

No. 717,009

Patented Dec. 30, 1902.

A. M. LOUGEE.
METHOD OF MAKING ELECTRIC CONDUITS.

(Application filed May 31, 1902.)

(No Model.)

Fig. 1.

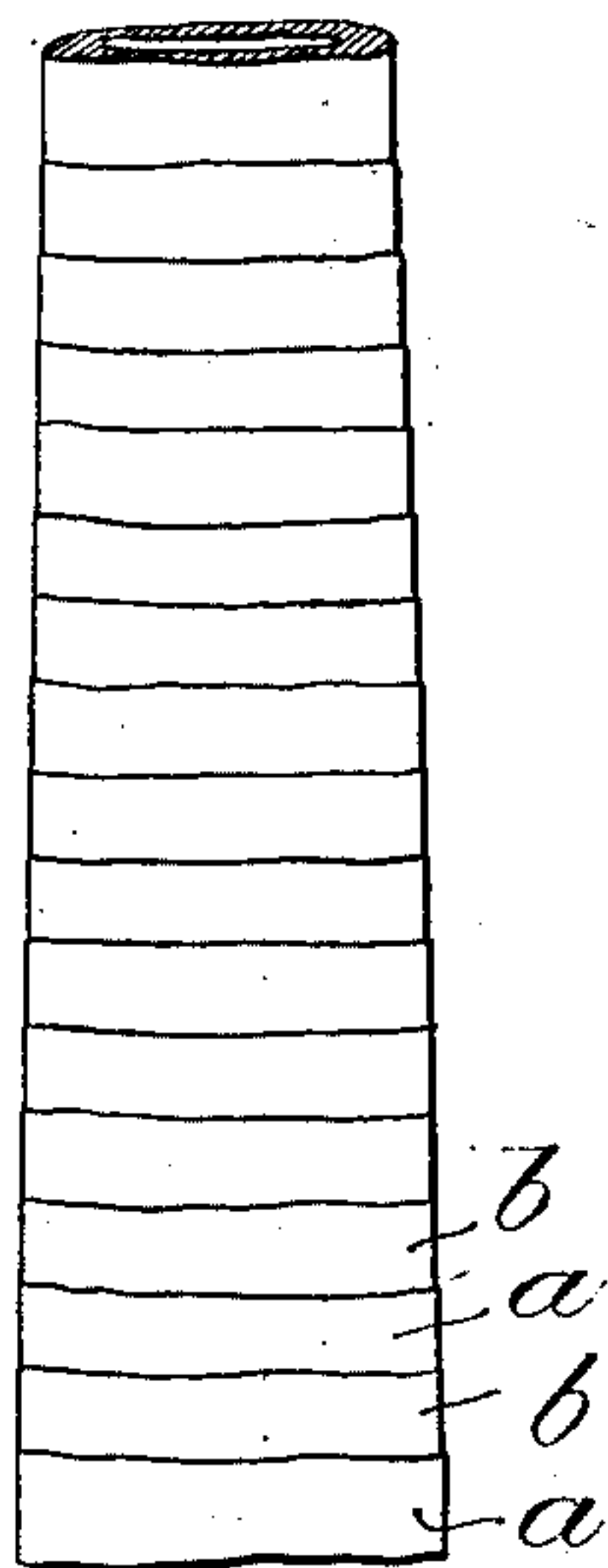
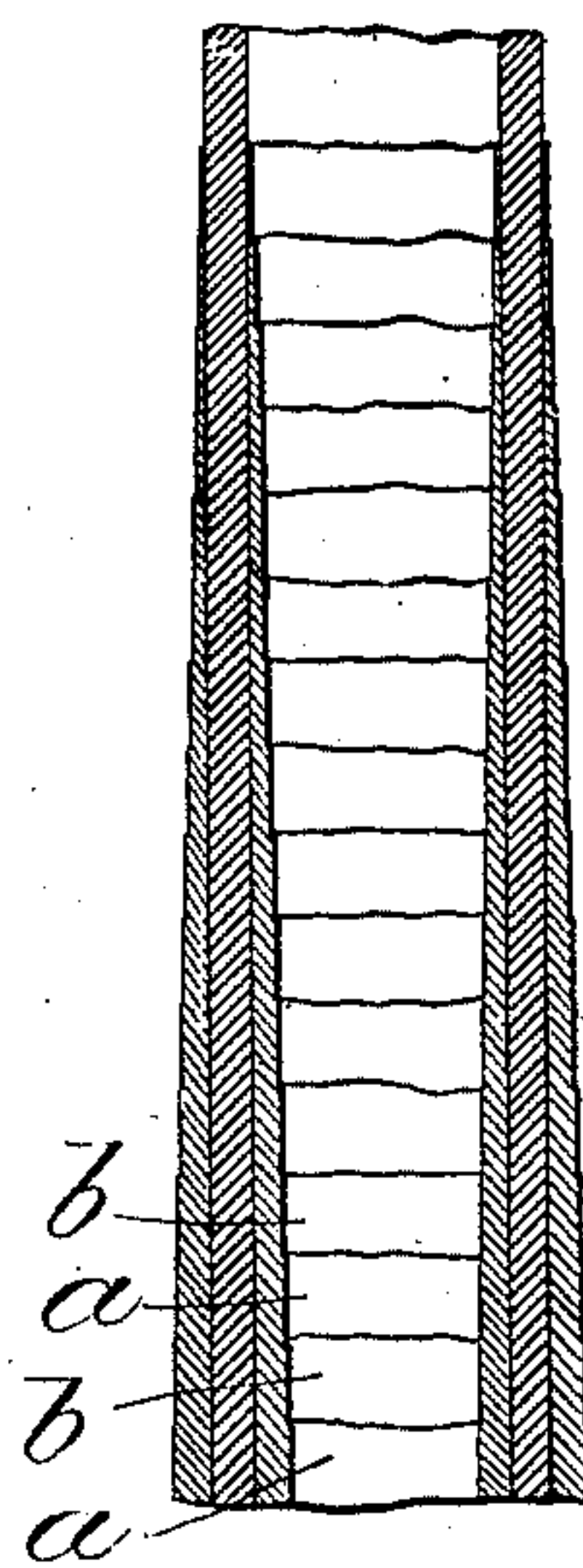


