(No Model.)

# W. A. SHAW.

## ELECTRICAL CONDUCTOR.

No. 290,121. Patented Dec. 11, 1883.

*Fig. 1.*

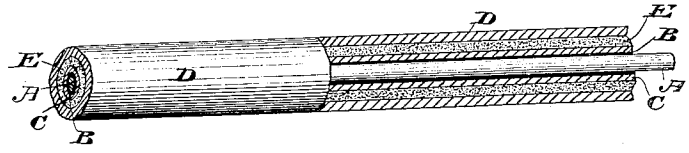
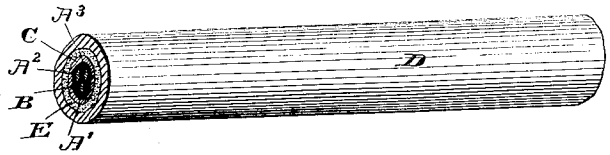



*Fig. 2.*




Attest:
Geo. T. Smallwood.
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Inventor:
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# UNITED STATES PATENT OFFICE.

WILLIAM ANTHONY SHAW, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO LEBBEUS H. ROGERS, OF NEW YORK, N. Y.

## ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 290,121, dated December 11, 1883.

Application filed June 25, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ANTHONY SHAW, of Pittsburg, in the county of Allegheny and State of Pennsylvania, (formerly of Brooklyn, Kings county, New York,) have invented a new and useful Improvement in Electrical Conductors or Cables for Lighting and other Purposes, which improvement is fully set forth in the following specification.

This invention relates more particularly to conductors for carrying the heavy currents in electric lighting and the distribution of power by electricity, although it may be applied to conductors for any purpose.

It has for its main object the prevention of accidents; and it consists in embedding the conductor in a pulverulent or granular fire-proof material, and specially in a mixture of alum and plaster or other materials adapted to become set or hardened when heated. If, therefore, for any cause, an arc should be formed, the alum and plaster will immediately set around the point and insulate it. The mixture, being normally in a pulverulent or granular condition, does not interfere with the bending of a conductor or cable in which it may form one of the layers, but conforms to the curved position which the conductor or cable may assume. The conductor or conductors are, or may be, insulated by gutta-percha or other suitable insulating material, which may be placed inside or outside the alum and plaster or other granular or pulverulent material.

The invention further consists in interposing pulverulent or granular material (whether fire-proof or not, and whether adapted to be set by heat or not, but especially when of that character) between an internal conductor or conductors and an external flexible sheath in the form of a lead tube or other form. The granular or pulverulent material conforms, as before stated, to the curves or bends in the cable; and the use of said material, broadly, in this connection is believed to be new, and is therefore included in this invention.

This invention consists, also, in the combination, with the granular or pulverulent material, of a coherent layer or layers of fire-proof substances, such as a mixture of asbestus and cement, plaited asbestus fiber, or the like.

In the accompanying drawings, Figures 1 and 2 represent a section or short length of conductor constructed in accordance with the invention. In Fig. 1 there is a single central conductor, A, and in Fig. 2 there are three separate conductors, $A'$ $A^2$ $A^3$. This conductor or these conductors are insulated with highly-insulating substance or composition, B, (gutta-percha, for example,) and this in turn enveloped in a coating, C, of asbestus or other fire-proof mineral mixed with cement—say water-glass, (silicate of soda or pot-ash)—and applied as a paste. It forms a coherent flexible coating. Other coatings could be used.

D is a lead sheath or a flexible inclosing-tube of other material, and E is an interposed layer of pulverulent or granular material, preferably dry alum, containing the normal water of crystallization, and dry plaster in a powdered or granular condition, say, one part, by weight, of alum, and two parts of plaster, although the proportion may be varied. The mixture of alum and plaster is an insulator, as well as a fire-proof coating. The lead sheath can be applied and the alum and plaster be introduced at one operation by means of a pipe-press, the powdered mixture being introduced through the core belonging to the die, which forms the lead sheath, or being placed with the lead ingot as the tin is in making the tin-lined lead pipe.

As shown in Fig. 2, the three conductors have a common fire-proof protection; but it is obvious that each may have its separate fire-proof layer or layers, instead of or in addition to the common protection.

In single overhead conductors the highly insulated layer would ordinarily be omitted, and it is obvious that the pulverized fire-proof material could be used in appropriate conditions with or without the said highly-insulating material, with or without the additional coherent fire-proof coating, and with or without the external lead sheath; or, in other words, parts of the invention may be used separately; but, at the same time, it is con-

sidered most advantageous, and it will ordinarily be preferred to use the whole.

No claim is made herein to a fire-proof coating of asbestus or similar material and cement, this being reserved to my application for improvement in electric conductors, &c., filed March 20, 1882, and officially numbered 55,858, of which the present application may be considered as a division and continuation.

What is claimed herein is—

1. An electric conductor embedded in or surrounded by fire-proof materials—such, for example, as alum and plaster—adapted to be set by the application of heat, said materials being in a pulverulent or granular condition, substantially as described.

2. An electric cable having one or more conductors surrounded by granulated or pulverulent material contained within a flexible sheath or tube, substantially as described.

3. An electric conductor provided with a coherent fire-proof coating, and surrounded also by granular fire-proof material, substantially as described.

4. An electric cable having one or more conductors insulated with highly-insulating material, surrounded with granular or pulverulent fire-proof material, and inclosed in a flexible tube or sheath, substantially as described.

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

WM. ANTHONY SHAW.

Witnesses:
A. POLLOK,
PHILIP MAURO.