

(No Model.)

E. CLARK.
CONDUCTOR.

No. 333,111.

Patented Dec. 29, 1885.

Fig. 1.

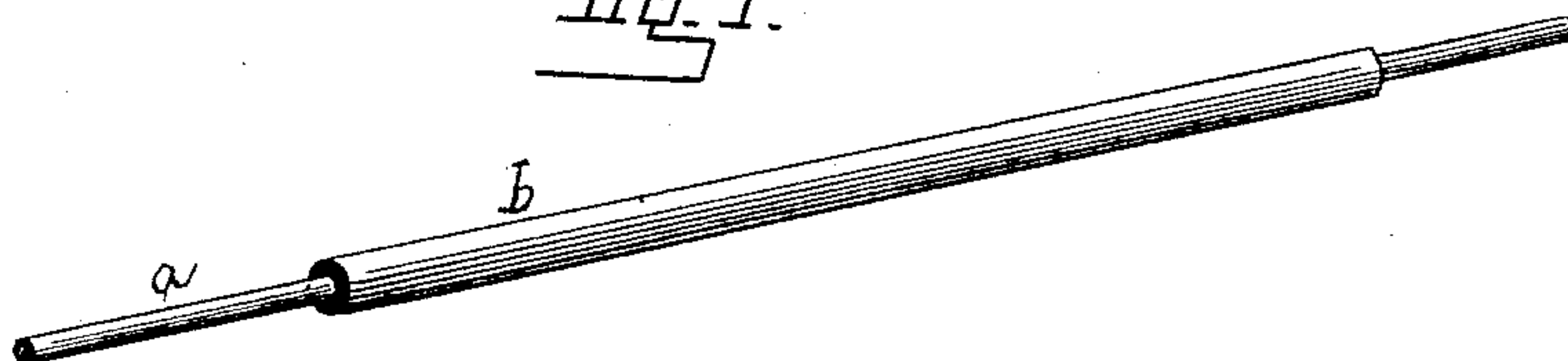
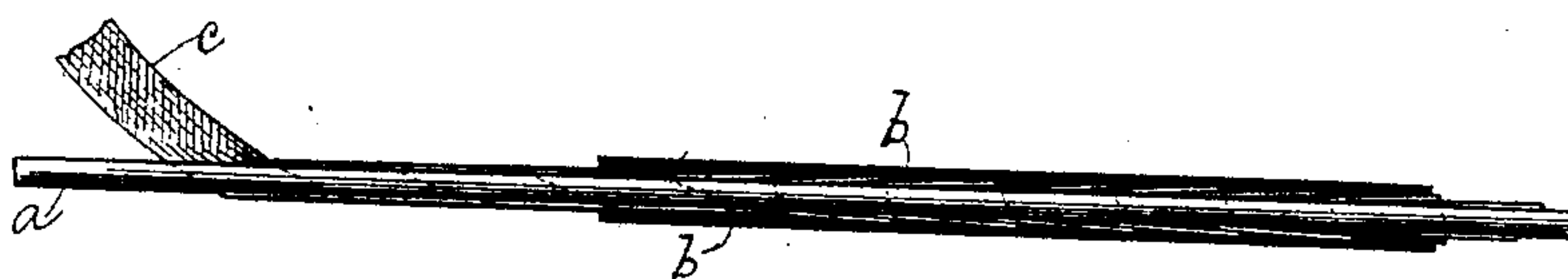


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD CLARK, OF JERSEY CITY, NEW JERSEY.

CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 333,111, dated December 29, 1885.

Application filed August 15, 1884. Renewed May 19, 1885. Serial No. 166,012. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CLARK, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Conductors, of which the following is a specification.

My invention relates to electrical conductors, and has for its object to produce an electrical conductor that shall be thoroughly insulated and at the same time be pliable and capable of bending without destroying or injuring the insulation, that will not be liable to corrosion nor affected by heat or cold, and that can be readily and cheaply constructed; and to these ends my invention consists of an electrical conductor covered with an insulating coating consisting of corundum with a suitable vehicle or binding agent, as more particularly hereinafter described.

Referring to the accompanying drawings, Figure 1 is a view of a wire coated with the insulating material, in which *a* is the wire, and *b* the insulating material. Fig. 2 shows another way of applying the material, in which *a* is the wire, *b* the insulating material, and *c* a fibrous material interposed between the two.

