

(No Model.)

W. P. THOMAS & E. J. FROST.

INSULATED ELECTRICAL CONDUCTOR.

No. 312,405.

Patented Feb. 17, 1885.

FIG. 1.

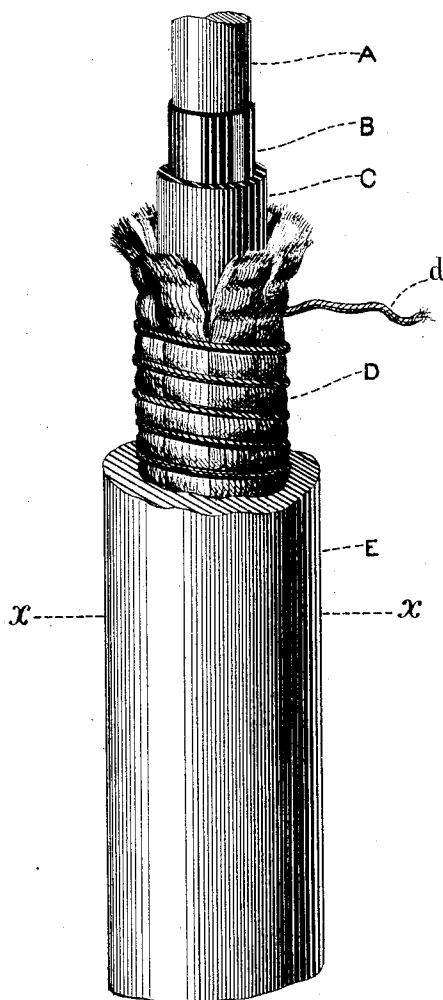
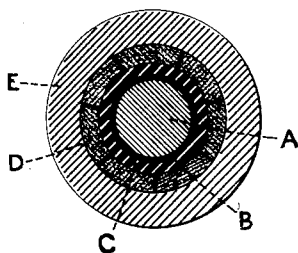


FIG. 2.



WITNESSES:

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INSULATED ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 312,405, dated February 17, 1885.

Application filed January 16, 1883. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM P. THOMAS and EDWARD J. FROST, both of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Insulated Wires or Cables for the Transmission of Electricity.

The following is a specification of our improvements, reference being had to the accompanying drawings, wherein Figure 1 is a view in perspective of a portion of our improved cable, showing the successive insulating coverings, and Fig. 2 is a cross section of the cable on the line *x x* of Fig. 1, the scale in both cases being somewhat enlarged.

Our invention is intended to be used as an underground conductor, and is especially adapted for the transmission of powerful electric currents, such as are used for electric-lighting purposes. Defects in insulation of underground conductors are especially due to leakage of water or moisture, and hence various water-proof plastic materials have been used as insulators, but the tendency of the conducting-wires to become heated by powerful currents such as above referred to renders the use of these ordinary water-proof plastic materials open to objections, since they are liable to be melted or even burned, thus exposing the wire.

Our invention is designed to obviate these difficulties; and to that end it consists in the combination, with the conducting-wire, of a comparatively refractory water-proof coating which is a non-conductor of heat as well as of electricity; and, further, in a secondary insulating coating of more pliable water-proof material, a third covering of a highly refractory character which is a non-conductor of heat and electricity, and an outer water-proof covering of metal.

In the accompanying drawings, A represents the conducting-wire, preferably of copper. Upon this wire we apply a coating, B, of japan (such as is ordinarily known in commerce as "baked japan") or similar gum, which is baked on at the temperature and in the manner usual in japanning metals, care being taken that the heat shall not be so great as to render the coating brittle. The japanned surface is then covered with a coating, C, of rubber, applied in solution and sufficiently thick to be entirely water-proof. The cable

thus formed is wrapped with asbestos D, which may be secured by a binding-cord, *d*, or may be plaited on, if preferred. An exterior pipe or conduit, E, of metal, is then applied, preferably by wrapping heavy sheet-lead tightly upon the asbestos and soldering the edges of the sheet. The primary insulating-coating of japan is water-proof, and sufficiently refractory not to yield unless the wire should become very highly heated. The pliable rubber coating is intended especially to protect the wire in case the japan should be cracked in bending the wire or from other cause, and as the interposed covering of japan is a non-conductor of heat the rubber is not liable to be burned or melted except under a very extraordinary increase in temperature. Should such extraordinary heat occur, however, the asbestos wrapping maintains the insulation, and being not only exceedingly refractory, but a very low conductor of heat, the metallic outer covering cannot become heated.

We deem the application of the rubber coating directly to the japanned surface the most economical form in which our invention can be embodied; but as it can be applied outside of the asbestos or fibrous coating with equally good results as regards insulation we do not desire to limit our claim to the exact order of application of these coats. The above combination thus produces an insulator which is in the highest degree water-proof, refractory to heat produced by the current, pliable, and durable.

Having thus described the nature and objects of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a conducting-wire, of an insulating-coating of japan baked directly thereon, and a coating of rubber applied around said japanned surface, substantially as set forth.

2. The combination, with a conducting-wire, of a japanned coating baked thereon, a rubber coating and asbestos wrapping applied around the japanned surface, and an exterior metallic pipe, substantially as and for the purposes specified.

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Witnesses:

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