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INSTRUCTIONS FOR THE INSTALLATION OF THE No. 1800 UNIT TYPE SWITCHBOARD

BULLETIN No. 1023 1-C-12-5-140

Assembling of Units into Complete Switchboards

INSTRUCTIONS
FOR
INSTALLING
THE No. 1800 SWITCHBOARD

GENERAL

The object of this bulletin is to furnish complete information for the assembling and installing the various units comprising the No. 1800 type switchboard.

Since there are a large number of possible combinations in which the units comprising this type of switchboard may be assembled, the various units have been considered separately.

SETTING UP THE SWITCHBOARD

The method of procedure in setting up one of these switchboards is to take the units in the following order: (1st) Supporting unit. (2nd) Cord unit. (3rd) Line unit or units. (4th) Top unit. Then begin the cabling and wiring.

SUPPORTING UNITS

The supporting units furnished with this switchboard are of two types, the table and the bracket units.

TABLE SUPPORTING UNIT D-3

The table type supporting unit is shipped knocked down, but is readily assembled by fastening the legs to the side pieces by means of ¼" x 5" flat head stove bolts, two bolts to each leg. The bolts are furnished with the table. The assembled unit is as shown in Fig. 1. The switchboard when placed in position on top of this skeleton table is fastened to it by screwing small iron corner braces to the side pieces. These iron braces are also furnished with the switchboard. The legs of supporting unit D-3 shall be fastened to the floor by commercial iron brackets, which should not be done until the entire switchboard is assembled.

SUPPORTING UNITS D-4 AND D-5

These units, a tier of drawers and writing panel, respectively, are used only in connection with table unit D-3 (Fig. 1). The desk type unit is mounted with unit D-3 by means of corner braces, screwed to the front and rear legs on the side of the table adjacent to unit D-4. The table top mounts on the skeleton table D-3 in front of those cord units which are not equipped with keyboards. It is fastened by means of small corner braces, screwed tothe side pieces. The legs of supporting unit D-4 shall be fastened to the floor by commercial iron brackets, which should not be done until the entire switchboard is assembled.

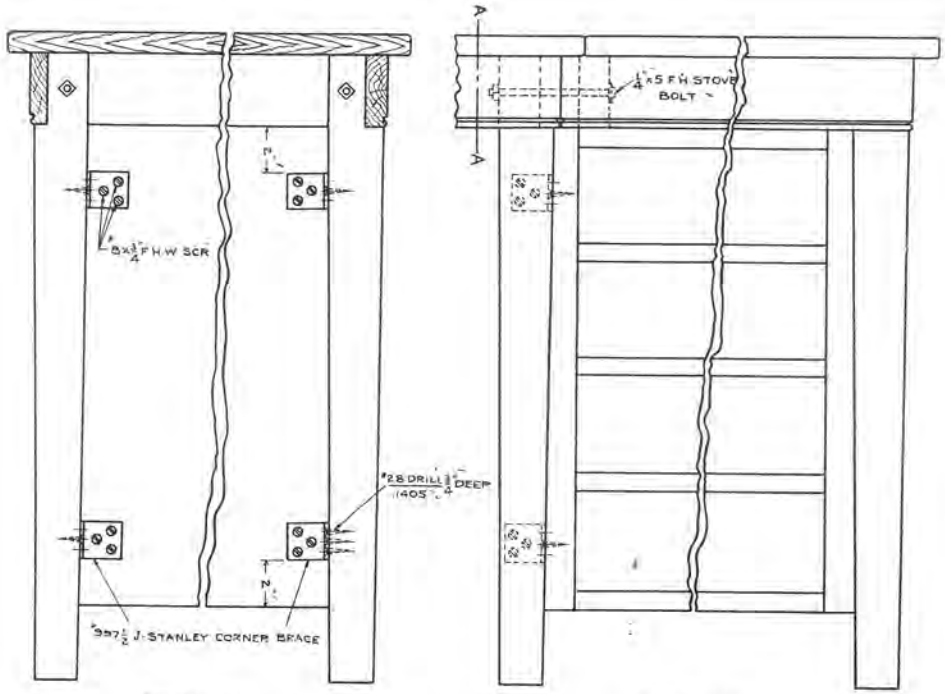


FIG. 1

BRACKET SUPPORTING UNITS D-1 AND D-2

These units consist of a set of steel hinged brackets, fastened to a supporting board. They should be assembled as shown on drawing P-49674 furnished with each supporting unit. The unit D-1 is used where there is no keyboard with the switchboard and D-2 is used when a keyboard is furnished. As the entire weight rests on the hinged bracket when the switchboard is opened, care should be taken to fasten the support securely to the wall, using wood screws in plastered walls and expansion bolts in brick walls, as shown in Figs. 2 and 3. These supporting units

should be located on the wall so that the line cables will lie along the hinged bracket at the line at which the bracket turns when the rear of the switchboard is opened, as in Fig. 8. There will then be no strain on the cables while the switchboard is being opened.

