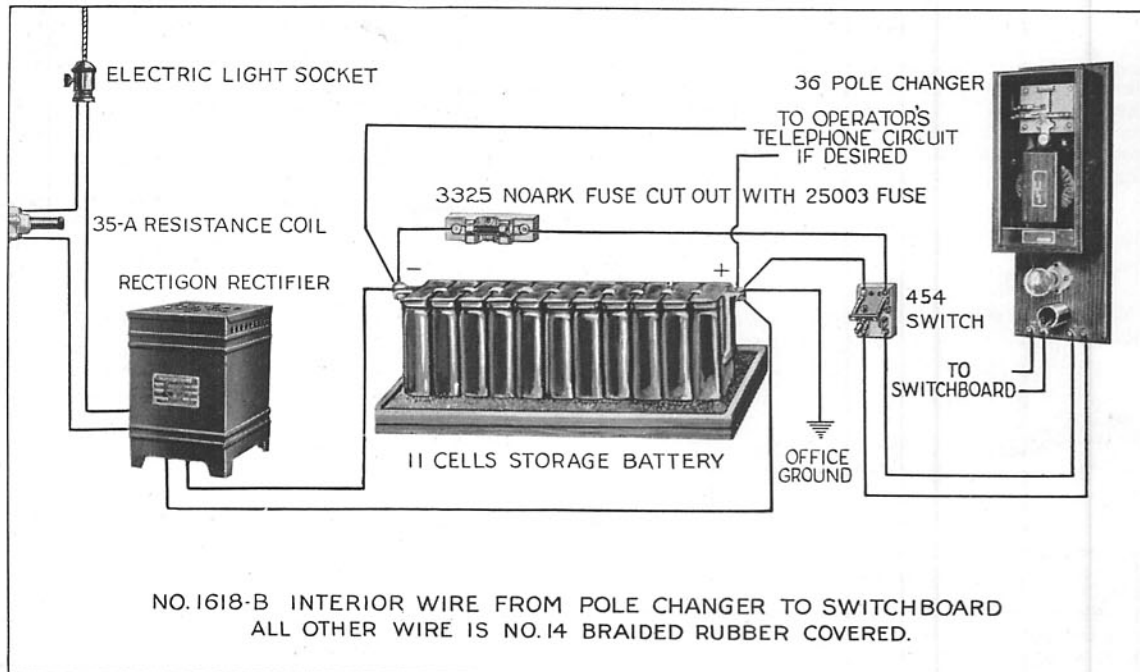
No. 23 Pole Changer

Through many years of experience the Kellogg Company has found pole changers are by far the most satisfactory ringing equipment available and we recommend them for all types of Magneto switchboards.

Kellogg pole changers are absolutely dependable, representing the same high principles of manufacturing incorporated in all Kellogg equipment. All spring and vibrator assemblies are of the best material, accurately designed and constructed. Even German silver springs, heavy insulation and special contact points insure reliable operation, requiring little, if any, attention.

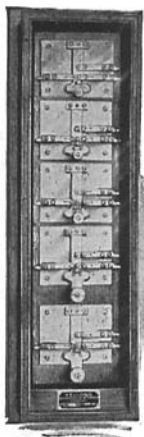
Kellogg pole changers are not only more satisfactory from a standpoint of service and maintenance, but are the most economical in current consumption, requiring less than $\frac{1}{4}$ of the current used by any kind of rotary machine. In fact, the cost of charging a storage battery suitable for operating the pole changer, operator's telephone, night alarm and lamp supervisory cord circuits is about equal to that of burning two 75-watt electric lights for 48 hours per week.

Power Equipment for Magneto Switchboards



Typical Storage Battery Installation Showing No. 36-A Single Frequency Pole Changer

Our standard pole changer sets include three types, furnishing single, four and five frequency ringing current respectively. The single frequency machine produces ringing current at the rate of 20 cycles per second, while the four frequency machine puts out 30, 42, 54 and 66 cycles. The five frequency is the same as the four with a 16 cycle vibrator added. All machines are built on the same principle, are of the same general construction and operate in exactly the same manner, the only difference being in the size and appearance with respect to the number of vibrators or frequencies furnished.



No. 19 Pole
Changer
Net Weight 58 lbs.

The apparatus is mounted in a nice oak cabinet, beautifully finished and with a full size glass door hinging outward, permitting a full view and easy access to all working parts. The four and five frequency machines have the transformers, condensers, etc. mounted in a separate cabinet, one transformer set serving two sets of pole changers. The cabinet and all apparatus is mounted to a slate slab arranged for wall mounting, avoiding the jar and vibrations that might be transmitted to the instrument from the floor.

