July 7, 1925. 1,544,592

T. E. MURRAY

LINING FOR CONDUITS

Filed Aug. 9, 1923

Fig. 1

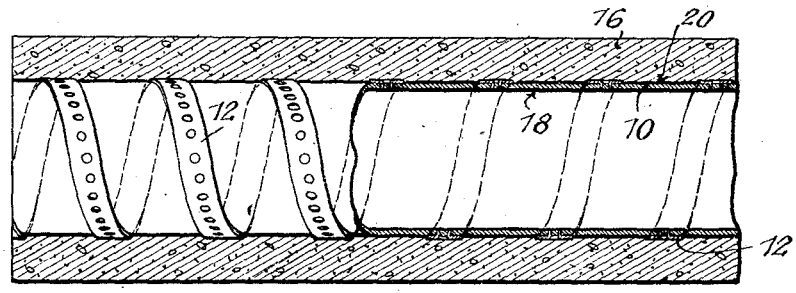


Fig. 2.

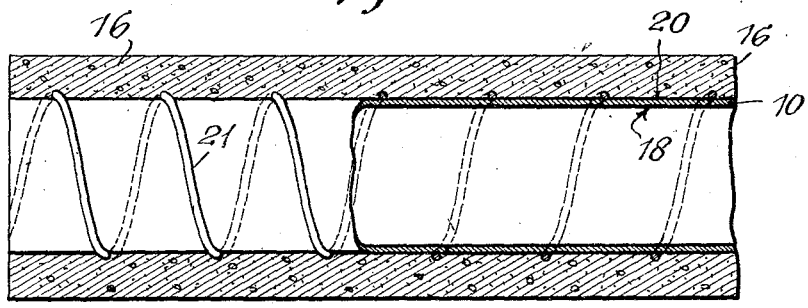


Fig. 3.

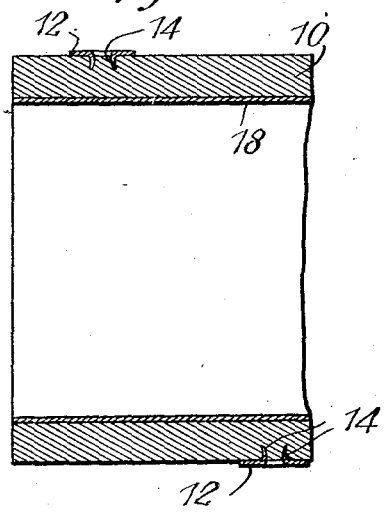
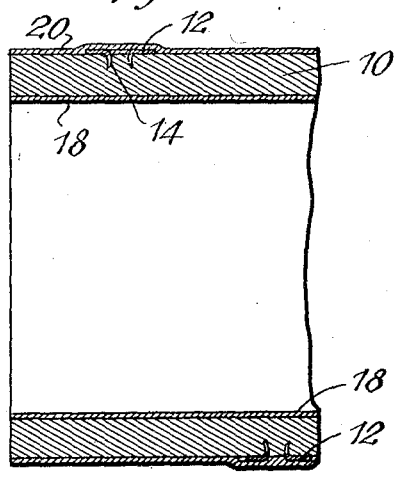


Fig. 4.



Inventor

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By his Attorney

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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

LINING FOR CONDUITS.

Application filed August 9, 1923. Serial No. 656,573.

To all whom it may concern:

Be it known that I, THOMAS E. MURRAY, a citizen of the United States, and resident of Brooklyn, Kings County, State of New York, have invented certain new and useful Improvements in Linings for Conduits, of which the following is a specification.

In several prior patents of Thomas E. Murray, particularly Patent No. 1,387,066 of August 9, 1921, there are described methods and devices for molding pipes and similar hollow structures of plastic material, as cement or the like.

The prior Murray patents are based on the use of a core which after the cement has hardened, is collapsed and withdrawn.

In the above identified prior patent, there is described a wire enclosing the core and adapted to be used for withdrawing the core longitudinally from the molded conduit. Said patent also shows an inner wire core on which a sheet of flexible material such as paper is wound.

The present invention is in part a continuation and in part an improvement on the inventions disclosed in the prior Murray patents, and contemplates providing a pipe or conduit having a lining of paper or the like which is adapted to remain in the conduit permanently, that is, it is not withdrawn as in the prior Murray patents.

Where conduits of great length are constructed as in street pavements, and where there is considerable moisture absorbed by the cementitious material forming the conduit, an ordinary paper lining would have several disadvantages. For example, when the paper became softened and electrical conductors were fished therethrough, the paper would be distorted and in time would clog the conduit and prevent fishing or threading conductors therethrough.