My invention is based upon the discovery that the mineral corundum, especially when in the form of a fine powder or flour, while magnetic in its character, is not a conductor of electricity, but is in fact one of the best-known "non-conductors," so called.

Corundum has generally been considered as a fair conductor of electricity, owing to its metallic nature, and while some of its properties that tend to make it a good material for use in the insulation of electric conductors have been recognized, it has been considered as practically unfit for such purposes, owing to its supposed conductivity of the electric current. I have found that it offers a very high resistance to the passage of the electric current, so much so as to be practically a non-conductor, and may be said to offer an infinite resistance. I make use of this property of the corundum and cover or insulate electric conductors with this material, and I have found that it can be used effectually as such insulator in a great many ways. One of the best modes of so using it is to combine with it a

sufficient quantity of some binding material or vehicle to hold it together in a more or less plastic condition, and one of the best vehicles consists of tar or asphaltum, to which other materials may be added to make the compound of the desired consistency, if necessary. One way of doing this is to take a quantity of corundum, preferably in the form of a very fine powder or flour—say ten pounds—and mix the same with about one-half as much tar or asphaltum. To this mixture may be added a small quantity of india-rubber and gutta-percha cement—say one-fourth as much—to give it the proper tenacity, and this mixture may be thinned with coal-tar benzole and coal-tar naphtha in about equal parts until of the desired consistency. Such a composition I have found forms a plastic material that can be readily applied to the conductor while hot, and it quickly sets or hardens, but at the same time remains pliable and tenacious, admitting of much bending and handling without breaking, cracking, or scaling, and at the same time it is impervious to water, acids, or alkalis that are likely to get in contact with it, and is not affected by changes in temperature within ordinary limits.

I have found that many other materials may be used in the vehicle for the corundum, depending much upon the use to be made of the conductor. For instance, instead of rubber and gutta-percha cement, pulverized elm-bark, malt, or fine asbestos may be used as a binding agent, and shellac may be used to give it a certain degree of hardness.

While the corundum may be used with many compositions and applied in many ways, I have found that the following is the best in most instances: The mixture being prepared in the desired proportions, a strip of cloth or fibrous material is saturated and coated on one or both sides therewith, and wound spirally around the conductor, and the whole be passed through the mixture and coated again.

One convenient mode of preparing the cloth strips consists in making a mixture of tar, asphaltum, and the like, and heating the same to quite a high temperature, and passing the cloth through the mixture and between pressing-rolls, and then dusting or sifting the powdered corundum over the cloth or applying it

by means of rollers, and causing the same to be intimately and thoroughly combined or mixed with the tar or asphaltum coating, filling the pores or interstices of the fabric. This fabric may then be slit or cut into strips of the desired width, and wound or otherwise applied to the conductor by any suitable means.

It is evident that more or less of these conductors may be joined in any suitable manner to form a cable, and the separate wires or conductors may be each insulated by a simple coating of the insulating material or with the cloth or fibrous material saturated therewith.

In conductors that are to be more or less exposed to the elements I find the saturated cloth strips are a great protection, giving strength to the conductor, and preventing the destruction or injury of the insulating coating by abrasion.

Many applications of the insulating material may be made that will readily suggest themselves to one skilled in the art, such as making a cable of many wires or conductors inclosed in an outside coating of metal, earthenware, or other material, and in this my insulating material is especially useful, as a very thin coating will prove a practical insulator, and the conductors may be very close together without danger of leakage.

I do not desire to limit myself to the precise conditions above set forth, as they may be varied in many ways without departing from the spirit of my invention.

I do not herein claim the use of the insulating material in connection with an insulator for supporting wires, &c., as that is claimed in my application No. 136,571; nor do I claim the use of emery as an insulating material, that being embraced in my application No. 163,481.

What I claim is—

1. An insulator for electric conductors, consisting, essentially, of corundum and a binding agent, substantially as described.

2. An electric conductor covered or coated with an insulator consisting of corundum and a binding agent, substantially as described.

3. An electric conductor having an insulating covering composed of corundum and tar or asphaltum, substantially as described.

4. An electric conductor having an insulating coating consisting of strips of fabric coated or impregnated with corundum and a binding agent, such as tar or asphaltum.

5. An electric conductor having an insulating coating consisting of strips of fibrous material coated or impregnated with a composition consisting of corundum, tar or asphaltum, rubber cement, and naphtha, substantially as described.

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

EDWARD CLARK.

Witnesses:

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