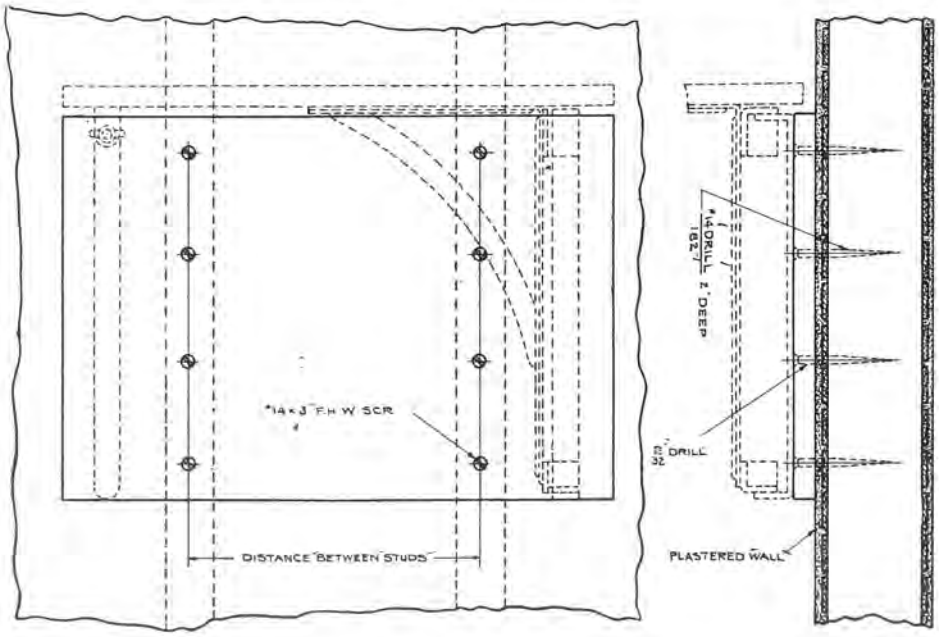


FIG. 2
FRONT VIEW

SIDE VIEW

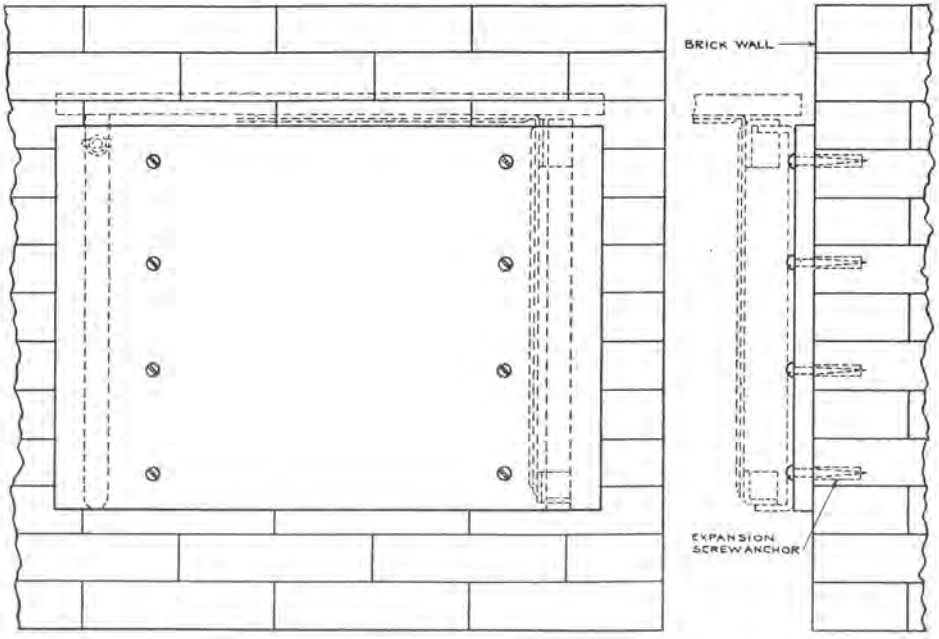
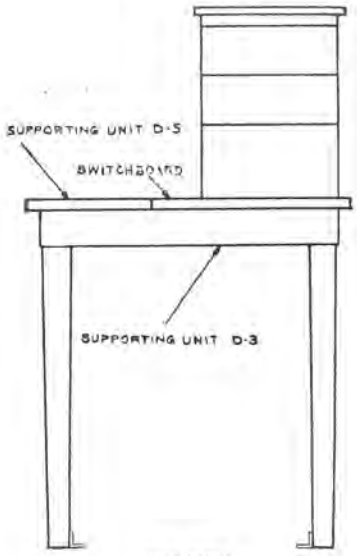


FIG. 3
FRONT VIEW

SIDE VIEW

CORD UNITS The cord units furnished with this switchboard are of two kinds, one equipped, and the other not equipped, with a keyshelf. After the supporting unit has been placed in position, the cord unit is placed on the table or bracket and securely fastened. If a table D-3 is used, the cord unit is fastened to it by means of small corner braces screwed to the inside of the side pieces. If a cord unit



SIDE VIEW
FIG. 4

without keyshelf is furnished, the writing panel D-5 is mounted in front of the cord unit as in Fig. 4. If a cord unit with keyshelf is furnished, this unit will cover the entire top of the table. If a bracket per D-1 and D-2 is used as a support, the cord unit is fastened to the hinged bracket by means of wood screws. Drawing P-49674 enclosed with each switchboard shows the method of fastening the cord unit to the bracket.

