



FARM LINE TELEPHONES BULLETIN NO. 92 OCTOBER 1916

A "how-to" bulletin about constructing a farm line magneto telephone line. Excellent reference material for the methods and materials used in early rural lines. Also included are several magneto sets of the "picture frame" style, with 5 bar generators, fluted receiver caps and the "battery saver" hook switch lock for monitoring the line before ringing up the operator, also great for listening in on the party line.

Printed in booklet form, 7.5 X 10 inches, gutter bound, 8 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.

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Farm Line Telephones

Kellogg Switchboard & Supply Company

CHICAGO, ILL.

KANSAS CITY

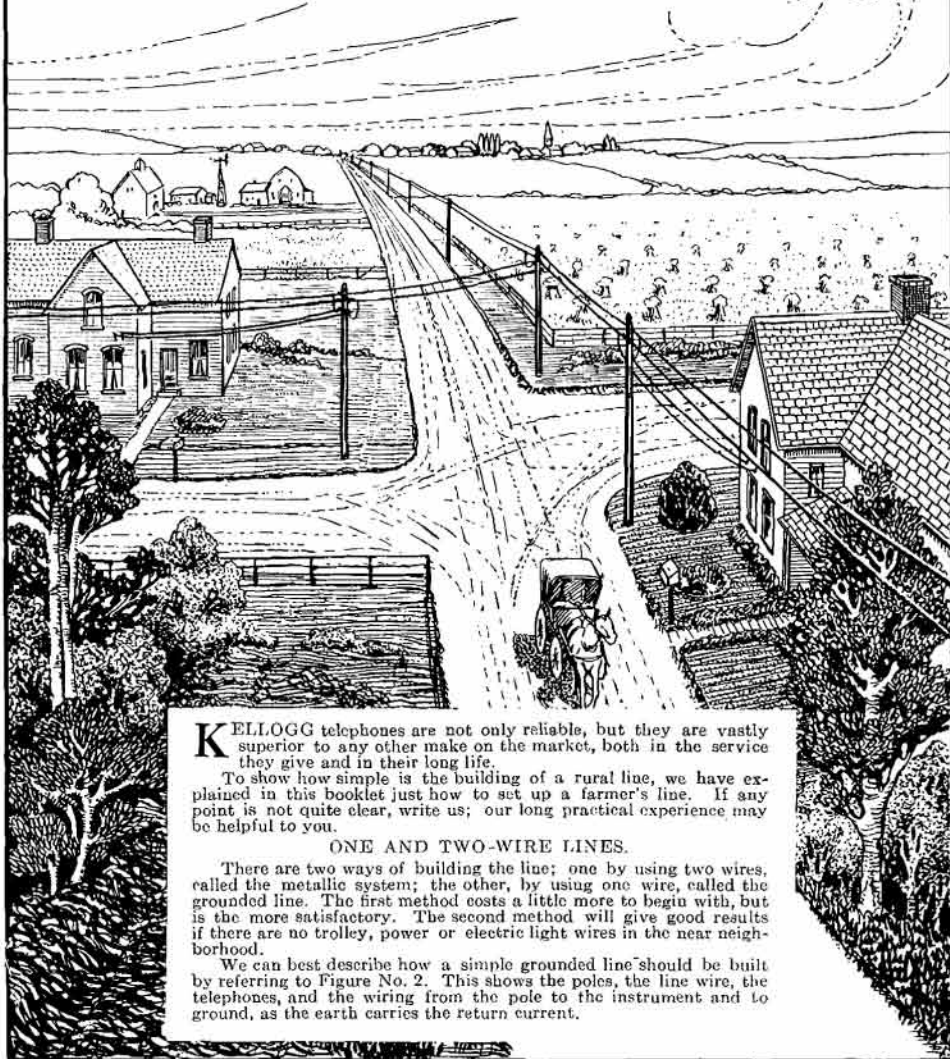
SAN FRANCISCO

WINNIPEG, CANADA

Manufacturers of Telephones and Switchboards

Bulletin No 92

Oct. 1916



KELLOGG telephones are not only reliable, but they are vastly superior to any other make on the market, both in the service they give and in their long life.

