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1,774,292

MOISTUREPROOF AND GAS TIGHT DAM FOR LEAD SHEATH CABLES

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Fig. 1.

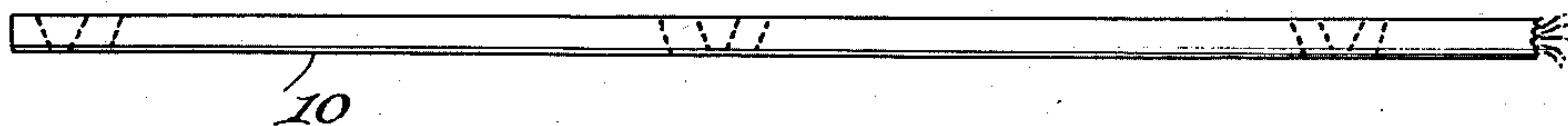


Fig. 2.

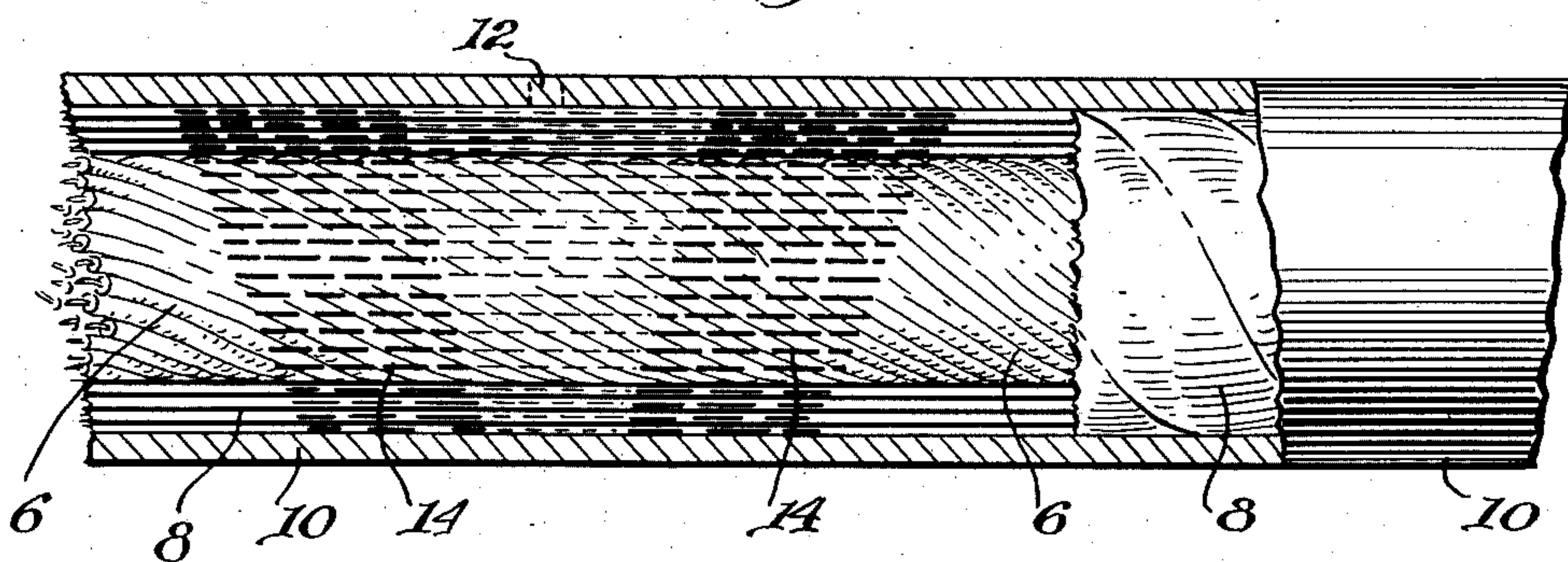


Fig. 3.