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING ELECTRIC CONDUITS.

SPECIFICATION forming part of Letters Patent No. 717,009, dated December 30, 1902.

Application filed May 31, 1902. Serial No. 109,653. (No model.)

To all whom it may concern:

Be it known that I, AMANDA M. LOUGEE, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Methods of Making Electric Conduits, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is a method of making electric conduits, and relates to the manner of applying the insulating lining or covering to the armor or tubing.

According to my present invention I provide the insulating material in a plurality of vats or receptacles of different ingredients and vulcanizable constituents and then dip the armor into these different vats or receptacles in succession, so that ultimately the armor is coated with a series of layers which when vulcanized will be alternately soft and hard or of other different properties, according to the order in which the dipping took place and according to the contents of different vats.

My invention will be more fully understood from the following description, reference being had to the accompanying drawings, in which I have graphically illustrated the method.

Figure 1 shows in elevation the outside of a conduit dipped according to my invention; and Fig. 2 is a central longitudinal section thereof, showing the inside of the conduit.

First I prepare the compounds in a plastic state. These compounds may be composed of any vulcanizing vehicle or binding agent—as, for example, a naphtha solution of rubber, cellulose, or gutta-percha, or hydrocarbon oils, or the like—containing sulfur, antimony, or other recognized vulcanizing ingredients, and fire-resisting material—such as comminuted asbestos, mica, magnesium, lime, slate, talc, infusorial earth, or any earthy substance, or any prepared mass or mixture of fireproof material. For some purposes it is desirable to have several compounds, as above indicated, differing from each other merely in the relative proportions of the ingredients. Also I prefer to have one receptacle contain simply the vulcanizable solution, and also, if desired, there may be several quantities of

this solution differing from each other in the amount of sulfur or other vulcanizing ingredients. I have not undertaken in this specification to set forth the various constituents of the compounds, but refer therefor more particularly to my copending applications, Serial Nos. 84,344 and 84,345, filed December 2, 1901. Then having properly cleaned and dried the armor or tubing I first dip it into one bath or compound, so as to cover the same with a thin layer thereof, and then having permitted the same to properly adhere to the armor I again dip the latter and continue to repeat this process until the armor has been coated to a sufficient depth or thickness for the purpose in hand, the successive layers being such that when subsequently vulcanized the armor will be provided with a lining and covering which may have a hard fire-resisting exterior and a soft interior or may consist of successive layers, which are alternately relatively soft and hard, and certain of them may be fire-resisting, while others are not or may have different properties, as will be obvious from the foregoing description. For convenience of illustration I have shown in the drawings the armor as dipped a large number of times in the solutions and have indicated (greatly exaggerated as to thickness for visual convenience) the layers which are formed thereby, as *a* and *b*, although, as already stated, the invention is not restricted to having the layers alternately soft and hard. By “dipping” I mean to include any equivalent means or manner of immersing, flooding, or getting the solution spread over the armor-surface. Having brought the armor-coating to the desired thickness by means of the successive dipplings, as explained, I subject it to a vulcanizing heat until the whole is properly vulcanized. The result is that the armor is protected by a coating, preferably of insulating material, throughout and having its layers of different characteristics, so that one layer may be extremely hard, and yet an adjacent soft layer will prevent any liability of said hard layer to break or become disrupted upon bending the armor, as may be required for building purposes or otherwise, and, moreover, the armor-coating is capable of being made extremely thin as well as efficient.

This method enables me to produce the armor with great uniformity and at minimum cost. Very little apparatus is required as compared with some previous methods of manufacture, and, moreover, by this method an armor may be readily made having any required special properties for particular places and purposes, inasmuch as all that is necessary is simply to vary the order of dipping or otherwise immersing, covering the armor-surfaces with the solution or solutions. By having the solutions quite thin or free-flowing they are sure to be evenly applied to the armor. This is desirable. The degree of hardness and softness may also to some extent be controlled by the manner of vulcanizing, as is well known in the art.

I do not intend to restrict my method to the application invariably of the coatings to both the outside and the inside of the armor nor indeed to armor *per se*, as it is useful in and applicable to many other articles and situations. I have described the method in connection with armor, as this is the most common use to which I have thus far applied it.

While I have set forth in the foregoing description the various details which I prefer to employ, I do not intend to restrict my invention thereto in all respects unless otherwise required by the claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The herein-described method, consisting in preparing different vulcanizable solutions, repeatedly dipping the armor or other article

into said solutions, certain of said solutions, when vulcanized, giving a hard layer or coating, and others thereof a soft layer or coating, and then applying vulcanizing heat to the whole.

2. The herein-described method, consisting in providing a solution of vulcanizing ingredients and a binding agent, and another vulcanizable solution containing fire-resisting ingredients, dipping the armor or article to be protected into one and the other of said solutions until brought to the required thickness, and then subjecting the whole to a vulcanizing heat.

3. The herein-described method, consisting in providing a solution of vulcanizing ingredients and a binding agent, and another vulcanizable solution containing fire-resisting ingredients, dipping the armor or other article into one solution for the formation thereon of a layer, of the required thickness, of said solution, dipping the article into the other solution for the formation on top of the previous layer of a second layer, of the required thickness, of said other solution, said dipping being repeated until the required number of alternate layers are produced, and then applying vulcanizing heat to the whole.

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

AMANDA M. LOUGEE.

Witnesses:

GEO. H. MAXWELL,
THOMAS J. DRUMMOND.