To show how simple is the building of a rural line, we have explained in this booklet just how to set up a farmer's line. If any point is not quite clear, write us; our long practical experience may be helpful to you.

ONE AND TWO-WIRE LINES.

There are two ways of building the line; one by using two wires, called the metallic system; the other, by using one wire, called the grounded line. The first method costs a little more to begin with, but is the more satisfactory. The second method will give good results if there are no trolley, power or electric light wires in the near neighborhood.

We can best describe how a simple grounded line should be built by referring to Figure No. 2. This shows the poles, the line wire, the telephones, and the wiring from the pole to the instrument and to ground, as the earth carries the return current.

WITH the two-wire, or metallic system, the two wires and connections are shown in Figure 6 (page 3). The difference in cost is simply the extra wire, brackets and nails. With each telephone are sent simple directions for connecting, whether the grounded or metallic system is to be built. These and the following illustrations show just how the wires and brackets should be connected; the important points to remember are to prevent crossing of wires and to make firm joints. Care in setting poles solidly, putting brackets and drop wires from pole to telephone firmly in place will save money in the longer life of the line.

The main line should be set as near as possible to the houses in which the telephones are to be placed. The straightest line saves money and time in building, however, so branch wires should be run from main line to more distant buildings. Figures 1 and 9 illustrate these points and other details of building.

For farmers' lines, poles can be set from 130 to 170 feet apart, from 30 to 40 to the mile and they should be from 20 to 25 feet in height, set from 4 to 5 feet in the ground. Dig the holes large enough to admit pole easily and full size to the bottom. When the pole is in the ground, the earth must be tamped well as hole is filled. Gravel and small stones make a good surface filling. The pole tops should be cut as in Fig. 7, the bark removed and extending knots cut off flush with the pole. If the line is expected to grow rapidly, heavier poles are a saving. When more than two line wires are to be used, cross-arms should be employed instead of brackets, as shown in our Bulletin No. 83, which treats of the subject more at length.

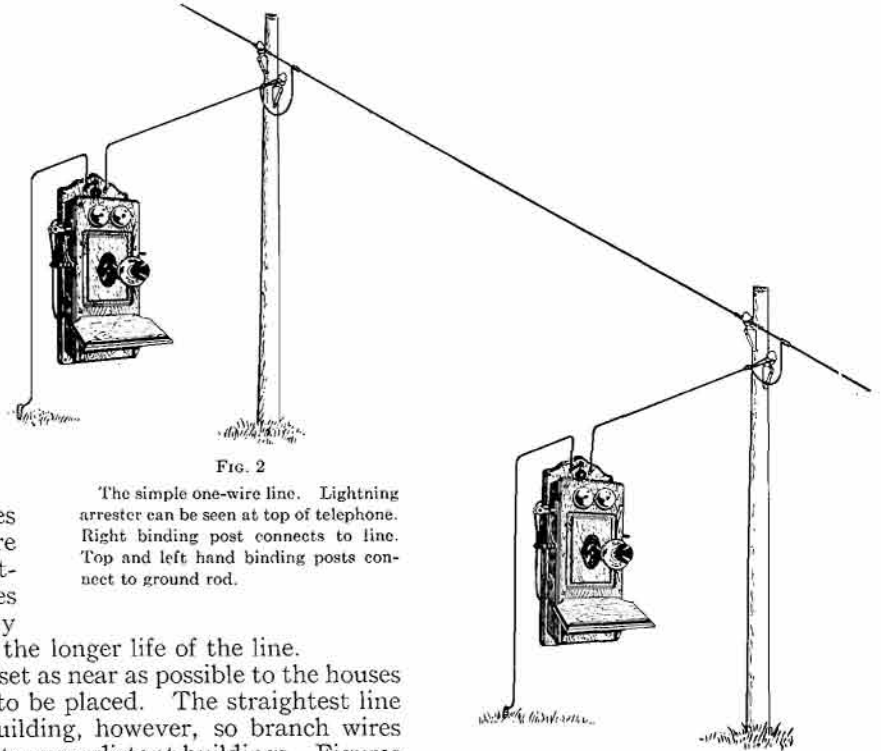


FIG. 2
The simple one-wire line. Lightning arrester can be seen at top of telephone. Right binding post connects to line. Top and left hand binding posts connect to ground.