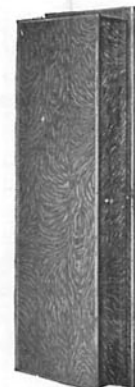
Kellogg harmonic pole changers have won Universal recognition and acclaim throughout the country. They enable the telephone manager to derive the

maximum revenue from a minimum outside plant investment, at the same time placing high class telephone service within the reach of all. You can easily understand that by ringing one of four telephones on the same line without disturbing the others has a distinct advantage. It not only makes party line service more attractive by virtue of the fact that it is practically special line service, but it lowers the per station cost of outside plant. Is it not better to have four telephones on the same pair of wires paying \$1.50 per month each than to have only one paying \$2.00?

When the rural lines are full metallic, the number of stations that can be rung individually can be increased to eight by the addition of a reversing key, ringing one side to ground.

In addition to the increased line revenue which this feature brings, it also saves in maintenance cost by reducing the number of lines to care for and speeds up operating due to the time saved in eliminating the code scheme, which requires more time and attention from the operator.

You will note we refer to storage battery pole changers. However, we manufacture pole changers that operate from dry cells, but are to be recommended and used only where electric current for charging purposes is not available.



No. 18-A
Transformer
Set
Net Weight
125 lbs.

Power Equipment

for Magneto Switchboards

Power Plant No. 1

1200 Calls per Day

For Magneto switchboards having drop supervision and single frequency ringing with No. 36-A pole changer, also where the operator's telephone circuit, the night alarm and code alarm are to operate from the same storage battery:

- 1—Set 11-cells C.T. $1\frac{1}{2}$ -ampere battery complete.
 - 1—3-ampere Rectigon rectifier equipped with 2 bulbs.
 - 1—Extra bulb for rectifier.
 - 1—No. 35-A resistance coil for reducing the rate of the 3-ampere rectifier to $1\frac{1}{2}$ amperes, the normal charging rate of the C.T. battery.
 - 1—No. 41-A Retardation coil for noise killer.
 - 1—No. 36-A pole changer.
 - 1—No. 36-A pole changer for emergency.
 - 2—No. 456 D.P.D.T. knife switches.
 - 1—No. 3327 Noark fuse cut-out base.
 - 3—No. 25003 Noark 3-ampere fuses (1 extra).
 - 1—No. 9402 porcelain receptacle for each position.
 - 1—No. 25-watt 110 volt Mazda lamp for each position.
- Necessary lengths of No. 814-A B.R.C. wire from battery to switches, from switches to each pole changer and from the storage batteries to the switchboard.

Necessary lengths of No. 1618-B duplex dry braid interior wire from the switches to each pole changer and to the switchboard.

Power Plant No. 2

3000 Calls per Day

For Magneto switchboards having lamp supervision and single frequency ringing with No. 36-A pole changer and with the operator's telephone circuit and the night and code alarms operating from the same storage battery:

- 1—Set 11-cells P.T. 3-ampere glass jar storage battery complete.
 - 1—3-ampere rectigon rectifier equipped with 2 bulbs.
 - 1—Extra bulb for rectifier.
 - 1—No. 41-A retardation coil for noise killer.
 - 1—No. 36-A pole changer.
 - 1—No. 36-A pole changer for emergency.
 - 2—No. 456 D.P.D.T. knife switches.
 - 1—No. 3327 Noark fuse cut-out base.
 - 3—No. 25003 Noark 3-ampere fuses (1 extra).
 - 1—No. 9402 porcelain receptacle for each position.
 - 1—No. 25-watt 110 volt Mazda lamp for each position.
- Necessary lengths of No. 814-A B.R.C. wire from battery to switches and from switches to pole changer, also from the storage batteries to the switchboard.

Necessary lengths of No. 1618-B duplex dry braid interior wire from switches to each pole changer and from switches to the switchboard.

Power Plant No. 3

With Dry Cells

For Magneto switchboards having drop supervision and single frequency ringing with No. 23 pole changers operating from dry cells:

- 1—No. 23 pole changer.
- Necessary lengths of No. 1618-B duplex dry braid interior wire from dry cells to pole changer and from pole changer to switchboard.
- Requires 76 dry cells.

Power Plant No. 4

3000 Calls per Day

For Magneto switchboards having lamp or drop supervision and five frequency ringing with No. 19-A pole changers and with or without the operator's telephone circuit and the night and code alarms operating from the same storage battery:

- 1—Set 11-cells P.T. 3-ampere glass jar storage battery complete.
- 1—3-ampere rectigon rectifier equipped with 2 bulbs.
- 1—Extra bulb for rectifier.
- 1—No. 19-A pole changer.
- 1—No. 19-A pole changer for emergency use.
- 1—No. 18-A transformer set.
- 6—No. 456 D.P.D.T. knife switches.
- 1—No. 3327 Noark fuse cut-out base.
- 3—No. 25003 Noark 3-ampere fuses (1 extra).
- 5—No. 9402 porcelain receptacles for each position.
- 5—No. 25-watt 110 volt Mazda lamps for each position.

