



MAGNETO SWITCHBOARDS

BULLETIN NO. 10 - CIRCA 1915

INCLUDES SALES BULLETINS 99 AND 100 - 1919

Printed in booklet form, 7.5 X 10 inches, gutter bound, 44 pages on 20 pound coated stock using the letterpress method. This piece was two hole punched on the left side. Part of a catalog set containing 13 booklets and several single sheet brochures ranging in dates from 1914 to 1918 and bound under a separate hard cover using Chicago screws. Also included are four undated two color sales brochures for magneto switch boards and six sales brochures for Kellogg replacement parts for Dean, Garford and Western Electric switchboards and telephone sets, dated April 1919.

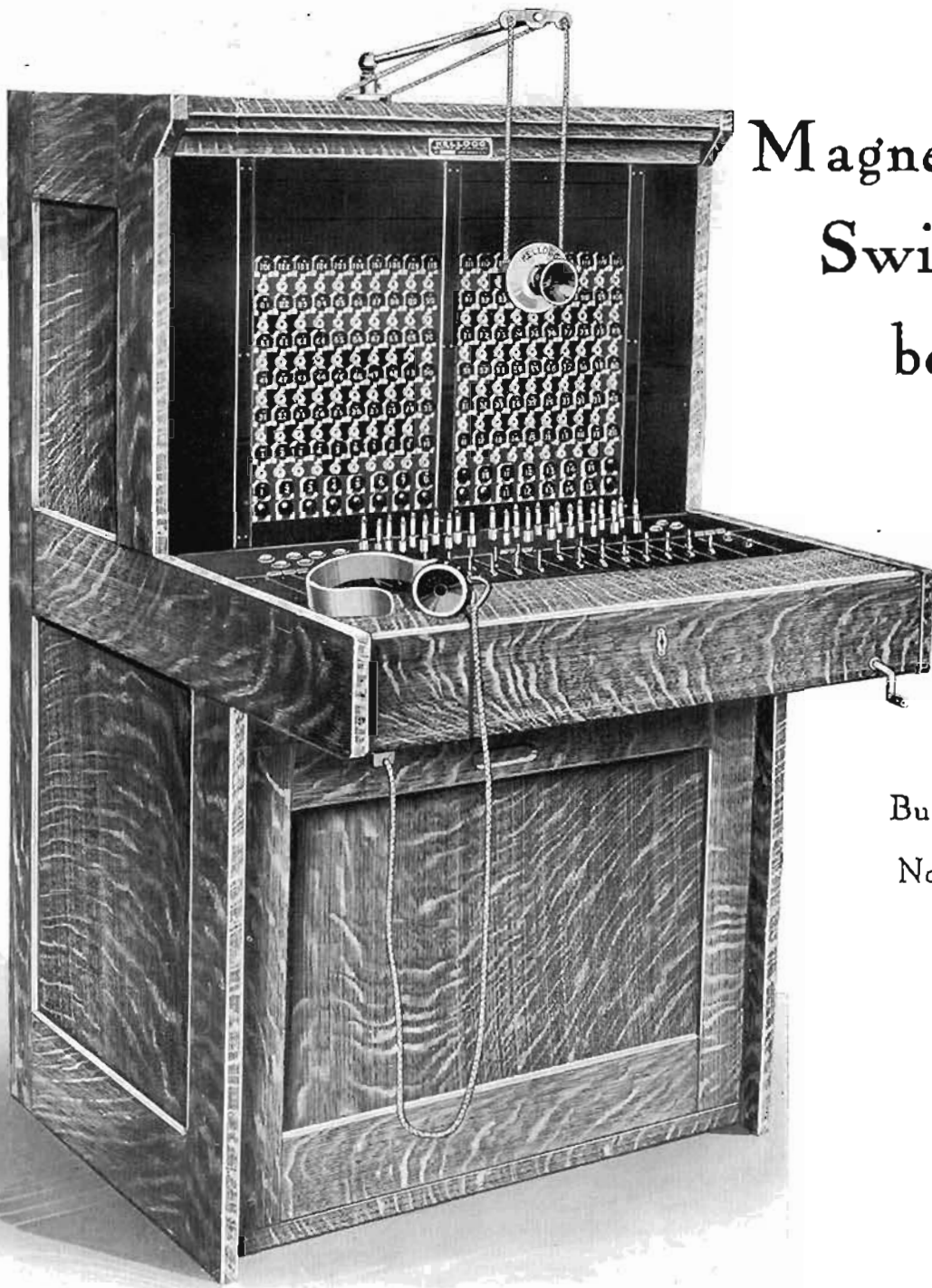
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Magneto Switch- boards

Bulletin
No. 10

Kellogg Switchboard & Supply Company

Kansas City, Mo.

Chicago, Ill.

San Francisco, Cal.

Manufacturers of Standard Telephone Equipment

INTRODUCTORY



HIS book describes and illustrates Kellogg magneto switchboards.

Reliability in service, adaptability to all exchange conditions, and simplicity, are the outstanding features.

The particular advantages of this splendid line of switching equipment can be judged by their popularity, by the number already in service.

Use Is The Test.

KELLOGG SWITCHBOARD & SUPPLY COMPANY

Chicago, Ill.

BRANCH OFFICES:

Kansas City, Mo.

San Francisco, Cal.

Columbus, Ohio

DISTRIBUTING HOUSES:

Canada West Electric, Ltd., Regina, Sask. Can.

The McGraw Company, Sioux City, Ia.

The McGraw Company, Omaha, Neb.

Pacific States Electric Co.,

Los Angeles, Cal.; Oakland, Cal.; Portland, Ore.; Seattle, Wash.

Northwestern Electric Co., St. Paul, Minn., Duluth, Minn.

Tower-Binford Elec. & Mfg. Co., Richmond, Va.

National Telephone Supply & Development Co., Atlanta Ga

Switchboard Cabinets



Fig. No. 101—160 Line Cabinet, Operator Caring for Office Work at Adjoining Desk

to the building of the complete woodworking plant.

The standard woodwork for all Kellogg magneto switchboards is heavy, quarter-sawed oak in dark finish. Over two weeks' time is required in applying, drying in and rubbing down, the several coats of shellac and varnish. In this manner, it is possible to secure a finish that will endure through years of continuous and hard usage which most switchboards receive.

All low keyshelf Kellogg switchboards can be used as above illustrated. Many large magneto exchanges use this equipment as a separate toll board during busy hours. Other large magneto plants use this equipment for a chief operator who also does clerical work, while for the smaller plants, the desk or table in connection with a low keyshelf Kellogg board will be found a great convenience.

Being fully convinced of the convenience and utility of low key shelf type equipment, the Kellogg Company has designed a line of such boards for all capacities up to and including 360 lines with two operators' positions and fifteen cord circuits for each operator.

In Kellogg ten per strip boards it is unnecessary to purchase as many as ten additional drops and jacks at a time, as a strip for ten can be furnished with say, five installed and the remaining drops furnished as needed. The drops readily attach by means of one screw while each jack is secured in place by its thimble which is screwed in with the socket wrench included in the set of tools furnished with each new board.

Thus it is really no more difficult to provide additions to ten per strip boards than to five per strip and by the use of ten per strip drops and jacks, it is possible to put 180 drops and jacks in one operator's position in low type boards.

Apparatus of that quality and durability which Kellogg equipment has proven itself to be, deserves housing in strong, handsome and durable cabinets. For this reason, Kellogg switchboard cabinets are not purchased in the open market, but are built from the raw material in the Kellogg Company's own woodworking plant. These cabinets are of a better quality than it is possible to procure in the open market, and it was the fact that woodwork of the Kellogg standard was not obtainable, that led

Fifty Line Cabinet

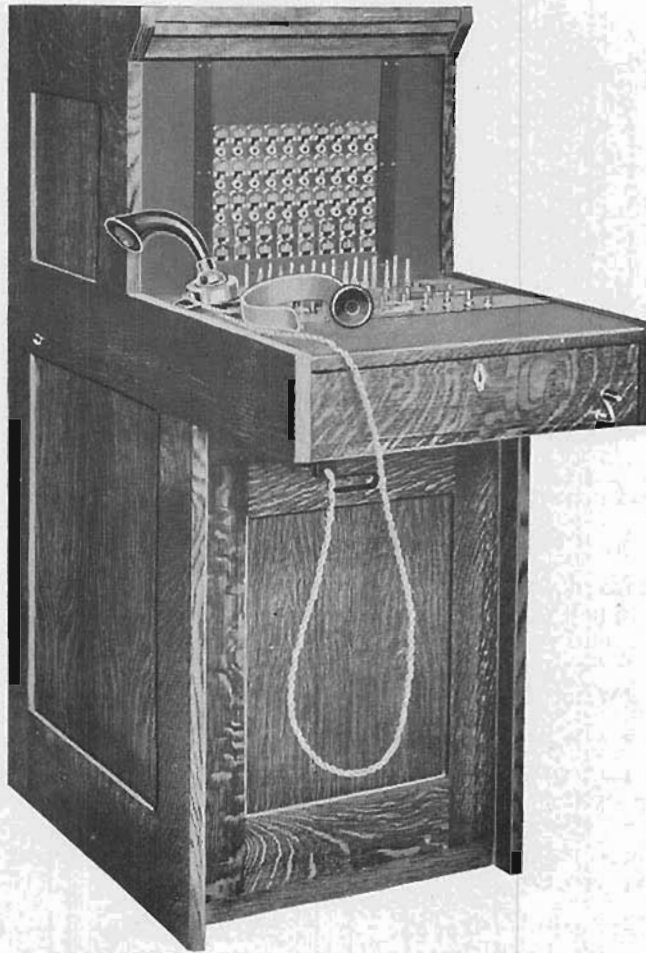


Fig. No. 102—Code No. 11-B—50 lines capacity

Equipped with breast plate transmitter

The No. 9 Dark Golden Oak finish regularly used on all low keyshelf Kellogg switchboards will match very nicely with a standard dark golden oak desk or table obtainable from any local furniture dealer. Kellogg cabinets of standard finish are carried in stock at all times. Special finishes can be supplied to order, at a small additional cost, but three to four weeks' extra time is required. We recommend the use of standard cabinets whenever possible.

Fifty Line Cabinet

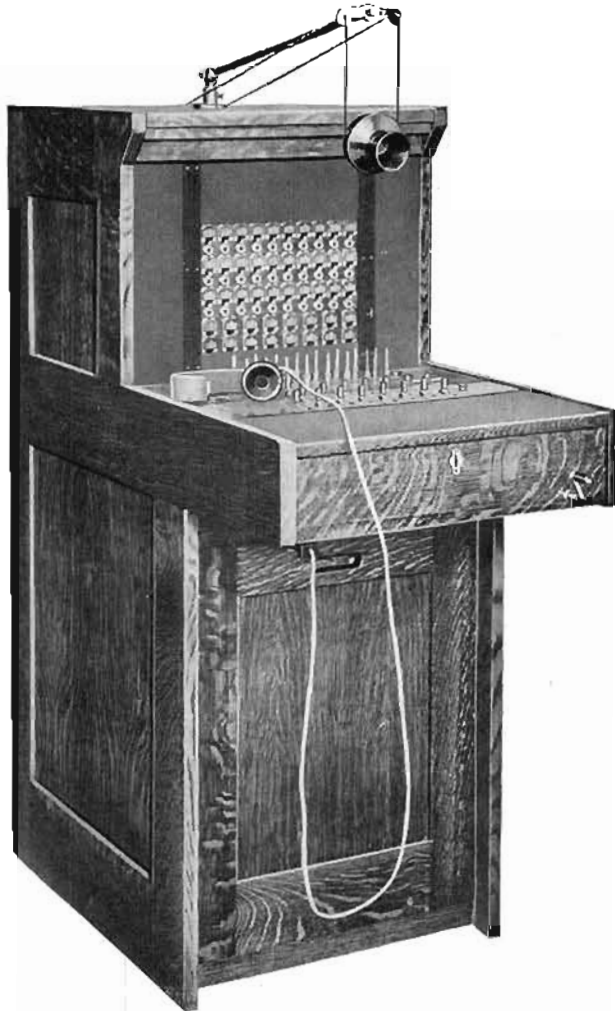


Fig. No. 103—Code No. 11-B—Wired for 50 lines, 8 cord circuits
Suspended type transmitter

The Kellogg boards, equipped with the new Kellogg transmitter arm, unless breastplate operator's equipment is preferred, have the added advantage of the superior service possible with this arm, for instance, the doing away with the clumsy transmitter cord weights.

This arm is of special merit in installations where the operator handles office work in addition to caring for the board because of its wider range of position and ease of handling. It means better service.

One Hundred Line Cabinet

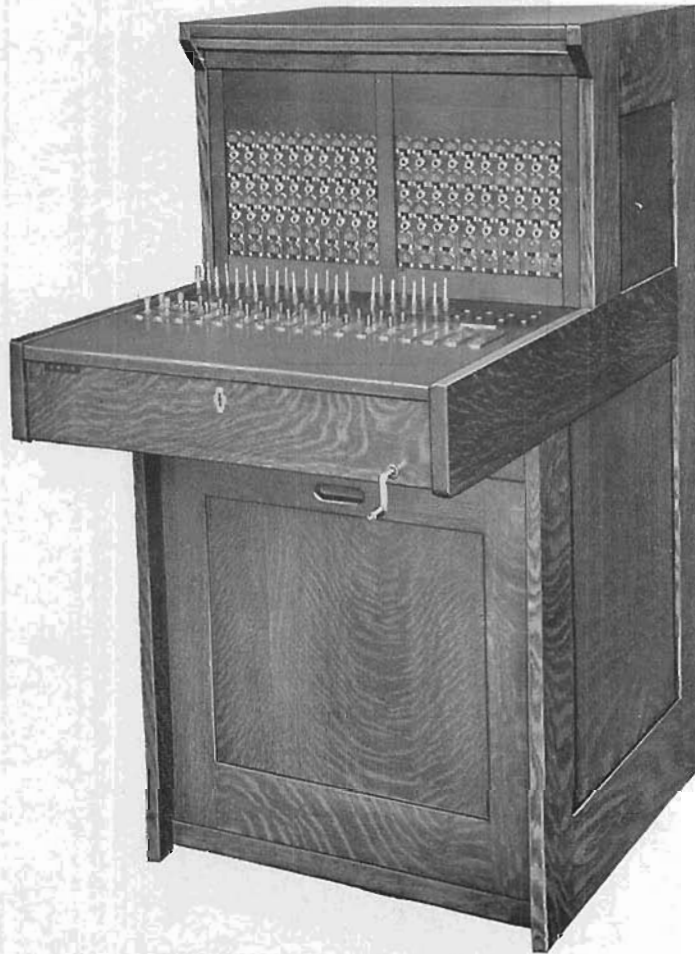


Fig. No. 104—Code No. 12-B—100 line capacity
Wired for 100 lines, 12 cord circuits

An ideal low key shelf equipment where an ultimate capacity of 100 lines is desired. Can be used in connection with desk or table.

FEATURES:

The height of the key shelf of all of these boards is such that ordinary office chairs are used, an added saving and convenience.

Standard woodwork and finishes in keeping with regular designs in office furniture.

One Hundred Line Cabinet

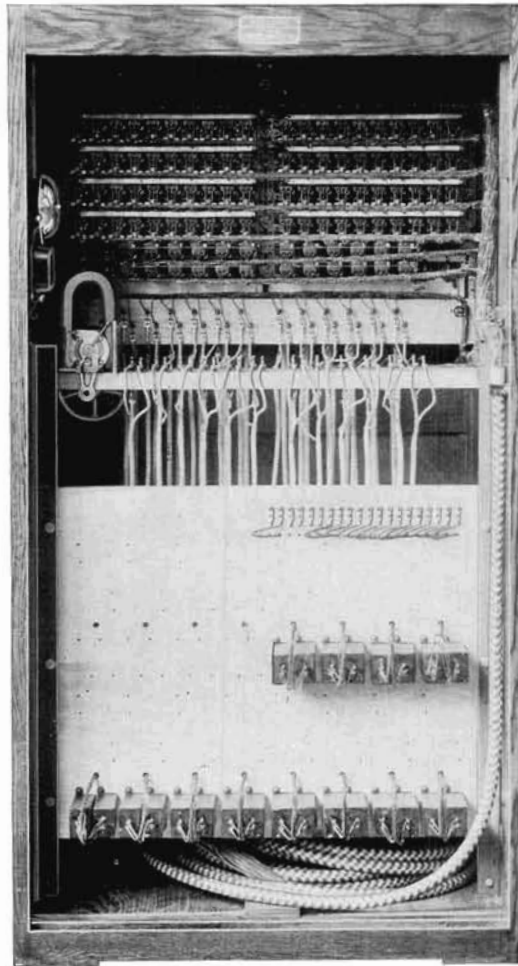


Fig. No. 105—Code No. 12-B

The very practical arrangement of apparatus is evident at a glance

Drops and jacks, generators, coils and condensers rigidly mounted and are accessible. Coils and condensers mounted on heavy maple panel.

The superiority of Kellogg drop and jack strip, generator night alarm, condenser and coil mounting is evident to the switchboard man.