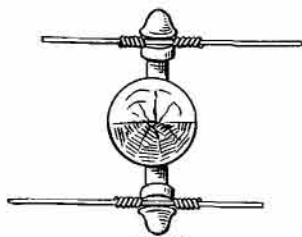


FIG. 3
VIEW FROM ABOVE, STRAIGHT LINE

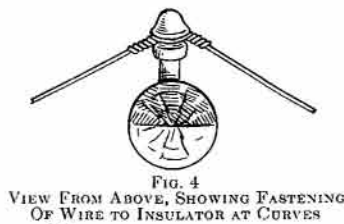


FIG. 4
VIEW FROM ABOVE, SHOWING FASTENING OF WIRE TO INSULATOR AT CURVES

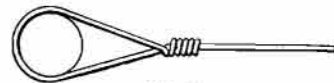
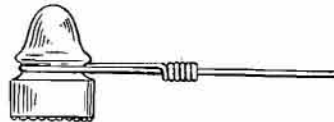


FIG. 5
DEAD ENDING TIE
SHOWING METHOD OF FASTENING WIRES TO INSULATORS



FIG. 5
TYING TO INSULATORS



FIG. 5
METHOD OF SPLICING WIRE

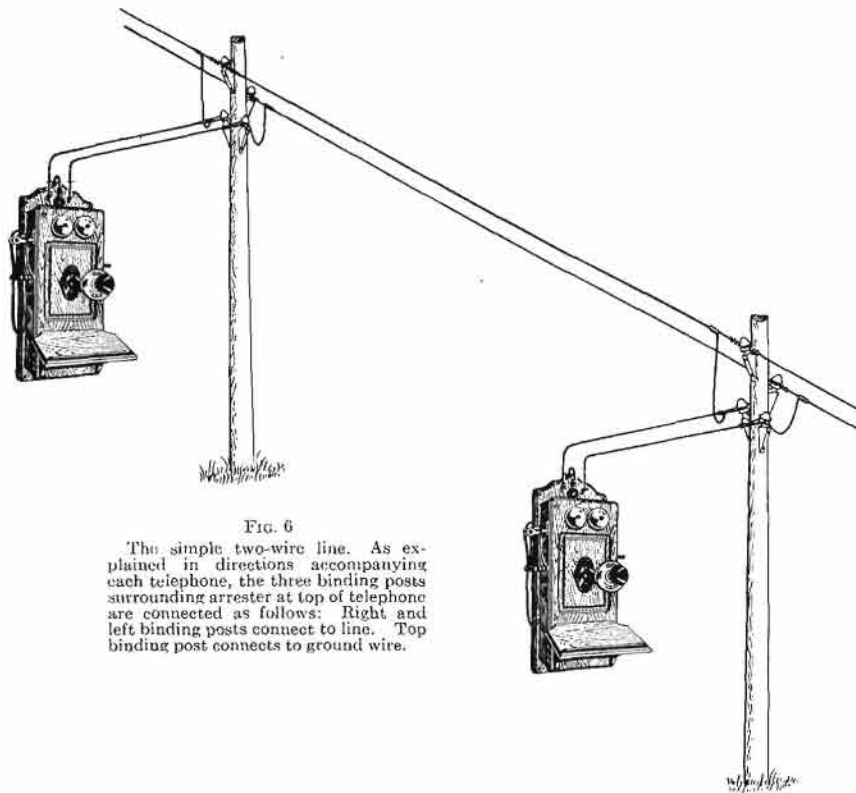


FIG. 6
The simple two-wire line. As explained in directions accompanying each telephone, the three binding posts surrounding arrester at top of telephone are connected as follows: Right and left binding posts connect to line. Top binding post connects to ground wire.