Necessary lengths of No. 122 cable from each pole changer to switches.

Necessary lengths of No. 122 cable from switches to the transformer set.

Necessary lengths of No. 105 cable from transformer set to the switchboard.

Necessary lengths of No. 814-A B.R.C. wire from the storage batteries to the transformer set.

If the operator's transmitters and night alarm are to be supplied from the storage battery, it will be necessary to add:

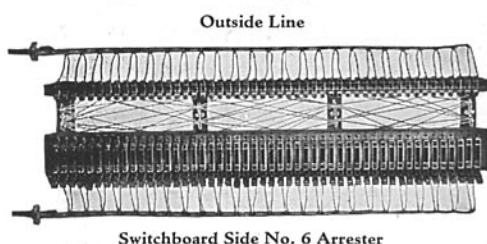
- 2—No. 25003 Noark 3-ampere fuses (1 extra).
 - 1—No. 81 induction coil for each operator's position.
 - 1—No. 3 battery feed coil for each operator's position.
 - 1—No. P.R. XXX 300-ohm vibrating bell for night alarm for the switchboard.
 - 1—No. P.R. XXX 300-ohm buzzer if switchboard is equipped with a code night alarm.
- Necessary lengths of No. 814-A B.R.C. wire from the storage batteries to the switchboard.
- 1—Set 11-cells B.T. $\frac{3}{4}$ -ampere noise killer battery.
 - 1—No. 23-A retardation coil.
 - 1—No. 3327 Noark fuse cut-out base.

Main Distributing Frames

Main Distributing Frames for Magneto Installations

Continued service and minimum loss to the more vital and costly equipment makes it necessary that much stress and precaution be exercised in selecting and providing sufficient protection in any central office. We recommend and offer three types of main distributing frames and protectors for use in magneto exchanges.

Kellogg No. 6 Type Arresters



The Kellogg No. 6 arrester furnishes very reliable and inexpensive protection for small exchanges and is furnished in two sizes. The No. 9, having a capacity of 10 pair, will take care of 10 metallic or 20 grounded lines and the No. 6, which has 25 pair of protectors, will handle 25 metallic or 50 grounded lines.



End View No. 6 Arrester

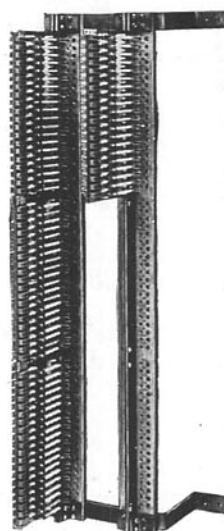
These arresters are provided with line terminals and cross connecting racks, permitting the same facilities as are found in larger, more expensive types. The protection consists of carbon arresters and mica enclosed copper terminal fuses.



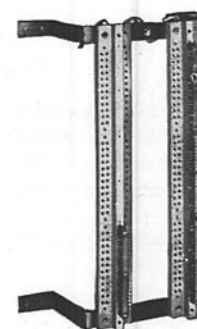
No. 11 Fuse— $2\frac{1}{8} \times \frac{3}{8}$ in.
Actual Size

Code No.	Mounting Centers	Carbons	No. of Pairs	Length
6	$\frac{5}{8}$ "	$1\frac{1}{4} \times \frac{3}{8} \times \frac{1}{4}$ "	25	$32\frac{1}{2}$ "
9	$\frac{5}{8}$ "	$1\frac{1}{4} \times \frac{3}{8} \times \frac{1}{4}$ "	10	$13\frac{3}{4}$ "

No. 103 Type Wall Frame



120 Pairs No. 103 M.D.F.
Equipped with 80 Pairs



100 Pairs No. 104-H
Line Terminals

For small exchanges having an estimated ultimate of less than 150 lines and other exchanges where a wall type frame is desired, we recommend the Reliable Electric

Company's No. 103 type wall frame.

This frame is designed to fit in limited space, having the fanning strips, terminals and protectors mounted on a substantial iron framework arranged for mounting on the wall. The ironwork and vertical sections clear the wall by six inches, allowing working room and jumper ring space, and makes an attractive job.

It is furnished in units having a capacity of 60 pair of arresters and 75 pair of line terminals each and can be purchased as desired up to 300 lines. The No. 303-H or No. 303-F protector should be used with this frame.

The No. 303-H protector using the No. 107 heat coil offers adequate protection against sneak currents and lightning, operating in accordance with standard specifications for central office protection. In addition to the air gap carbon arrangement draining the lines of overcharges, each side of the circuit is also provided with a No. 107 heat coil of the wire wound self-soldering type, which melts and opens the circuit if subjected to an overcharge of current. This coil can be re-set and re-used by pressing on the indicating rod while a current of one ampere is applied to the coil. When you feel the rod give, the current should be cut off and the rod held a moment longer to give the solder time to set. If desired, the No. 106 fuse can be used instead of the No. 107 heat coil.