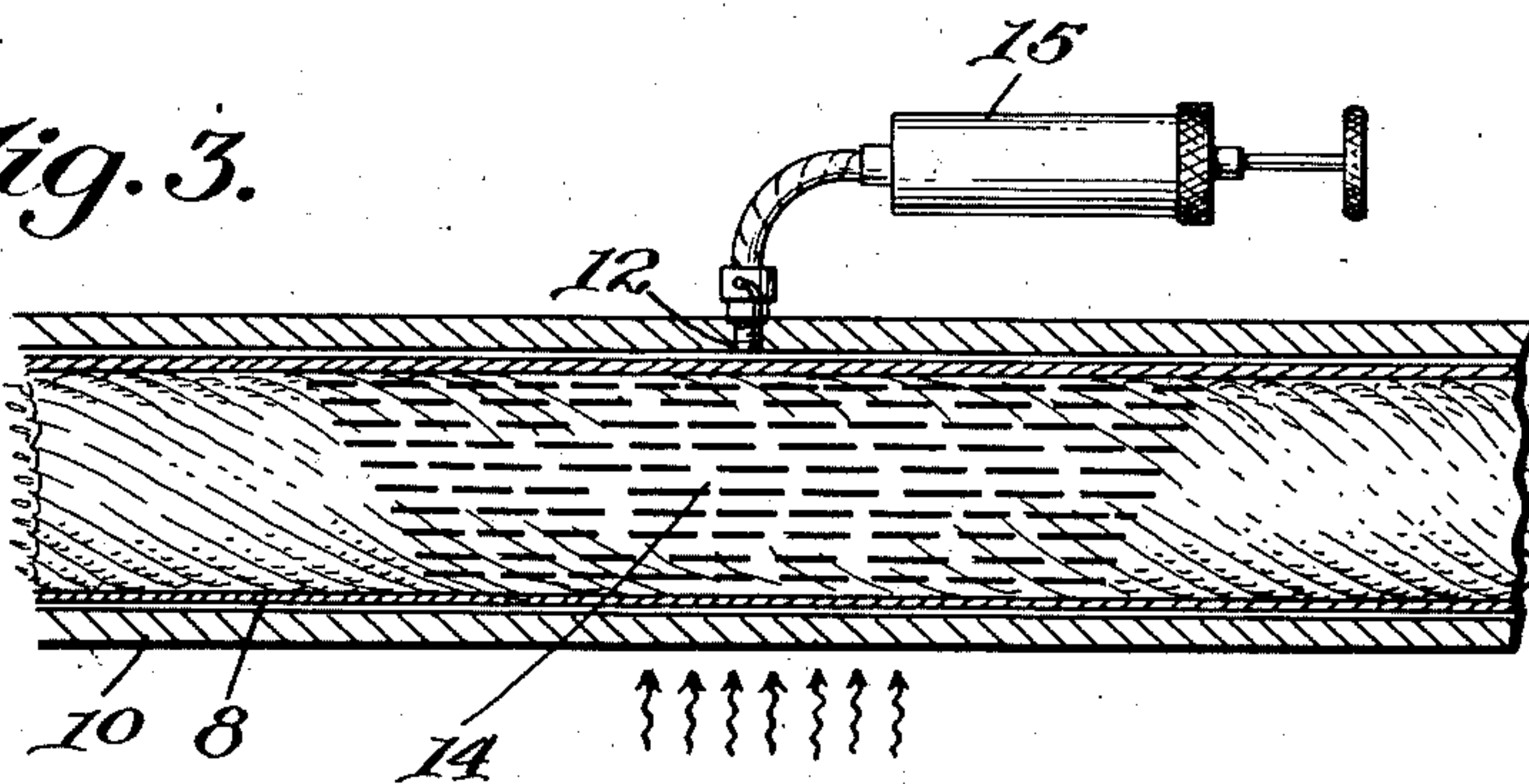
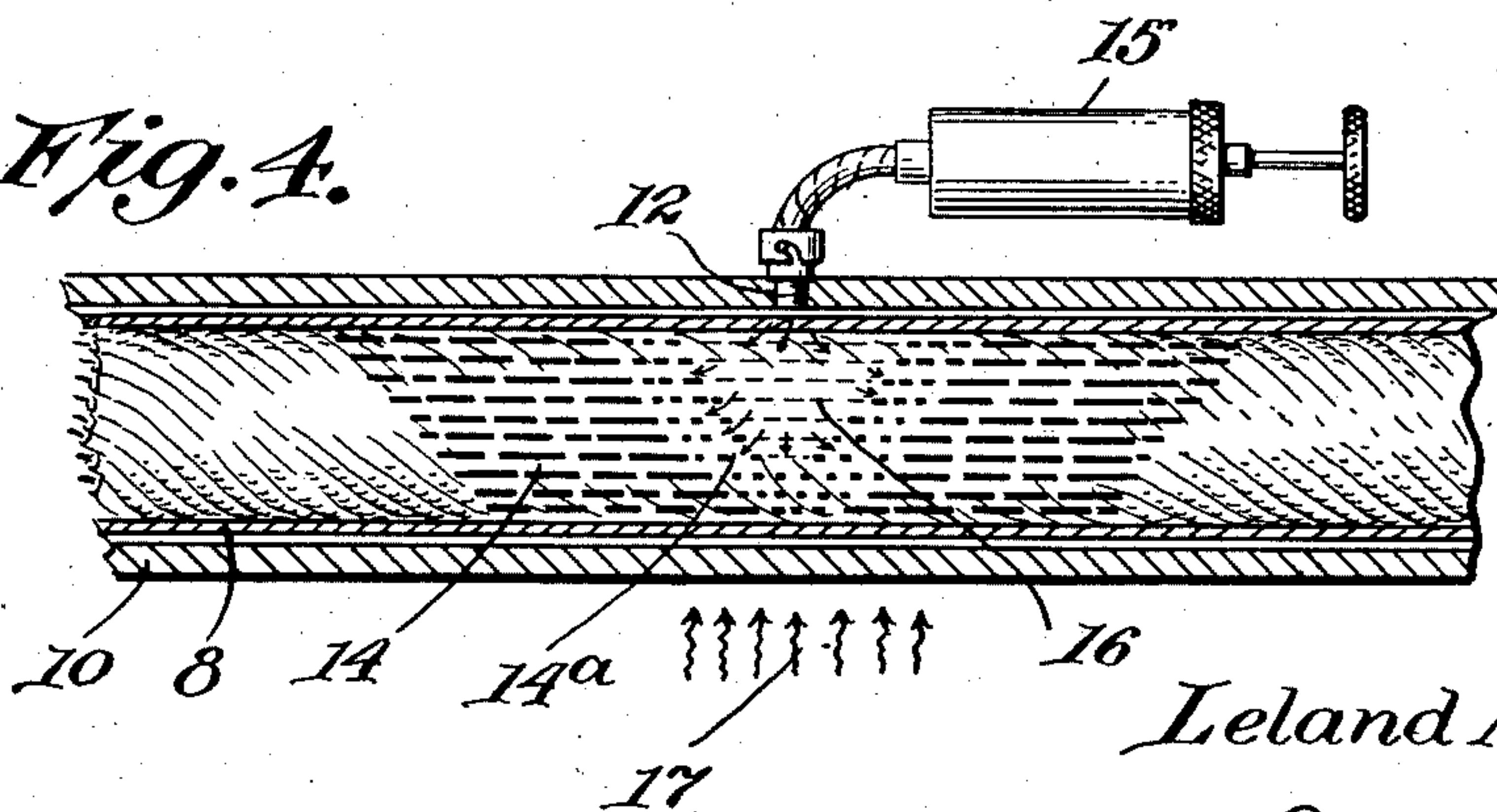