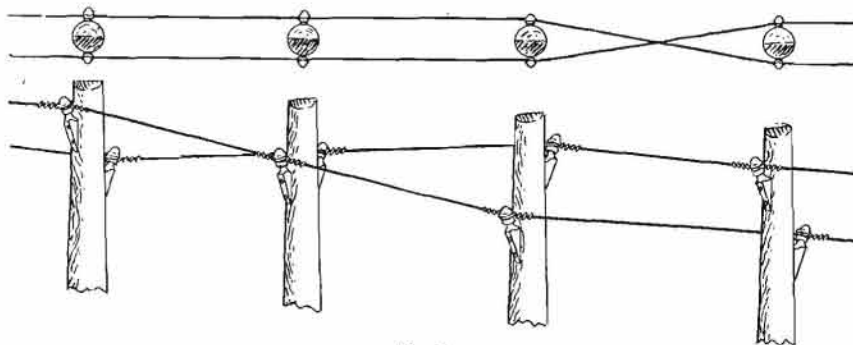


FIG. 7
ILLUSTRATING SIMPLE TRANSPOSITION

insulator, on a straight line and on a curve; tie the wire inside insulator except on curves, when it should be tied on outside. Figure 5 shows most approved way of splicing, tying and dead-ending the line wire. Use same kind and size of wire in tying to insulators as is the line itself.

Two wire or metallic circuits on brackets, must be transposed or crossed from side to side as shown in Figure 7.

THE brackets should be put on the pole before it is set up, and when only one or two wires are to be put on, the form of oak brackets, shown in Figures 7 and 8, fitted with glass insulators, should be secured to the pole with 40 to 60-D nails, as indicated.

For rural lines, the best wire is 12-BB, double galvanized iron. On very short lines, up to 10 miles long, No. 14-BB can be used, but the heavier wire is the more economical in the end.

When the poles are in place the line wire can be unwound along the line, pulled to the top of each pole and fastened to the insulators.

Figures 3 and 4 show the best method of securing wire to

Illustrating manner of pole guying. Plain guy. The butt of the pole should be reinforced by two logs bolted to pole as shown. Plant guy rod, bolted to log, as far as possible from pole.