One Hundred and Sixty Line Cabinet

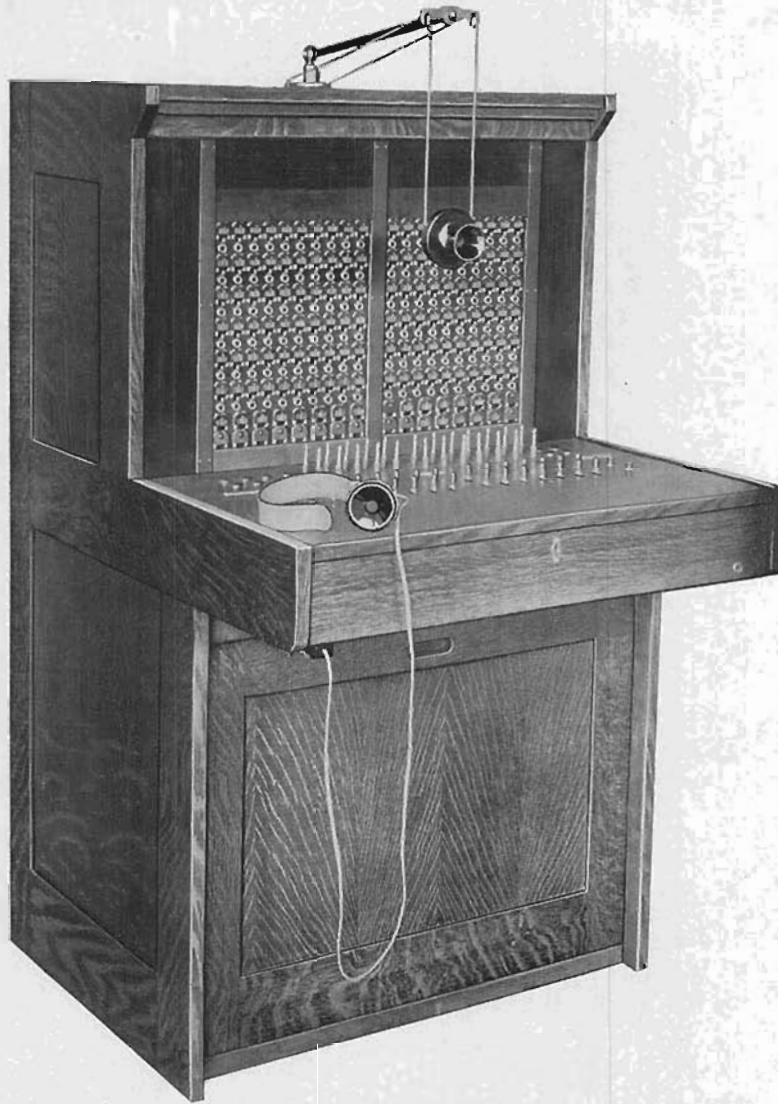


Fig. No. 100—Code No. 13-B—160 line capacity
Wired for 160 lines, 16 cord circuits

ADVANTAGES:

Generous key shelf room allowing ample writing space. Transmitter conveniently adjusted to position by raising or lowering arm. No weights to wear out transmitter cords or injure wiring. Operator's jack mounted under key shelf.

One Hundred and Sixty Line Cabinet

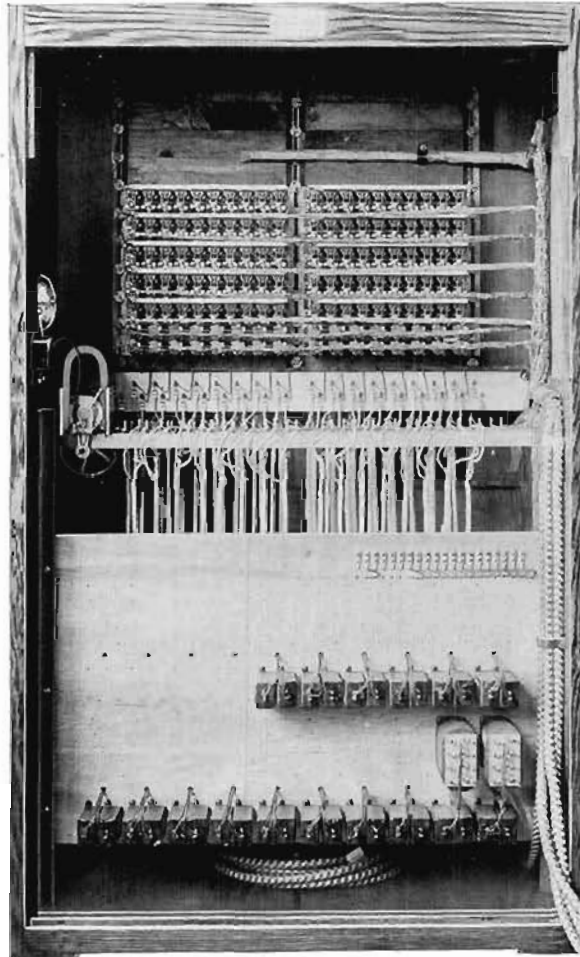


Fig. No. 107—Code No. 13-B

ADVANTAGES:

.. Cord connecting racks arranged to prevent tangling of cords. All connections are distinctly and carefully marked and the hard maple connecting panel affords spacious mountings for the high efficiency repeating coils and condensers.

The line cable is brought out at the base or top of the cabinet, and all miscellaneous keys, such as generator, switching, master keys, etc., are located according to the layout shown in this bulletin.

Two Hundred and Forty Line Cabinet



Fig. No. 108—Code No. 14-B—Wired for 240 lines, 30-cord circuits

To meet the demand for a switchboard of larger capacity than 160 lines, where future growth might not warrant the wiring and capacity of our Code 15-B we have the above switchboard, Code No. 14-B, two operators positions and wired for 240 lines, 30 cord circuits. This offers a fast operating board. 60 lines per panel. A standard board throughout. For dimensional drawings, see page 18.

Three Hundred and Twenty Line Cabinet



Fig. No. 109—Code No. 15-B—Wired for 320 lines, 30-cord circuits

The above cabinet has a capacity for 360 lines when single supervision is used.

This is an ideal two-position switchboard. The sturdy, compact cabinet, of heavy quartered oak, is built to stand years of hard usage. A roomy cabinet and shelf, with ample line and cord capacity for extreme service conditions.

Three Hundred and Twenty Line Cabinet

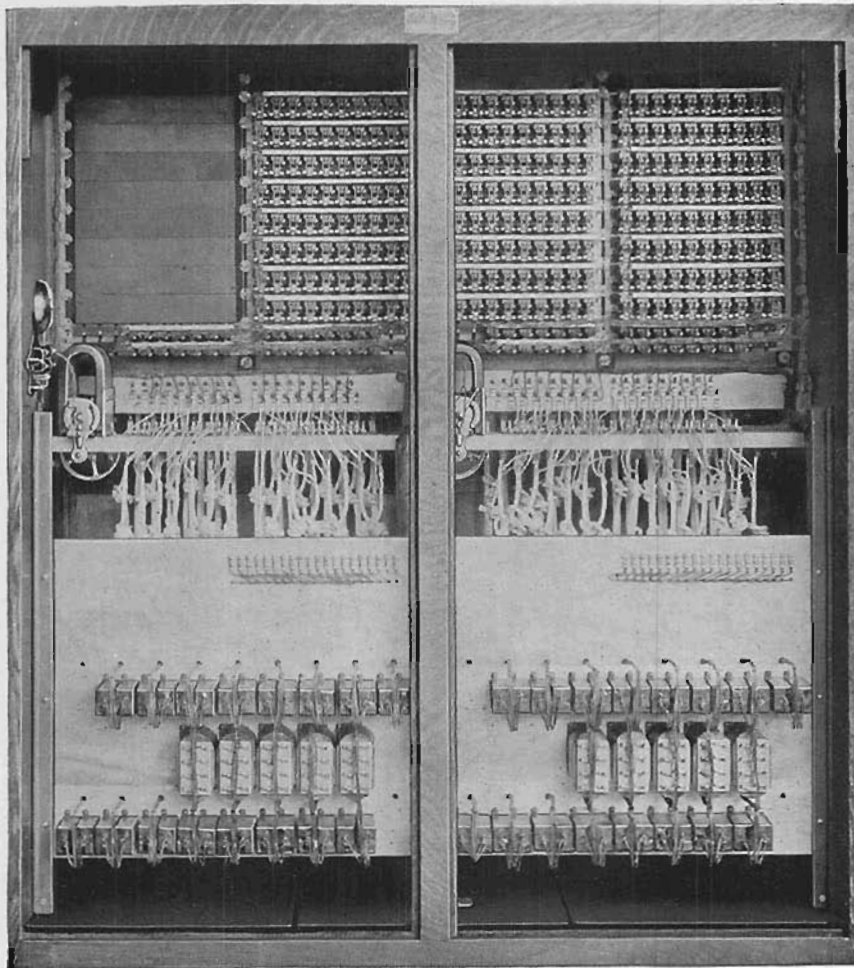


Fig. No. 110—Code No. 15-B—320 lines capacity

Note accessibility of all parts

One Hundred and Fifty Line Cabinet

High Type Cabinet

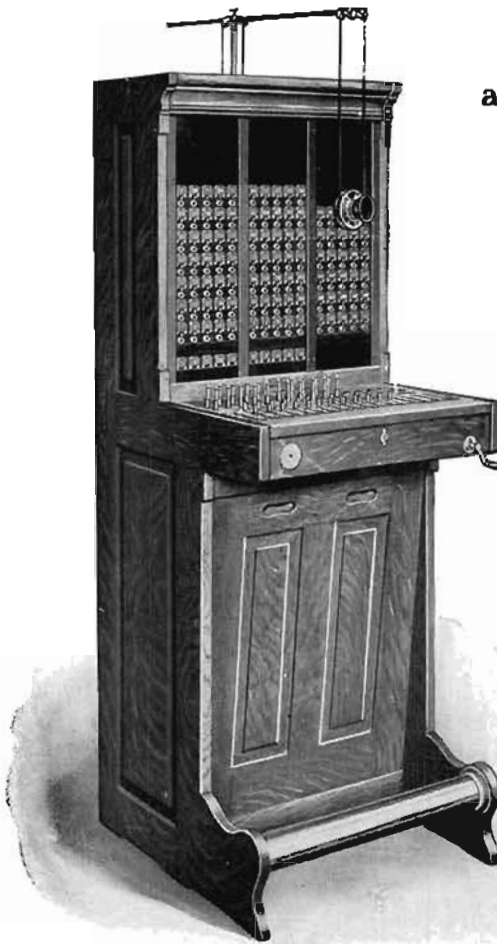


Fig. No. 111

Cabinet No. 12053—Wired for 150 Lines
and 15 Cord Circuits

To meet the needs of exchanges having the high type sections and wishing uniform extensions promptly, we have in stock and ready for immediate shipment some of these popular types.

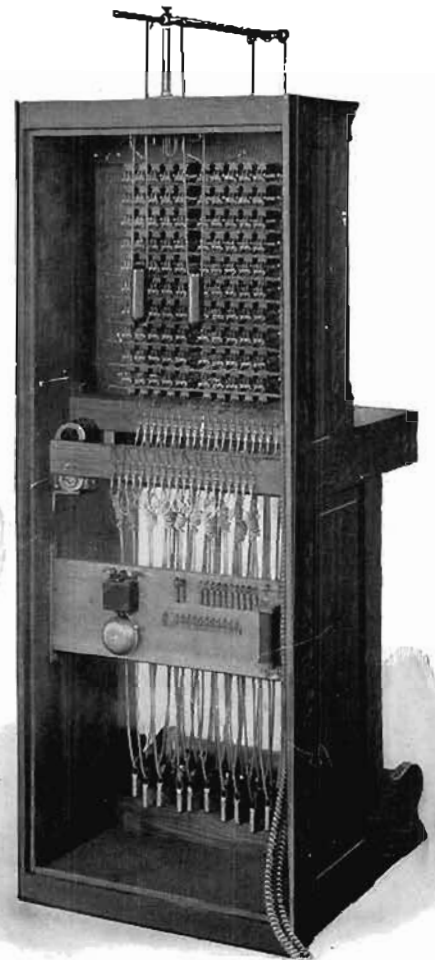


Fig. No. 112
Rear View Cabinet No. 12053

Four Hundred and Fifty Line Cabinet

High Type Cabinet



Fig. No. 113

Cabinet No. 13755 Wired for 450 Lines, 5 per Strip, and 45 Cord Circuits
Cabinet No. 13755, same as above, but arranged for 600 combined drops and jacks, ten per strip; 45 cord circuits either single or double supervision.

Dimensional Drawings, Code No. 11-B, 50 Line Cabinet

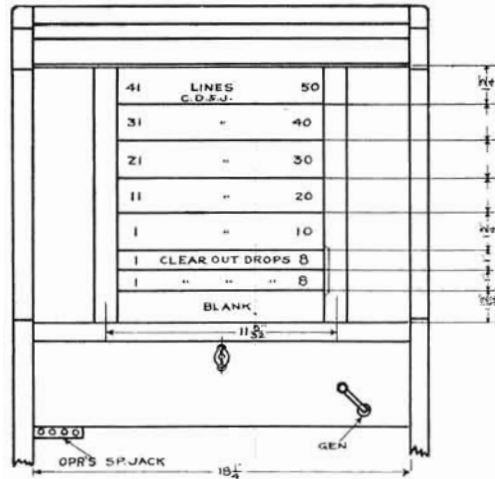


Fig. No. 114

Top view of key shelf showing keys and cord equipment.

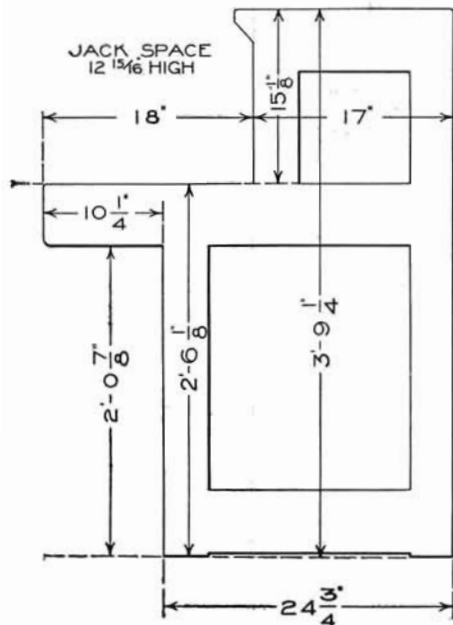


Fig. No. 116, Side Elevation
Code No. 11-B Cabinet
Total width 20"

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

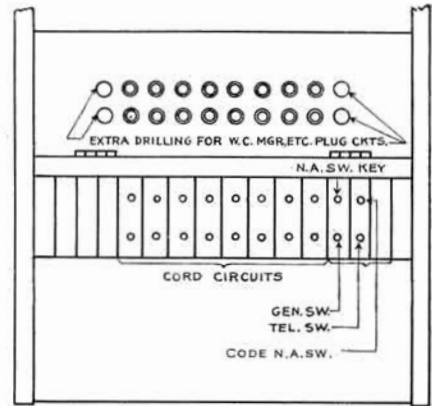


Fig. No. 115

The side elevation gives an excellent idea of the convenient key shelf space.

Cabinet No. 11-B (10 to 50 lines) is arranged for the following ultimate capacity:

- 50 combined drops and jacks, ten per strip
- 8 complete cord circuits, either double or single supervision
- Repeating coils in as many cord circuits as desired
- 1 operator's set
- 1 night alarm circuit
- 1 five bar hand generator
- 12 ft. cable from base or top of board

Dimensional Drawings, Code No. 12-B, 100 Line Cabinet

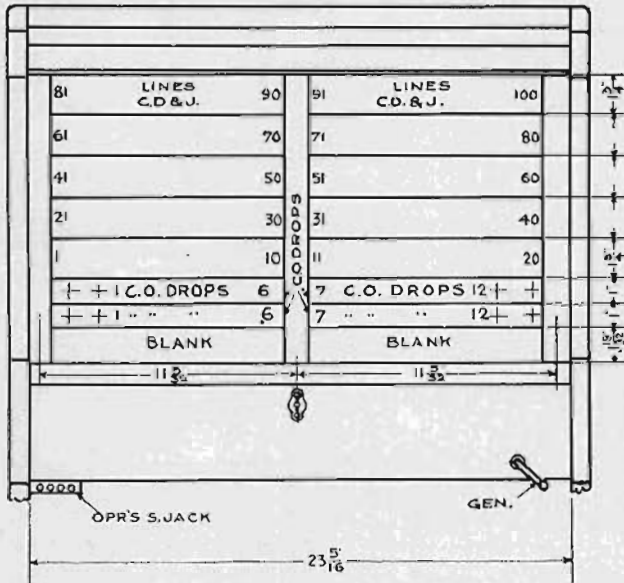


Fig. No. 117
Top view of key shelf
showing keys and cord
equipment.

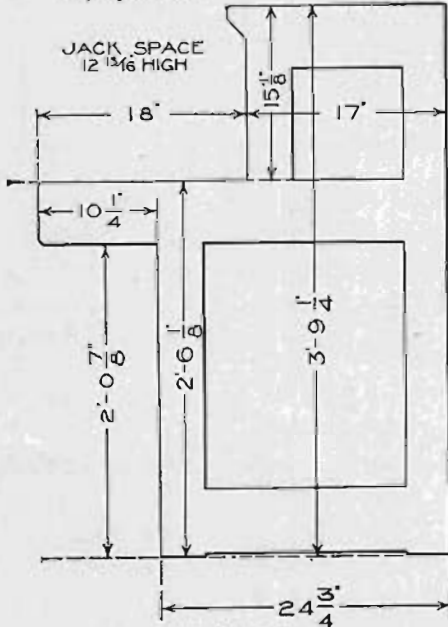


Fig. No. 119
Code No. 12-B Cabinet
Side Elevation
Total width 25 1/16"

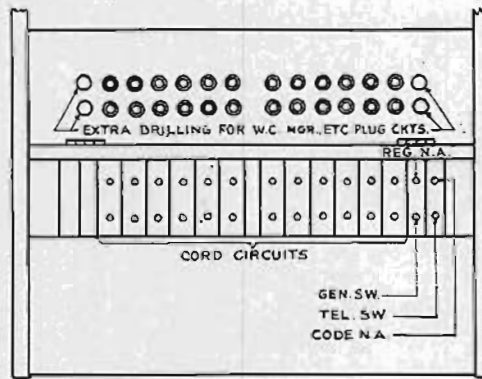


Fig. No. 118

Cabinet No. 12-B has the following ultimate capacity:

- 100 combined drops and jacks
- 12 complete cord circuits, either double or single supervision
- Repeating coils in as many cord circuits as desired
- 1 operator's set
- 1 night alarm equipment
- 1 five bar hand generator
- 12 ft. cable from base or top of board

Dimensional Drawings, Code No. 13-B, 160 Line Cabinet

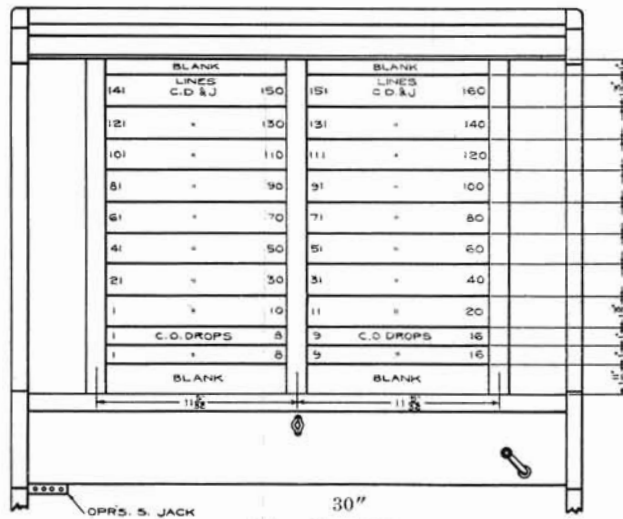


Fig. No. 120

Top view of key shelf showing keys and cord equipment.