The present invention contemplates providing a waterproof coating for the paper lining so that it will be practically impervious to moisture and also contemplates providing a reinforcement for the paper tube or lining which will prevent it from sagging inward when moisture reaches the same due to imperfections or removal of the waterproof coating.

The accompanying drawings illustrate embodiments of the invention.

Fig. 1 is a longitudinal section through a pipe or conduit having an inner lining of paper or similar fibrous or flexible material;

Fig. 2 is a similar view showing an alternative form of reinforcement for the lining;

Fig. 3 is an enlarged view of the core showing a layer of waterproofing material on the inner surface thereof;

Fig. 4 is a similar view showing a core waterproofed both on its inner and outer surfaces.

The core 10 is preferably made of flexible or fibrous material such as paper or cardboard which can be commercially produced in various ways, for example, by winding either single or superposed strips of paper or cardboard on a mandrel. Such tubes can be made of varying thicknesses so as to have greater or less rigidity of flexibility, but in order to produce a commercially practical core or lining for conduits, it is preferable to use a minimum amount of paper so as to keep down the cost. This means that the core wall must be of comparatively thin cross section. To prevent such thin paper tubing from collapsing when handling the core and also when casting material around it, I provide a spirally wound reinforcement 12 preferably in the form of a flat strip, as shown in Figs. 1 and 3, this strip having prongs 14 which bite into the fibers of the paper tubing 10.

The core 10 is adapted to form a permanent lining for a pipe or conduit which as illustrated in Fig. 1 is formed of a layer of cementitious material 16, which is molded around the exterior of the core and allowed to set.

The core 10 forms a smooth inner lining for the conduit and preferably has applied to its inner and outer surface a layer of waterproofing material 18 and 20, best shown in Figs. 3 and 4. The waterproofing layers 18 and 20 may be of cloth impregnated with suitable moisture resisting compound such as tar, paraffin or the like, or these moisture or water resisting elements may be of paper which is shellacked or varnished. Or either the inner and outer layer may be merely a coat of shellac, tar, paraffin or other moisture resisting paint or compound applied directly to the surface of the paper tube 10. Such waterproofing elements will prevent the moisture from the outer layer 16 from causing the paper tube to soften on its inner surface. The outer reinforcing strip 12 will prevent the paper tube from sagging or being pressed inward even though it becomes somewhat dampened

by the surrounding layer of concrete or other cementitious material.

In Fig. 2 the outer reinforcement for the core comprises a spirally wound wire 21, the ends of which may be secured to the tubing by passing the same through suitable perforations in the tube or merely by bending the end of the wire over the extreme ends of the tube.

The lining herein described forms a neat smooth finish for conduits such as are used for enclosing electric conductors, and while not limited to such use the conduits having paper linings as shown and described are well adapted for use in the walls and flooring of building structures where there is not present a great deal of moisture such as below street pavements, tunnels, subways and similar underground structures.

As best shown in Fig. 4, the outer reinforcement 12 is a flat or non-circular strip which has a considerable area in contact with the tapered tube. This sectional shape of reinforcement adds to the longitudinal rigidity of the core. That is to say, such a flat reinforcement presents greater resistance to collapse in the direction of the axis of the core. This flat form of reinforcement has the added advantage over reinforcements of circular cross-section such as heretofore proposed, that it can be readily covered with a layer of water proofing material (as indicated in Fig. 4). It is apparent that where the reinforcement is thin and flat as here shown, it does not require such a thick layer of tar, paint or other water proofing compound as would be necessary in the case of a thick wire reinforcement.

Though I have described with great particularity the details of the embodiments of the invention herein shown, it is not to be construed that I am limited thereto, as changes in arrangement and various modifications may be made without departing from the invention as defined in the appended claims.

What I claim is:

1. A hollow molding core adapted to form a lining for a pipe or conduit comprising a tube of flexible material having a spiral reinforcement and a layer of moisture resisting material outside of the reinforcement.

2. A hollow molding core adapted to form a lining for a pipe or conduit comprising a paper tube having an outer metallic spiral reinforcement and a layer of moisture resisting material covering the latter to protect it from the corrosive action of moisture.

3. A hollow core adapted to form a permanent lining for a conduit comprising a tube having an outer spiral reinforcement of a sectional shape which presents a flat face to the tube and formed of a material of greater stiffness than that of said core, and a coating of waterproofing material covering both the tube and the reinforcement.

4. An article of manufacture comprising a paper tube having a waterproof coating on its inner and outer surface and a metallic reinforcement between the tube and the coating, said tube being adapted to form a permanent lining for pipes or conduits.

5. A pipe or conduit comprising an outer layer of cementitious material and an inner lining comprising a tube of fibrous material having an outer reinforcement and a layer of waterproofing material covering both the tube and the reinforcement.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.