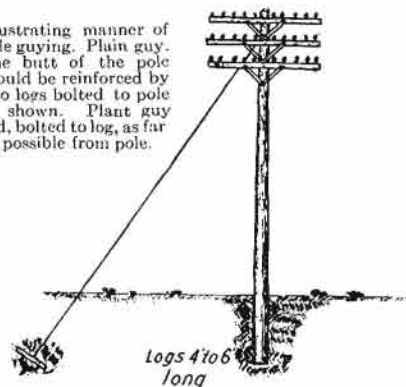


FIG. 8
logs 4' to 6' long
Page Three

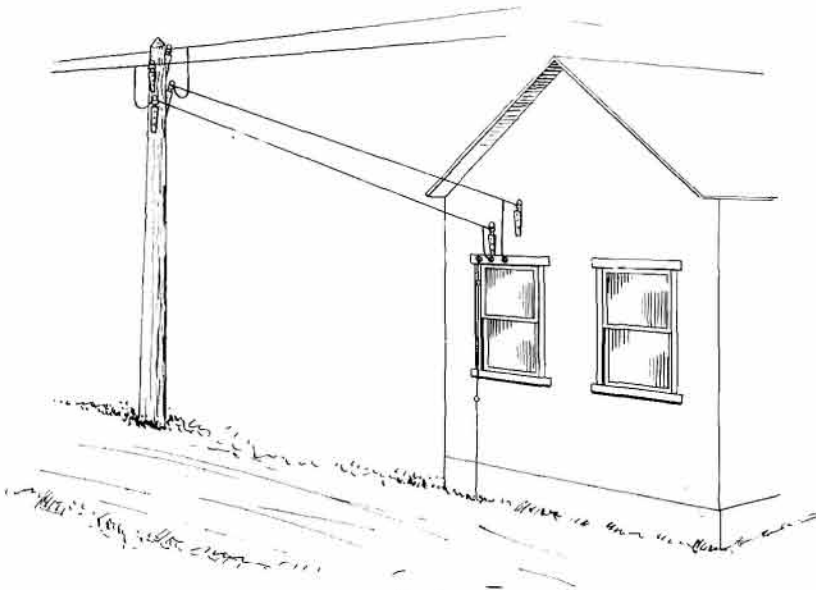


FIG. 9

SHOWING DETAILS OF DROP WIRE ARRANGEMENT FROM POLE TO HOUSE

THIS change in brackets of the two wires prevents cross-talk or noises on the line when the telephone wires are in the neighborhood of power, lighting or other telephone circuits. When the line consists of more than two wires the method of transposition is described in our Bulletin No. 83.

The method of attaching drop wires, or wires leading from main line to house wires, is shown in Figures 1 and 9.

The branch wires, leading from main line to house or barn where the telephone is to be placed, should be secured to separate brackets, and the connecting wires must be long enough to allow sufficient slack, as indicated in this figure.

Figure 10 illustrates the method of fastening drop wires at the house or building in which the telephone is to be located. Figures 9 and 11 show how drop wire should be supported from the nearest pole to house. The same kind of wire should be used on house as on main line.

Figures 12 and 13 illustrate the best way of bringing wires through the wall into the house, and the connection to the telephone. If they must be extended along outside of house, they should be carried on insulators fastened to wall.

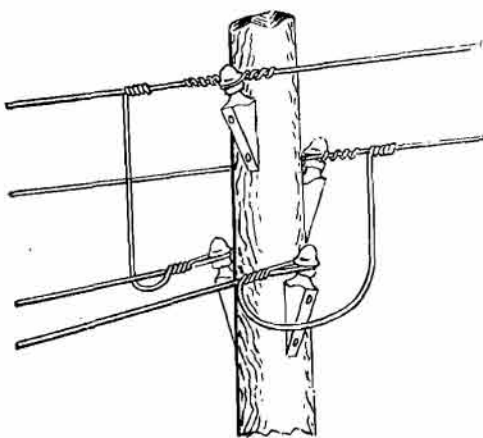
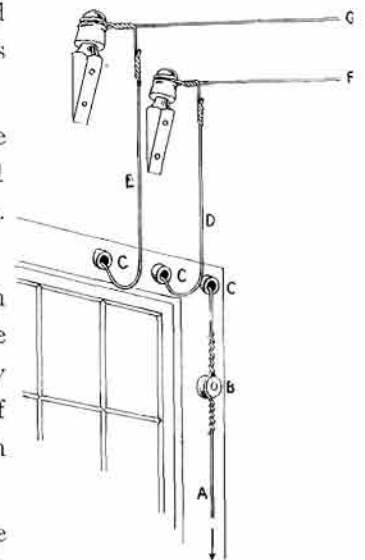


FIG. 11

DETAILS OF DROP WIRE AND BRACKET FASTENING TO POLE



TO GROUND ROD
FIG. 10
PLAN OF WIRES ENTERING HOUSE, AS DESCRIBED

In running wires through the wall, two separate holes, 2 or 3 inches apart, sloping upward, should be drilled, the wires being run through porcelain tubes set in the holes for more perfect protection. The arrester shown in Figure 16, used when there are high tension currents in immediate vicinity, should be placed in the inside wall as close as practicable to the holes.