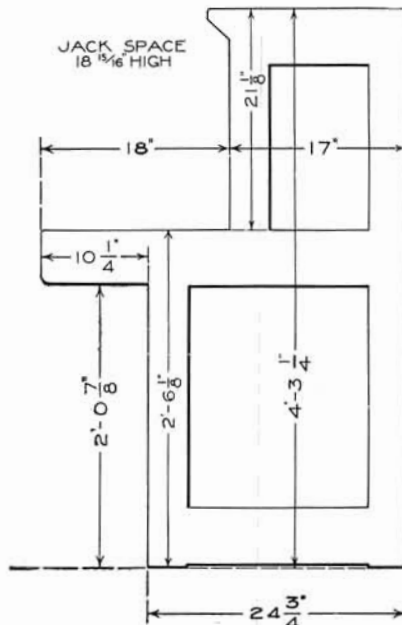


Fig. No. 122

Side Elevation
Code No. 13-B Cabinet
Total width 31 3/4"

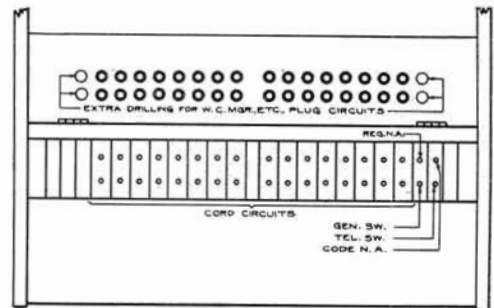


Fig. No. 121

Cabinet No. 13-B has the following ultimate capacity:

- 160 combined drops and jacks
- 16 complete cord circuits, either double or single supervision with repeating coils in as many cord circuits as desired
- 1 operator's set
- 1 night alarm equipment
- 1 five bar hand generator
- 12 ft. cable from base or top of board

Dimensional Drawings, Code No. 14-B, 240 Line Cabinet

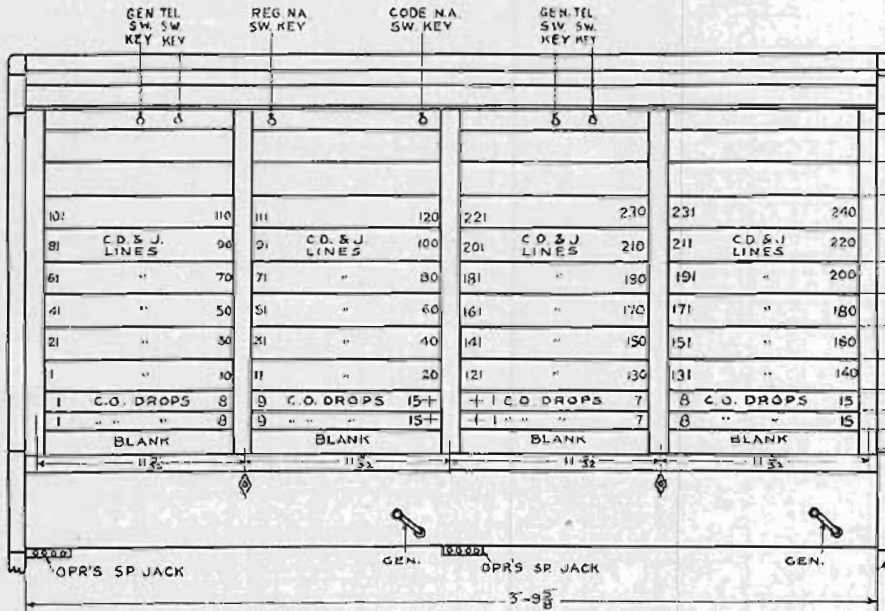


Fig. No. 123

Front View of Face Equipment Showing Drops and Jacks and Front End of Key Shelf, With Operators' Jacks

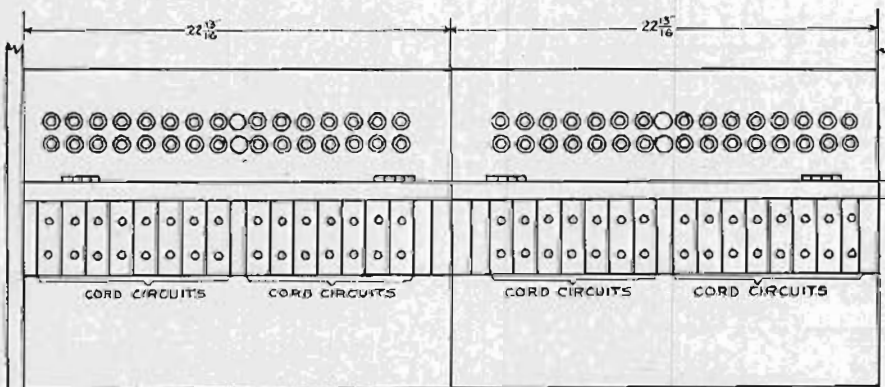


Fig. No. 124

Top View of Key Shelf Showing Keys and Cord Equipment

Dimensional Drawings, Code No. 15-B, 320 Line Cabinet

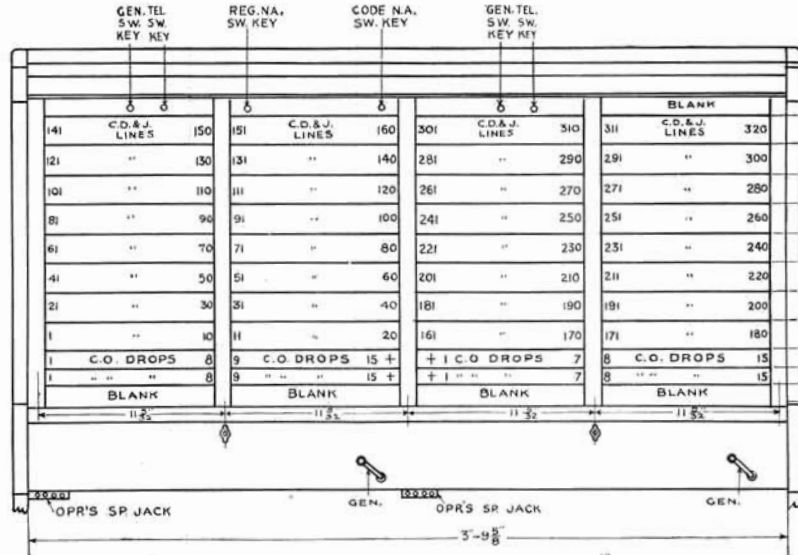


Fig. No. 125

Front View of Face Equipment Showing Drops and Jacks and Front End of Key Shelf with Operators' Jacks

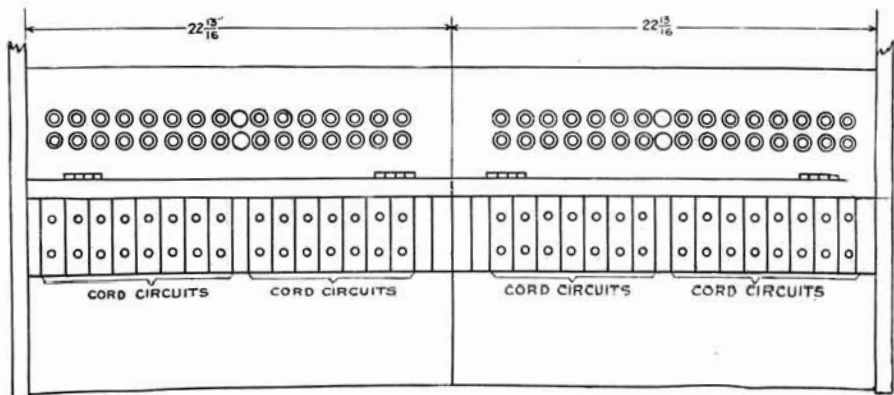


Fig. No. 126

Top View of Key Shelf Showing Keys and Cord Equipment

Dimensional Drawings, Code No. 12053, 150 Line Cabinet

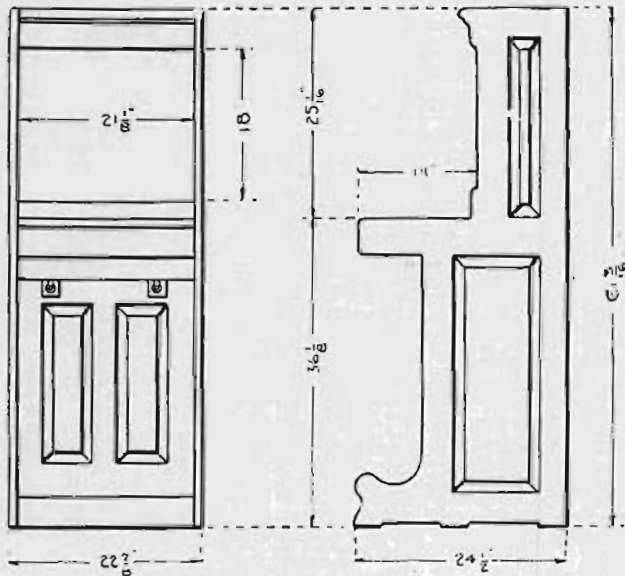


Fig. No. 127

Cabinet 12053 has the following ultimate capacity:
150 Combined drops and jacks.

15 complete cord circuits, either double or single supervision.

1 operator's set.

1 night alarm equipment.

1 five-bar hand generator.

12 ft. of cable from base or top of board.

Calculagraph Section:

Cabinet drawing No. 25008— $12\frac{5}{32}$ " wide overall, otherwise same dimensions as high key shelf type cabinet No. 12053. Key shelf drilled for calculagraph. Standard pigeon holes can be mounted in the face of cabinet. Front and rear doors removable.

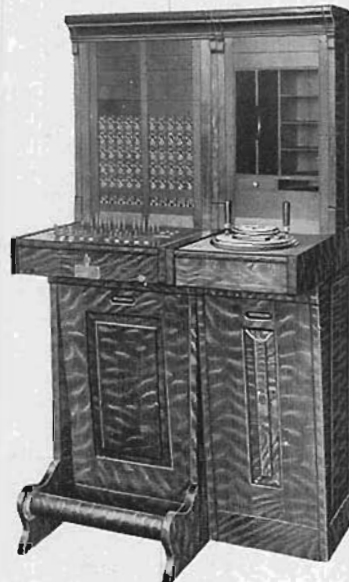


Fig. No. 128

**Dimensional Drawings, Code No. 13755, 450 Line
Cabinet**

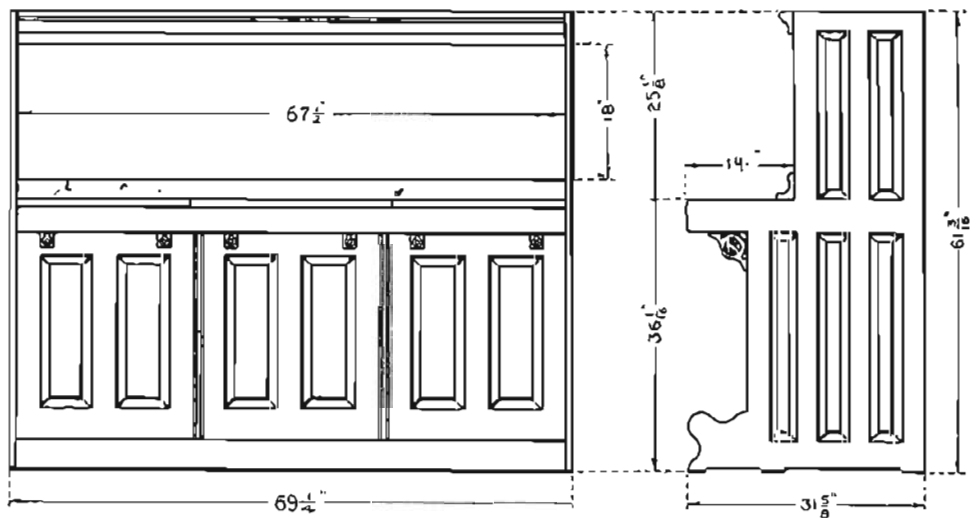
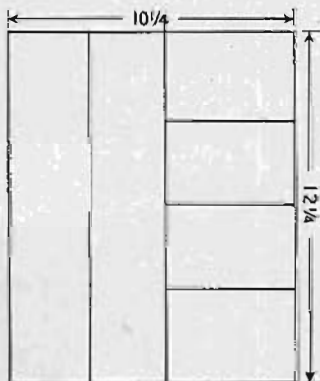
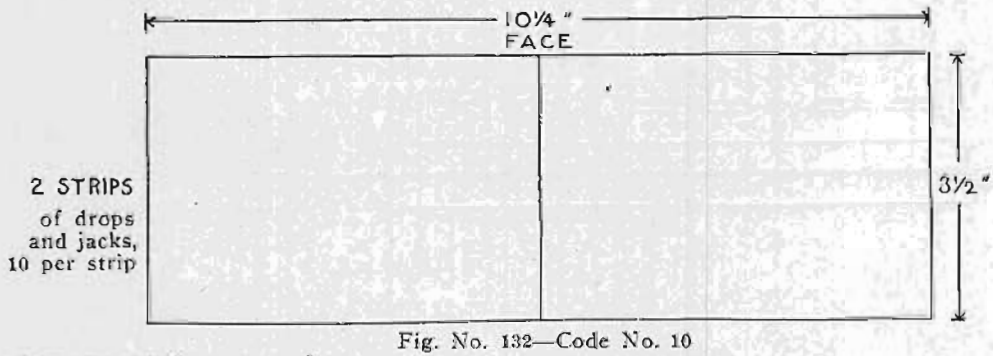
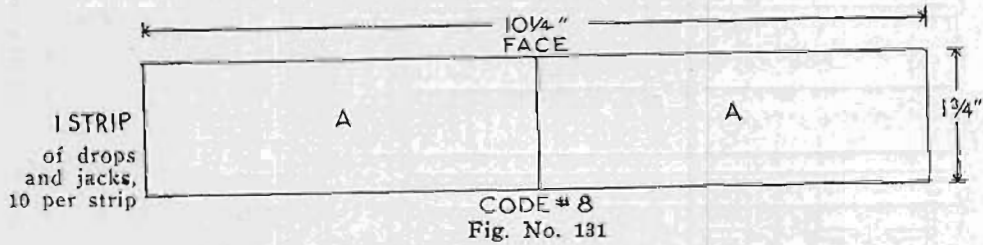
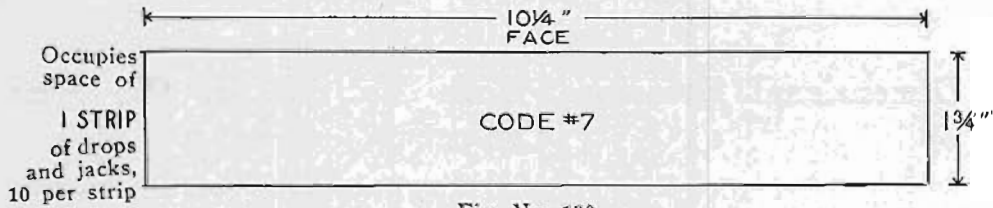


Fig. No. 129

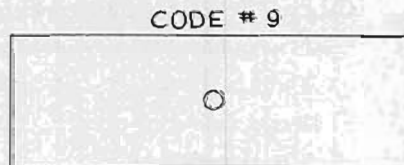
Cabinet 13755 has the following ultimate capacity:

- 450 combined drops and jacks, 3 per strip.
- 660 combined drops and jacks, 10 per strip.
- 45 complete cord circuits, either double or single supervision
- 3 operator's sets
- 1 night alarm equipment
- 3 five-bar hand generators
- 12 ft. of cable from base or top of board

Standard Pigeonholes



Occupies space of 7 strips of
10 per strip drops and jacks.



CASH DRAWER
TO FIT "A"

Fig. No. 134

On this page are sketches showing
the four standard pigeonholes and cash
drawer equipments for magneto
switchboards.

Equipment Code No. 15-B Cabinet

Cabinet No. 15-B has the following ultimate capacity:

- 320 Combined drops and jacks
- 30 complete cord circuits, either double or single supervision, with repeating coils in as many cord circuits as desired
- 2 operators' circuits
- 1 night alarm circuit
- 2 five bar hand generators
- 12 ft. cable from base or top of board
- 15-B Special same as above but has a capacity of 360 lines when single supervision is used.

RINGING AND LISTENING KEYS

The requirements of a perfect ringing, and listening key are as follows:

1. It must afford absolutely reliable connection for the talking circuit, since the connected parties have to talk through four contacts in the two ringing keys of each cord circuit.
2. Friction of wearing parts must be reduced to a minimum or the key will be extremely short lived because of the fact that one key has to take care of the combined traffic of about ten average lines.
3. Insulation must be such that no noise or inductive disturbances from power generator ringing current will be noticed either by operator or subscribers.
4. Key levers must be located close together so that all key shelf-space will not be taken up and the operator deprived of necessary shelf room.
5. Key cable wiring must be soldered to non-movable portions of the key springs, or broken connections and continued trouble will result.
6. Ringing springs must be so arranged that they will break contact with the calling party before connecting with the power generator springs. Otherwise calling party will receive a disagreeable ring in the ear when the ringing key is operated.
7. The listening key must trip easily into position and remain locked until released. When released, it must return gently to upright position.
8. The key must be so constructed as to prevent the lodgment of dirt and dust between the springs as this is bound to result in generator noise and under certain conditions will produce arcing and a complete breakdown in the key's insulation.

