

MEDICAL.

YOUR TELEGRAPH LINE.

HERE IT IS, IF YOU WANT ONE, AND ARE A HANDY WORKMAN.

And Here Thirteen Dollars is Spent—That's What It Will Cost. In Addition to Your Wires—Here is Interesting Information, Even if You Don't Build.

A short private telegraph line can be put up and equipped with instruments, batteries, etc., at a small cost, and it is the purpose of this article to give plain directions as to how this can be accomplished, so that any bright boy, with the co-operation of one or more of his friends, may build the line and use it at his own pleasure.

The essential parts of a short telegraph line are: 1. The battery, which supplies the electric current. An illustration of a cell of battery is shown in Fig. 1.

2. The key, which is a device for breaking and re-establishing the electric circuit. It is manipulated by the thumb and first two fingers of the right hand. An illustration of a key is seen in Fig. 2.

3. The sounder, which is the instrument upon which the signals are received. An illustration of a sounder is shown in Fig. 3.

4. The iron wire, connecting the two or more different houses.

In giving directions to build a short line we will suppose that the two houses we wish to connect are situated 500 feet apart. The first thing to do is to stretch out wire. No. 12 galvanized iron wire is best suited for short lines. Get about 525 feet of it.

FIGURE I. BATTERY CELL. The iron wire, connecting the two or more different houses.

FIGURE II. INSTRUMENTS. The extra twenty-five feet being allowed for possible tension from a direct line. We shall also need about six "insulators," which are wooden pins with glass caps, as shown in Fig. 2.

Now fasten an insulator to the side of one of the houses at a point as near as possible to the window where you wish the line to enter. Good weather-sticks must be used, because there will be considerable strain on the insulator, and if it is not well seated the wire will eventually pull it out. Next, take one end of the iron wire and beginning a foot back, wind it around the groove in the glass insulator a couple of times, then twist it to a straight line.

After this is done proceed in the direction of the other house, and attach insulators to iron or wood stakes at intervals of about one hundred feet apart, keeping in as nearly a straight line as possible. Next run your wire over the route, and fasten it to the

insulators with "tie-wires," in the manner shown in Fig. 3. A "tie-wire" is simply a piece of iron wire the same as is used for the line, about eight inches long, bent in the shape of the letter "U." This is passed around the groove of the insulator, and the two ends are twisted around the telegraph wire to hold it in place against the insulator, as shown at each end of the iron wire. The same fastening of the end of the wire that we did with the beginning; then our line is complete.

In running the wire through trees the branches should be cut away as much as necessary to avoid touching the wire. The objection to branches or leaves touching the wire is that a good deal of the current would escape there to the ground. Care must also be taken while fastening all insulators to place the top, or rounded part, up. The object of the insulator is to prevent the escape of current from the telegraph wire, and as glass is one of the best materials available for this purpose, it is the best to use. In stringing the wire be sure to make a tight splice between the points of support, that is, the insulators. Two such splices are objectionable.

Our work is finished stretched and made secure, the next thing to do is to connect our instruments and batteries. Every telegraph office house has what is called a "combination set" of telegraph instruments, which consists of the receiving instrument on one base—the transmitting instrument on the other—a very convenient arrangement, because the instruments are connected together as much as we please without trouble. Fig. 4 is an excellent illustration of one of these combination sets, the instrument on the right being the receiver, and that on the left being the sender.

We will require two combination sets, one at each end of the wire, and about four cells of battery. The one at each end of the wire, and about four cells of battery, the one at each end of the wire, and about four cells of battery.

Having our batteries and instruments connected, we must now provide ourselves with some No. 18 "solder." One pound will be plenty. Ours is of copper wire covered with cotton braided wire, in wax, which will be found at the end of the wire. Now remove the covering at one end of the wire for about eight or ten inches back, and if you have it wrapped the wire will connect all right. Now we need a wire that is very tight around the outside iron wire at a point next to the insulator on the outside of the house. This connects the outside wire with the inside.

After having selected the most convenient hook on the telegraph wire, run the copper wire from the outside to the inside of the house, and connect it to the battery cell, and out it off, allowing a little slack. Next take the end of the wire for an inch or two, scrape it clean, and then insert it in either of the two "binding posts," which will be found at the base of the instruments. Be sure you know the wire goes tight, because loose connections cause needless waste of current. Now take one end of the wire that you are using, and strip and scrape it, as in the above illustration, insert it in the second binding post, and now it is done. Tighten the wire on the wire to the nearest battery cell, and cut it off, allowing a little slack. Here the end of the wire, clean it, and connect it with, say, the positive or copper pole of the battery cell. Next cut off a short length of wire—say one foot—and remove the covering from one end of it. Then connect it to the wire with the negative or zinc pole of the instruments. And the other end with the positive pole of the second cell. To the negative pole of the copper pole of the first cell of the remaining portion of the wire, and carry the wire to the nearest exposed point along the gas-pipe. After cutting off the wire, have the end of the wire to the gas-pipe, and get a couple of Kenzie's or copper pipe, and get a couple of Kenzie's or copper pipe, and get a couple of Kenzie's or copper pipe.

Connecting the wire with the gas-pipe is the ground, and by doing this we actually use the ground as the end of the return wire to the instrument. In the case of a return wire to the instrument, in the case of a return wire to the instrument, in the case of a return wire to the instrument.

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