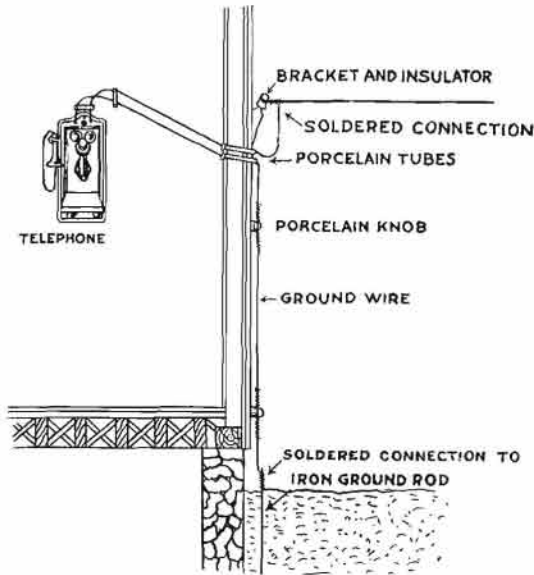


Fig. 12

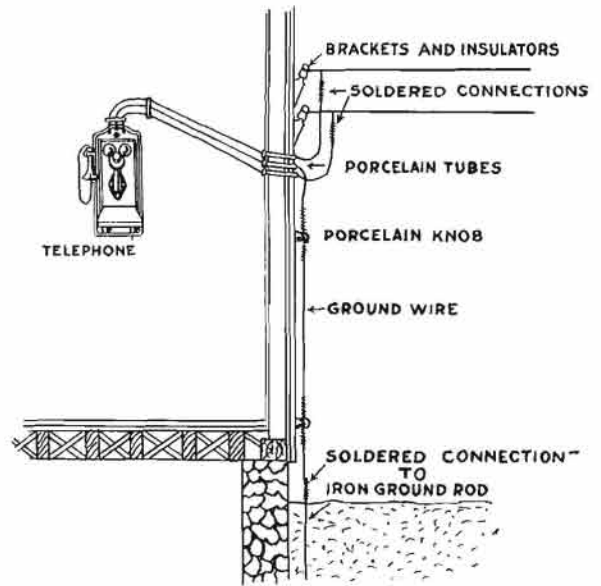


Fig. 13

THESE leading-in wires should be braided and rubber covered to insure perfect insulation, and should be connected directly to terminals of telephone binding posts. The outer ends of the insulated wires should be soldered securely to the end of drop wires, as indicated. A "drip loop" should be made in outer end of leading-in wires just below entrance holes on outside of wall, as this prevents rain water from running along wire into building. Fig. 10, "E" and "D."



Fig. 14

The KELLOGG FARM TELEPHONE

Its Record Proves It Unequaled

Inside the house braided and rubber covered twisted pair copper wire, No. 19 B & S gauge, should be used.

Complete directions, sent with each telephone, show method of connecting these wires to telephone binding posts inside each instrument.

The best practice is to have all inside wiring concealed, but neat and careful work is of the most importance. Additional insulating tape or tubing should cover wires that cross water or other pipes or conductive substances. In fastening wire to the inside wall fibre, cleats or insulated staples should always be used, and the insulation of the wires must not be marred or broken.

The wall telephone, Figures 14 and 15, should be attached firmly to the wall, using screws of sufficient size to withstand any strain to which the instrument is liable.

Kellogg telephones operate with two dry batteries, where other makes require three and then give inferior service. Directions for connecting the dry cells in lower compartment of telephones are sent with every instrument.