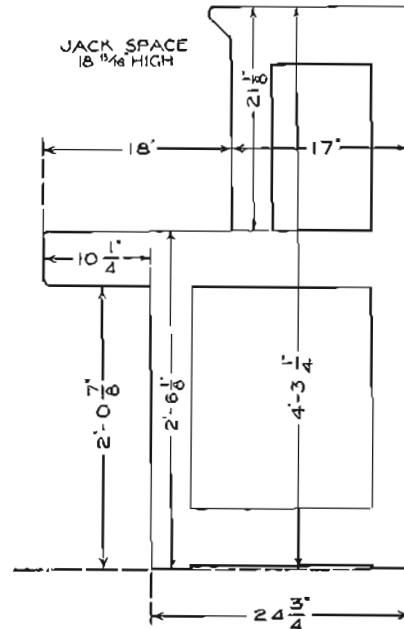


Fig. No. 135

Side Elevation
Code No. 15-B Cabinet

Principal Advantages of the Kellogg Cam Type Key

Some of which are omitted in all other makes

1. Long flexible contact springs of the proper thickness and tension with short action, which reduces spring breakage to a minimum and avoids excessive wear on the cam and rollers.
2. Contacts are of Platinum.
3. Kellogg Bakelite insulating material used throughout.
4. Tube bushings are of Kellogg Bakelite and of the headless type.
5. All screws are flush with escutcheon.
6. Frame securely mounted to escutcheon by means of four machine screws.
7. Heavy metal clamps are used under the mounting screw heads, which permit rigid contact spring assembling.

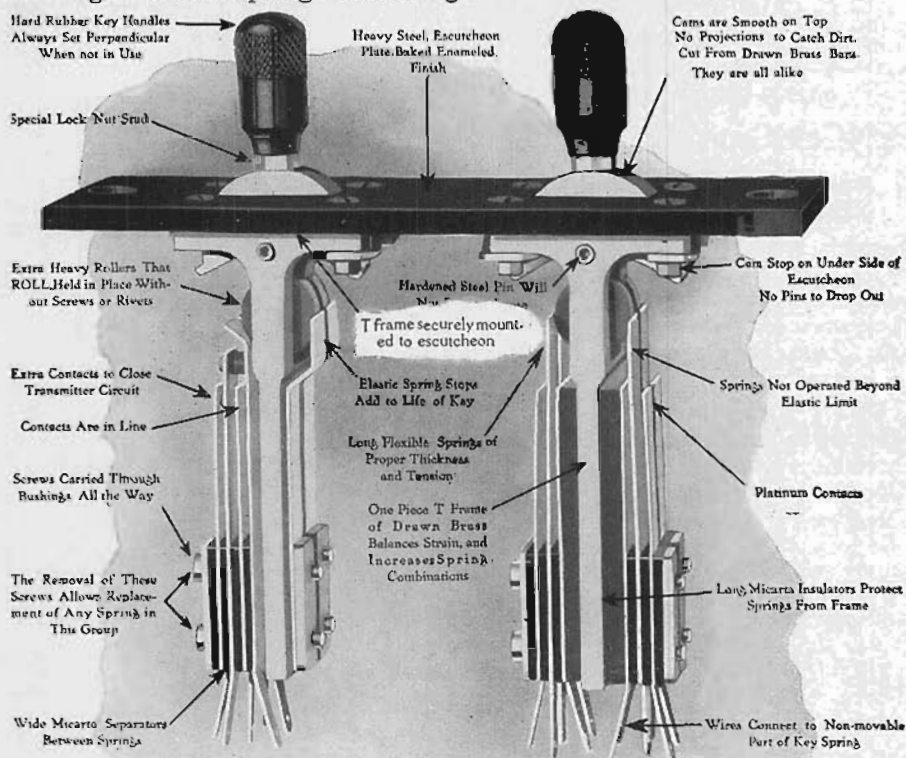


Fig. No. 136

8. The heavy brass "T" frame permits the contact springs to be mounted on both sides, thereby increasing possible spring combinations and at the same time balancing the strain under all conditions.

9. The cam is so designed that the extra heavy rollers are held in place without the use of screw or rivets.

10. Large bearings are provided for the rollers.

11. Extra wide, heavy steel bearings are provided for the cam, thereby eliminating side play.

KELLOGG SWITCHBOARD AND SUPPLY COMPANY, CHICAGO

12. A special stud is used to mount the cam handles which greatly increases the strength of this particular part.

13. The general construction of the cam type key is such that only one frame and one cam, together with the Universal stop, is necessary for any combination of key that is desired, making it possible to change this key to any combination by merely changing the springs and re-arranging the stops.

14. The frame and cam are constructed of drawn brass.

15. The studs and screws are of steel.

16. The escutcheon is made of heavy steel with baked enamel finish.

17. Extra contacts furnished on listening keys for closing operators transmitter battery circuit.

KEY-SHELF:

The key-shelf is reinforced by grooved metal key frames. Centered holes for mounting the keys are entirely done away with, the keys being securely held in place by a clevis, which is drawn up into the grooved key frame by means of screws through the escutcheon plate.

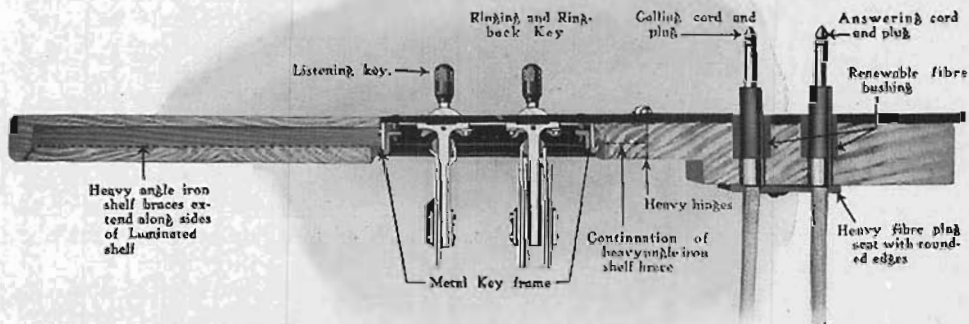


Fig. No. 137—Cross section view of plug and key shelf

The plug shelf is covered with wear-resisting material which will not mar from the impact of the plugs.

The plug drillings are provided with removable fibre bushings to prevent wear on cords and insure proper seating of plugs.

Heavy angle irons give added strength and durability to our key-shelves, preventing warping or splitting. To properly support the key shelf, a piano type hinge, extending the full length of each key shelf, is used. Added shelf space aids in operating and general office work.

Detail of Apparatus

Combined Drops and Jacks

The requirements of a perfectly designed combined drop and jack are as follows:

1. Drop must be sensitive and respond to extremely weak currents in case of line trouble.
2. When used on country lines, the drop shutter must produce a clean cut rattle to indicate incoming signals and code rings.
3. Drop shutter must not be left to fall down, but must be KICKED DOWN by the shutter rod.

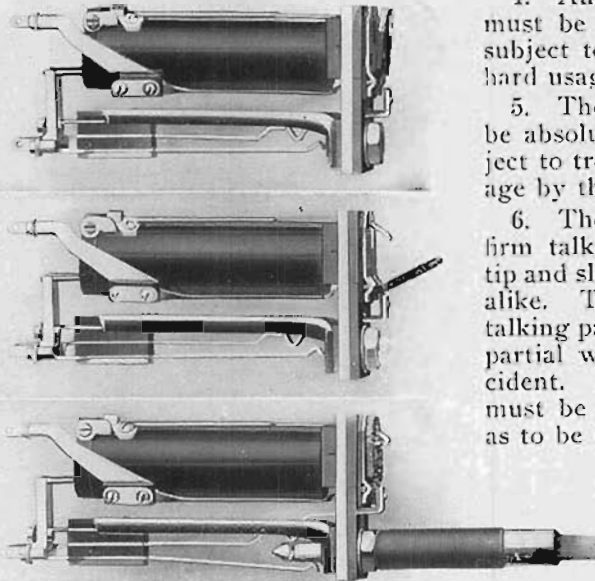


Fig. No. 138

Showing operation of Kellogg combined drop and jack armatures must be so treated as to be wholly rust-proof and to prevent the shedding of metallic scales.

8. Each drop coil with its core and containing shell must be heavily insulated with hard rubber from the mounting plate, from the night alarm circuit, and from all other drop coils and adjacent parts. Such construction is very expensive, but it renders burnouts and damage from lightning highly improbable under any circumstances and practically impossible when proper carbon protection is employed. Investigation will reveal that every one of the above points has been carefully taken care of in the Kellogg combined drops and jacks.

9. Armature screw not of old beveled type, it does not have adjustment.

10. Springs adjusted so they are not strained beyond point necessary to restore shutter. Only natural tension when plug is entirely in jack. This reduces wear on tip and sleeve springs as well as plug and jack thimble.

4. Automatic restoring device must be reliable in action and not subject to disability from wear and hard usage.

5. The night alarm contact must be absolutely positive and not subject to trouble from dust or to damage by the plugs.

6. The jack springs must make firm talking contact both with the tip and sleeve of new and worn plugs alike. They must wholly prevent talking parties being "cut off" by the partial withdrawal of plugs by accident. The springs themselves must be so designed and tempered as to be free from breakage and yet withstand the maximum of wear and tear. Both jack springs and thimbles must be easily removable when finally worn out on extremely busy lines.

7. All iron work about drop coils and armatures must be so treated as to be wholly rust-proof and to prevent the shedding of metallic scales.



Fig. No. 139

Illustrating strip of ten Kellogg combined drops and jacks

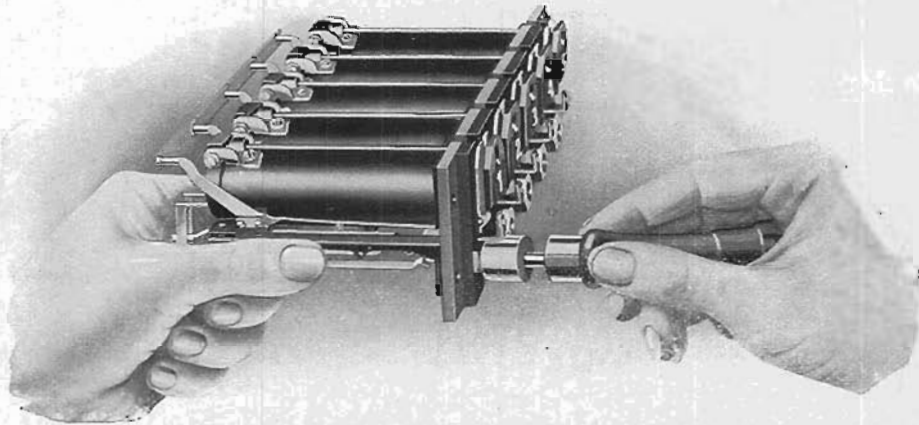


Fig. No. 140

Illustrating how any jack can be removed from mounting strip without disturbing other lines

Advantages of the Kellogg combined drop and jack :

1. Sensitiveness: Extreme sensitiveness is secured through the proper design of armature and shutter hook, so that a very small armature movement will produce a full movement of the shutter hook.
2. Clearness of Signal: Secured on all Kellogg drops by providing shutter with rigid surfaces to strike against both above and below. A good rattle is thereby secured and the drop is left perfectly sensitive.
3. Kellogg drop shutter is forced down by the peculiar shape of shutter rod, which is also forced to latch and hold the drop shutter when the latter is restored.
4. The restoring device used on Kellogg drops has been thoroughly tested by seventeen years of service and the drops never fail to restore, no matter how badly plugs may be worn.
5. Kellogg night alarm contact is held point up in a long and resilient spring. It is completely protected from damage by the restoring device and will not fail to operate the bell. The night bell connections are so arranged that each can be tested separately.
6. Kellogg jack springs exert a firm pressure on the plug. They hold securely old and new plugs alike, and the springs are so tempered as to secure an extremely long life even on the busiest toll and country lines, while the jack springs and jack thimbles are easily renewed and at trivial expense when finally worn out on extremely busy lines.
7. All iron work about Kellogg drops and jacks is permanently protected against rust and scaling by the well known and patented Parker rust proof process, which will endure unchanged for all times.
8. Every drop coil on the Kellogg board is so insulated that lightning has no inducement to jump from the winding to the core or shell. Hence, it jumps to earth at the lightning arrester instead and burnouts are practically unknown, the average being less than one drop damaged by lightning in each five hundred and forty years of drop service.
9. The night bell connections are so arranged that the circuit can be opened at any point with a screwdriver and at once closed again.

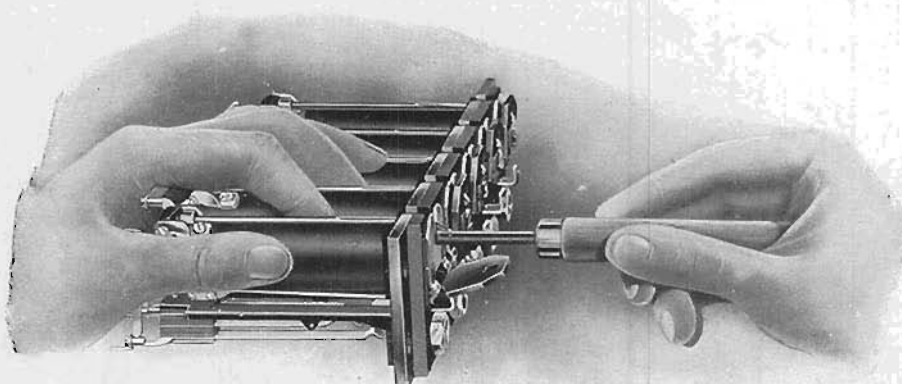


Fig. No. 141
Showing how any drop coil can be removed from mounting strip without disturbing other drops or jacks

RING-OFF DROPS:

The Kellogg ring-off drops or "clearing out drops," as they are sometimes called, are similar in design and embody all points of excellence found in the Kellogg line drops already discussed. They are sensitive. Shutters are forced to fall. Drops are of rust-proof construction and are fitted with reliable night alarm contacts.

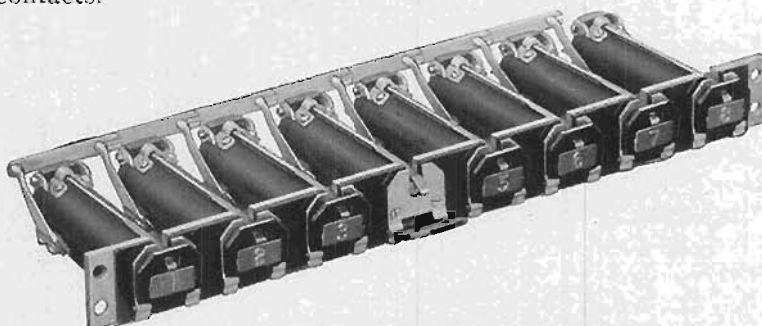


Fig. No. 142
Showing strip of eight Kellogg ring-off drops

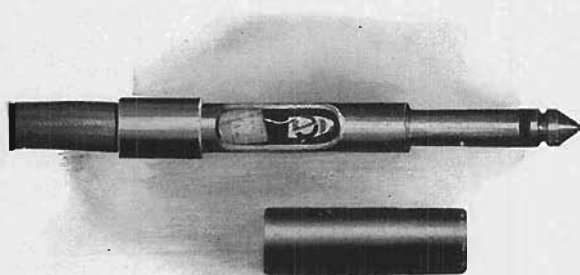


Fig. No. 143
Kellogg plug (sleeve removed) with linen pulled back showing simple and efficient manner of connecting cords without solder

PLUGS:

The No. 42 plugs used with all Kellogg magneto boards have been especially designed for magneto service. Many manufacturers fail completely by trying to use the same design of switchboard plug for both magneto and common battery service. The Kellogg Company believes in magneto designs for magneto exchanges and by using the plug illustrated herewith they greatly increase the life and efficiency of their equipment.

A plug intended for both magneto and common battery work must have a small round, ball-like tip which cannot afford the great spring displacement and consequent long life secured by a plug with a tip of same diameter as the sleeve and a conical point to facilitate its swift and sure insertion.

The Kellogg plug is extremely strong and simple and lasts without any maintenance until completely worn down by natural wear. Heavy Bakelite insulation is employed, the center of the plug being a strong steel pin over the threaded end of which the tip is screwed down against the head of the bushing, holding all parts of the plug firmly in place. The outside of the plug is covered with a fibre handle which has been found to be the most durable for this purpose.

Switchboard Cords

The Kellogg cord with its combination tinsel and steel conductors and treated outer braid, was placed on the market in 1904. The service of these cords under all operating conditions proves beyond question their great durability.

The Kellogg Company is prepared to make up cords to fit any make of standard switchboard plug and solicits inquiries for quotations on such cords made up to fit plugs as per samples submitted by customer. Notwithstanding their longer life and better service qualities, these Kellogg cords will be found to cost very little, if any, more than many inferior cords.

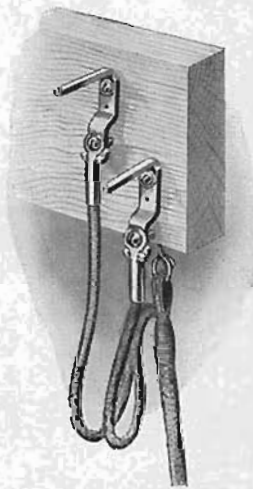


Fig. No. 145
Method of suspending Kellogg cords. Note "Pigtail" cord hooks

APPARATUS ACCESSIBLE

Accessibility and practical features of layout are outstanding advantages of the apparatus arrangement in these new switchboards. Switchboard men who have struggled with the inaccessible and poorly mounted parts of some switchboards will acknowledge the superiority of the new Kellogg boards as shown in the front and rear view illustrations on other pages.



