

lag screws. Fig. 3 illustrates a wood bracket, which can be spiked to poles or houses and provided with a glass insulator. The glass insulators must always be fastened in a nearly vertical position, the closed end on top, so the space between the pin and glass insulator, Fig. 2, will remain perfectly dry in rainy weather and secure perfect insulation.

Fig 5 shows a rubber hook insulator. This should for the

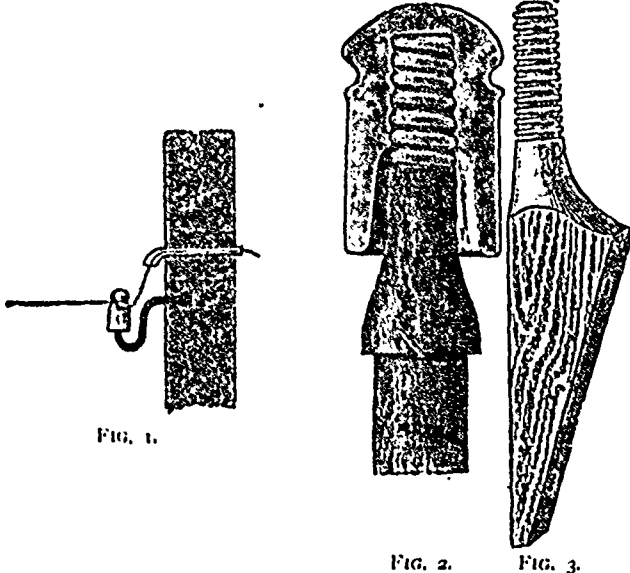


FIG. 1.

FIG. 2.

FIG. 3.

same reason be fastened with the hook downward. A hole can be bored with a $\frac{3}{8}$ inch bit underneath a cross-arm and the rubber hook screwed in with a wrench.

An extra heavy insulating material, such as rubber hose or hard rubber or porcelain tube, Fig. 4, must be put over the wires where they pass through walls or partitions.

Poles for lines should be set deep enough in the ground ; the



FIG. 4.

depth, of course, will depend upon the soil and the height of the pole. In sand, at least one-fifth of the length of the pole should be buried in the ground, while in rock one-tenth of the length is sufficient. In putting up wires, the season, or, in other words, the temperature, should be taken into consideration, allowing for contraction in cold weather. If, for instance, a wire should

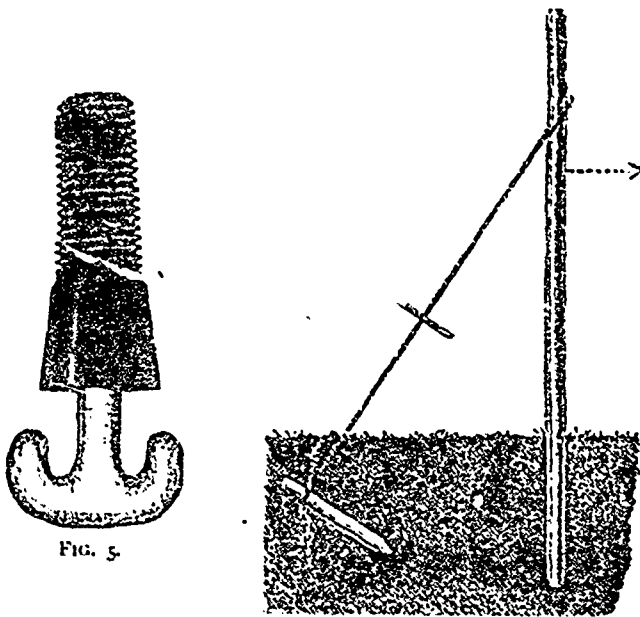


FIG. 5.

FIG. 6.

be put up very tight in July, it would cause a good deal of damage in breaking off glass insulators and pins as soon as the temperature fell to zero and caused the wire to contract. Corner poles must be braced or anchored to keep them in a nearly vertical position. See Fig. 6 and 7.

When a splice is necessary, it should be made after the fashion of the American telegraph splice, Fig. 8, and should be perfectly clean and solidly soldered and then well taped with insulating tape. In order to prevent the tape from peeling off, it is advisable to fasten the last turns of the tape to the wire with a few turns of bare copper wire, say about number 20. If this precaution is omitted the tape is sure to peel off in time. Most of our electric light lines will show places where the tape is hanging down a couple of feet. Besides, having no insulation

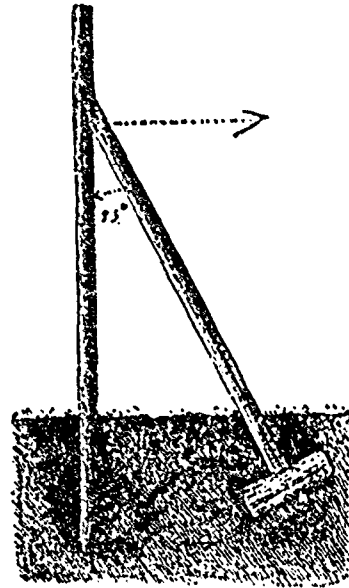


FIG. 7.

on the splice, this, of course, does not contribute to the beauty of overhead wires.

Brass line connectors, Fig 9, are only allowed for inside work where there is no strain on the wires. The set screws should be well tightened, and the connector be run full of solder and taped. Good soldering and taping of joints will save at least 50 per cent. of all the troubles that occur in an electric light plant. Joints should never be left unsoldered, even if persons who



FIG. 8.

claim to know all about it should think it unnecessary. The best apparatus for soldering joints on line wire out of doors is the gasoline blow-pipe, Fig. 10. Every trace of acid should be wiped off the wire with a moist or oily cloth before taping, to avoid corrosion.

OUTDOOR LEADS FOR INCANDESCENT LIGHTING.—The rules which were given for outdoor arc lines can be applied for incandescent light lines. As the wire used will very often be considerably larger than number 4 wire, the poles, cross-arms and other supports must necessarily be heavier to stand the greater strain, and poles should be set closer together. In a low tension incandescent system, very often bare wires are used,

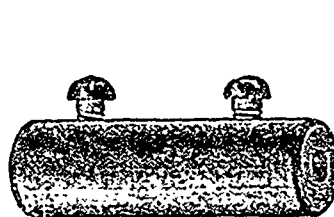


FIG. 9.



FIG. 10.

and still more care must be taken to prevent accidental contact of the positive and negative wires with each other or with the earth.

ARC CIRCUITS INSIDE OF HOUSES.—The wires for these circuits should be fastened to porcelain insulators, Fig. 11, and be exposed to view. Owing to the high tension which prevails in arc light circuits the concealing of these wires is not permitted by the underwriters. The directions given for splicing and insulating hold good also for inside wiring.

In rooms which are exposed to steam or moisture, as, for