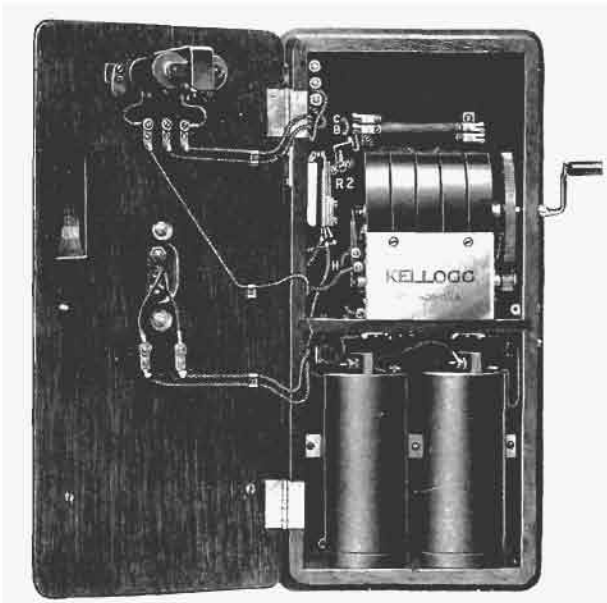


FIG. 15
OPEN VIEW KELLOGG FARM TELEPHONE.

MATERIAL

The following tables give quantity of line material needed for a one-wire (or "grounded") line and a metallic (or two-wire) line up to 12 miles in length.

TABLE ONE

For a "metallic" two-wire line not more than twelve miles long there will be needed for each mile:

- 193 pounds of No. 14-BB galvanized iron telephone wire.
- 60, 12-inch painted oak brackets.
- 60, 40-D and 60, 60-D wire nails.
- 30, 20 or 25-foot poles.

TABLE TWO

For a "grounded" one-wire line, there will be needed:

- 96 pounds of No. 14-BB galvanized iron telephone wire.
- 30 No. 9 pony glass insulators.
- 30, 12-inch painted oak brackets.
- 30, 40-D and 30, 60-D wire nails.
- 30, 20 or 25-foot poles.

In addition to the telephone proper, which we ship complete and ready for immediate placing on the wall, there will be needed for each telephone installation:

- 18 feet single wire (to connect telephone arrester binding post to ground rod).
- 18 feet twisted pair wire (to connect drop wires to telephones) 4 porcelain knobs (for securing ground wire to building) 4, 3-inch F. H. screws to fasten same.
- 12 insulated staples.
- 2 porcelain tubes (3 for metallic lines).
- 2 dry cell batteries.

Any further information regarding the cost of telephone installation, or in fact any other information that will be of help, may be obtained by writing to our main office at Chicago, or to one of our branches at Kansas City or San Francisco.

The location of our branch houses is of especial advantage to our customers in making the cost of transportation low, owing to the nearness of one or another of these points.

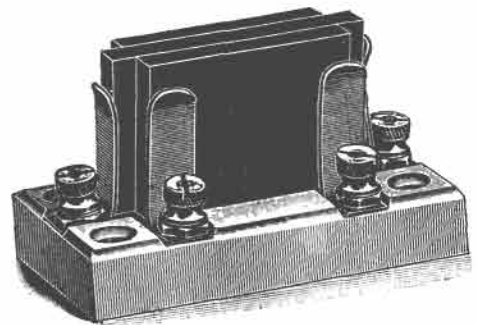


FIG. 16

RUBBER covered copper wire should be used for connection between the telephone or protector and ground rod. The best method of grounding is to use an iron rod about 6 feet long and at least $\frac{1}{2}$ inch in diameter, driven into the earth where dirt in contact with the lower end of the rod at least will be permanently damp. This rod with the ground wire soldered to the upper end should be used in the same way with a grounded line system, the upper end of the grounding wire being run directly to the telephone. In any case the ground wire should be as short and with as few bends as possible. Porcelain knobs should be used to prevent it coming in contact with the house, and the porcelain tube should surround the wire in entering the wall, as already described, and shown in Figures 10, 12 and 13.

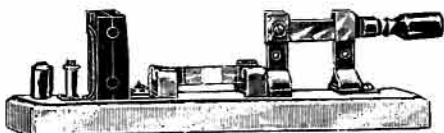


FIG. 17
TYPE USED ON ONE-WIRE LINES



FIG. 18
METALLIC OR TWO-WIRE LINE PROTECTOR

For ordinary conditions the lightning arrester included with each telephone is sufficient, but when it becomes necessary to run inside wiring for long distances to reach the telephone, it is advisable to install an additional protector near the point where the wires enter the building. For this purpose we recommend arrester shown in Figure 16.