No. 107 Heat Coil

Floor Type Main Distributing Frames

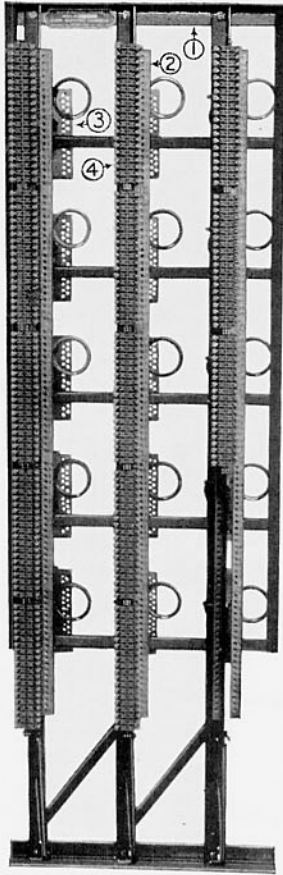


Fig. 1
"L" Main Distributing Frame
Protector Side

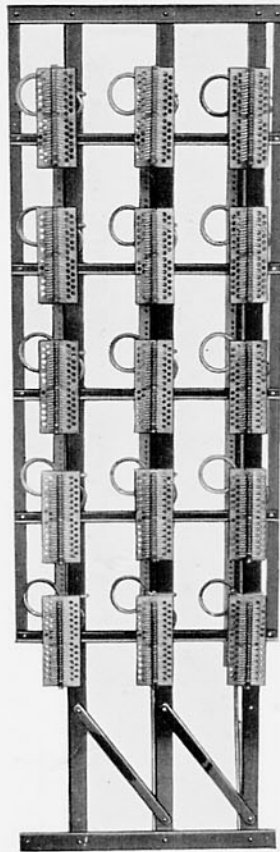


Fig. 2
"L" Main Distributing Frame
Individual Line Terminal
Blocks

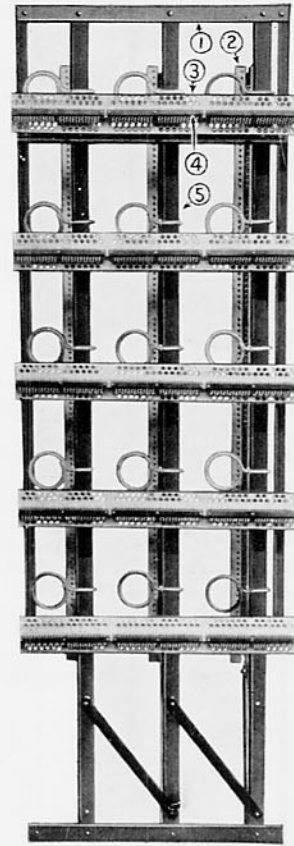
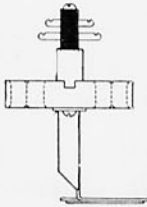


Fig. 3
"L" Main Distributing Frame
Continuous Horizontal Maple
Distributing Strip

We know of no better floor type main frames than the Cook L type. These frames can be furnished in either single or double angle iron construction but, unless otherwise specified, single angle construction will be furnished. The verticals are in sectional form, having a capacity of 100 line protectors and 130 line terminals each. They are of heavy ironwork with angle

irons for bottom and top of frame, and channel irons are used for horizontal irons and cross connecting ties. All ironwork is given two coats of black asphaltum paint and the entire arrangement is designed for minimum floor space and maximum strength, rigidity and accessibility.



Cat. No. 1002
Two-Clip Terminal Block

Continuous maple fanning strips run the full length of working space on the uprights. The terminal blocks are held securely in the rear of the frame by cross arms, which arms also are adjacent to enamel finished jumper rings. The arresters are mounted to metal face strips drilled for this purpose.

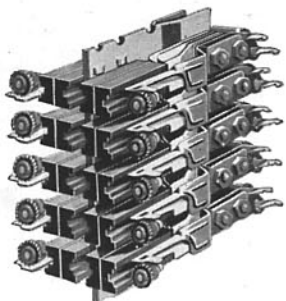
The terminal blocks usually furnished for magneto offices are of the two clip type firmly mounted in maple blocks properly drilled for jumpers and cable pairs, having a capacity of 26 pair terminals each. These blocks are so cut that they can be mounted vertically or horizontally.

These main frames will take either the Cook No. 100 or H-36 arrester.

