

DISCUSSION OF MATERIALS USED

THE CABLE OR CONDUCTOR.

Two materials are commonly used as conductors for carrying the lightning to the ground—iron or steel cable and woven or twisted copper cable. There was a time when copper was the only material used, but investigation and experience have proved that well galvanized iron or steel cable will answer the purpose just as well in every respect as copper. In fact, some of the highest authorities have advocated iron in preference to copper. In discussing this matter, A. J. Henry, Professor of Meteorology of the Weather Bureau, Washington, D.C., says: "While iron is not so good a conductor as copper, it is less likely to cause dangerous side flashes, and it also dissipates the energy of the lightning flash more effectively than does the copper." Sir Oliver Lodge, F.R.S., in reporting for the Lightning Research Committee of Great Britain, 1905, writes in regard to conductors as follows: "A lightning conductor of perfect conductivity, if struck, would deal with the energy in far too rapid and sudden a manner, and the result would be equivalent to an explosion. A conductor of moderate resistance, such as iron, would get rid of it in a slower and therefore much safer and quieter manner, though with too thin a wire there is a risk of fire." In the report of this committee, it says: "Iron is in many situations a very useful material for lightning rods. This metal, however, unfortunately oxidizes rapidly in towns and smoky districts, and the use of copper as a material is still recommended for main conductors in inaccessible positions." It is to be noted in the above that the committee does not discourage the use of well galvanized iron even in cities. Quoting Mr. Henry again: "Iron oxidizes rapidly when exposed to air; it is necessary, therefore, that it be galvanized."

The committee recommends 5-16 inch galvanized steel or iron strand for the conductor, or galvanized guy wire, as it is often called. The iron is preferable to the steel on account of its somewhat greater durability, though the steel cable is used by the telephone companies because of its greater strength, they figuring that the durability of steel is sufficiently great, twenty-five to thirty years being considered the minimum life of their cable located in cities. From this we may figure a much longer life for iron cable stretched loosely on buildings in the country, and not exposed to strain or danger of scraping off the galvanized surface. This durability can be increased indefinitely by a good coat of a common paint, which does not affect the efficiency of the conductor. In selecting cable, see that the galvanizing is free from cracks. The galvanizing can be easily tested by bending the cable