LINE UNITS The line units, equipped with either jacks and signals or jacks and drops, are placed on top of the cord units. These units are fastened together at each end by means of machine screws, which serve two purposes:—

(1) **To fasten the line unit to the cord unit.**

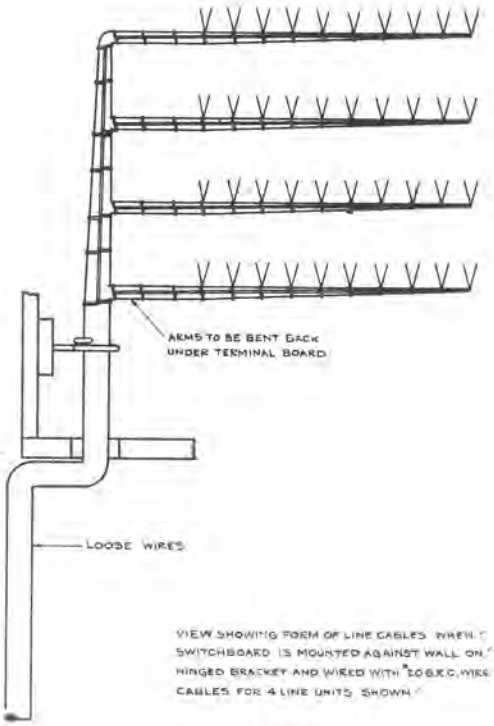
(2) **To complete the night alarm connection through the line units.**

TOP UNITS After all the line units have been put in place, the top unit is mounted on the upper line unit and fastened to it at each end with machine screws, thus completing the assembly of the switchboard. An assembled switchboard is shown in Fig. 4, consisting of two supporting units, one cord unit, two line units and one top unit. (See also Figs. 17 and 18).

FORMING OF LINE CABLES

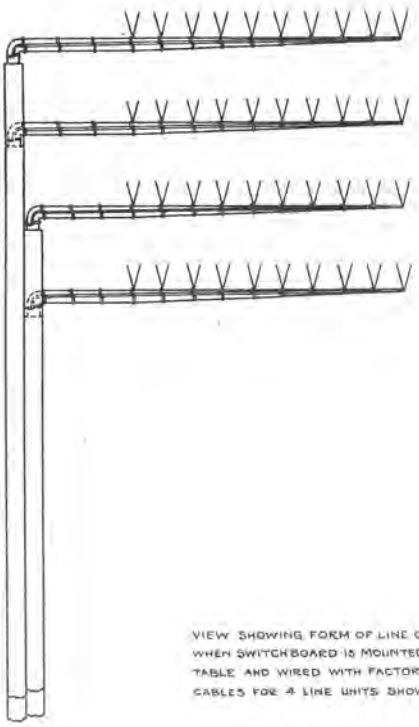
Uncoil the line cable and lay it in the position which it will occupy permanently, thus measuring the length to the protective apparatus. Determine, by placing the cable parallel to the arrester strip, the length of cable which will allow sufficient length of wire to reach any terminal to which a conductor must be connected. Cut away all excess cable. Mark the cable 3/8" back from the point in the cable where the first pair of wires will be let out to the apparatus and butt the cable at that point by removing the braiding and insulation. The butt of the cable should then be securely tied down with twine. Lay out a forming board, using wire nails to mark bends and points where wires are to be brought out and form up the cable, making sure that the numbering corresponds with the color scheme given below. The form should then be sewed with lacing twine from the butt and at each point where paired conductors leave the form.

If braided rubber covered wire is used instead of switchboard cable, the wire should be sewed into a form similar to that explained above. The finished cable or wire forms should then appear as in Figs. 5 and 6.



VIEW SHOWING FORM OF LINE CABLES WHEN SWITCHBOARD IS MOUNTED AGAINST WALL ON HINGED BRACKET AND WIRED WITH 20 B.&S.G. WIRE CABLES FOR 4 LINE UNITS SHOWN

FIG. 5



VIEW SHOWING FORM OF LINE CABLES WHEN SWITCHBOARD IS MOUNTED ON TABLE AND WIRED WITH FACTORY CABLE CABLES FOR 4 LINE UNITS SHOWN

FIG. 6.

