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PIPE LINE COVERING

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Fig. 1.

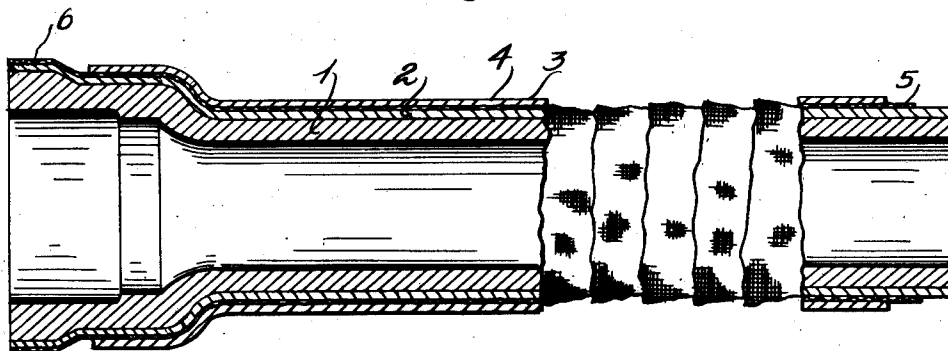
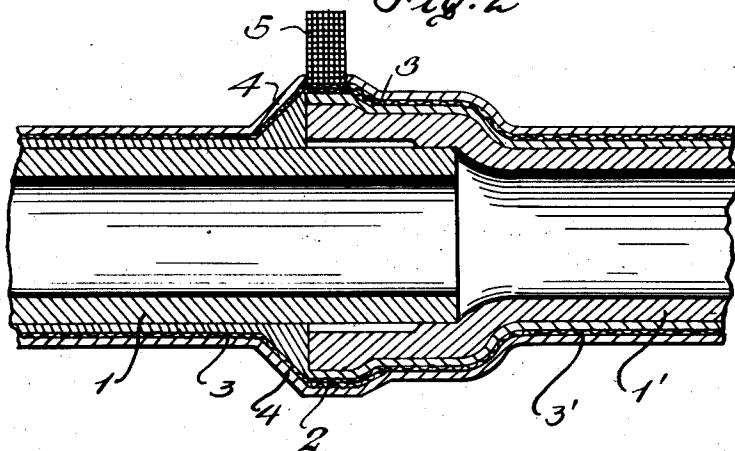


Fig. 2.



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PIPE-LINE COVERING

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The present invention deals with a new and improved pipe covering and a method for producing the same. The invention has particular reference to that type of pipe covering which is applied to water, gas, oil and steam conduit lines which are embedded beneath the surface of the earth and which therefore entail considerable expense in the removal and substitution of sections thereof which have become corroded to the extent that the fluid may escape, or which have become otherwise defective. For example, in water, oil and gas conduits the material of which the conduit is constructed is usually steel. The steel when embedded in the earth undergoes corrosion due to the chemical reactions taking place between the steel and water, dissolved salts, acids, alkalies and other reactive substances with which it comes in contact. Another very common source of failure of metallic conduits is due to stray currents in the earth with which the said metallic conduits very often come in contact.

The present invention contemplates a covering for pipes, particularly metallic pipes, which not only protects the pipe from the ingress of substances which would react chemically with the metal of the pipe, but provision is also made for conducting from the pipe stray currents located in the vicinity thereof. Preferably these stray currents are conducted through a metallic conductor, which surrounds the pipe, in a direction which is parallel to the direction of the pipe, the said metallic conductor being grounded at convenient points along the line of progress of the pipe line.

I am fully aware that it has been proposed prior to this invention to cover metallic pipes with waterproofing substances of various types and to reinforce this protective covering by metallic cylinders, spirally wound wire and the like embedded in the waterproof coating, but insofar as I am aware it has never been previously proposed to protect the metallic conduit proper with a waterproof covering in which a continuous metallic conductor is provided, which is grounded along the line of progress at suit-

able points, for the purpose of shielding the pipe proper from such currents as are found in the vicinity of the said pipe.

In carrying my invention into effect I may primarily apply to the metallic pipe proper a priming coat of asphalt or other bitumen, which bitumen may be applied either hot or cold. This priming coat is followed by a coat of bituminous substance such as asphalt, asphalt and filler, pitch, pitch and filler or a mixture of asphalt and pitch with or without a filler. The thickness of this second layer is preferably about 1/16 of an inch. I next wrap around the pipe brass wire mesh in which the openings between the strands are approximately 1/8 of an inch in all directions and in which the thickness of the strands is approximately 1/64 of an inch. This wire mesh may be wound about the pipe by hand or by any suitable machine. The wire cloth is preferably 3 to 4 inches in width and it is preferably wound about the asphalt covered pipe in such a manner that the widths overlap about 1/4 of an inch. I have found it convenient to use rolls of wire mesh which consist of one continuous length. The method of insuring that the wire mesh will not become separated at the union of pipe sections will be fully described in connection with the drawing. The wire mesh should be flexible enough to permit wrapping the same about all obstructions in the pipe length such as nipples and joints. It is desirable but not essential to coat the wire mesh with hot asphalt before wrapping it about the asphalt covered pipe. This may be accomplished by merely drawing the wire mesh through molten asphalt or pitch.

