(No Model.)

F. MOORE.

ELECTRICAL CONDUCTOR.

No. 284,970. Patented Sept. 11, 1883.

Fig. 2.

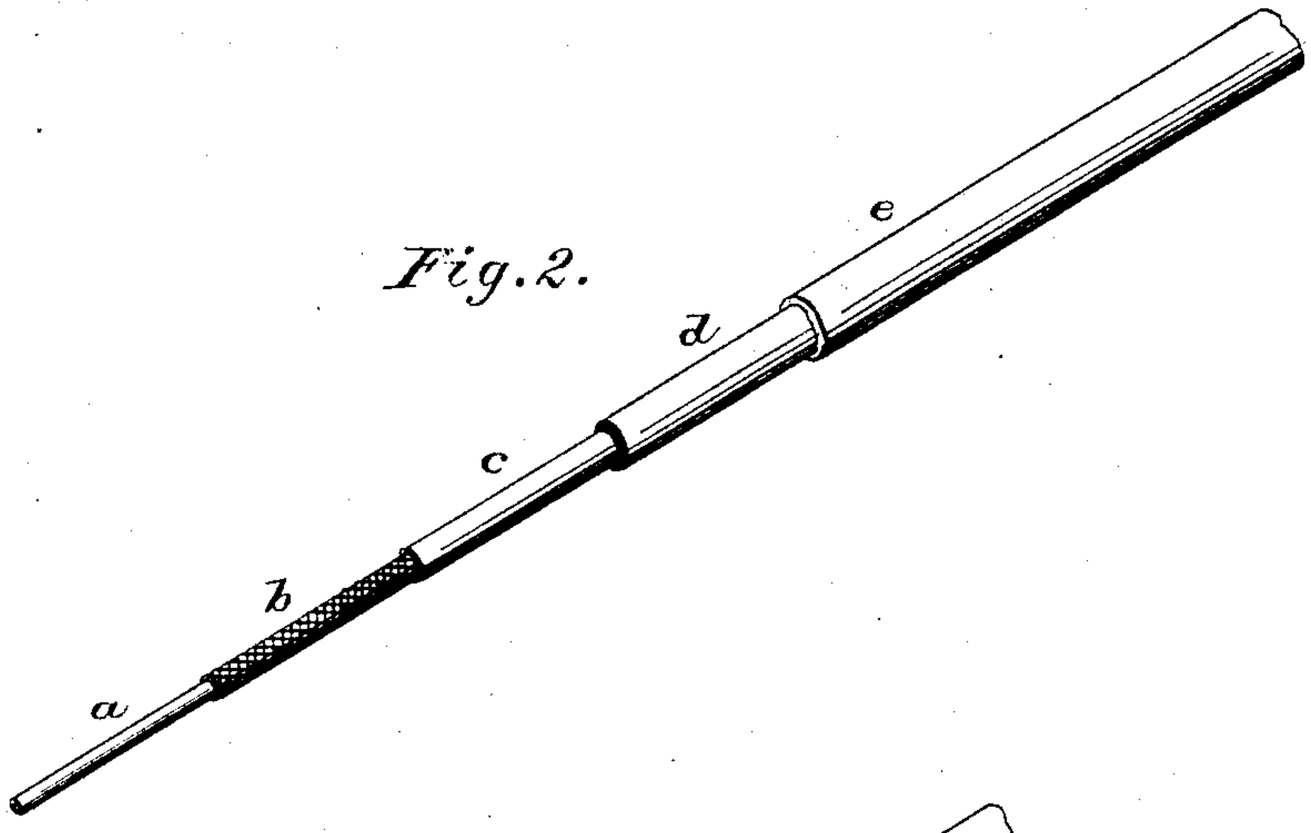
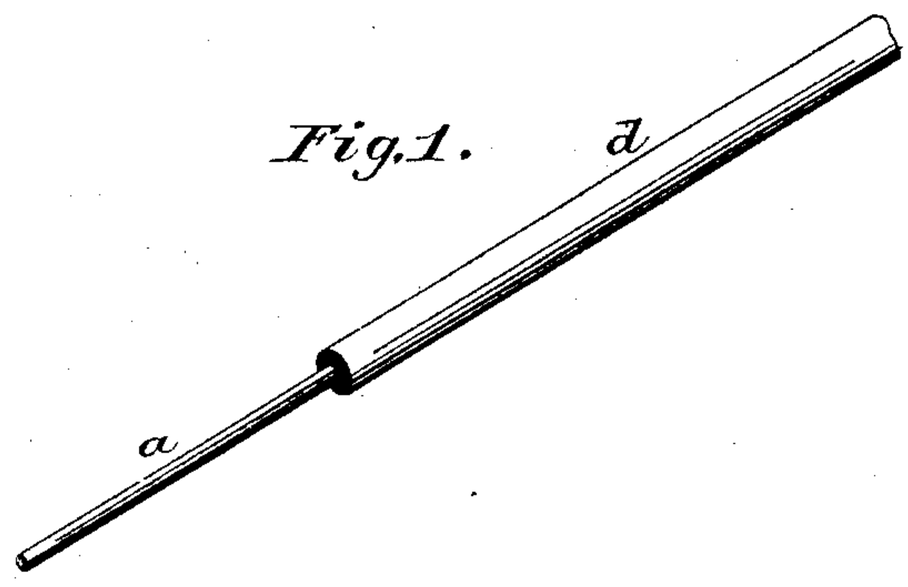


Fig. 1.



