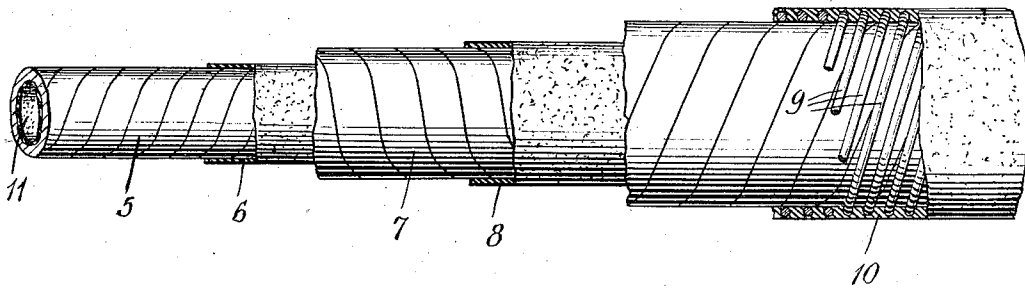


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CORROSION RESISTING CONDUIT PIPE.
APPLICATION FILED DEC. 3, 1915.

1,310,715.

Patented July 22, 1919.



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UNITED STATES PATENT OFFICE.

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CORROSION-RESISTING CONDUIT-PIPE.

1,310,715.

Specification of Letters Patent.

Patented July 22, 1919.

Application filed December 3, 1915. Serial No. 64,938.

To all whom it may concern:

Be it known that we, CHARLES ALBERT ROSE and GUSTAVE MONRATH, both citizens of the United States, residing, respectively, at Perth Amboy, county of Middlesex, State of New Jersey, and Chuquicamata, Chile, have invented certain new and useful Improvements in Corrosion-Resisting Conduit-Pipes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in conduit pipes, intended particularly as a substitute for metal pipes having a lining of lead or other corrosion-resisting material. Conduit pipes constructed in accordance with the invention provide an economical substitute for the customary lined metal pipe referred to, and their manufacture is of special advantage in regions remote from distributing centers, as, for instance, in mining regions and the like, where it is of importance to have at hand available facilities for conveniently and expeditiously producing conduit pipes of different size and length to meet the varying demand.

In the figure of the accompanying drawing we have illustrated a conduit pipe embodying the present invention.

In carrying out the invention, we find it practical and advantageous to make up the main body portion of the pipe of a material such as roofing felt, "ruberoid", or the like, adapted to be cut into strips of appropriate width capable of being wound spirally into the form of a cylindrical tube 5, the edges of the convolutions of the spiral abutting against each other as the spiral is wound. The tube thus formed is thereupon given a coat 6 of asphalt or similar acid-proof and moisture-excluding viscous material having adhesive properties. It is then wrapped spirally with an outer layer 7 of the roofing felt or the like laid thereon in tubular form, as before. This second layer is then given an outer coating 8 of asphalt or the like. So also, additional spiral layers of the roofing felt or the like, and additional coatings of asphalt are applied,—usually to the ex-

tent of five or six layers,—until a composite tube of the required wall thickness is obtained.

In most instances, it will be preferable and desirable to have the spiral coils of the second layer run in a reverse direction to the spiral coils of the first layer, and so on, so that the adjacent layers of the composite tube will consist throughout of tubular coils wound spirally in opposite directions. The remaining coatings of viscous asphalt or the like serve to cause firm adhesion of the several spiral layers to each other, and the opposite direction of winding of the spirals imparts corresponding strength and resistivity to the completed product and has the general effect of counter-acting any possible tendency of the individual spirals to unwind.

It will be understood that in forming the individual spirals into tubular form, the meeting edges of the convolutions will be preferably cemented together by a suitable binding agent, which may itself be an appropriate asphalt or asphaltic compound, or which may be a suitable glue. The several spirally wound tubular layers and, indeed, the composite tube as a whole may be made by hand upon a suitable mandrel, in appropriate lengths corresponding to the requirements of use, or in greater lengths which may thereafter be cut up into smaller fractions, the material being of such a character that it can readily be subdivided into such lengths by a saw or other similar means.