Kellogg

Main Distributing Frames and Accessories

No. 100 Protector

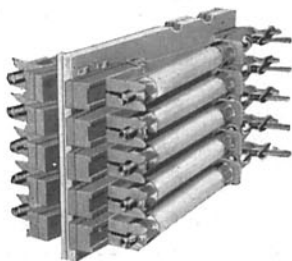


The Cook No. 100 and H-36 protectors are recommended for use with the L type frame.

The No. 100 is of the wire wound, self-soldering, heat coil type having an air gap carbon drain for each side of the line, also a heat coil which melts and releases a spring automatically opening the switchboard end and grounding the line side of the circuit. After being permitted to cool, these coils are ready for use again and may be reset by snapping the springs back in place. These coils are easily replaced when worn or damaged beyond repair.

Cat. No.	Description	Length Inches	Width Inches	Depth Inches	Net Weight Per 100 Pair
1230	Protectors in 10 pr. sections.....	5½	2	3½	22 Lbs.
1231	Protectors in 20 pr. sections.....	10½	2	3½	21 Lbs.
1232	No. 100 Heat Coils.				
1234	No. 100 Test Plugs.				

No. H-36 Protector



The H-36 arrester is of the fuse type and can be furnished in 10 and 20 pair banks with wood or fibre fuses.

Cat. No.	Description	Length Inches	Width Inches	Depth Inches	Net Weight Per 100 Pair
1200	Protectors in 10 pair sections with A-46 Wood Fuses.....	5½	1½	5½	20 Lbs.
1201	Protectors in 20 pair sections with A-46 Wood Fuses.....	10½	1½	5½	20 Lbs.
1202	Protectors in 10 pair sections with A-45 Composition Fuses.....	5½	1½	5½	21 Lbs.
1203	Protectors in 20 pair sections with A-45 Composition Fuses.....	10½	1½	5½	21 Lbs.

No. L-10 Protector



This floor type frame may be used in mounting H-51 Central Office Protector.

It consists of two vertical upright angle iron supports with cross pieces, wall braces, jumper rings for top and bottom and necessary bolts. Additions may be made to 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 in height. The frame is 16 inches wide and braces are 18 inches long. All steel parts are finished in aluminum.

No. H-51 Protector

The H-51 Protector, in sections of 10 pairs each are installed as required.

It is a combination of line terminals and central office protector.

The base is of metal, aluminum treated.

Carbons ground on a copper ground strip that runs the length of the mounting plate, with provisions to make the ground continuous.

Fuses are composition type A-12 of 1 ampere capacity. Standard grooved carbons and "U" shaped dielectrics are used.

No. L-10 Frame with 30 Pairs No. H-51 Protectors

Cat. No.	Description	Length, Inches	Width, Inches	Depth, Inches	Net Weight, Lbs.
1260	L-10 Frame, 50 pair.....	61	12	18	16
1040	H-51 Protector, 10 pair sections.....	12	11¼	2	45

Ground Cones



Ground Cone

Too much stress cannot be laid on the importance of sufficient grounds at the central office. As a solution to this question we offer a ground cone composed of perforated sheet copper filled with pea size coke and having five feet of No. 4 B. & S. gauge copper lead-in wire. This cone should be buried in a clay subsoil not less than five feet from the surface of the ground and should have a heavy insulated copper conductor not smaller than No. 8 B. & S. gauge well soldered to the lead-in wire and securely bolted to the lug on the main frame. Before filling in the earth, the cone should be thoroughly saturated by pouring water in the hole. If the soil is sandy or the climate dry, a one-inch pipe may be inserted, running from the cone to a few inches above ground and corked, which can be used for pouring water into the cone in dry periods.

Jumper Wire

We carry in stock both the silk insulated and rubber insulated flame-proof jumper wire. The silk insulated jumper wire is recommended because of its smaller diameter and better fire resisting qualities.

Method of Installing Magneto Type Switchboards

All Kellogg magneto type switchboards are wired complete before shipment and include a complete set of circuit blueprints and a set of specifications showing quantities and code numbers of apparatus contained in the switchboard cabinet.

All apparatus is wired by means of various colored wires corresponding to the colors specified on the circuit blueprint and an operating test is made on every switchboard before shipping. Consequently, Kellogg Magneto Switchboards are extremely simple to install and require little or no adjustment after the completion of the installation.

The line circuits consisting of drops and jacks are connected by means of a machine made cable comprised of No. 22 B & S gauge twisted pair wire having enamel, one silk and one cotton insulation or it may be of the tinned type having two silk and one cotton insulation. These wires are made up into a cable having a waxed and moisture proof core and an outer braided wrapping, the whole making a cable of 50 pairs or 100 pairs of wires.

The line cable extends from the base or the top of the cabinet for cabling to the protector equipment. When due to local conditions the cable extends under the floor to the distributing frame on which the protector equipment is mounted, the Installer shall ascertain whether there is a possibility of cable absorbing moisture or becoming wet due to any possible leakage when floor is cleaned.