Attest:
Court. A. Cooper.
Josephine Campbell.

Inventor:
Frank Moore
by Foster & Freeman
attys

UNITED STATES PATENT OFFICE.

FRANK MOORE, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 284,970, dated September 11, 1883.

Application filed July 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANK MOORE, of the city and county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Electrical Conductors, of which the following is a specification.

My invention relates to electrical conductors, and has for its object to provide an effectual insulator for such conductors; and to that end my invention consists in a covering for conductors, composed, essentially, of pure gutta-percha, coal-tar, and collodion or cellulose. To this composition may be added the fiber of asbestus, wool, silk, cotton, &c., and the whole formed into a plastic mass, which subsequently hardens. The conductor may be first covered with a woven braid of asbestus fiber, or the asbestus may be applied to the conductor in other ways. Over the covering of asbestus may be applied a coating of white lead or other metallic oxides. Outside of the coating of composition may be applied a protecting covering of any suitable substance, as a strong braid or strips of fibrous substance; or a metallic coating of copper or other metal may be applied by electrolytic action; or a sheathing of lead may be formed by pressing the metal around the insulated conductor; or lead, copper, or iron wire may be wound around the insulated conductor or applied in any other suitable manner.

Referring to the drawings forming part of this specification, Figure 1 represents a wire or conductor covered with the insulating-composition. Fig. 2 represents a conductor covered with the composition, having an interposed coating of asbestus and oxide of lead and a protecting covering.

a represents a conductor of any suitable material.

b represents a covering of asbestus, which may be woven, as indicated, or applied in strands or filaments. The asbestus, being noncombustible and a poor conductor of heat, is useful in this connection to prevent any accidents if perchance the conductor should become overheated by the electric current or otherwise.

c is a coating of white lead or other metallic oxide in the form of paint or otherwise, which may be applied as an additional safeguard against fire and dampness.

d is a coating of my improved compound for insulating the conductor, consisting, preferably, of about seventy per cent. (70%) of pure gutta-percha, twenty-five per cent. (25%) of coal-tar, and about five per cent. of collodion or cellulose. In preparing this insulating compound I prefer to dissolve the gutta-percha in chloroform or naphtha, and then mix the coal-tar thoroughly with the gutta-percha, when the collodion or cellulose is added. The mixture, being in a soft plastic state, may be applied to the conductor in any of the well-known means, one convenient way being to draw the conductor through a vessel having proper dies containing a quantity of the mixture. As the compound is exposed to the air, the chloroform or other volatile solvent evaporates and leaves a solid compact coating, but one that is sufficiently flexible and pliable to avoid cracking and allow bending, &c. If desired, a small quantity of asbestus or other fiber may be added to the composition to strengthen it. Outside of the insulating material is a protecting coating, *e*, which may be copper or other metal deposited upon the conductor by electrolysis. A sheathing of lead or similar metal may be applied in the usual manner, or it may be lead, iron, or other wire coiled around the conductor, which may be fused or brazed together into a solid coating. In some instances the insulating material may be applied directly to the conductor without the interposition of the asbestus or other protection. The outside protecting covering may be omitted also when the use of the insulated conductor is such as not to need such protection. In this composition I have combined the advantages of the various substances and overcome the disadvantages of using either of the substances alone. In using about the proportions specified, the composition is of a proper consistency to be readily applied to the wire, and it rapidly solidifies and hardens to some extent, though not enough to become brittle when exposed to the cold, or too soft when exposed to the heat, and its nonconducting or insulating qualities are of the higher order, enabling a comparatively thin coating to be effectually used.

By means of the materials above mentioned, all kinds of conductors can be properly insulated to readily adapt them for carrying all the various electrical currents, from the lowest

to the highest tension or quantity, without leakage.

What I claim as my invention is—

1. An insulating composition consisting of gutta-percha, coal-tar, and collodion, substantially as set forth.

2. An electrical conductor covered with a composition consisting of gutta-percha, coal-tar, and collodion, as set forth.

3. The combination, with an electrical conductor having a covering of asbestus, of an insulating coating of gutta-percha, coal-tar, and collodion, substantially as set forth.

4. An electrical conductor consisting of a wire covered with asbestus coated with lead oxide, an insulating material consisting of a composition of gutta-percha, coal-tar, and collodion, the whole being protected by an external metallic covering, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK MOORE.

Witnesses:
JOSHUA C. MECASKEY,
SAMUEL E. CAVIN.