Special lightning and high tension current protectors fitted with switches so that connection with line can be broken during electrical storms are shown in Figures 17 and 18. We carry a full line in stock listed in Catalogue No. 1.

SIMPLE OPERATING POINTERS

Kellogg telephones will stand the hardest tests and save the first cost many times over in low cost of maintenance.

Once in from ten months to two years, depending on usage, the two dry battery cells in each instrument should be replaced by new ones. This is easily and quickly done. Very little attention is required by other parts of the telephone if treated with ordinary care.

To telephone it is only necessary to turn the generator handle on the right hand side of the box. This causes all the bells on the line to ring. A system of calls may be arranged of long and short rings. One turn of the handle gives a short ring and several continuous turns a long ring. A short ring is given as a signal that the conversation is finished and the line is once more clear.

When a person wishes to carry on a conversation with another party he rings the proper signal and then removes the receiver from the hook, holding it close to his ear, and waits till the signalled party answers by giving his name or number. The party doing the calling gives a short ring when the conversation is finished, to notify the other subscribers that the line is again clear. It is best to remove the receiver from the hook and listen a moment before ringing to make sure that the line is not in use.

OUR RURAL TELEPHONE BULLETINS

Our Bulletin No. 83 explains more in detail the building of lines with more than two wires, and covers the best methods of setting cross-arms, pole guying, transposition, and Bulletin No. 88 gives the blank forms, contracts, applications, notices, etc., generally used by telephone companies.

Our Bulletin No. 70 explains fully the theory of modern bridging or party lines telephones. Bulletin No. 90 describes our magneto switchboards. These bulletins are illustrated and will be sent free to those interested in telephone work.

A feature of great value to users of Kellogg telephone and switchboards is that the long experience of our complete Engineering Department is at the disposal of our customers and prospective buyers. If there is any point you do not fully understand, or any operating difficulty on which you wish information, write us—this assistance is free and of value to every telephone man, from the beginner to the most experienced. Write us to-day.

The Kellogg woodworking plant occupies seven separate buildings, 46,000 square feet. Complete equipment for the perfect production of telephone and switchboard boxes and cabinets.

TELEPHONE WIRE REFERENCE TABLE

LIST NUMBER	GAUGE	DIAMETER OUTSIDE RUBBER	STYLE OF BRAID IF ANY	SINGLE OR TWISTED PAIR	DESCRIPTIVE NAME IF ANY AND REMARKS
134	19 B. & S.	3-32	None	Single	
129	19	" 3-32	"	Twisted Pair	Pot-head Wire
1074	19	" 3-32	Dry	Single	Int'r wire ea. con. brd.
137	19	" 3-32	"	Twisted Pair	" " " " "
136	18	" 7-64	"	" "	" " " " "
127	19	" 3-32	Black Saturated	Single	Spider wire
126	18	" 7-64	" "	"	" "
1075	16	" 4-32	" "	"	" "
1076	14	" 5-32	" "	"	" "
133	19	" 3-32	" "	Twisted Pair	Brd. over all
132	18	" 7-64	" "	" "	" " "
163	19	" 3-32	" "	" "	Ea. con. brd.
162	18	" 7-64	" "	" "	" " "
165	16	" 4-32	Bk. sat. ex. heavy	" "	Drop wire " " "
164	14	" 5-32	" " " "	" "	Hd. Drawn Ea. con. brd. Hd. Drawn
1077	19	" No rubber	Dbl. weatherproof	Single	Hd. Drawn Copper
1078	18	" " "	" "	"	" " "
1032	16	" " "	" "	"	" " "
1031	14	" " "	" "	"	" " "
169	18	" " "	Paraffined cotton	"	Damp proof office
168	16	" " "	" "	"	" " "
173	18	" " "	" "	Duplex	" " "
1081	14 BW.	" "	Dbl. weatherproof	Single	Iron Wire
865	12 BW.	" "	No insulation		B. B. iron wire dbl. galv.