Fig. 4.



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MOISTUREPROOF AND GAS-TIGHT DAM FOR LEAD-SHEATH CABLES

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This invention relates to a method of forming dams in lead sheathed cables at points where it is desired to sectionalize the cable or at a terminal.

5 Such dams are formed in the cable preparatory to making tests for defects in the sheath by introducing gas under pressure into the cable. It is necessary that each end of a section to be tested shall be closed with
10 a gas tight plug. In so far as I am aware no satisfactory method of forming a gas tight and moisture proof dam or closure had been devised prior to that disclosed by A. Z. Mample in his application, Serial No.
15 348,346, filed March 19, 1929. The present invention is an improved method of forming the tri-sectional dam described in said application.

In the following description I shall refer
20 to the accompanying drawing in which—

Figure 1 is a longitudinal view of a cable provided at intervals with a tri-sectional dam formed in accordance with my invention.

25 Figure 2 is an enlarged detail view, partly in elevation and partly in section illustrating the construction of the tri-sectional dam.

Figures 3 and 4 are detail sectional views illustrating the various steps in the method
30 of forming said dam in accordance with my invention.

The cable is constructed of a multiplicity of wires or conductors 6 insulated with a wrapping of paper, the bundle of wires thus
35 formed being surrounded by insulating paper wrappings 8 and the whole encased in a sheath of lead 10.

The plugs or dams which have heretofore been employed consisted of a single mass of wax introduced at a high temperature, usually at 350° F. or higher. In cooling and solidifying there was a certain amount of shrinkage which caused minute crevices to
40 be formed between the wax and the inner wall of the sheath. Even if a tight joint could be secured when the plug was first formed, the continual expansion and contraction induced by changes in atmospheric
50 temperatures soon destroy the integrity of

the seal. These prior wax plugs or seals have, therefore, been absolutely unreliable.