COLOR CODE
FOR 10 PAIR CABLE

Line No.	PAIRS COLORS		
1	WHITE	PAIRED WITH	BLUE
2	WHITE	"	ORANGE
3	WHITE	"	GREEN
4	WHITE	"	BROWN
5	WHITE	"	SLATE
6	WHITE	"	BLUE, WHITE
7	WHITE	"	BLUE, ORANGE
8	WHITE	"	BLUE, GREEN
9	WHITE	"	BLUE, BROWN
10	WHITE	"	BLUE, SLATE

INSTALLING LINE CABLES

The line cables should be installed in the switchboard as shown in Figs. 7 and 8, depending upon the type of supporting unit. The legs of the cable forms should be placed in position under the fanning strips, the wires drawn through the holes, the insulation removed and the bare wires fastened securely under the heads of the screws on the line terminals. The cables should be supported by means of leather straps cleating the cable to the wall in the case of the wall type switchboard and to the leg in the case of the table type switchboard. When installed in a wall type switchboard, the cable should be laced to the hinged bracket, so that it will turn freely when the switchboard is opened (Fig. 8).

WIRING TO PROTECTORS

For protection against high potential currents, such as lightning, etc., and abnormal currents from trolley wires, lighting mains, etc., it is customary to use double protection consisting of fuses, heat coils and arresters (Figs. 9 and 10). With this method of protection, the outside wires or cable should be soldered to the fuses or No. 7-D protectors and the wires or cable from the switchboard to the arresters or No. 84-A protectors (Fig. 9). This sketch also shows the method of wiring between fuses and arresters, by means of jumper wire, and the grounding of the protector mounting.

Where there is no danger from trolley wires, lighting mains or other wires carrying current, it is not customary to use fuses, and the No. 7-D protectors shown in Fig. 9 may be omitted. In this case the outside wires or cables should be soldered to the No. 84 protectors at the terminals to which the jumper wires are shown connected and the jumper wires omitted. When there are ten or less lines 12-A protectors may be used (in place of the No. 7-D and No. 84 protectors) as shown in Fig. 10.

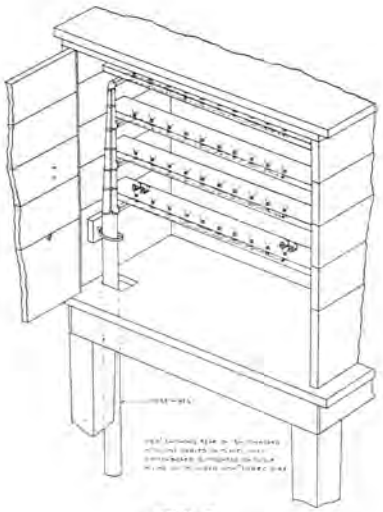


FIG. 7

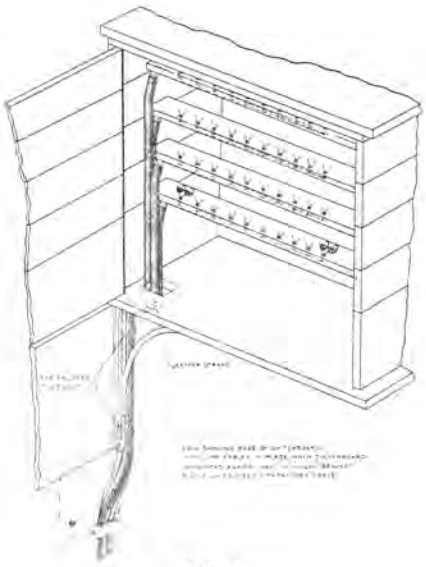
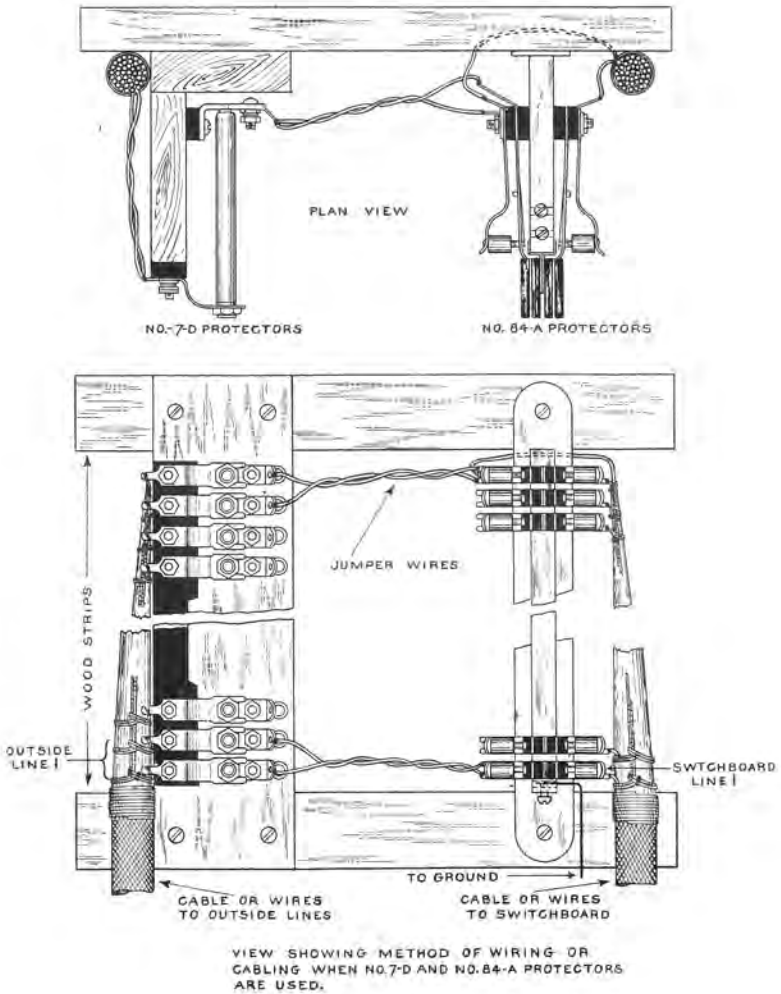


