No. 672,071.

Patented Apr. 16, 1901.

H. N. & E. D. SPEER.

FIREPROOF INSULATING DUCT.

(Application filed Sept. 8, 1900.)

(No Model.)

Fig. 1

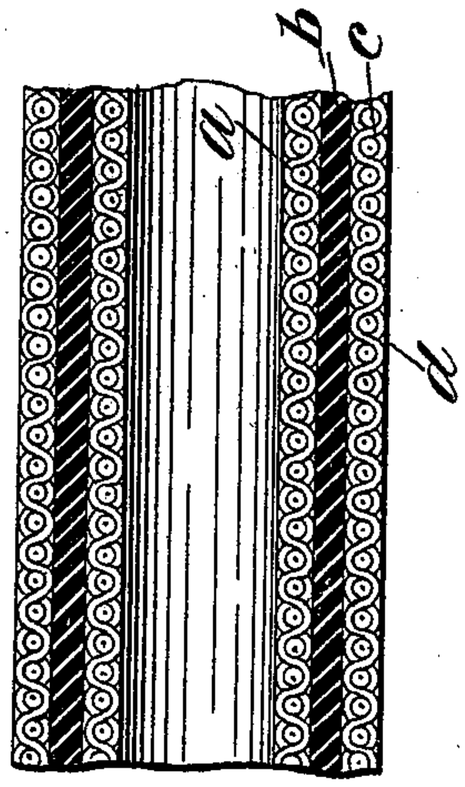


Fig. 3

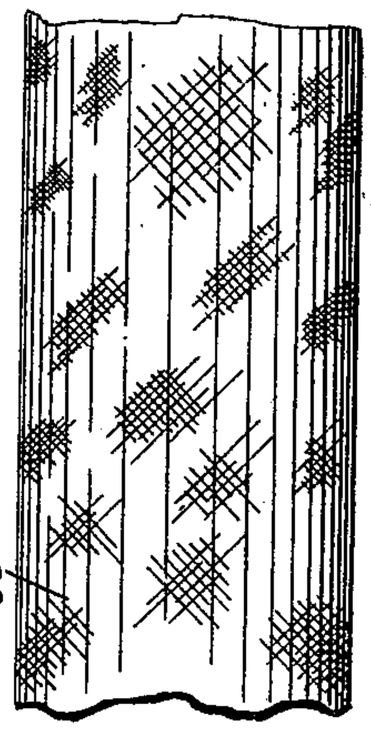


Fig. 2

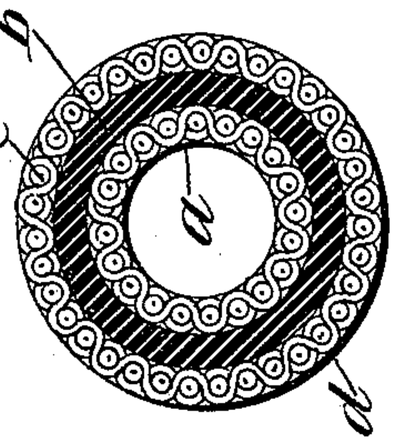


Fig. 5

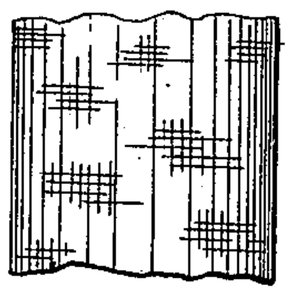
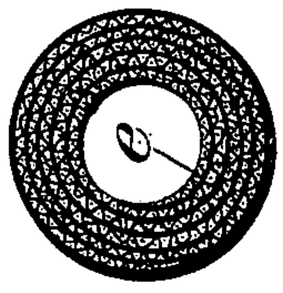


Fig. 4



Witnesses
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By their Attorney D. Walter Brown

UNITED STATES PATENT OFFICE.

HORACE N. SPEER AND EDWARD D. SPEER, OF NEW YORK, N. Y., ASSIGNORS TO THE SECURITY CONDUIT COMPANY, OF SAME PLACE.

FIREPROOF INSULATING-DUCT.

SPECIFICATION forming part of Letters Patent No. 672,071, dated April 16, 1901.

Application filed September 8, 1900. Serial No. 29,430. (No model.)

To all whom it may concern:

Be it known that we, HORACE N. SPEER and EDWARD D. SPEER, citizens of the United States of America, and residents of the city of New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Fireproof Insulating-Ducts, of which the following is a specification.

