

106. COMPOSITIONS,  
COATING OR PLASTIC.

77

(No Model.)

Cross Reference

464,986

Examine

W. E. OEHRLER.  
ELECTRIC CONDUCTOR.

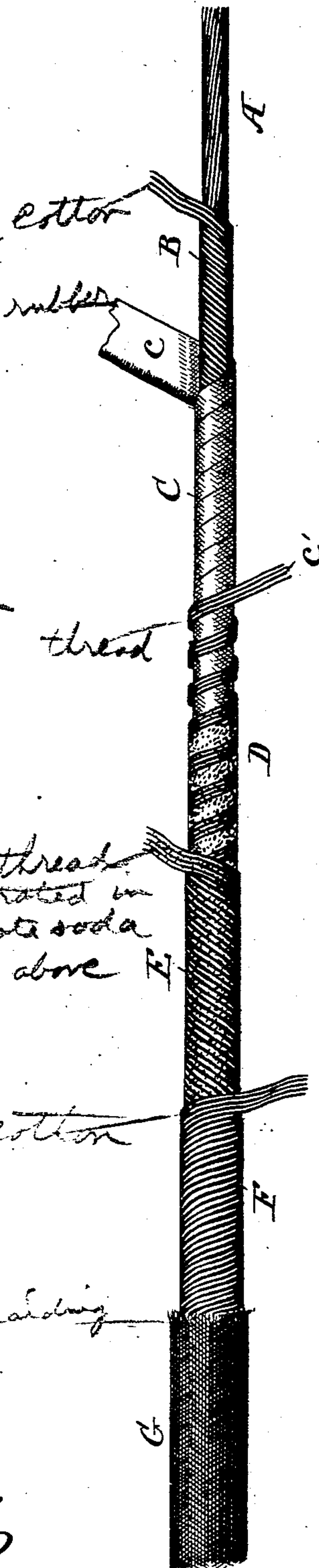
No. 464,986.

Patented Dec. 15, 1891.

174-120

silicate soda  
alum  
cop  
magnesia  
chalk  
plaster paris  
sulphate magnesium cotton

paraffin  
talc  
tungstate sodium  
sulphate aluminum



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 464,986, dated December 15, 1891.

Application filed September 14, 1891. Serial No. 405,840. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM EDWARD OEHRLE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Conductors, of which the following is a specification.

My invention relates to electric conductors which are adapted to be used more especially in connection with electric-lighting systems where the current is distributed throughout the building or otherwise; and it has for its object to provide such a conductor which will be flexible and capable of bending without injury, proof against moisture and dampness, as well as non-combustible, either from extraneous flame or interior heating, and at the same time shall be cheap in construction and effective in operation; and to these ends my invention consists in an electric conductor embodying the features of construction and arrangement substantially as hereinafter pointed out.

The accompanying drawing shows a perspective view of a portion of a conductor made in accordance with my invention.

It is a well-understood fact that in the growing use of electric lights and other electric translating devices, where they are distributed throughout a building or other places and where the current has to be subdivided and passed through the conductors to the translating devices, there is great liability to deterioration of the conductors themselves, they being exposed to the elements, and there is, further, great liability to fire arising from the use of improper conductors, and many buildings have been destroyed from this cause.

This fact has been recognized by the public, and more especially by the electrical experts and the Board of Fire Underwriters, and it has been the object of many inventors to provide a conductor which shall answer the requirements and will be applicable to all conditions and applications in distributing electric current, and it is now requisite to meet these requirements that a moisture-proof, fire-proof, and flexible electric conductor should be provided.

In my prior patent, No. 436,432, I have described and shown a conductor constructed with these objects in view, and my present invention is an improvement on such conductors.

In the drawing, A represents the metallic core or conductor, which may consist of one or more wires, preferably of copper, and having a certain amount of flexibility in themselves. This core or conductor is covered by being wound or otherwise covered with a layer of some insulating material B, preferably of a fibrous nature, as cotton. Over this insulating material I apply a coating C of some water-proof material which will effectually prevent all moisture and dampness reaching the conductor or insulating material thereon, and while various materials may be used, I prefer a strip of rubber tape c, wound spirally around the conductor, having a full lap, so as to insure a complete covering of the insulating material and in order to further insure the proper union of the coils or laps of rubber I may apply to the edges some well-known rubber cement, which will practically make a seamless cover for the core. Over this I preferably wind a thread of fiber c', having open spaces between the coils, and this thread or fiber will effectually secure the water-proof material and hold it in place on the conductor, even without the aid of the cement; but it is evident that when both the cement and thread are used the water-proof material is more effectually secured to the conductor and all possible danger of turning up of the edges or otherwise interfering with the moisture-proof covering is avoided. The conductor as thus constructed is then covered with some material D that will act as a preservative or protector to prevent the destruction of or injury to the water-proof and insulating material, and I have found that paraffine or ozocerite alone will accomplish this purpose to a greater or less degree; but I preferably use a compound of paraffine or ozocerite with talcum, tungstate of soda, and sulphate of aluminium, and while these may be used in various compositions, I prefer to use a compound consisting of about ninety-five parts of paraffine or of ozocerite, two



