(No Model.)

S. F. SHELBOURNE.

ELECTRICAL CONDUCTOR.

No. 313,380. Patented Mar. 3, 1885.

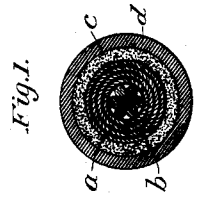


Fig. 1.

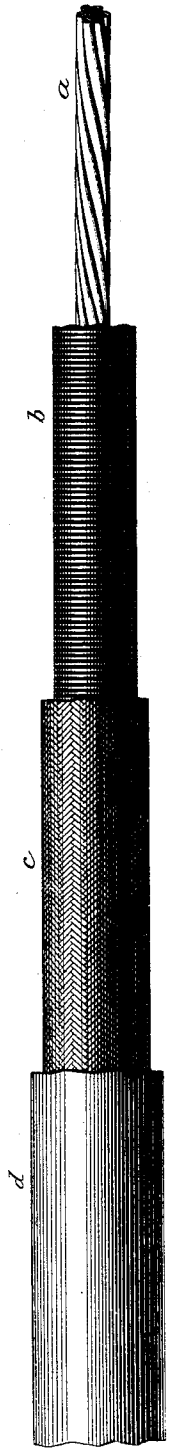


Fig. 2.

Attest:

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UNITED STATES PATENT OFFICE.

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ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 313,380, dated March 3, 1885.

Application filed March 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY F. SHELBOURNE, a citizen of the United States, residing in the city of New York and State of New York, have invented a new and useful Improvement in Electric Conductors; and I hereby declare that the following is a true, clear, and exact description of the same.

This invention relates more particularly to that class of conductors designed to convey powerful currents of electricity, as in the case of the electric light and automatic telegraphy, and which are required to be heavily insulated in order to prevent the diversion and escape of the current to adjacent conductive media by the rupture of a thinner insulation. Hitherto such conductors have been insulated by one of two methods—first, by a heavy covering of gutta-percha, caoutchouc, or other plastic substances, forced from a reservoir through dies around the wires, or, second, by several coverings of braided fiber saturated with or having superimposed upon them a fireproofing-paint or semi-insulating material. Both these methods have proved expensive, the first by reason of the cost of the materials employed, and the second because of the labor and time required in the details of the several braidings and the application and drying of the saturation or fireproofing materials; also, in the methods described the conductor itself has usually been of a single rigid wire, which has been found most desirable in securing an even and uniform coating of the gutta-percha or other material upon it.

For underground conduction, where the greatest flexibility in the conductors is desirable to enable them to be drawn readily into tubes or conduits, such conductors have been found impracticable, because their rigidity and irregularities or unavoidable bends or deviations from a straight line make it difficult or impossible to draw them in or out of conduits, except all together in a group. Besides, the fiber-surface of the insulation has usually been abraded and nearly destroyed by the dragging contact with the rough interior of the tubes within which the conductors were being introduced.

To obviate the several objections mentioned, I make a conductor as follows: The copper conductor-core is composed of any number of small wires twisted together into a rope of a size to obtain the required conductivity, as has hitherto been done in submarine telegraphy and some other cases. This conductor is then placed in a machine by which a multiple winding in one operation of coarse jute or similar fiber builds up around the conductor the insulation to the required thickness. The threads or strands of fiber as they pass onto the conductor are made to submerge into a melted insulating material, which becomes solid on cooling, preferably the petrapitta compound described in Patent No. 275,422, granted to me April 10, 1883. From the winding operation the conductors are made to pass through grooved wheels or dies, by which their insulation is made round and uniform. A single heavy braiding is then given the conductor around its insulation-windings, which braiding itself being saturated with insulating material, and the conductor as thus finished being passed through a lead press, it receives and is inclosed within a uniform and continuous jacket or close-fitting tubing of lead, which protects the insulation both from exterior moisture and from abrasion in the operation of drawing the conductors into their subterranean tubes or conduits, at the same time securing their greatest possible flexibility.

In the drawings, Figure 1 shows a cross-section, and Fig. 2 a longitudinal elevation, of the improved conductor, like letters referring to like parts in both the figures, in which—

Letter *a* is the copper-rope conductor; *b*, the multiple-winding insulation; *c*, the braiding inclosing such insulation, and *d* the lead jacket or tube inclosing the whole.

What is claimed as new is—

1. A flexible electric conductor composed of the following elements: a copper core of several small wires forming a rope-conductor, an insulation about the same formed of multiple windings in bulk, of jute or other fiber saturated with a melted insulating material, a braiding of fiber inclosing such insulation,

and a jacket or tubing of lead inclosing and protecting the whole, substantially as described.

2. An insulation for electric conductors built up around such conductors with multiple windings of fiber, in combination with a saturation of solidifying insulating material and a braiding surrounding and inclosing the same, as set forth.

3. As a new article of manufacture, an electric conductor consisting of a rope-wire core, a multiple fiber winding in bulk with saturation of melted insulating material about said core, and a braiding inclosing such insulation, with a jacket or outer shield of lead, as and for the purpose set forth.

SIDNEY F. SHELBOURNE.

Witnesses:
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