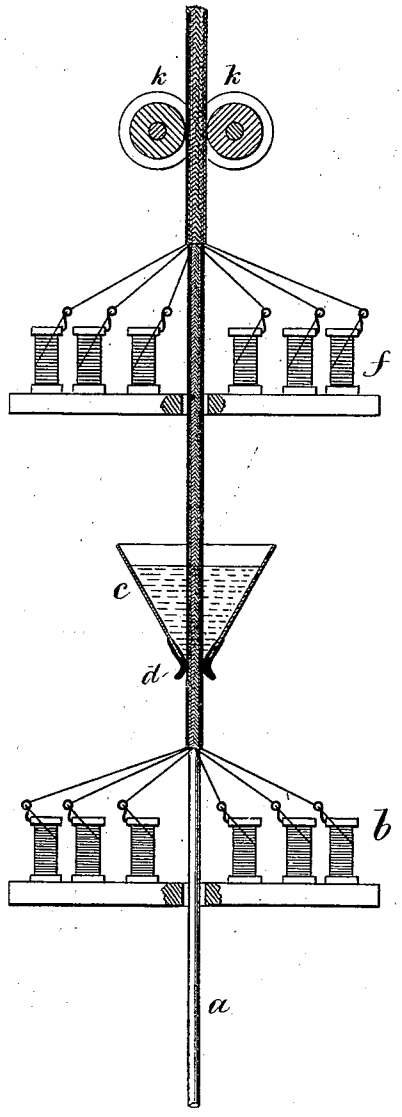
(No Model.)

A. A. COWLES.

INSULATED ELECTRIC CONDUCTOR.

No. 272,660. Patented Feb. 20, 1883.



Witnesses

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UNITED STATES PATENT OFFICE.

ALFRED A. COWLES, OF NEW YORK, N. Y.

INSULATED ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 272,660, dated February 20, 1883.

Application filed November 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. COWLES, of the city and State of New York, have invented an Improvement in Insulated Electric Conductors, of which the following is a specification.

Before my invention copper wires had been covered with one or two braidings of cords, and paraffine, tar, asphalt, and various substances had been employed for rendering the covering water-proof and furnishing a proper insulation. With conductors of this character several accidents occurred in consequence of the conductor becoming heated and setting fire to the insulation. For this reason objections were made to insuring buildings against loss by fire where electric-lamp wires were introduced. To render the conductor fire-proof without interfering with the insulation led me to invent and manufacture the insulated electric conductors to which the present invention relates, which conductors have gone extensively into use during about a year and a half before the date of this specification.

I manufacture the said fire-proof insulation of the conductor in the following manner, reference being had to the annexed drawing, which illustrates the devices employed. The wire *a* is passed up through the head of a braiding-machine, and a layer of cotton or other threads is placed upon the wire in the ordinary manner. The braiding head, with spools, is indicated at *b*. The covered wire now passes in at the bottom of the vessel *c*, through a suitable packing, *d*. This vessel *c* contains paint, preferably white lead or white zinc ground in oil and mixed with a suitable drier. The paint saturates the braided covering and the surplus runs down the same back into the vessel *c* as the braiding progresses. I next apply a second braiding directly upon the paint. For this purpose a second braiding-machine head is employed, the same being shown at *f*. The threads that are braided upon the paint force the paint into the first braided covering and at the same time the paint oozes through between the threads. Hence the paint is incorporated throughout the braided covering and fills up the pores. The braided covering is rendered even and consolidated by suitable means, such as one or two pairs of grooved rollers, *k k*.

In practical use it is found that the covering is of the most reliable character, it is compact and hard, the wire is perfectly insulated, and there is no possibility of inflaming the covering. With intense heat the threads may char, but they will not burn. For these reasons this insulated conductor is preferred to those before made.

I remark that in the manufacture of this conductor it is preferable to reel the covered wire as it passes from the braiding and painting machine and then remove the reel from the coil and hang up such coil in a heated room until it is thoroughly hardened.

More than two layers of braiding may be employed, the paint intervening between the layers. Winding with threads or cords may take the place of braiding.

If desired, a coat of paint may be applied outside the outer layer of fibrous material, and this may be colored, so as to be used in distinguishing the wires. It is always preferable to braid the second or subsequent coats upon the paint when fresh; but I do not limit myself in this particular, as the paint may be dried, or partially so, before the next layer of braiding is applied. Paint might be applied to the wire before the first braiding.

I am aware that wire has been covered with braided threads; also that india-rubber, asphaltum, and similar materials have been applied upon the covering either hot or cold; but one coating of such material was allowed to set or harden before the next layer of braided material was applied. Hence the asphaltum or similar material was not forced into the interstices, and besides this all these substances ignite by the wire becoming heated, or fire will follow along upon such covering.

I have discovered that ordinary paint composed of lead or zinc with linseed-oil is practically non-combustible, and it prevents the covering being ignited by the wire becoming hot if there is a resistance to the electric current; besides this, fire will not burn along the conductor, as is the case where the fibrous covering is saturated with asphaltum, india-rubber, or similar material.

I claim as my invention—

1. The method herein specified of insulating electric conductors and rendering the coating

substantially non-combustible, consisting in applying a layer of fibrous material, a layer of paint, and a second layer of fibrous material upon the paint before it dries or sets, substantially as set forth.

2. An insulated and non-combustible covering for electric conductors, composed of two or more layers of cotton or similar threads, with paint that intervenes between the layers and fills the interstices of the covering, substantially as set forth.

Signed by me this 6th day of November, A. D. 1882.

ALFRED A. COWLES.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.