FIG. 8

MOUNTING OF PROTECTORS

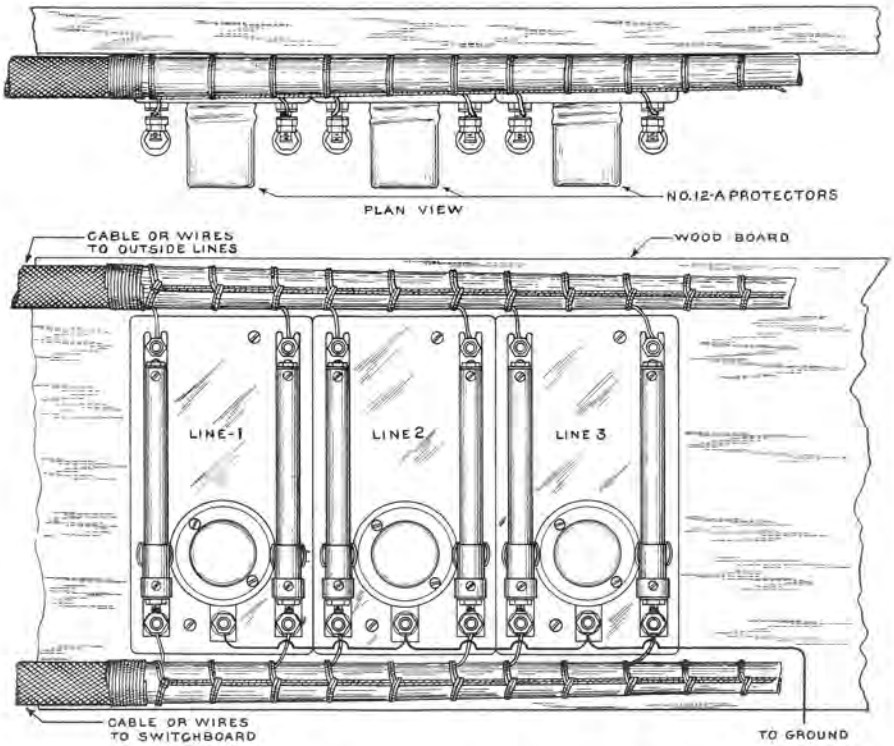
The protectors should be located as near as possible to the point where the outside wires enter the building. The protector mountings should be mounted against the wall on suitable wood cleats or boards, at a convenient distance from the floor. Two



VIEW SHOWING METHOD OF WIRING OR CABLING WHEN NO. 7-D AND NO. 84-A PROTECTORS ARE USED.

FIG. 9

common methods of mounting protectors are shown in Figs. 9 and 10, and it should be noted that it is desirable to mount the protector strips vertically wherever possible. This reduces the number of cable bends and makes a neater appearance.



VIEW SHOWING METHOD OF WIRING OR CABLING WHEN NO.12-A PROTECTORS ARE USED.

FIG. 10

CONNECTION BETWEEN UNITS

BETWEEN TOP AND CORD UNITS

When the operator's telephone set consists of a head receiver and a transmitter suspended from a transmitter arm mounted on the top unit, it is necessary to connect the transmitter to the telephone circuit apparatus in the cord circuit. The transmitter leads are coiled up in the cord unit and are plainly tagged, They should be connected to the binding posts in the top unit marked "+" and "—," per Fig. 11. The receiver cord should be connected to the terminal punchings marked TELEPHONE "T" and "R" on the connecting rack in the cord unit. If the leads are too long, coil them up in the top unit so that they will be long enough when additional units are added.

If the telephone set consists of a hand set the hand set cord should be connected to the terminal punchings marked "Telephone 1, 2 and 3," Fig. 12, located on the side of the switchboard.