Fig. No. 144

Showing plug in seat and detail of Kellogg cord and tangential sewing of outer braid, which cannot ravel back should it be neglected after wearing in two near the plug. Note the fibre bushing which protects leather and the fibre seat which will never wear sharp and injure the cord.

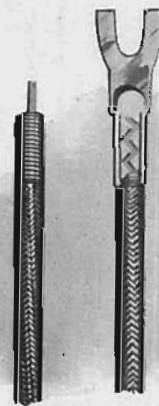


Fig. No. 146
Kellogg Terminals



Fig. No. 147
No. 67 Cord Circuit
Condenser

CONDENSERS:

The condensers used in Kellogg special double supervisory or "double ring-off" switchboards have been designed for this particular service. They possess a high insulation resistance, and while they permit the free passage of talking current, they effectually hold back ringing currents and insure reliable supervision.

CORD WEIGHTS:

Many excellent cords have had their life materially shortened by use with cord weights of poor design. Kellogg cord weights are of lead, covered with steel protection jackets to prevent battering. These weights operate perfectly, the rollers always roll, and the cords do not become tangled.

OPERATOR'S SET:

The necessary equipment for each operator's position of a switchboard comprises: Transmitter, transmitter battery, induction coil, head receiver, hand generator, power to hand generator switching key, and in boards arranged for more than one operator, a "position switching key" to connect positions together.



Fig. No.
148
No. 9 Cord
Weight

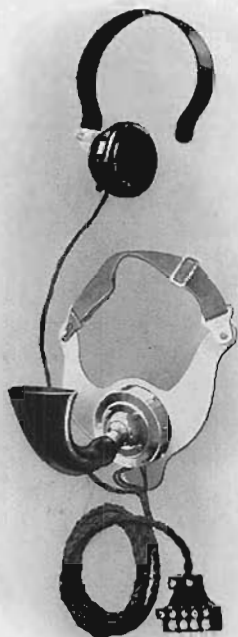


Fig. No. 149
No. 46-A Receiver with No.
2 Leather Covered Head
Band Complete with No. 76
Transmitter, No. 111 Cord
and No. 145 Plug

The head receiver shell is made of Bakelite, the wonderful new unbreakable material used by the Kellogg Company. It is of surpassing strength and endurance; is not brittle, will not chip, crack, or lose its shape, texture or color, under the most severe conditions.

Durability is especially important in this receiver equipment, as many operators do not use the head band continuously. Being often engaged in clerical work, the frequent handling results in breakage in less durable shell materials.

Breast plate transmitters furnished when specified. They are of aluminum, light weight and very durable. The mouthpieces are correctly shaped and built for proper transmission.

Kellogg switchboards will be furnished either with suspended or breast-plate type of operator's transmitter, as the purchaser may select.

The suspended type is recommended as having been found more satisfactory in small exchanges and will be furnished except when the breastplate type is specified. Many prefer the latter for use in large exchanges.

Adjustable Transmitter Arm

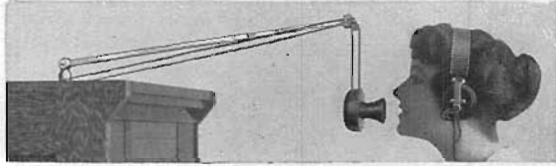


Fig. No. 150—Code No. 48—Transmitter Arm

A marked improvement over old styles. Does away with the cord weight bother. With this arm, position of transmitter can be instantly changed; brought forward or backward, moved sidewise or raised and lowered. Holds transmitter conveniently for use in standing as well as sitting position.

This arm is especially valued on magneto switchboards where operator attendant has other work to do and uses adjoining desk or counter.

The world renowned talking qualities of Kellogg telephone transmitters are not lacking in Kellogg operator's transmitters, which is very important, as patrons and neighboring exchanges judge the character of service of any plant very largely by how well they hear the operator.

OPERATOR'S JACK:

The No. 43 type operator's jack is used on all Kellogg switchboards both for breastplate and suspended transmitters. An advantage of this jack is that the conductors are separate and cannot cross or cut out.

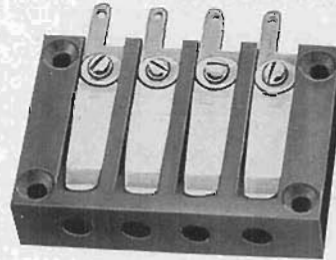


Fig. No. 151
No. 43 Operator's Jack

HEAD BANDS:

Kellogg head bands are of three types, leather covered steel, black enameled steel and black enameled wire. Each of these has advantages of its own and is preferred under various conditions. All are extremely light, retain their shape and fit comfortably.

KELLOGG OPERATORS' RECEIVERS AND HEAD BANDS:



Fig. No. 152
No. 46-A Receiver with
No. 4 Head Band

A good operator's receiver is a very difficult piece of apparatus to produce, as the many poor receivers on the market testify. The limited space permits of using only a very small permanent magnet as compared with the large permanent magnets in regular telephone receivers. The Kellogg operator's receiver is of the ring magnet type, which insures maximum talking efficiency. The receiver is light and comfortable and extremely popular with operators. The head band is leather covered or treated with hard black insulating enamel, at purchaser's option, and is so tempered that it can be adjusted large or small. It cannot catch and become entangled in the operator's hair.

KELLOGG SWITCHBOARD AND SUPPLY COMPANY, CHICAGO

Kellogg standard operators' Bakelite shell receivers are listed as Code No. 46-A. Specify Kellogg Bakelite when ordering.

If leather covered band is desired, specify Code No. 2 head band with 46-A receiver.

If flat metal band is desired, specify Code No. 4 head band with 46-A receiver.

If swivel flat metal band is desired, specify Code No. 5 head band with 46-A receiver.

If swivel leather covered band is desired, specify Code No. 5 head band with cover, with 46-A receiver.

If swivel wire band is desired, specify Code No. 6 head band with No. 46-A receiver.

Hand Generator

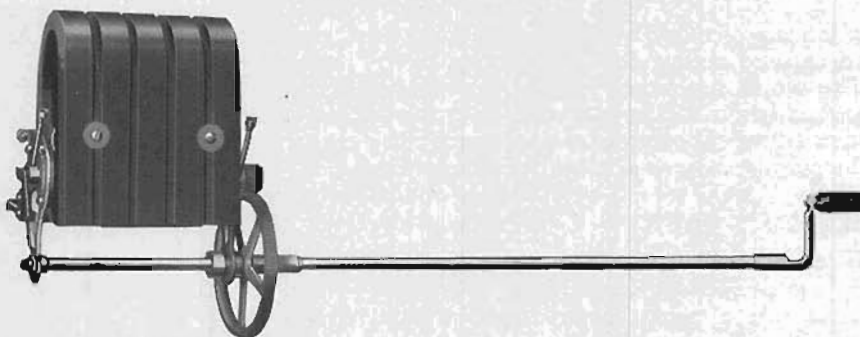


Fig. No. 153—Five bar generator with extension shaft

The same powerful generator used in Kellogg bridging telephones is employed in switchboards. All magneto switchboards will be furnished with five-bar generators, to supply alternating current only. Special generators delivering both alternating and pulsating current are furnished when required.

It might be well to remark that there is a growing tendency on the part of many companies to dispense with hand generators entirely on large magneto boards and provide, instead, two reliable power generators, one being used, while the other is ready to switch into service on a moment's notice in case of trouble in the regular equipment. We heartily approve of this in exchanges where three or more operators are required.

GENERATOR SWITCHING KEY:

The generator switching key shown herewith is of the plunger type design.

NIGHT ALARM EQUIPMENT:

The accompanying illustration shows the high class night alarm bell regularly supplied with Kellogg boards. Kellogg combined drops and jacks are so arranged, the night alarm circuit can be opened at any point with an ordinary screw driver and instantly closed again.

The careful design of the night alarm contact in the Kellogg combined drop and jack has already been described.

With night alarm equipment furnished by the Kellogg Company, there is no occasion whatever for failure to answer night calls, as the bell can be depended on to do its part.

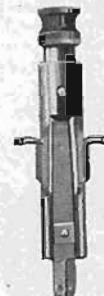


Fig. No. 154
Generator
Switching Key

Reliable Night Bell



Fig. No. 155
Night bell used on
Kellogg switch-
boards

Induction Coil

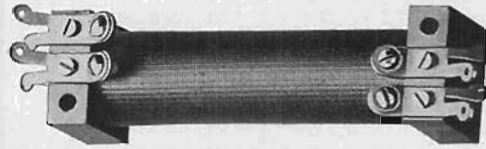


Fig. No. 156
No. 28-C Kellogg coil

The new No. 28-C Kellogg induction coil for switchboard use has been specially designed to give a maximum talking efficiency together with a minimum cutting down effect when the operator finds it necessary to listen in on a conversation.

Switchboard Circuits



Fig. No. 157
Standard Line Circuit used with Kellogg combined self restoring
Drop and Jack

LINE CIRCUIT:

Figure No. 157 shows the standard Kellogg line circuit as used with combined drops and jacks. The drop circuit is completely opened and perfect talking and ringing contacts are assured wherever a plug is inserted, no matter how badly the plug and jack thimble may have become worn, through hard and continued usage.

The heavy insulations between drop and jack and mounting plate, insure absolute freedom from the cross talk and inductive disturbances so common in switchboard equipment having non insulated drops.

NIGHT ALARM CIRCUIT:

Fig. No. 158 shows the standard Kellogg night alarm circuit as used with Kellogg switchboards. This circuit is absolutely dependable. It contains the fewest possible number of parts and such parts are of the best construction. Each night alarm contact has its point turned upward, as shown in Fig. 159, making a contact that cannot be affected by accumulated dust, since dust does not settle on sharp upturned points, nor on the under side of flat surfaces. A night alarm system is no more reliable than the contacts in the drops and with these made perfect, only the high class bell and switch furnished is needed to complete a first-class, reliable night alarm equipment.

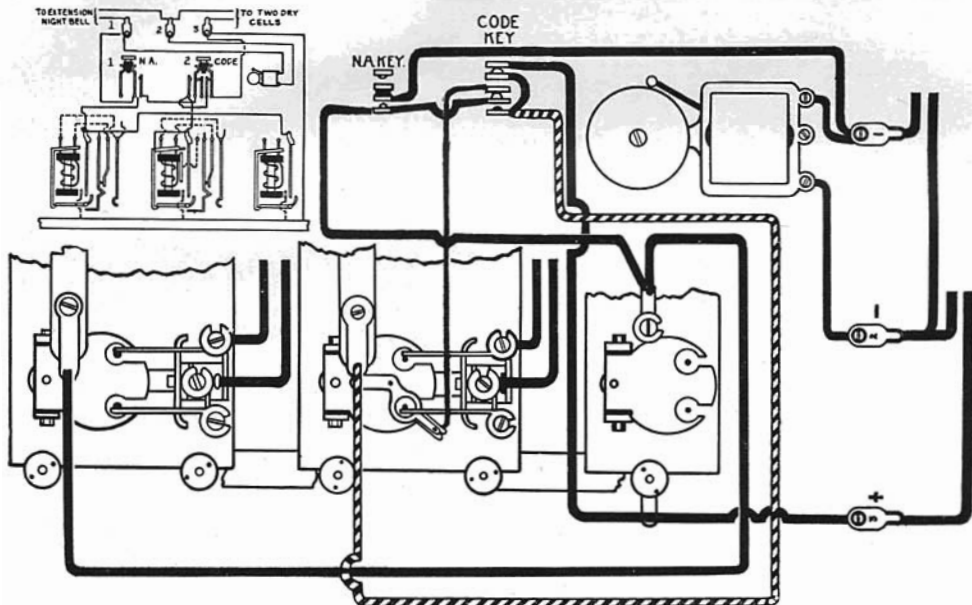
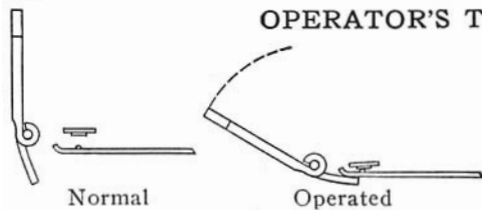


Fig. No. 158—Line and Night Alarm Circuit.

NOTE: When No. 1 key is depressed, code ringing night alarm operates all drops arranged for code ringing, and constant night alarm operates all drops arranged for continuous ringing.

NOTE: When both No. 1 and 2 night alarm keys are depressed, constant ringing night alarm will operate on all drops.



OPERATOR'S TALKING CIRCUIT:

This comprises the complete talking circuit of a standard telephone. All circuits are carefully balanced against the possibility of cross talk and power generator noise, by the use of twisted pairs for all wiring. The detail construction of the various pieces of apparatus used in the operator's talking circuit has already been shown.

Keys are regularly equipped with contact to close battery circuit only while listening key is operated.

Fig. No. 159
View of Night Alarm Contact used in Kellogg combined Drops and Jacks

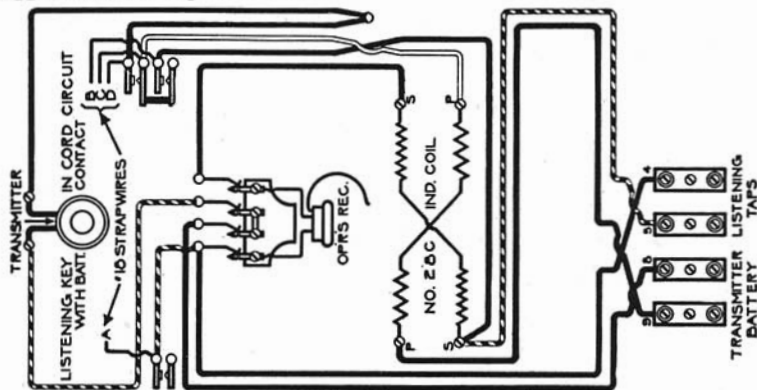


Fig. No. 160.

Standard Operator's Circuit for Kellogg Board Suspended Type Transmitter

OPERATOR'S RINGING CIRCUIT:

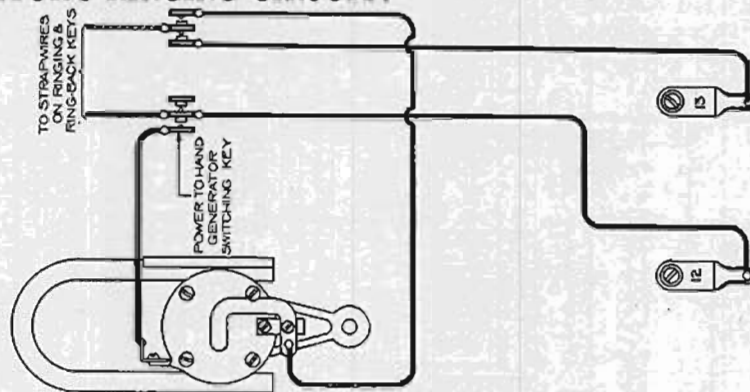


Fig. No. 161
Standard Generator Ringing Circuit

Figure No. 161 shows the standard generator or ringing circuit for Kellogg boards. This circuit is certainly to be commended for its extreme simplicity and completeness. Kellogg boards of 100 lines capacity and smaller are regularly wired so that power to hand key is in normal position to hand generator, and in tilted position for power generator.

The detail construction of the various pieces of apparatus used in the operator's ringing circuit has already been shown.

CONNECTING CORD CIRCUITS:

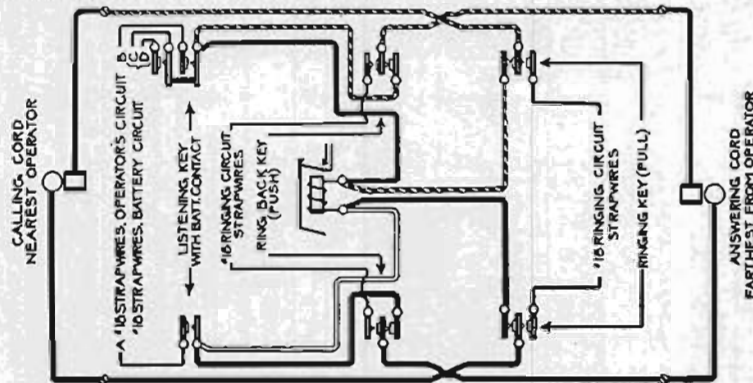


Fig. No. 162
Standard Kellogg Cord Circuit of the Single Supervisory Type

Figure No. 162 shows the standard connecting cord circuit as used with Kellogg boards, having single bridging ring off drop.

Figure No. 163 shows the Kellogg cord circuit of the improved double supervisory type with separate high wound bridging ring-off drops for each of the two connected parties. The detail construction of the apparatus used in these cord circuits has already been shown. Whether to have a new board equipped with the standard cord circuits having single bridging ring-off drops, or to pay a little more and get the improved double supervisory cord circuits, is a question that each purchaser must determine from local conditions. The double supervisory system should always be installed where trouble has previously been encountered in "ringing off." The Kellogg double supervisory system will overcome all ring-off trouble previously encountered, when heavily loaded bridging lines have been connected with series telephones in town, when two

KELLOGG SWITCHBOARD AND SUPPLY COMPANY, CHICAGO

heavily loaded country lines have been connected with each other, or when two antiquated series telephones with old and weak generators have been unable to throw the ring-off drop, due to the escape of most of the current to the other telephone.

