

(No Model.)

J. M. KINNEY.
CONDUIT FOR ELECTRICAL CONDUCTORS.

No. 557,830.

Patented Apr. 7, 1896.

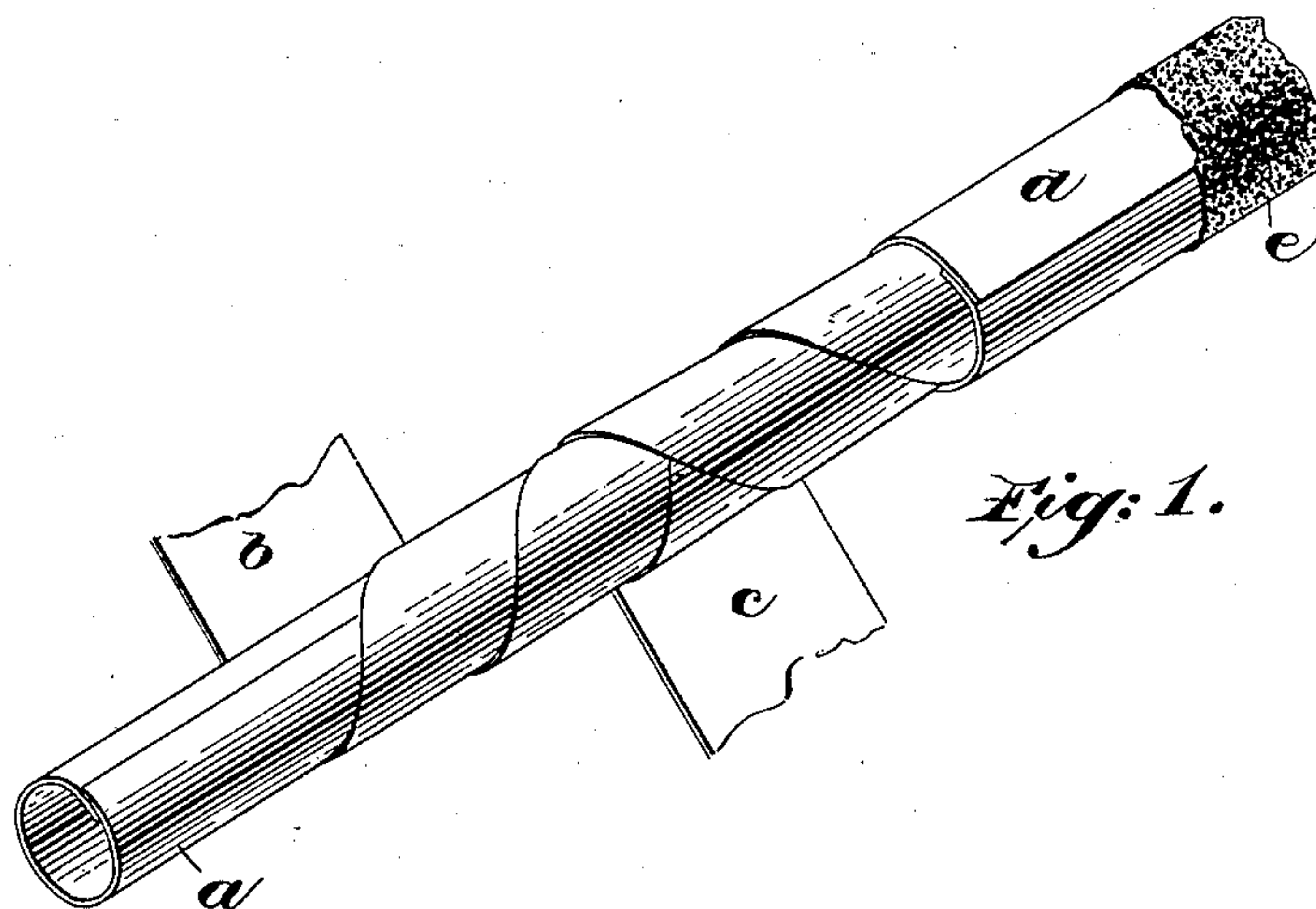


Fig. 1.