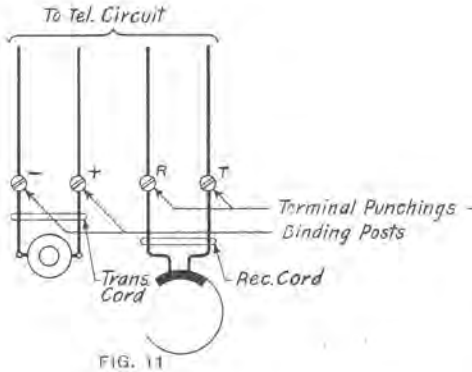


FIG. 11

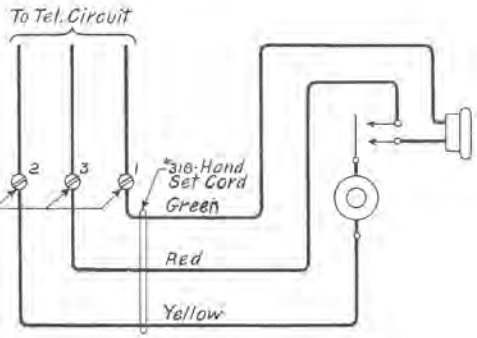


FIG. 12

BETWEEN LINE UNITS

The night alarm circuit is connected between the different units through the screw holding the units together. No other connection is necessary except in those units equipped with an audible code ringing signal circuit, namely units B-3 and B-6. When assembling units having this signal circuit, it is necessary to connect the circuit to the one in the unit below. The lead furnished for this purpose is tagged "Connect to screw clip marked 'Aud. Code' in the next unit below." This screw clip is marked "A" in the switchboard.

BATTERY CONNECTIONS

BATTERY FOR NIGHT ALARM

Three Blue Bell dry batteries are used for the night alarm battery and should be connected carbon to zinc (never carbon to carbon or zinc to zinc). The cells should be connected to the terminal punchings marked "NIGHT ALARM BATTERY" in the rear of the cord units by a pair of No. 20 B. & S. braided rubber covered wire as shown in the wiring diagram furnished with the switchboard.

BATTERY FOR TELEPHONE CIRCUIT

Three Blue Bell dry batteries are used for transmitter battery and should be connected carbon to zinc. They should be connected to the terminal punchings marked "TRANSMITTER BATTERY" in the rear of the cord units by a pair of No. 16 B. & S. braided rubber covered fixture wire as shown on the diagram furnished with the switchboard.

NOTE.—The positive terminal of a dry cell is the carbon and should be connected to terminal punchings marked "+" and the zinc connected to terminal marked "—."

METHOD OF CONNECTING LEADS TO GROUND

MAKING THE EXCHANGE GROUND

A wire attached to a service pipe of a water supply system will in general give an earth connection of lower resistance than a rod or plate. The method of making a connection to a water pipe is illustrated in Fig. 13, "A." In a great many localities it is illegal to utilize water pipes for this purpose and it is necessary to construct an earth connection. The best method of making a ground connection is shown in Fig. 13, "B," in which four coils of copper wire each containing twenty-five feet are buried in gas coke or

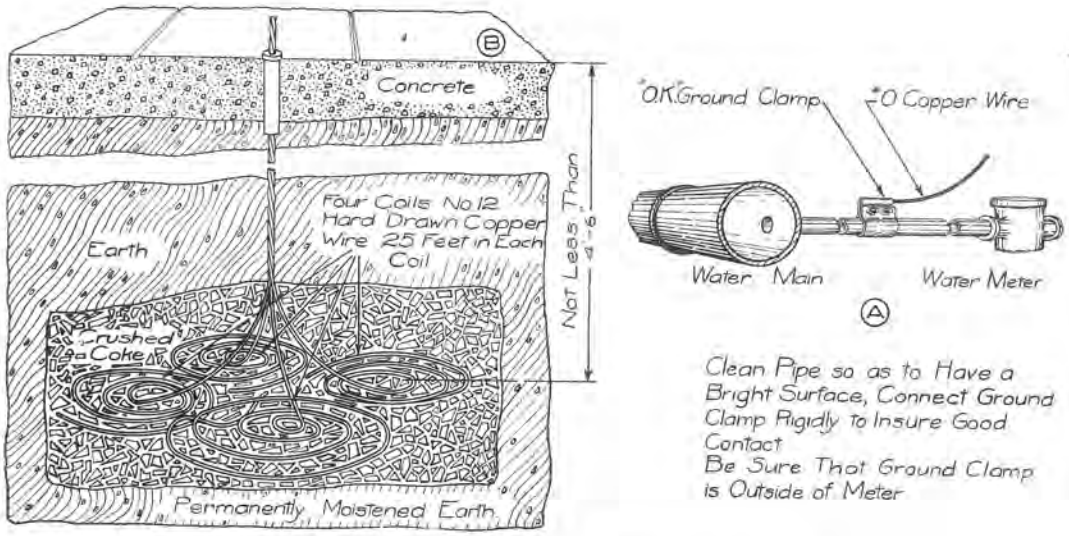


Fig. 13—The Proper Way to Make an Exchange Ground

charcoal below the permanent moisture level, in the manner shown. The protectors should be grounded before any lines are connected to the switchboard. Serious fires have occurred during the night in new central offices before they were placed in service, due to their being left without lightning protection.

LINE UNIT B-11

When line unit B-11, employing central office selective signalling, is used, it is necessary to provide a "GROUND" as this system rings through to ground. This "GROUND," is obtained from the exchange ground.

METHOD OF CUTTING REPEATING COILS INTO CORD CIRCUITS

CORD UNITS

The first two cord circuits No. 1 and No. 2 of cord units C-2, C-3, C-5, C-6, CA-1, CA-5, CB-1 and CB-5 are wired in such a manner that a repeating coil with or without condenser can be connected in the circuit when desired. (See wiring diagram furnished with the switchboard).