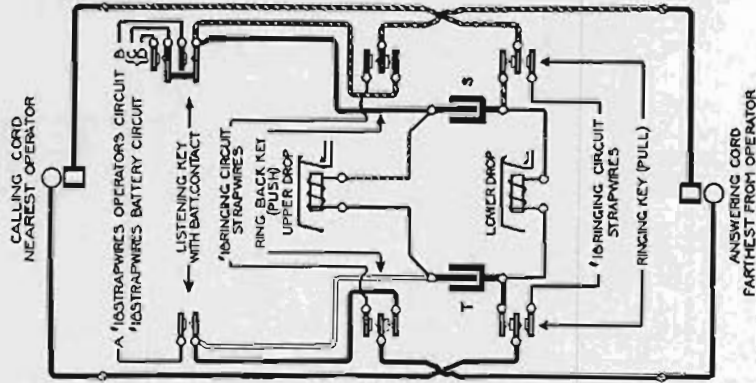


Fig. No. 163

Standard Kellogg Cord Circuit of the improved Double Supervisory type

With the Kellogg double supervisory system, the operation of the two ring-off drops is warranted to be as clean cut and reliable as that of the line drops when the lines are not connected.

Where but little ring-off trouble has been encountered with the old board, it is safe to assume there will be none with single supervisory cord circuits in a new Kellogg board, owing to the greater sensitiveness of the Kellogg ring-off drops.

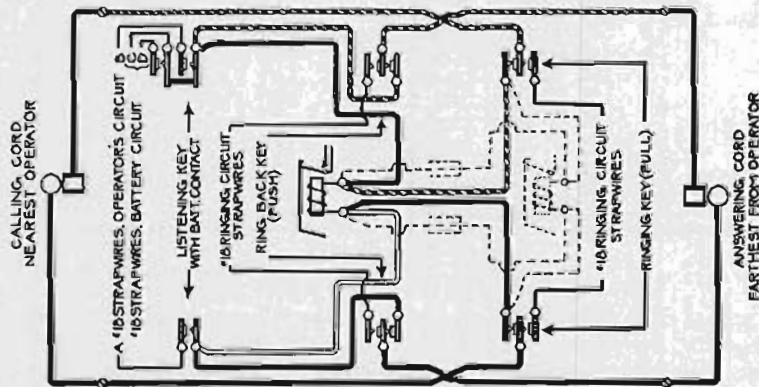


Fig. No. 164

Standard wiring for single ring off drop cord circuit, showing in dotted lines how a second ring off drop and 2 condensers may be added at any time, thereby changing the board to double supervision

It will be noticed from Figure 164 that the single ring-off system is furnished so wired, that change to the double supervisory system can be made at any time without opening key shelves or even approaching the face of the board.

SPECIAL REPEATING COIL CORD CIRCUITS:

It becomes necessary to equip at least a part of the cord circuits of a switchboard with repeating coils, whenever the following classes of connections are encountered:

1. Two wire "metallic circuit" toll lines with grounded (or common return) city lines.
2. Two wire "metallic circuit" toll lines with grounded country lines.
3. Two wire "metallic circuit" country lines with grounded city lines, or country lines or with grounded toll lines.



Fig. No. 165
No. 16-A Repeating Coil. This coil is the most efficient for talking purposes on the market today

It is not usually considered necessary to use repeating coils for connecting two wire metallic circuit city lines with grounded toll or country lines, though it is sometimes found advisable to do so when the city lines are exposed to excessive induction from electric light or power circuits. In general, whenever two circuits (normally quiet) become noisy when connected together, the trouble can be overcome by using a repeating coil cord circuit.

The repeating coil keeps the lines wholly separate from one another. Electric voice currents coming in over one line pass through one winding of the repeating coil and produce magnetic currents in its iron core. These magnetic currents in turn produce corresponding voice currents in the other winding of the repeating coil which are sent out on the connected line. This double transformation within the repeating coil cannot take place without a slight loss of energy, but so carefully and scientifically have Kellogg repeating coils been designed that it is impossible to tell when the repeating coil is in circuit and when out of circuit, provided the connected lines are quiet when the coil is cut out. If the connected lines are noisy when the coil is cut out, talking parties can hear better with coil cut in.

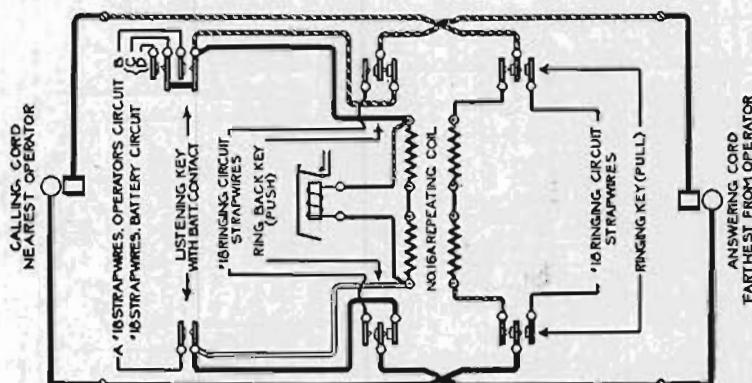


Fig. No. 166

Standard Repeating Coil Cord Circuit with single ring-off drop as used in Kellogg boards, with repeating coil wired in permanently

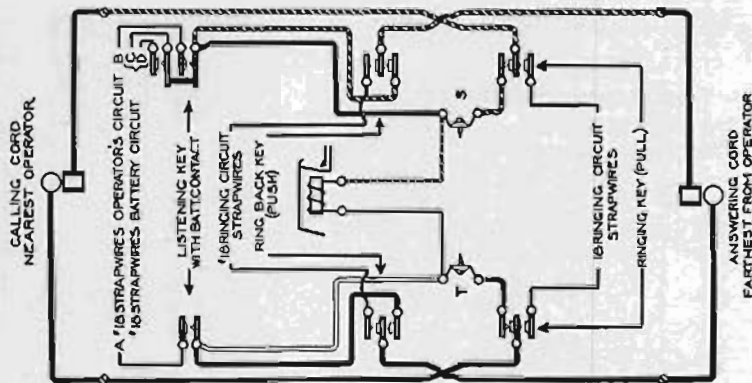


Fig. No. 167

Standard Connecting Cord Circuit as used with Kellogg boards. Single bridging ring-off drop. Arranged for future installation of repeating coil

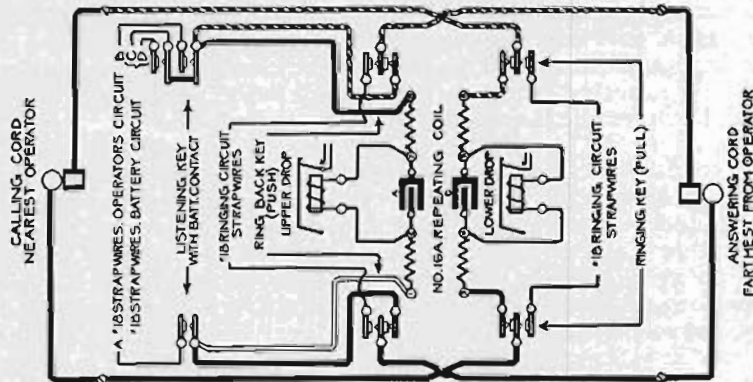


Fig. No. 168

Standard Repeating Coil Cord Circuit with double ring-off drops as used in Kellogg boards

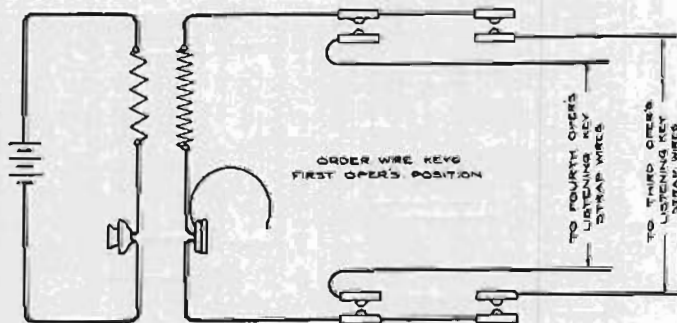


Fig. No. 169

Kellogg Order Wire Circuit

CUT IN STATIONS } three way jacks, sometimes called Water-
 THROUGH TOLL CIRCUITS: } loo jacks.

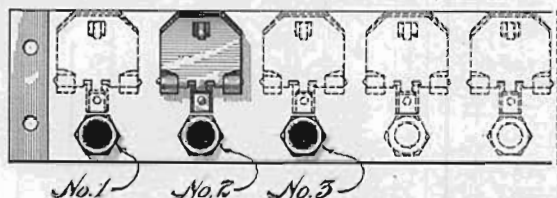


Fig. No. 170

Combined Drop and Jack and Two Extra Jacks
 for Through Toll Circuit of Fig. No. 171.

It frequently becomes desirable to arrange a long toll circuit so that two or more talks can be made over different portions of the circuit at the same time, and still retain the circuit in such shape that talks can be made clear through without the use of a pair of connecting plugs.

This can be accomplished by the equipment shown in Figs. No. 170 and 171, which show the arrangement of the Kellogg "through toll circuit," as used at intermediate toll stations.

The operation of this equipment is as follows: The operator on receiving a call plugs into the center jack and so connects her set across the uncut through line. As soon as she learns what station is calling she moves the plug into the right or left hand jack, as the case may be, thereby cutting the through line at her station. The through toll drop now becomes a terminal drop on the end of the line that has been cut off, and the operator is in position to receive calls from that end of the line, while the other end may be in use. In this manner both ends of the line may be used at the same time.

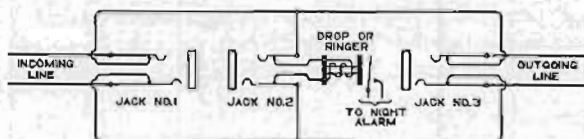


Fig. No. 171

Kellogg Through Toll Circuit

When both conversations have been finished the withdrawal of the plugs automatically connects the line through the intermediate station, making it unnecessary to call the several intermediate operators when desiring to reach the station at the distant end of the line.

desiring to reach the station at the distant end of the line.

In using this equipment operators should always be careful to listen in on the center jack before cutting the line to put in a call. Intermediate operators should also answer calls for points beyond when they have line cut at their station, so that the calling operator will not be trying in vain to get the distant end of the line. This equipment properly used at intermediate stations will greatly increase the efficiency and earning power of toll lines, and we recommend its use wherever conditions are suitable.

We can furnish when desired:

Combined jack and bell equipment, pilot lamp equipment, transfer circuits, divided circuit ringing, etc.

Those who are operating large exchanges without four-party equipment would do well to investigate the subject thoroughly and see if the installation of such service would not result in a great increase in the net revenue from their plant.

On account of its great importance, four-party selective equipment for magneto exchanges has been made the subject of a special bulletin, for which interested parties will kindly write.

Wall Switchboards

An excellent switching arrangement for 10 lines, straight cord circuits, where one of the line drops is adapted for ring-off signal when the plug is inserted in our Code No. 9A.

Used with standard bridging telephone for operator's set, and is arranged for separate night bell.

This 10-line wall board is provided with saw tooth lightning arresters and is regularly equipped with 10 high wound drops and jacks, 2 pairs cord circuits and one answering cord for attaching to standard bridging telephone. Dimensions: Height $6\frac{7}{8}$ ", width $14\frac{1}{4}$ ", depth $6\frac{1}{8}$ ".

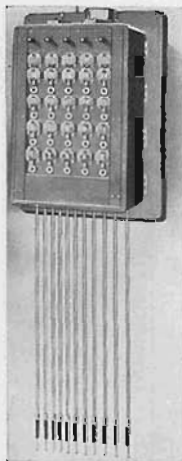


Fig. No. 173

Cabinet No. 11134
Kellogg 20 line wall switchboard with combined self-restoring drops and jacks, ringing and listening keys.

It is equipped for twenty lines and five cord circuits and is operated in the same manner as the regular floor switchboards, using keys for listening and ringing. Dimensions: Height 15", width $10\frac{1}{2}$ ", depth 6".

Kellogg Thirty-four Line Magneto Wall Switchboard, Code No. 17A, used with standard compact bridging telephone. It is arranged for thirty local lines and four toll lines; six connecting cord circuits, keys for ringing, listening and ring-back features. This board is strongly built, simple to operate, with standard Kellogg apparatus throughout. A very economical and satisfactory equipment where the number of lines is not liable to exceed thirty.

Arranged for separate night bell. Dimensions: Height $16\frac{3}{4}$ ", width $14\frac{1}{4}$ ", depth $7\frac{1}{4}$ ". Depth, including plugshell, $10\frac{1}{4}$ ".

No. 23A is a wallboard with the same cabinet as No. 17A, but wired for twenty lines, four cord circuits.

No. 29A is a wall board with the same cabinet as the 17A, but wired for twelve combined 1600 ohm ringer drops and jacks and twelve connecting cord circuits.

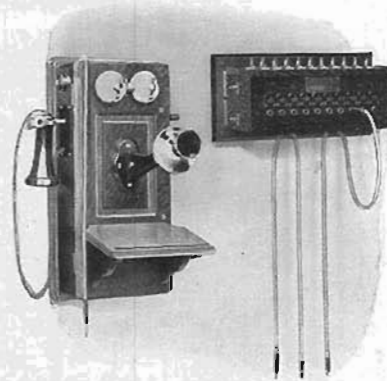


Fig. No. 172

Code—9A—Ten Line Wall Switchboard

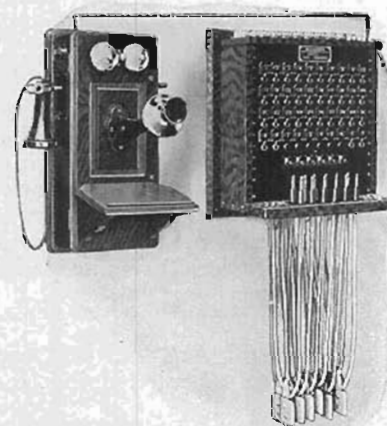


Fig. No. 174

Code 17A—Ultimate Capacity, 34 Lines

SWITCHBOARD PROTECTION AND CROSS CONNECTING EQUIPMENT:

Every magneto switchboard should be protected from lightning by some form of carbon lightning arrester for each incoming line. Where there is danger from electric light and power circuits best practice calls for the use of a fuse or heat coil sneak current protector in addition to the carbon arrester which is intended as a protection against lightning.

Every magneto exchange of any size at all requires some means of cross connecting in order that subscribers moving from one part of town to another can do so without changing their old number.

Switchboard cables should be permanently formed up and the pairs num-

Continued on page 42.



Fig. No. 175

Strip of Kellogg No. 15 Combined Carbon and Fuse Lightning Arrester and Cross Connecting Equipment, Caring for 20 Full Metallic Two-Wire Circuits. Same as No. 6, except 20 pair.

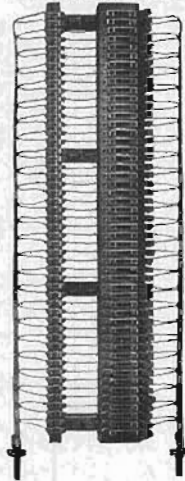


Fig. No. 176

Strip of Kellogg No. 6 Combined Carbon and Fuse Lightning Arrester and Cross Connecting Equipment, Caring for 25 Full Metallic Two-Wire Circuits. Cross Connecting Strip Was Attached to Switchboard Cable at the Factory.

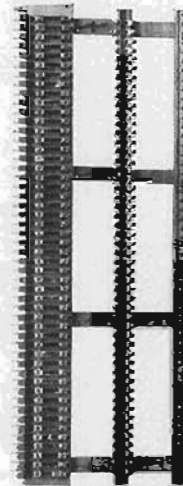


Fig. No. 177

Kellogg No. 14 Combined Carbon and Fuse Lightning Arrester and Cross Connection Equipment, Caring for 50 Grounded One-Wire Lines. Provided with Brass Connecting Strip for Grounding One Side of Lines in Switchboard Cable Without Soldered Connections.

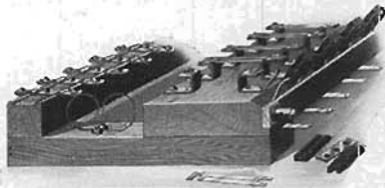


Fig. No. 178—End view No. 6

No. 6 TYPE.		Mounting		Carbons
Code No.	Type	Centers		
6	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"
8	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"
9	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"
13	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"
15	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"
No. 14 TYPE.		Mounting		Carbons
Code No.	Type	Centers		
14	Swbd.	5/8"		1 1/4" x 3/8" x 1/4"

Kellogg No. 6 combined carbon and fuse lightning arrester and cross connecting panel for wall mounting. Capacity 25 metallic lines, or 50 grounded lines.

We furnish mica fuses in 1/4 and 1/2 ampere.

Kind	No. of Pairs	
Fuse Arr. & Cross Conn. Rack	25	
Fuse Arr. & Cross Conn. Rack	5	
Fuse Arr. & Cross Conn. Rack	10	
Fuse Arr. & Cross Conn. Rack	15	
Fuse Arr. & Cross Conn. Rack	20	
Fuse Arr. & Cross. Conn. Rack	50	Sim. to Grd. No. 6, but with ground strip added

KELLOGG SWITCHBOARD AND SUPPLY COMPANY, CHICAGO

bered to correspond to the connected drops. In like manner the line cables should be permanently formed up and the pairs numbered to correspond with cable box numbers.

Then there should be a flexible link between switchboard and line cables, making it possible to connect any switchboard drop on to any outside line. These flexible links are called cross connecting wires or "jumper" wires, and the terminals to which they attach are termed cross connecting strips.

For convenience the protection and cross connecting strips are usually mounted together, and the whole combination is called a protector and main distributing frame or rack.

These are put up in two forms; wall mounting equipments for small exchanges and self supporting upright racks of angle iron construction for large exchanges.

Where switchboard orders include orders for lightning arresters, we will, without extra charge, form up and boil out and shellac the line cables ready to attach, and in the case of small boards, the line cables can actually be attached to the cross connecting strips and the latter enclosed in the board.

The purchaser, however, must in such cases accompany switchboard order with a request in writing that the cables be formed and must also furnish a diagram or sketch showing how the arrester panels are to be arranged and whether each panel is to care for twenty-five lines wired metallic or fifty lines wired grounded.

The foregoing arrester, the No. 6 type, is also furnished in strips of five metallic or ten grounded lines, which combination is known as the No. 8 Kellogg arrester, and in strips for ten metallic or twenty grounded lines, which combination is known as the No. 9 Kellogg arrester.