When cable extends overhead from switchboard to the distributing frame, a supporting rack can readily be made locally of either wood or iron to support the cables.

The outer wrapping of the cable should be removed at the main distributing frame and the wires laced into a form, each pair of wires having the proper skinner length. The insulation should be removed from the ends of the wires for connection to the proper terminals either by soldering or screw connection, depending upon the type of terminals or protector equipment in use.

The color code of the 50 pair cable is the same as the first fifty pairs of the 100 pair cable.

The 100 pair cable has two additional pairs of wires as spare pairs, colored blue, orange white with white mate and red with a white mate. The 50 pair cable has one spare pair of wires only, colored blue, orange white.

A definite color code is used on machine made

line cables. The color code of the 100 pair cable is as follows:

	Twisted with White Mate	Twisted with Red Mate	Twisted with White Mate	Twisted with Brown Mate	Twisted with White Mate
Blue	Line 1	21	41	61	81
Orange	2	22	42	62	82
Green	3	23	43	63	83
Black	4	24	44	64	84
Slate	5	25	45	65	85
Blue White	6	26	46	66	86
Blue Orange	7	27	47	67	87
Blue Green	8	28	48	68	88
Blue Black	9	29	49	69	89
Blue Slate	10	30	50	70	90
Orange White	11	31	51	71	91
Orange Green	12	32	52	72	92
Orange Black	13	33	53	73	93
Orange Slate	14	34	54	74	94
Green White	15	35	55	75	95
Green Black	16	36	56	76	96
Green Slate	17	37	57	77	97
Black White	18	38	58	78	98
Black Slate	19	39	59	79	99
Slate White	20	40	60	80	100

The operator's and night alarm circuits, when designed to operate from dry cells, do not require fusing at the battery bars or binding posts. Three dry batteries only will be required for the operator's circuit and two only for the night alarm circuit.

The three dry batteries for the operator's circuit should be connected in series, that is, negative "zinc" (outside) of one cell to positive "carbon" (center) of another cell and then connect the negative and positive sides of the end cells to the battery posts mounted on the connecting rack marked "operator battery."

The two dry batteries for the night alarm circuit should be connected negative "zinc" (outside) of one cell to positive "carbon" (center) of another cell and then connect the remaining negative and positive sides of the battery to post marked "N. A."

When a switchboard has two or more positions manufactured as separate units, it is necessary, when installing, to connect the battery to the position only for night alarm circuit in which the night alarm key and bell are located, but the connecting posts should be connected from one position to the other so that all line drops are connected to the common night alarm circuit. This is shown in the night alarm circuit blueprint.

Switchboards having more than one position have as a general recognized practice, a switching key per position to enable the operator at Position 1 to use cord circuits in Position 2, or switchboard may also be operated from Posi-

Method of Installing Magneto Type Switchboards—Continued

tion 2, permitting the latter to use the cord circuits in Position 1.

The wiring for switching positions together on a two position unit switchboard is run in and connected completely in the factory, but when switchboards are of the single position unit type or when additional positions are added, the wiring from one position to the other must be placed and connected by the Installer. The switching key wires are connected to posts on the connecting rack inside of the cabinet and are marked to correspond to the operator's circuit blueprint and wires should be run in accordingly.

Magneto type switchboards are generally equipped with a hand operated generator. This generator is wired through a switching key, having a pair of wires connected to a pair of binding posts marked "Gen." To the latter should be wired the power ringing machine in case one is to be used. The switching key is for the purpose of switching from the hand generator to the power ringing.

When more than one position of switchboard is installed, it is necessary to wire the power ringing machine from the first position to the other position ringing circuit post, it not being necessary to run a separate pair of wires to each position from the power ringing machine.

When power ringing is used a 25 watt, 110 volt Tungsten lamp should be wired in series in the non-grounded side of the ringing leads and when more than one position is used, a lamp must be wired in series with the non-grounded side in each position as shown on the generator circuit.

When the switchboard, operator's telephone and night alarm circuits are designed to operate from a storage battery, a pair of wires shall be connected to the negative and positive battery fuse bars or posts located on the connecting rack inside of the cabinet. These wires should be connected to the proper terminals on the power control panel.

The negative side of the storage batteries is always the non-grounded side and the positive, the grounded side.

Switchboards designed for lamp supervision cord circuits operate from storage batteries and the same battery feed wires that furnish current for the supervisory lamps are used for battery

feed for the operator's telephone, night alarm and pilot circuits.

It is necessary that the Installer place the lamps and lamp caps, as these are not placed before shipment due to the possibility of becoming loose while in transit.

Installation of power equipment consisting of storage batteries, battery charging outfit, control power board, ringing machines or pole changers, power wire and conduit is determined by the arrangement of equipment in the Telephone Building. The power circuit furnished with the equipment shows the method of wiring and the detailed instructions on pole changers and batteries, furnish the necessary information as to the care and operation of same, care being taken that pole changers are mounted on a wall free from vibration.