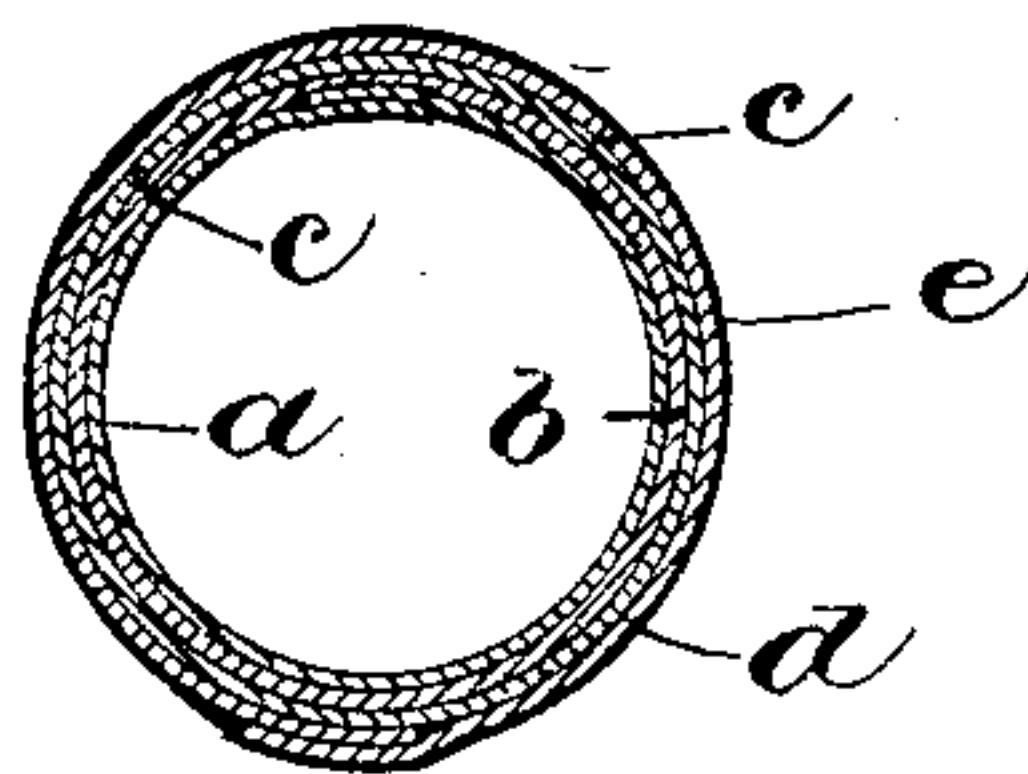


Fig. 2.

Witnesses.
Arthur H. Randall.
W. B. May.

Inventor.
John M. Kinney
By
Arthur H. Randall.
Att.

UNITED STATES PATENT OFFICE.

JOHN M. KINNEY, OF BOSTON, MASSACHUSETTS.

CONDUIT FOR ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 557,830, dated April 7, 1896.

Application filed August 6, 1895. Serial No. 558,435. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. KINNEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Conduits for Electrical Conductors, of which the following is a specification.

The object of this invention is the production of a tube, duct, or conduit for electrical conductors which shall meet, as far as possible, the requirements of perfectly insulating the conductors and protecting them from flame and moisture.

To those who are acquainted with the art it is well known that it has long been endeavored to produce a conduit or tube for conductors formed of paper, for the reason that a tube thus formed can be manufactured cheaply, is extremely light, and can be manipulated easily; but to my knowledge no tube has been yet produced which was a perfect insulator and at the same time was waterproof and fireproof to the extent desired. As heretofore manufactured such a tube had to be covered with layers of foreign material—such as copper, glass, &c.—which involved additional expense and added to its weight. Such tubes have also been coated with insulating material of highly-inflammable character, so that they have endangered the safety of the building in which they were placed by the rapidity with which they burned. I desire, therefore, to produce an insulated paper tube which shall not only resist a current of the highest tension, but which shall be fireproof and waterproof as well.

To these ends my invention consists of a conduit or tube for conductors of electricity formed of paper wrapped upon a mandrel, having been first saturated in a solution of alum or other non-combustible substance, and then coated with a mixture of bichromate of potash, glue and diatomite or china-clay, or similar material, and finally covered by a coating or layer of waterproof material.

Reference is to be had to the annexed drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

In the drawings, Figure 1 is a perspective view of a tube, illustrating the method of form-

ing it. Fig. 2 is a cross-sectional view of the same.

In forming a conduit in accordance with my invention I first thoroughly saturate the paper strips (preferably manila) which are employed in a strong solution of alum or other non-combustible substance, and then coat them with a mixture of bichromate of potash, glue, diatomite, or kaolin or equivalent substance.

Upon a suitable mandrel I first place a strip of paper *a* longitudinally thereof and join its edges and coat it with the said bichromate mixture. On the layer or tube thus formed I wind a strip of paper *b* in one direction in close coils or helices with the edges meeting or overlapping. This layer is coated with the bichromate mixture, and another strip of paper *c* is wound upon it in the other direction with its edges meeting or overlapping, and then after the last layer has been coated with the mixture of bichromate of potash, glue and diatomite the last strip of paper is placed thereon longitudinally, has its edges joined, and is also coated. The layers of paper all form a solid dense homogeneous mass capable of withstanding a current of the highest tension and being also of the highest degree of incombustibility. The strips of paper *a* and *d* insure that the conduit shall be smooth both inside and out, while the interior strips, being helical, add to its strength.

In order to render the tube waterproof, I thinly coat it with a heated mixture of coal-tar pitch and coal-tar, or other equivalent hydrocarbonaceous material, and cover the latter with powdered mica, glass, Canadian cement, or equivalent material, and then roll the tube between two flat surfaces until the non-inflammable material and the hydrocarbonaceous substance form a dense homogeneous mass; or, if desired, the coal-tar and coal-tar pitch may be mixed with the Canadian cement or mica and applied while heated to the tube with a brush.

A tube thus formed is extremely light, can be manufactured cheaply, and is easy to manipulate. At the same time it is excellently insulated and is capable of resisting heat and water.

Having thus explained the nature of the invention and described a way of constructing

and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

5 1. A conduit for electrical conductors formed of a series of layers of paper first saturated with alum and coated with a mixture of bichromate of potash, glue and diatomite, as set forth.

10 2. A conduit for electrical conductors formed of a series of layers of paper saturated with alum and coated with a mixture of bi-

chromate of potash, glue, and diatomite, and covered with a mixture of hydrocarbonaceous material and incombustible material, as set forth. 15

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of March, A. D. 1895.

JOHN M. KINNEY.

Witnesses:

WM. A. MACLEOD,
M. B. MAY.