To equip a cord circuit with a repeating coil only or a repeating coil with condenser, proceed as follows:

UNITS CA-1, CA-5, CB-1 AND CB-5

In cord units CA-1, CA-5, CB-1 and CB-5, mount the repeating coil and condenser on the bottom of the unit opposite the switchboard terminals marked "A," "B," "C," "D" and connect these terminals with the repeating coil terminals marked "A," "B," "C," "D," respectively, as shown in Fig. 14. Then remove the straps from "A" to "B" and "C" to "D" on the switchboard terminals.

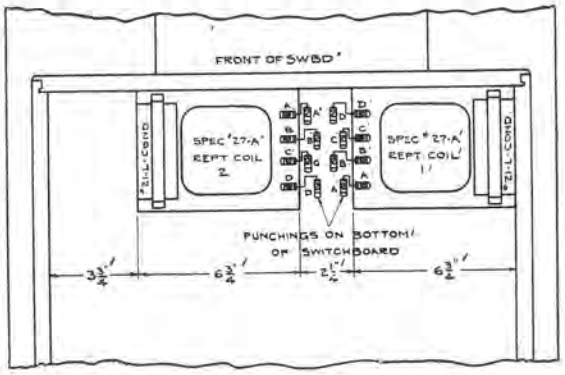


FIG. 14
TOP VIEW

UNITS C-2 AND C-6

In cord units C-2 and C-6 mount the repeating coil and condenser on the left side of the unit opposite the switchboard terminals marked "A," "B," "C," "D" and connect these terminals with the repeating coil terminals marked "A," "B," "C," "D," respectively, as shown in Fig. 15. Then remove the straps from "A" to "B" and "C" to "D" on the switchboard terminals.

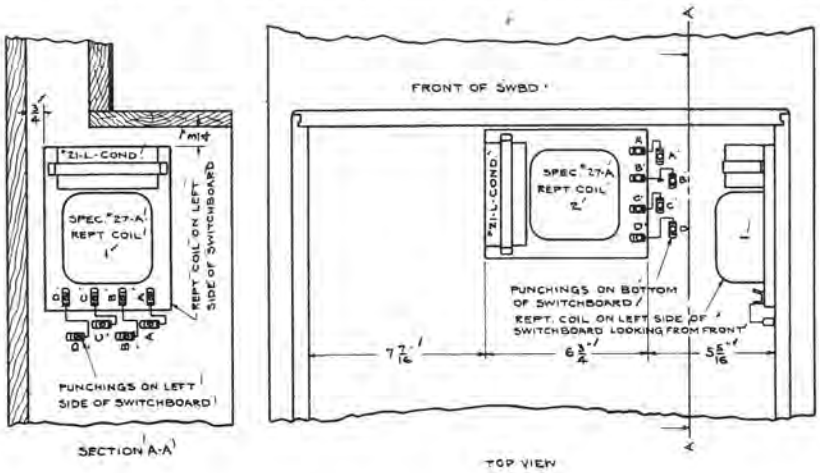


FIG. 15

UNITS C-3 AND C-7

In cord units C-3 and C-7 mount the repeating coil against the left side of the unit so that its terminals are near the switchboard terminals marked "A," "B," "C," "D," "E," "F," "G," "H," "J," "K." There are two sets of these terminals, the set nearer the front of the switchboard is for cord circuit No. 1 and the set in the rear of the switchboard is for cord circuit No. 2, as shown in Fig. 16.

Remove all straps from the above set of terminals. Then strap switchboard terminals "C" to "D" and "G" to "H" and connect the repeating coil terminals to the different switchboard terminals as shown in Fig. 16.

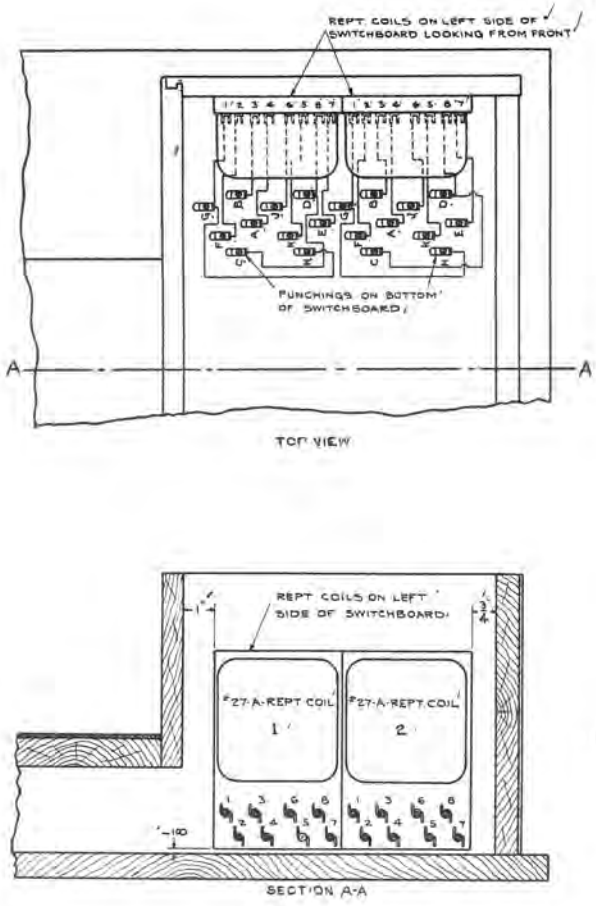


FIG. 16

ADDITIONAL INFORMATION

The instructions listed in this bulletin should simplify the installation of the No. 1800 Type Switchboard, but if further information should be desired, this can be obtained by writing our nearest branch house.