All battery, charging and ringing wires shall be carried in conduit whenever it is necessary, to protect the wires. The wire leading from the ground plate to the arrester frame should, however, never be run in iron conduit, circular loom being permissible.

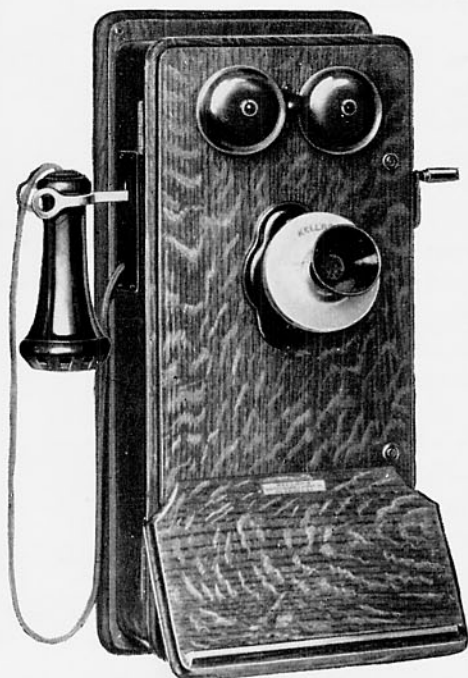
The ground can be made as per Ground Specifications of the National Electrical Code or made by means of laying a copper plate 24" x 24" x $\frac{1}{4}$ " between equal layers of coke 6" thick below the permanent moisture level. The wire lead to the arrester frame should be sweated across the entire face of the plate. Where wire is sweated across the plate and at the point where it leaves the plate it shall be carefully painted with insulating paint to prevent corrosion.

The positive side of the battery which should be grounded, should be tapped to the ground wire. This wire can be protected if necessary by conduit.

Storage batteries should always have a ventilating outlet to carry off the fumes generated while charging and when batteries are installed in a cabinet, the inside of the cabinet shall be thoroughly painted with several coats of a good acid resisting paint.

All joints shall be carefully soldered with a non-corrosive flux and wherever same are exposed to acid fumes, should be painted with a good acid resisting paint after soldering, then taped with Okonite tape and adhesive tape of standard quality and given an outside coat of paint.

Kellogg Magneto Telephones



Rural Type Kellogg Magneto Telephone

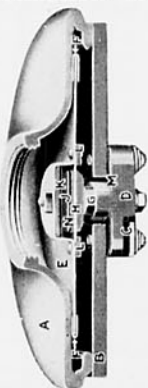
practically the last, and the result is a compact, neat, efficient equipment that not only pleases the user in every respect, but inspires a feeling of pride.

The non-technical man is, of course, interested only in results, and having either used a Kellogg telephone, or talked with some one who does, he knows Kellogg is the answer to efficient, reliable service and to the problem of low maintenance cost.

For the technical man we will say that the reason for the greater transmission efficiency of Kellogg telephones is due primarily to the solid back, reverse type Kellogg transmitter. These transmitters are the result of many years of study and research and the fact that they have surpassed every other transmitter on the market, in repeated tests for transmission and current consumption, proves their correctness. Placing the carbon cup in the diaphragm provides maximum sensitiveness with a minimum current supply, while carbon grain of uniform size insures a steady current flow and no packing.

The accurate reproduction of the weakest voice current into clear, distinct tone waves is largely responsible for the popularity of Kellogg receivers. This extreme sensitiveness is accomplished by using permanent magnets of the exact form and pole pieces of carefully annealed Norway iron.

Kellogg magnetotelephones have long been the established standard among magneto telephone users. The same dignity of design and assembly characteristic of all Kellogg manufactured apparatus is evident in each and every instrument. It is our policy to make the first cost of a magneto telephone practically

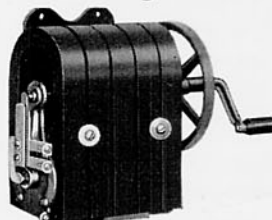


Cross Section Kellogg Transmitter

The diaphragm is formed from perfectly flat ferrotype iron and adjusted to the proper thickness, being held in position for the best effect. By encasing these receivers in heavy shells moulded from Kellite, perfect insulation and protection is provided. The durability of these shells is such as to command the universal support of maintenance men and managers everywhere.