The No. 7 Kellogg arrester is same as the No. 6 arrester, except it is without cross connecting strip.

No. 101—MAIN DISTRIBUTING FRAME

The No. 101 Main Distributing Frame is designed for use in large and small telephone exchanges where a substantial floor type frame is required. Mild steel angles, channels and bars of ample strength are used and all uprights are bolted to the floor angles to give the frame proper footing. The jumper rings are of generous size and well insulated. The cable fanning strips and jumper wire facilities permit a neat cable layout with plenty of space and convenient terminals for running jumper wires.

The switchboard protectors, are designed to protect the central office plant from lightning, from sneak current, and from crosses with electric light and power wires. The flat fuses are of one-half ampere carrying capacity. They are made so that opens can be detected at a glance and the old fuse wire easily removed.

The protectors are mounted in banks of twenty pairs on mild steel mounting plates with rigid supports for attaching to the frame. The mounting plates are covered with sheet micarta to prevent the possibility of contact between mounting plates in wiring. Heavy phosphor bronze fuse clips hold the fuse terminals in a firm grip and the wire terminals and fuse clip are riveted together to insure permanent electrical contact.

Twenty pair blocks are standard. Single rows, pairs, triples or quads can be supplied in sets of twenty or twenty-five per terminal block.

The tests plugs slip into the fuse clips as easily as a fuse.

Standard Frames are built with verticals on 9-inch centers unless otherwise specified. All frames are made for growth in either direction.

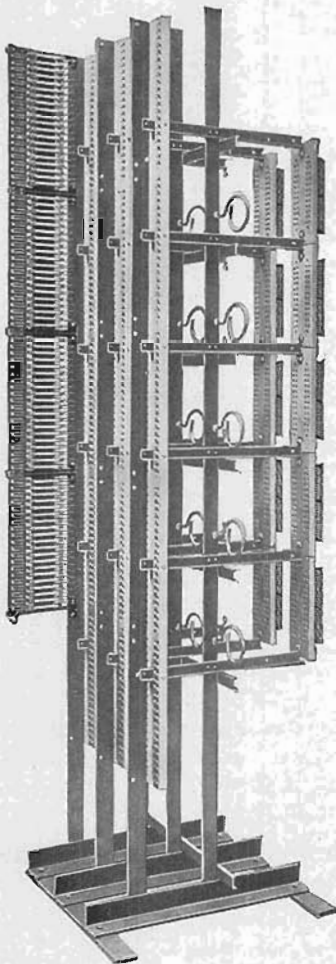


Fig. No. 179.

No. 101 Main Distributing Frame.

Installation

While we are prepared to furnish expert installers when purchaser so desires, we recommend that competent local men be given preference whenever they are available.

Switchboards of one section are extremely simple to install, as all necessary wiring within such boards is done at the factory and after their arrival it is only necessary to connect night alarm battery, transmitter battery and the power generator (if one is used) as indicated in diagrams and blue prints sent with the board.

Where the board has two or more operator's positions, all in one cabinet, the night alarm battery and power generator need be connected to the first position only, as wiring is run to other positions at the factory, but it is of course necessary to connect transmitter battery to bus bars at each operator's position. Blue prints of these connections, together with blue prints of all other circuits, are sent with each board showing just how everything has been wired and how it is to be connected.

In addition to connecting battery and power generator, all that remains to the installation of a magneto board is the forming up of the switchboard cables and their connection to the lightning arrester equipment. Such work is now so well understood by telephone men that its further treatment here seems almost superfluous. However, it might be well to give the standard color code of switchboard line cable, which will enable those not familiar with color code cables to connect the equipment without the delay of "testing out."

Kellogg Magneto switchboards are regularly wired with 40, 50 pair or 100 pair cables. Color code of the 100 pair cable regularly used is as given below, while color code of the 40 and 50 pair cable is same as that of the first 40 and 50 pairs of the 100 pair cable.

	Twisted with white mate	Twisted with red mate	Twisted with red and white mate	Twisted with brown mate	Twisted with brown and white mate
Blue	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

Spares: Blue-Red-White with white mate, and (in 100 pair cables only), red with white mate.

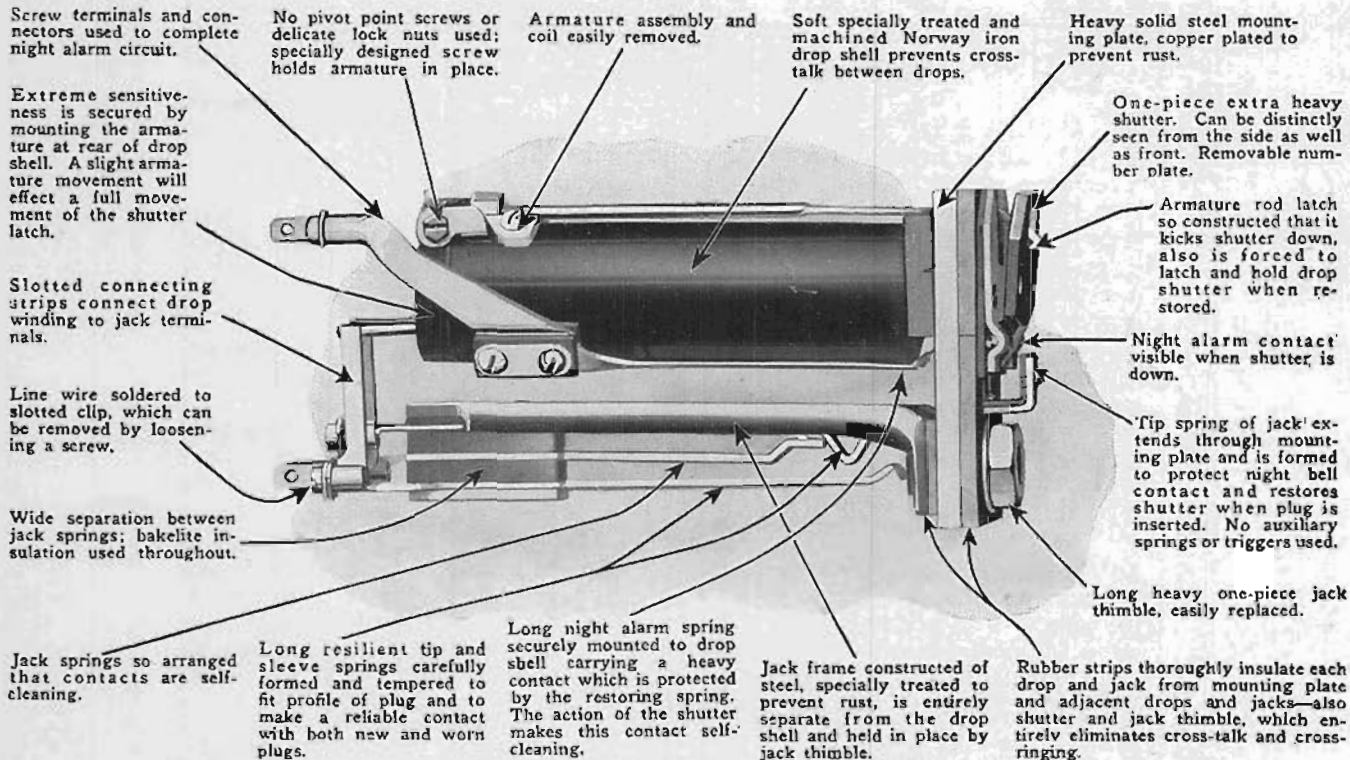


Fig. No. 180
Standard Kellogg Combined Drop and Jack.

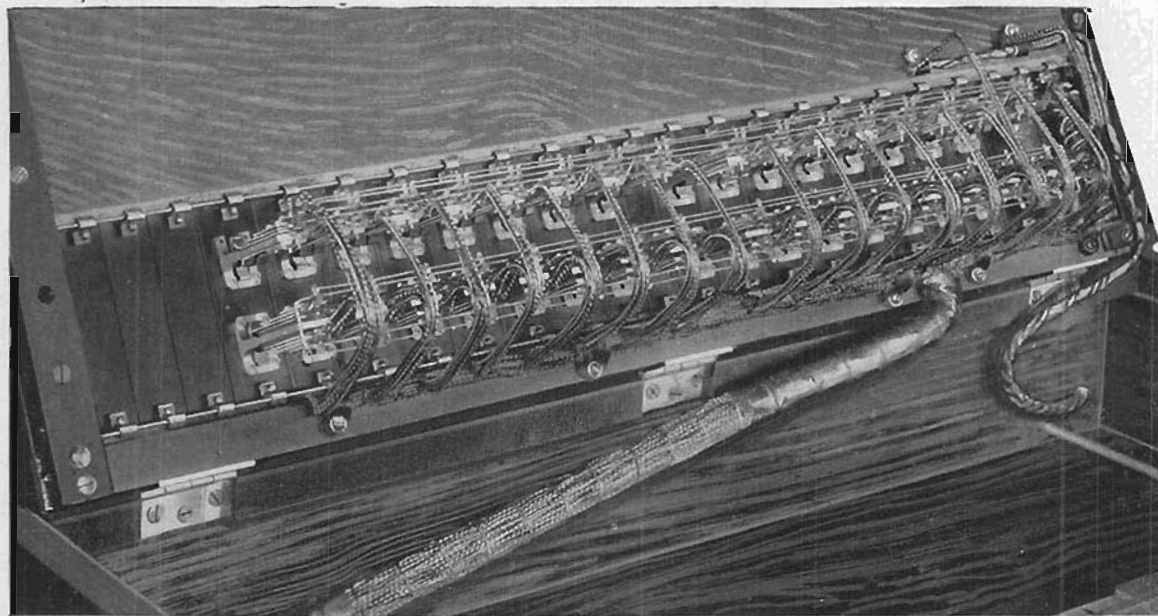


Fig. No. 181
Open View Standard Kellogg Magneto Key Shelf.



CODE No. 11-B, 50 LINE CAPACITY

The Kellogg Magneto Switchboard

Maximum equipment of this switchboard consists of

50 line circuits, Code No. 101-A, combined drops and jacks, 100 ohms; or No. 101-E, 500 ohms.

8 cord circuits, with or without repeating coils, single or double supervision.

1 operator's circuit (suspended or breastplate transmitter).

12 feet of cable from base or top of the board.

Dimensions:

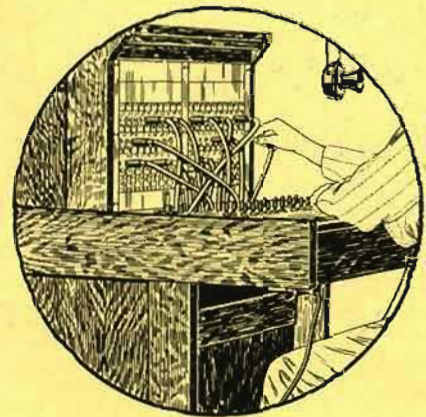
Height, 3 ft. 11 in.

Height to bottom of
keyshelf, 2 ft. 2 $\frac{3}{4}$ in.

Depth on floor, 24 $\frac{3}{4}$ in.

Depth keyshelf, 18 in.

Width, 20 in.





CODE No. 12-B, 100 LINE CAPACITY

The Kellogg Magneto Switchboard

Maximum equipment of this switchboard consists of

100 line circuits, Code No. 101-A, combined drops and jacks, 100 ohms; or No. 101-E, 500 ohms.

12 cord circuits, with or without repeating coils, single or double supervision.

1 operator's set complete (suspended type or breastplate transmitter).

12 feet of cable from base or top of the board.

Dimensions:

Height, 3 ft. 11 in.

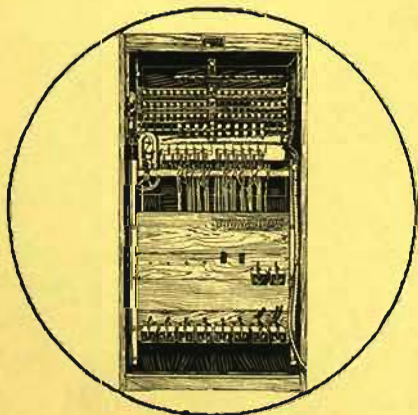
Height to bottom of keyshelf, 2 ft. 2 $\frac{3}{4}$ in.

Depth on floor, 24 $\frac{3}{4}$ in.

Depth from front of keyshelf, 2 ft. 11 in.

Depth keyshelf, 18 in.

Width, 25 $\frac{1}{8}$ in.





CODE No. 13-B, 160 LINE CAPACITY

The Kellogg Magneto Switchboard

Maximum equipment of this switchboard consists of
 160 line circuits, Code No. 101-A, combined drops and
 jacks, 100 ohms; or No. 101-E, 500 ohms.
 16 cord circuits, with or without repeating coils, single or
 double supervision.
 1 operator's circuit (suspended or breastplate transmitter).
 12 feet of cable from base or top of the board.

Dimensions :

Height, 4 ft. 5 in.

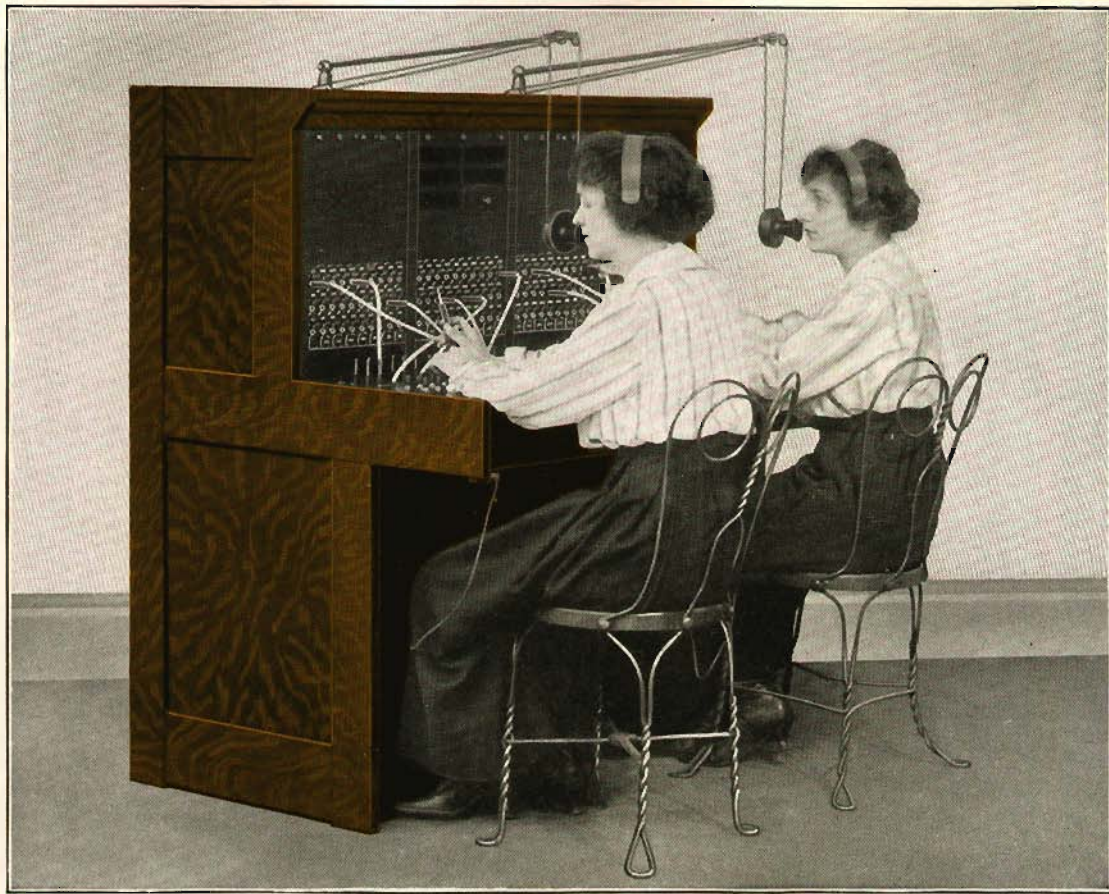
Height to bottom of key-
 shelf, 2 ft. 2 $\frac{3}{4}$ in.

Depth on floor, 24 $\frac{3}{4}$ in.

Depth keyshelf, 18 in.

Width, 25 $\frac{1}{8}$ in.

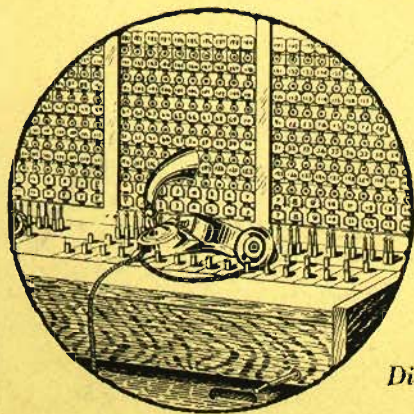




CODE No. 14-B, WIRED FOR 240 LINES; 30 CORD CIRCUITS
 CODE No. 15-B, WIRED FOR 320 LINES; 30 CORD CIRCUITS

The Kellogg Magneto Switchboard

Code No. 14-B—To meet the demand for a switchboard of larger capacity than 160 lines, where future growth might not warrant the wiring and capacity of our Code 15-B, we have the above switchboard, Code No. 14-B, two operators' positions and wired for 240 lines, 30 cord circuits. This offers a fast operating board, 60 lines per panel. A standard board throughout.

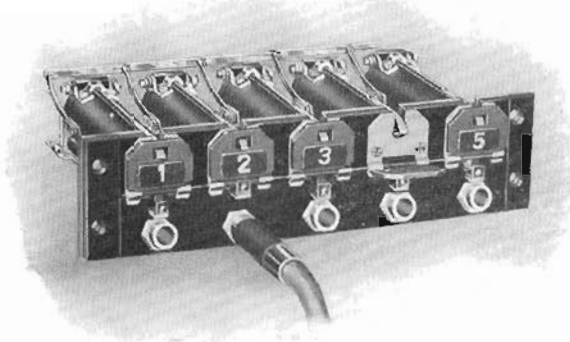


Code No. 15-B—Maximum equipment of this switchboard consists of

- 320 line circuits, Code No. 101-A, combined drops and jacks, 100 ohms; or No. 101-E, 500 ohms.
- 30 cord circuits, with or without repeating coils, single or double supervision.
- 2 operators' circuits (suspended or breastplate transmitter).
- 12 feet of cable from base or top of the board.