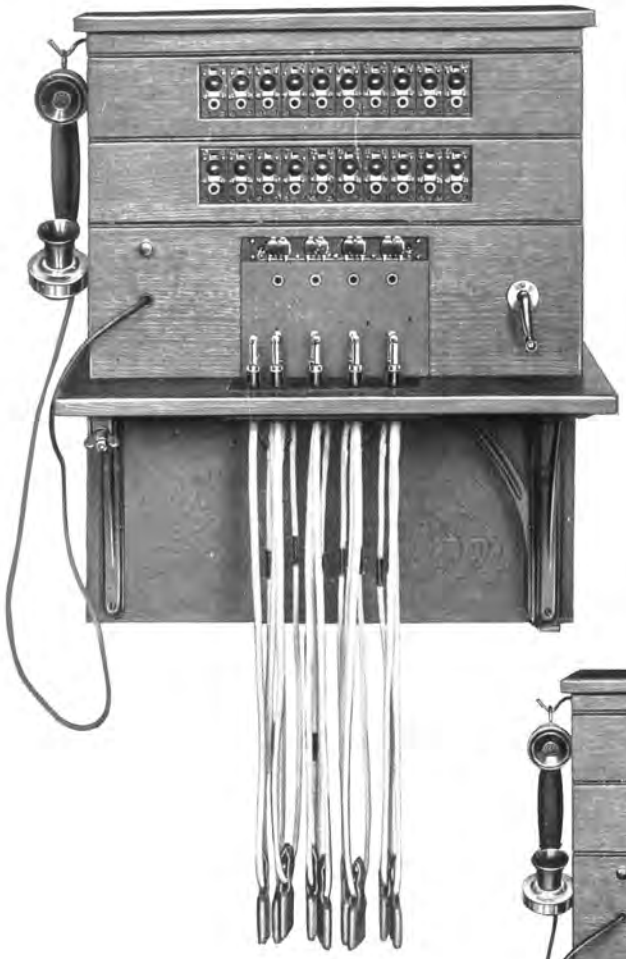


FIG. 17 Assembled Wall Type No. 1800 Switchboard. Consists of:

1—No. A-1 Top Unit.

2—No. B-2 Line Units.

1—No. CA-1 Cord Unit.

1—No. D-1 Supporting Unit.

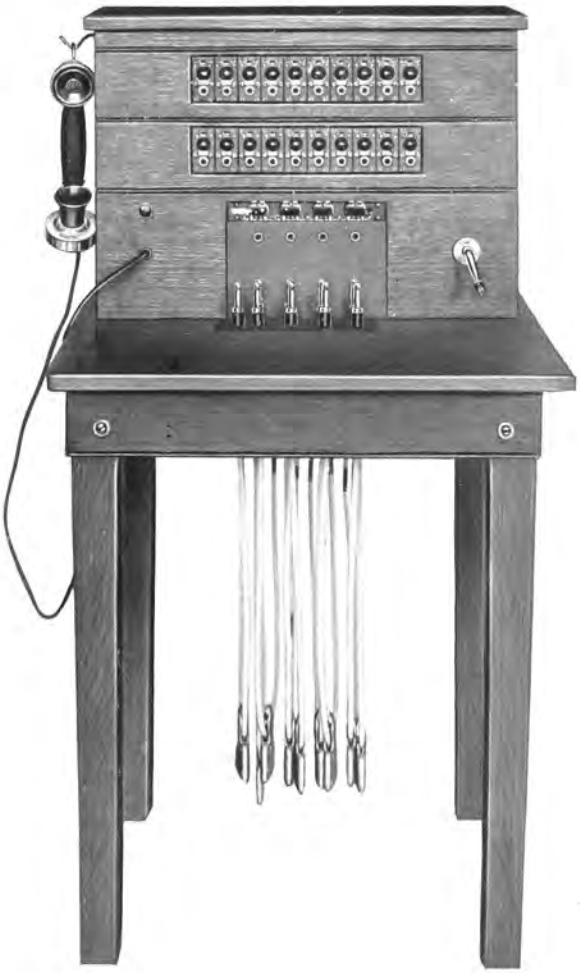


FIG. 18 Assembled Floor Type No. 1800 Switchboard. Consists of:

1—No. A-1 Top Unit.

2—No. B-2 Line Units.

1—No. CA-1 Cord Unit.

1—No. D-3 Supporting Unit.

1—No. D-5 Supporting Unit.