The tri-sectional dam completely overcomes the defects in prior plugs and forms an absolutely gas-tight and moisture proof
55 closure which maintains its integrity indefinitely. Instead of introducing a wax at a temperature considerably above its melting point, the outside members of the Mample tri-sectional dam are formed by introducing into the cable under pressure, a wax
60 or other sealing material at a temperature only slightly above its melting point. The contraction, if any, is exceedingly slight in solidifying, due to the comparatively small
65 change in temperature in cooling and this is offset by the pressure to which the wax or other sealing material is subjected while it is being inserted. Hence the initial shrinkage heretofore manifested in the leakage of
70 the plugs is thus overcome. Nevertheless the continual expansion and contraction of the sheath tends to produce crevices between the sealing material and the sheath. This difficulty has been entirely eliminated in the
75 Mample dam by the introduction of a semi-liquid filling between the end plugs which permeates any crevices that may develop and also saturates the paper insulation on
80 the wires.

In the Mample tri-sectional dam, the end plugs of wax or other sealing material were first introduced through separate openings in the sheath after which the semi-liquid
85 sealing medium was inserted through a central opening. I have devised an improved method of forming the dam which not only greatly simplifies the process but also forms a more intimate bond between the intermediate and end sections.
90

All of the material is introduced through a single opening in the sheath indicated at 12. The first step in my method or process is indicated in Fig. 3. The wax or other
95 sealing material 14 is warmed to a temperature slightly above its melting point and forced into the cable with a pressure gun 15 which may be of the type employed in forcing lubrication into the bearings of machinery. The wax in this condition while
100

under pressure will penetrate the core of the cable, permeating the paper insulation and closing all crevices for a distance of approximately two feet on both sides of the opening in the sheath. The sheath is slightly warmed or heated depending on the temperature prevailing at the time the dam is made in the cable.

After the wax or other sealing material has solidified, there are numerous small spaces and openings in the solidified material due principally to contraction of the material during the cooling. In order to completely fill these openings or crevices, the central portion is slightly heated by applying heat from a suitable source as indicated at 17, until it has liquefied, as indicated at 14^a. The semi-liquid sealing compound 16 is then forced through the opening 12 under considerable pressure by means of the pressure gun 15, which forces the liquefied sealing compound into whatever openings or crevices are existing in the still solidified end sections, compressing the central zone of melted sealing material and causing it to commingle at either side with the softened sealing material to form an intimate bond or union between the outer solidified ends and the central semi-liquid sealing compound. This compound may be composed of a semi-solid wax and rosin oil which forms an efficient waterproofing.

The central semi-liquid sealing compound penetrates any crevices that may later develop in the end sections or between the end sections and the wall of the sheath. If by any possibility the gas pressure to which the cable is subjected when undergoing a test, should cause the gas to penetrate through the adjacent solidified end portion the semi-liquid sealing compound in the central zone will be forced toward the opposite side and will effectually seal any crevice or weak spot in the other solidified end portion. In this manner the tri-sectional dam is effective at all times against the passage of gas or moisture.

I claim:

1. The process of forming a gas-tight and moisture proof seal or dam in a lead sheathed electric cable, which consists in cutting a small aperture in the sheath, introducing therethrough melted wax or other sealing material, displacing an intermediate portion thereof by forcing a semi-liquid insulating compound through said aperture under pressure, thereby forming a tri-sectional dam and closing said aperture.

2. The process of forming a gas-tight and moisture proof seal or dam in a lead sheathed electric cable, which consists in cutting a small aperture in the sheath, introducing therethrough melted wax or other sealing material, permitting the wax or other sealing material to solidify, applying

heat to soften an intermediate portion of said wax or other sealing material, forcing a semi-liquid insulating compound through said aperture under pressure into said softened intermediate portion to displace the same and closing said aperture.

3. The process of forming a gas-tight and moisture proof seal or dam in a lead sheathed electric cable, which consists in cutting a small aperture in the sheath, introducing therethrough a wax or other sealing material which is heated to a temperature slightly above its melting point, permitting said sealing material to solidify, applying heat to soften an intermediate portion of said sealing material, forcing a semi-liquid insulating compound through said aperture under pressure into said softened sealing material to displace the same and closing said aperture.

In testimony whereof I affix my signature.
LELAND A. REED.