parts of sulphate of aluminium, and two of talcum and one of tungstate of soda, and this material or compound may be applied in any suitable way, preferably by passing or drawing the wire through a bath of the material. The conductor as thus prepared is then covered with some fibrous material E, such as cotton, and it is then treated with a bath of some fire-proof matter, such as silicate of soda or potassium, or their equivalents. In some instances I apply the fireproofing material, more specifically set forth in my former patent above referred to, consisting, essentially, of a composition of silicate of soda, or equivalent, alum, borax, magnesia, French chalk, and plaster-of-paris, which I have found forms an effective fireproofing composition. This fire-proof material is then subjected to a bath of sulphate of magnesia, or its equivalent, to decompose the silicate of soda, to prevent the soda or the alkalis from absorbing moisture from the air or otherwise being converted into a caustic material, which not only discolors the covering of the wire subsequently applied, but is apt to injuriously affect the waterproofing material. In order, however, to more thoroughly prevent the fireproofing material from affecting the waterproofing material, I interpose the preservative or protective material D, above described, which I have found effectually prevents any injurious action on the waterproofing material or insulating material from the fireproofing material. A conductor as thus constructed is then provided with a suitable covering to protect the fireproofing material and prevent it from cutting or chafing the exterior braiding or coating, and I preferably use a cotton winding F, and the conductor is then finished by covering it with any suitable outside coating G, which may be a braiding of any desired color or thickness.

While I have thus specifically described the preferred embodiment of my invention, it will be understood, of course, that the details may be varied by those skilled in the art without departing from the spirit of my invention—as, for instance, more than one coating of the fire-proof material or insulating material may be applied to the conductor and other variations may be made which will readily suggest themselves; but it will be seen that I produce an effective conductor which is flexible, is properly insulated and protected against deleterious influences of moisture, and is non-inflammable, while the waterproofing material is fully protected from injury or destruction by the fireproofing material, which latter has been a great source of destruction and injury to conductors as heretofore prepared.

Paraffine and ozocerite and similar sub-

stances have been used for insulating purposes; but they are open to the objection that they are not fire-proof and are liable to burn, and for this reason cannot properly be used outside of the fireproofing covering; but I have discovered that they perform the important function of protecting the waterproofing material from the influences of the fireproofing material, and, being covered by the fireproofing material, their use is not objectionable as a preservative in the manner set forth by me.

What I claim is—

1. A flexible electric conductor consisting of a core covered with an insulating material, a moisture-repellent material, and an insulating fire-proof material and having an interposed protective coating between the moisture-repellent material and the fire-proof material, substantially as described.

2. A flexible electric conductor consisting of a metallic core covered with insulating material, a moisture-repellent material, a protective coating of paraffine, an insulating fireproofing material, and an exterior braiding covering, substantially as described.

3. In a flexible electric conductor having an insulating-coating, a moisture-repellent covering, and a fireproofing material embracing the silicates, an interposed protecting-covering consisting of a compound of paraffine, ozocerite, talcum, tungstate of soda, and sulphate of aluminium, substantially as described.

4. In a flexible electric conductor, a core covered with insulating material, a water-proof coating consisting of a strip of rubber wound spirally thereon, means for securing the rubber to make a water-proof covering, a protective coating of paraffine or equivalent for the water-proof material, and a coating of fire-proof material applied above the protective coating, substantially as described.

5. An electric conductor consisting of a core, an insulating fibrous material applied thereto, a water-proof coating consisting of strips of rubber arranged spirally thereon, threads wound over the rubber to retain it in position and to receive and hold the protective covering, a protective covering of paraffine, a fire-proof covering of silicate of soda, a coating of fibrous material applied thereto, and an exterior braided covering, substantially as described.

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

WM. E. OEHRLE.

Witnesses:

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