On the wire cloth which has been wound about the asphalt covered pipe, a second coat of asphalt or other bituminous substance is applied. This finishing coat should preferably be approximately 1/16 of an inch in thickness. It may be desirable to wrap about the pipe following the final coating with asphalt, a heavy wrapping paper or a tar paper.

In applying the asphalt to the pipe any of the known methods may be used. Thus, for example, the asphalt may be melted and

"wiped" about the pipe by a cloth somewhat in the manner of lead joint wiping. In this operation two men hold a burlap sling beneath the pipe while a third pours molten asphalt upon it. The ends of the burlap sling are manipulated by drawing the same backwardly and forwardly in an arc of a circle while the molten asphalt is solidifying, until a smooth coating of the desired thickness is attained. The same result may, of course, be obtained with any of the pipe coating machines available, and instead of using molten asphalt it is possible to use cut-back asphalt, that is, asphalt dissolved in a suitable solvent.

Reference is now had to the accompanying drawing in which a preferred modification of my invention as illustrated. In said drawing, Figure 1 is a vertical section, the central portion being an elevation with the outer coating removed to show the wire screening forming an intermediate coating. Figure 2 is a vertical section showing a preferred mode of forming the joints in the pipe.

Figure 1 shows a section of a pipe partly in section which has been covered according to my invention. 1 designates the pipe, 2 the first bituminous covering, 3 the brass or other metallic wire mesh, 4 the second bituminous covering. In winding the wire mesh around the individual pipe sections, one must take into account that the pipes are later to be jointed together and that consequently such portions which are going to be screwed into another pipe section or a nipple, must be kept free from the wire mesh. In covering pipes of the type illustrated in the accompanying drawing, the method of applying my covering would therefore be as follows:

The first bituminous application marked #2 is applied over the entire surface of the pipe. The metal wire mesh marked #3 leaves the pipe uncovered at point 5, extends however over the entire nipple at point 6. The loose end of the mesh is pasted onto the pipe at this point 6 with asphalt. The final bituminous covering is applied in such a way that the wire mesh remains uncovered for about 2 or 3" at both ends of the pipe. This is necessary because a transmitting connection is to be made between the wire mesh wrappers of two different pipe sections.

After two pipe sections are jointed together in the field, the visible portions of the wire mesh are connected by a wire mesh bandage which then is covered with asphalt that might be cut back with solvents for cold application or might be applied hot according to local conditions. Figure 2 shows two sections of pipe jointed together and my novel method of covering such a connection. The two sections of pipe are marked 1 and 1' respectively. 2 designates the wire mesh bandage connecting the wire mesh wrappers 3 and 3'. 4 represents the final bituminous

covering which is applied over the wire mesh bandage after it is in place.

This wire mesh bandage connecting the wire mesh wrappers of two different pipe sections also represents the logical earth conductors. A suitable ground connection 5, Fig. 2, may be conveniently provided at the jointure of two sections of pipe. Whenever it is desired to ground the transmission line it is only necessary to let the free end of the wire mesh bandage extend approximately 5" into the soil instead of pasting it down with asphalt as it should be done in all instances where no grounding lead is desired. Of course, instead of using the wire mesh bandage for grounding the transmission line, separate metallic conductors may be employed which in any suitable manner are connected with the wire mesh wrappers at any convenient point along the line. All grounding leads should extend into the soil in a direction at right angles to the principal axis of the covered pipe.

As used in the claims, "continuous strip of wire mesh" signifies continuity as regards electrical conductance, although the wire mesh conductor may consist of a plurality of lengths overlapped in the manner hereinbefore described. The final coating of bituminous substance is applied and if desired the joint is wrapped with paper, to further protect the pipe.

It can be seen from the foregoing description that a waterproof, reinforced coating of the pipe is obtained which serves to shield the pipe from the corrosive effects of water and dissolved substances capable of reacting with the metal of the pipe proper, and also from stray electric currents, the latter result being effected by the continuity of the interposed metallic mesh which is grounded at convenient points.

It will be readily observed from the foregoing that the wire mesh serves a threefold purpose, namely:

- (1) It reinforces the asphalt or pitch covering and thus protects the pipe against the mechanical stresses produced;
- (2) It reinforces the asphalt proper and,
- (3) It provides an uninterrupted transmission line for stray currents which are thus prevented from reaching the metallic pipe proper and causing battery action which is of course highly conducive of corrosion.

Having set forth the invention, what I claim is:

1. A protected pipe line comprising a metallic pipe, an inner coating of bituminous material, a continuous winding of wire mesh carrying conductors at convenient points along the line of progress of the said pipe line, by means of which the said wire mesh windings are grounded, and an external coating of bituminous substance.

2. A protected pipe line as set forth in

claim 1 in which the coating of bituminous substance is approximately $\frac{1}{3}$ of an inch in thickness.

3. A protected pipe line as set forth in claim 1 in which the wire mesh windings overlap approximately $\frac{1}{4}$ of an inch.

4. A protected pipe line as set forth in claim 1 in which the openings in the wire mesh are approximately $\frac{1}{8}$ square inches in area.

In testimony whereof I affix my signature.
Dr. ADOLPH F. PISTOR.

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