Our invention relates to improvements in fireproof insulating-ducts, and especially such ducts as are intended for electric wires.

It is the object of our invention to provide a duct that shall be fireproof and waterproof, while easily and cheaply constructed, and that shall have sufficient flexibility to permit of its being bent around corners and turns and carried into all the places where electric-light and other wires are placed.

The need of a practically absolutely fire and water proof insulation for electric wires which shall be at once cheap and easily made and applied is very great. Such insulations as are now employed are far from being fireproof, and their use increases danger of fire from the presence of the wires. It is also necessary that in addition to being fireproof the insulation shall be waterproof, for if it is not it soon deteriorates under the exposure to moisture which is inevitable in the use of insulators, and becomes worthless.

Essentially, our improved insulator consists of a plurality of layers of a fabric or material which will absorb a suitable fireproofing solution—such a fabric, for example, as woven cotton hose, cloth, or paper wound into a tube. The layers are each saturated with a suitable fireproofing solution and are separated by a layer of some waterproof substance, as rubber. Outside of all is also a layer of waterproofing substance, which may also preferably be fireproof.

A duct made as above described is practically absolutely fireproof. Even a powerful electric arc in the duct cannot ignite it and cause it to burst into flame, and the waterproof coating renders it practically indestructible by the weather.

To more clearly exhibit the construction, we refer to the drawings which accompany the specification, and whereof—

Figure 1 is a broken longitudinal section of the preferred construction of our invention. Fig. 2 is a cross-section, and Fig. 3 is a broken elevation, of the same. Fig. 4 is a cross-section, and Fig. 5 is a broken elevation, of a modified construction.

Referring to Figs. 1, 2, and 3, a tube *a*, of suitable material which can be saturated, as cotton yarn, is first formed of any desired length. This tube is readily made by weaving it on the machines now used for weaving hose, and we prefer to saturate the yarn with the fireproofing solution before weaving. After saturation the yarn is dried and then woven into a tube. Of course, instead of saturating the yarn before weaving, the tube can be first woven and then saturated.

Any suitable solution for fireproofing purposes can be used to saturate the yarn or tube *a*; but we prefer to use the following, although we do not wish to limit our invention to the use of any particular fireproofing solution—viz., two ounces (avoirdupois) of phosphate of ammonia to one quart of water.

After the tube *a* is completed a coating *b* of any suitable waterproofing solution or paint—as, for instance, dissolved rubber gum—is applied, which also acts as a cement to fasten the outer layer or tube *c* firmly to the inner tube *a*. If rubber gum is used, we prefer to vulcanize tubes *a* and *c* together. Said outer tube *c* is made in the same manner as said tube *a*, but of a size to fit snugly over the latter and its coat of waterproofing, and we prefer to saturate the yarn of which the tube *c* is to be woven with the said fireproofing solution before tube *c* is woven, although, of course, said tube *c* may be first woven and then saturated. After tube *c* is placed over tube *a* we apply a coat of any of the pigments known in the trade as "fireproof paints," and which are both fire and waterproof, or we may employ a coat simply of waterproofing substance, as a solution of rubber.

Instead of applying the fireproof paint to the tube *c* after said tube is woven we may saturate the yarn of which said tube is to be

woven after the said yarn has been saturated with the fireproofing solution and dried, as above described. We may also apply said fireproof paint as well to the inner tube *a* as to the outer tube *c*.

Referring to Figs. 4 and 5, the duct is made by rolling any suitable fabric *e*, as cotton cloth, into a tube with a plurality of spiral layers. Before being rolled the cloth is saturated with the aforesaid fireproofing solution and dried and is then coated on both sides with any suitable waterproofing substance, as dissolved rubber gum. The fabric is then formed into a tube by rolling on a mandrel while the gum is still soft and sticky, whereby the gum cements all the layers together. We then vulcanize the rubber, and the duct is ready for use, or it may be coated with fireproof paint, as above described.

Now, having described our improvements, we claim as our invention—

1. A fireproof insulating-duct consisting of a plurality of layers of fabric saturated with a fireproofing substance, a layer of waterproofing material between the layers of fabric, and a waterproof coating outside of all, substantially as described.

2. A fireproof insulating-duct consisting of an inner woven tube saturated with fireproofing solution, a layer of waterproofing material on said tube, an outer woven tube saturated with fireproofing solution, and a coating of fire and water proof substance outside of all, substantially as described.

Signed at New York city, New York, this 5th day of September, 1900.

HORACE N. SPEER.
EDWARD D. SPEER.

Witnesses:
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