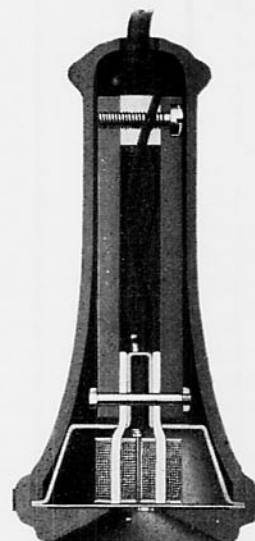
The unequaled performance of Kellogg telephone generators is also explained in the careful design and building of each separate part. By giving special attention to the armature, Kellogg has provided greater winding space than will be found in other types. Enclosing this armature in a magnetic field provided by

large, accurately cut and tempered magnets insures the greatest source of power to be had from similar equipment. The gears are cut and machined for the greatest ease of operation and longest wear. Rigidly mounting all parts, protecting the metal from corrosion and insulating the contact springs with best grade hard rubber, micarta or Kellite gives us a hand generator unequaled for performance.

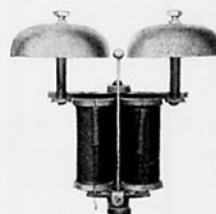


5 Bar Generator

The ringers used in Kellogg telephones are properly assembled and adjusted, requiring practically no attention throughout their entire life. Large spools of highly insulated wire, wound round cores of annealed Norway iron provide coils that operate on the slightest impulse. A long armature stroke permits close air gap adjustment insuring quick response to the weakest as well as strong current flow. Proper armature adjustment at the factory and a thin strip of metal inserted between the pole piece and armature prevent sticking. Gongs of the concentric type shaped from the best brass are protected with a heavy coating of black enamel or nickel and give out a rich tone that can be easily heard at considerable distance.

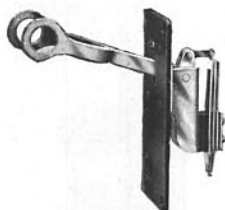


Cross Section Kellogg Receiver



Straight Line Ringer

Kellogg Magneto Telephones



Hook Switch

Rigid construction, durability and snappy operation characterizes the Kellogg hookswitch. The hook is snugly fitted into a socket that permits the hook being quickly removed or replaced, yet prevents its working loose. The contact springs are of select metal being of the proper length and tension for the most positive and accurate operation. Special contact points are used in these springs and heavy mica insulation separates them.

Kellogg induction coils are equal to the transmitter and receiver they operate with. They are carefully wound to the proper degree for sending outgoing voice currents the greatest possible distance without distorting it and at the same time give the greatest receiving efficiency on incoming waves. For clear, distinct local or long distance service Kellogg induction coils are the best.



Induction Coil

For party lines and especially heavily loaded rural lines, order your Kellogg telephones equipped with condensers. These telephones will be equipped with one of our standard one-half microfarad condensers having a minimum resistance of 10,000 ohms, which prevents the crippling of the ringing current should the receiver be removed from the hook while some one is ringing.



Condenser

The wiring or cabling used in Kellogg telephones is well formed from best grade copper conductors well insulated and though well arranged for protection it is in easy reach for inspecting.



Desk Type Magneto Telephone

The equipment for our magneto telephones is assembled in very compact, sturdily built cabinets

cut from kiln dried quarter-sawed oak, dull rubbed and hand finished in a beautiful dark oak. While building a neat compact cabinet we have provided ample space for all apparatus allowing plenty of room for inspection or changing of parts. All cabinets are designed primarily for wall mounting having a full length door hinging outward, which is held firmly in place by machine screws.

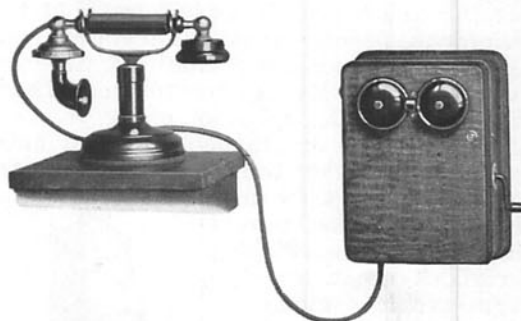


Residence Grabphone

Neat comfortable writing shelves are conveniently located in the lower front of the rural type sets.

All binding posts, terminals, etc., are conveniently located and properly marked.

The Kellogg desk stands are unique in design, being as attractive in appearance as they are rugged in construction. A heavy felt ring encircling the base protects both the stand and furniture. The switchhook assembly of long properly tempered springs is securely mounted in the base in full view and at the convenience of the inspector. A heavy Kellite tube protects



Grabphone Type Magneto Telephone

the upright against chipping, flaking, discoloring or ravages of sweaty hands. The transmitters are firmly held in proper position by the only perfect transmitter adjustment on the market.

Further information regarding Kellogg magneto telephones will be found in our Bulletin No. 56 or Catalog No. 8-M.

KEYSTONE

Magneto Switchboards



BULLETIN NO. 121

KEYSTONE
MAGNETO SWITCHBOARDS
COMPANY
CHICAGO

REVERSE OF THE COVER SHOWING EMBOSSED ENGRAVING