Dimensions: { Height, 4 ft. 5 in. Depth on floor, 24 $\frac{3}{4}$ in.
 Height to bottom of key- Depth keyshelf, 18 in.
 shelf, 2 ft. 2 $\frac{3}{4}$ in. Width, 3 ft. 11 $\frac{3}{8}$ in.

Kellogg Standard Magneto Equipment for Western Electric Switchboards



Strip of five Kellogg No. 111 type, combined drops and jacks, on mounting No. 395. They replace the bulls-eye and shutter type jack and signal, and are arranged to use our No. 130 plug or W. E. No. 47. Numbered as requested. 500 ohm, 111-E. Price \$2.45 each.



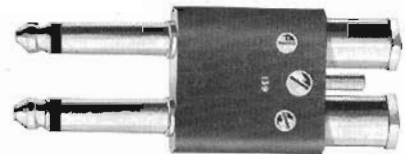
No. 55 Transmitter and Cord (35)
Price \$2.00.



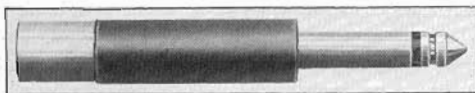
No. 9
Cord Weight
Price \$0.35 each.
For Suspended Type Transmitter



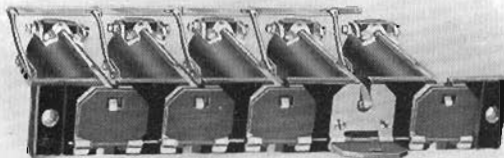
No. 4
Cord Weight
Price \$0.40 each.



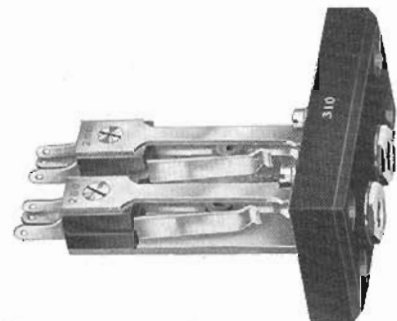
Code No. 139 Operator's Plug
Fits our Code No. 310, shown below,
and W. E. No. 80 type jack.
Price \$2.25 each.



Code No. 130 Plug
Replaces W. E. plug No. 47
Use Cord No. 304. Price \$0.75 each.

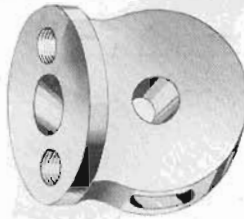


Strip of five Kellogg No. 51 type ring-off drops, on mounting No. 449. Numbered as requested. 500 ohm. Price \$1.80 each.



Code No. 310 Operator's Jack
Used with our No. 139 plug and
W. E. No. 137. Price \$1.50 each.

KELLOGG SWITCHBOARD AND SUPPLY CO., CHICAGO



Transmitter lug for adapting the famous Kellogg reverse type, solid back transmitter to the Western Electric telephone. Piece 33860. Price \$0.20 each

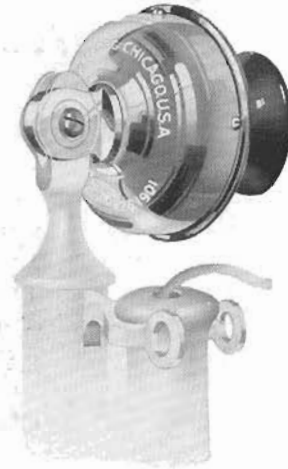
CORDS

Operator's. Code No. 140 four-conductor cord for Western Electric operator's breastplate equipment fits No. 137 Western Electric operator's plug. Tinsel conductors. Length 96 inches. Green silk over all. Price \$110.60 per C.

Switchboard. Code No. 216 two-conductor cord for Western Electric switchboard. Flexible steel conductors. Fits Nos. 47, 66 and 106 Western Electric plugs. Length 72 inches. Fawn colored silk overall. Price \$61.95 per C.

SWITCHBOARD CORDS FOR PLUGS NOT OF OUR MANUFACTURE

We can furnish switchboard cords for practically all makes of plugs. In ordering cords for plugs not of our manufacture that are not listed below, kindly bear in mind that a sample plug and length of cord desired, also a description or sample of the switchboard end of the cord, should be furnished us, so that your requirements will be fulfilled exactly.

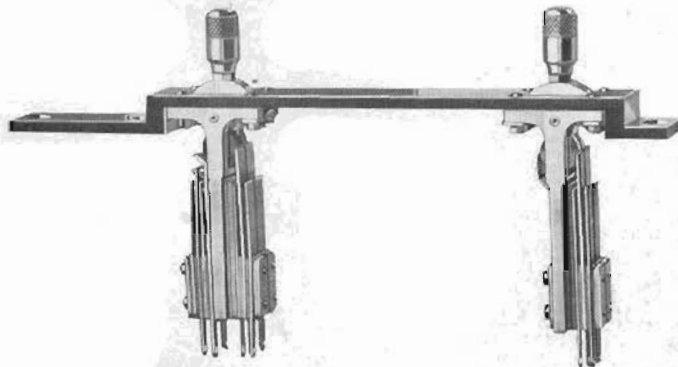


Showing how Kellogg transmitter adapter is used.

CORDS FOR WESTERN ELECTRIC PLUGS

Spiral steel and tinsel conductors, Maroon Agawam cotton braid overall.

	Code No.	Conductor	For W. E. Plug No.	Standard Length	Tips and Connectors		Price
					On Swbd. End	On Plug End	
	224-A	3	109	72	3 No. 2119 W. E.	1 Pc. No. 6069	\$110.85 C
	225-A	3	110	72	3 No. 2119 W. E.	1 Pc. No. 6069	108.70 C
Tinsel Conductors, Maroon Agawam Cotton Braid Overall	226-A	3	110	72	3 No. 2119 W. E.	2 No. 38 W. E.	124.60 C
Spiral Steel Conductors, Fawn Linen Braid Overall	212-A	3	109	72	3 No. 2119 W. E.	1 Pc. No. 6069	65.25 C
	214-A	3	110	72	3 No. 2119 W. E.	1 Pc. No. 6069	66.55 C
Spiral Steel Conductors, Red Linen Braid Overall	213-A	3	109	72	3 No. 2119 W. E.	1 Pc. No. 6069	65.25 C
	215-A	3	110	72	3 No. 2119 W. E.	1 Pc. No. 6069	64.05 C
Flexible Steel Conductors, Fawn Linen Braid Overall	216-A	2	47-66-106	72	2 No. 2119 W. E.	1 Pc. No. 6069	61.95 C
Flexible Steel Conductors, Red Linen Braid Overall	217-A	2	47-66-106	72	2 No. 2119 W. E.	1 Pc. No. 6069	77.05 C

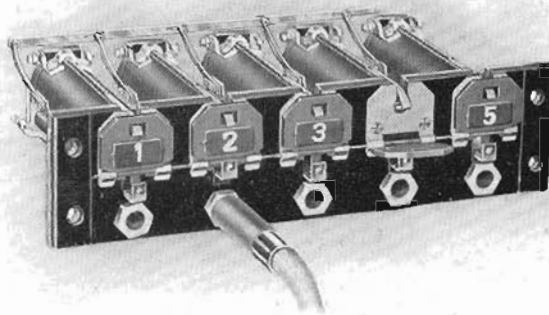


Code No. 1033 and 1043 Kellogg keys, mounted on No. 1049 escutcheon for Western Electric switchboards. Price \$7.25 with platinum contacts; \$6.25 with gold contacts.

KELLOGG SWITCHBOARD & SUPPLY COMPANY, CHICAGO, ILL.

Branch Offices: Kansas City, Mo.; San Francisco, Cal.; Columbus, Ohio, 409 Huntington Bank Building

Kellogg Standard Magneto Equipment for Old Dean and Garford Switchboards



Illustrating strip of five Kellogg No. 101 type combined drops and jacks on No. 395 mounting to fit old Garford and Dean boards. In strip of five, 500 ohm. Price **\$2.45** each.

Resistance of Drops

Regularly furnished in 100, 500 and 1,000 ohm resistance.

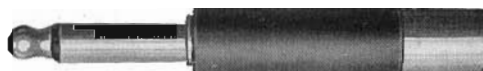
Price 100 ohm, **\$2.40** each; 500 ohm, **\$2.45** each; 1,000 ohm, **\$2.50** each.



Jack Thimble

Piece No. 26688. Jack thimble for replacing worn thimble on old Garford and Dean boards. Price **\$0.05** each.

Plugs



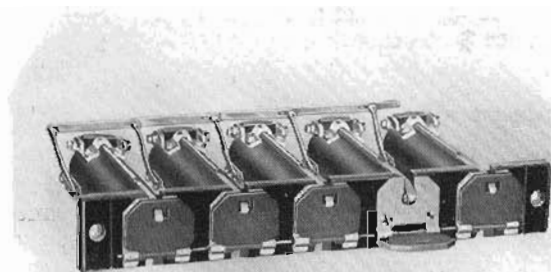
No. 8 Plug Seat

No. 8 Plug seat. Price **\$0.25** each.

No. 109 Kellogg plugs fit Dean and Garford jacks of the combined drop and jack type. Price **\$0.75** each.

Code No. 301 or 304—2-conductor white Kellogg cords fit Code No. 109 Kellogg plug.

Ring-Off Drops



Showing strip of five Kellogg No. 51 type ring-off drops on No. 449 mounting, to fit Dean and Garford magneto boards. Price **\$1.80** each.

Regularly furnished in 500 ohm resistance.

Operator's Equipment



No. 46-A Receiver with
No. 4 Enameled Steel Band

The head receiver shell is made of Bakelite, the wonderful new unbreakable material manufactured by the Kellogg Company. It is of surpassing strength and endurance; is not brittle, will not chip, crack or lose its shape, texture or color under the most severe conditions.

Durability is especially important in this receiver equipment, as many operators do not use the head band continuously. Being often engaged in clerical work, the frequent handling results in breakage in less durable shell materials. No. 46-A receiver with No. 4 enameled steel band, price \$2.60.

Breastplate transmitters furnished when specified. They are of aluminum, light weight and very durable. The mouthpieces are correctly shaped and built for proper transmission. No. 46-A receiver, No. 4 steel band, No. 76 transmitter, No. 111 cord and No. 145 plug, price \$7.90.



No. 55 Transmitter
and No. 35 Cord

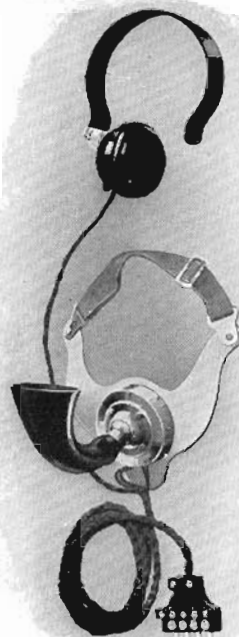
Suspended Type Transmitter

The suspended type transmitter is recommended as having been found more satisfactory in small exchanges, and will be furnished except when the breastplate type is specified. Many prefer the latter for use in large exchanges. No. 55 transmitter and No. 35 cord, price \$2.00. No. 43 jack, price \$0.75 each.



Code No. 28-C
Induction Coil

The No. 28-C Kellogg induction coil for switchboard use has been specially designed to give a maximum talking efficiency, together with a minimum cutting-down effect when the operator finds it necessary to listen in on a conversation. Price \$0.60 each.



Operator's Equipment
No. 46-A Receiver, No. 4 Head Band, No. 76
Transmitter, No. 111 Cord, No. 145 Plug

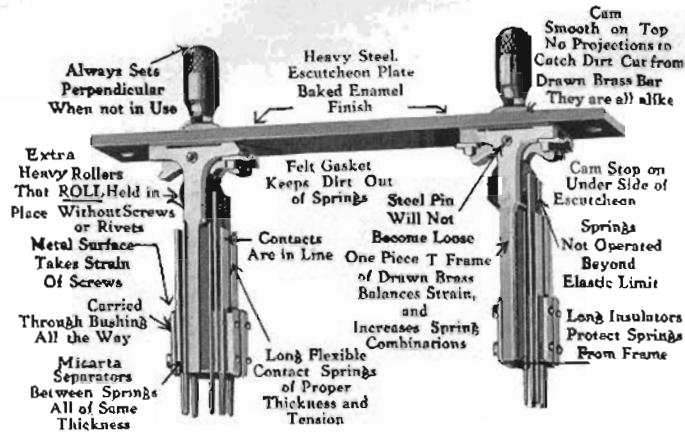


No. 43 Jack



Cord Weight
No. 4

Kellogg Keys and Adapter



No. 1013 escutcheon, complete with 1041 and 1033 keys. Price \$4.25 with platinum contacts and \$3.50 with gold contacts.

No. 1041 key with platinum contacts, price \$2.50; with gold contacts \$2.00.

No. 1033 key with platinum contacts, price \$1.75; with gold contacts \$1.50.

No. 1043 and 1033 keys with primary cutout when using dry cells.



No. 1013 Escutcheon.

Standard key for Dean boards. Can be mounted in wood shelf. For Dean metal key shelf, use adapter illustrated below.

Kellogg standard four-party master or individual key may be used with same adapter.

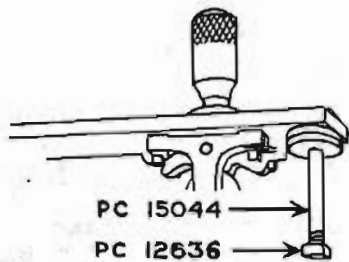


Diagram of Adapter for Installing Kellogg Standard Keys on Dean Boards

Cord Weights

Many excellent cords have had their life materially shortened by use with cord weights of poor design. Kellogg cord weights are of lead, covered with steel protection jackets, to prevent battering. These weights operate perfectly, the rollers always roll, and the cords do not become tangled. No. 9 cord weight, price \$0.35 each; No. 4 cord weight, price \$0.40 each.



No. 9 Cord Weight

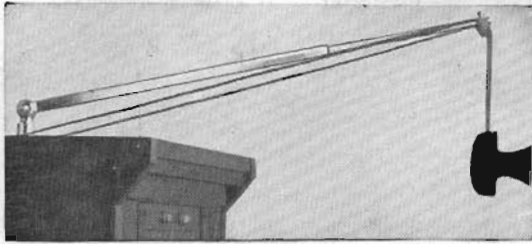
Condensers

The condensers used in Kellogg special double supervisory or "double ring-off" switchboards have been designed for this particular service. They possess a high insulation resistance, and while they permit the free passage of talking current, they effectually hold back ringing currents, and insure reliable supervision. No. 67 cord circuit condenser, price \$0.75 each.



No. 67 Cord Circuit Condenser

Kellogg Switchboard Transmitter Arms



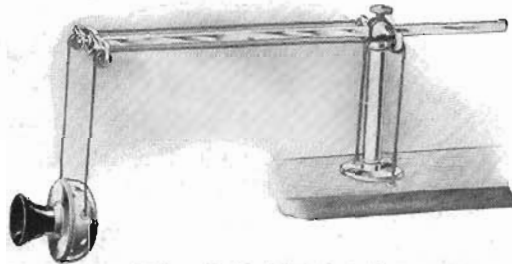
Code No. 45 Transmitter Arm.

backward, moved sidwise, raised or lowered. Holds transmitter conveniently for use in standing as well as sitting position.

This arm is especially valued at P. B. X. or magneto switchboards, where operator or attendant has other work to do and uses adjoining desk or counter.

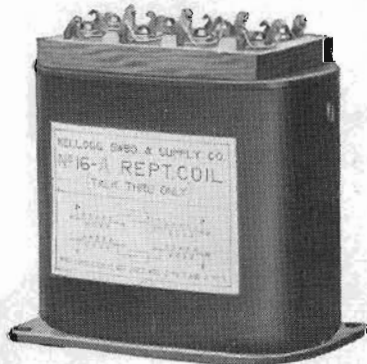
Code No. 45 arm, price **\$4.00** each.

Code No. 24 adjustable arm, price **\$4.00** each.



Kellogg Horizontal, Adjustable Style Transmitter Arm No. 24 Arm only.

Kellogg Repeating Coils



No. 16-A Repeating Coil

Code No. 16-A repeating coil is especially designed for long distance work—a high-efficiency talk-through coil with a compact pressed steel case, for mounting in small space. Price **\$3.65**.

The Code No. 17-A repeating coil is the ring-through type, and is as efficient for talking as No. 16-A type. This repeating coil has four parallel windings, 26 ohms to each winding. Price **\$4.66**.

Where two well balanced metallic telephone circuits exist, Kellogg No. 17-A repeating coils make it possible to obtain a third circuit without stringing additional wires, which under good conditions is more efficient for transmission than either of the original circuits. The two original circuits are called physical or real circuits, and the third circuit a phantom or derived circuit.

We especially recommend our repeating coils as the most efficient type which has ever been built by any company.

USE IS THE TEST

**KELLOGG SWITCHBOARD & SUPPLY COMPANY
CHICAGO, ILL.**

Branch Offices: Kansas City, Mo., San Francisco, Cal.

Columbus, Ohio, 409 Huntington Bank Building

DISTRIBUTING HOUSES: Canada West Electric, Ltd., Regina, Sask., Can.; The McGraw Co., Sioux City, Iowa; The McGraw Co., Omaha, Neb.; Pacific States Electric Co., Los Angeles, Cal., Oakland, Cal., Portland, Ore., Seattle, Wash.; Northwestern Electric Equipment Co., St. Paul, Minn., Duluth, Minn. Tower-Binford Elec. & Mfg. Co., Richmond, Va. Southern Electric Supply Co., Atlanta, Ga.