After the composite tube has been made up to the desired wall thickness it is then wound with flexible wire 9 of suitable gage so as to give it an external armor which will protect it from injury from without and which will enable it to withstand heavy interior pressures. Finally, the composite tube, with its armor envelop of wire is given an interior coating 11 and an exterior coating 10 of asphalt, in any convenient manner, as, for instance, by dipping or otherwise; and, in making up the completed conduit, the pipe sections are connected up by any suitable coupling means.

In some instances, it will be desirable to form the composite tube by means of a tube-forming machine of any type appropriate

to laying the spirals with their convolutions edge to edge, suitable provision being made for applying the asphalt and for winding on the armor envelop of wire referred to.

5 Where such a machine is adapted to produce the product continuously, it may be severed into appropriate lengths for particular uses, and where the spiral layers are to be wound in opposite directions, as preferred, each layer will, of course, be wound
10 by mechanism having the corresponding direction of lay of the convolutions.

It will be evident that, in the practice of the invention, it will not be necessary to
15 restrict the production of the composite product to pipes of a circular cross-section, although, for most purposes, it will be preferable to give them that conformation. So also, for the roofing felt, or "ruberoid,"
20 there may be substituted an equivalent fibrous material of a corresponding elastic character capable of bending into spiral tubular form without breaking, and adapted to cooperate similarly with the edge cementing material and the coating or lining of
25 asphalt or like corrosion-resisting and moisture-excluding viscous material. The "roofing felt" of a type particularly adapted to the practice of the invention may
30 consist of paper originally of an absorptive character, impregnated with a hydrocarbon residuum, and compacted, by means well known in the manufacture of such roofing
35 felts, into sheets of a thickness of say $\frac{1}{16}$ th of an inch, more or less, into flexible sheets which are preferably provided with irregular longitudinal surface depressions, particularly adapted to cooperation with the asphalt adhesive.

40 It will be apparent that, for the uses of the invention, it will be sufficient to maintain in stock at the place of manufacture, a supply of asphalt, a supply of roofing felt or the like, and a quantity of the desired armor
45 wire, in addition to a supplemental edge binding or cementing material when the latter is employed. With these materials, the plant is equipped with the necessary elements to make up, at will, conduit pipe of
50 such length and diameter as may be required from time to time, and is independent of the delay, inconvenience, and expense of obtaining lined metal pipe from distant sources.

55 What we claim is:

1. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive; substantially as described.

2. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material impreg-

65 nated with a hydrocarbon residuum and compacted, adjacent spirals of the series being wound in opposite directions, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive; substantially as described. 70

3. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive and provided with an outer armor envelop of spirally wound wire; substantially as described. 75

4. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material, adjacent spirals of the series being wound in opposite directions, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive, and provided with an outer armor envelop of spirally wound wire; substantially as described. 80 85

5. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material impregnated with a hydrocarbon residuum and compacted, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive and provided with an outer armor envelop of spirally wound wire, the inner of said spirally wound layers and said armor envelop being further provided with an interior coating and an exterior coating respectively of corrosion-resisting and moisture-excluding material; substantially as described. 90 95 100

6. A conduit pipe, whose main body portion comprises a series of layers of spirally wound roofing felt with intervening coatings of asphalt and an outer protective coating of spirally wound wire; substantially as described. 105

7. A conduit pipe, whose main body portion comprises a series of layers of spirally wound roofing felt with intervening coatings of asphalt and an outer protective coating of spirally wound wire, together with an interior coating of asphalt and an exterior coating of asphalt; substantially as described. 110 115

8. A conduit pipe, having a main body portion comprising two or more spirally wound layers of elastic fibrous material impregnated with a hydrocarbon residuum and compacted, each of said layers being spirally wound in a direction opposite to that of any adjacent layer or layers and having the meeting edges of the convolutions thereof cemented together by a suitable binding agent, a coating of a corrosion-resisting and moisture-excluding viscous adhesive between adjacent layers of said elastic fibrous material, and an exterior coating and an 120 125

interior coating of a corrosion-resisting and moisture-excluding viscous adhesive on the outer and inner of said layers respectively.

9. A conduit pipe, whose main body portion comprises a series of spirally wound layers of elastic fibrous material, combined with intervening coatings of a corrosion-resisting and moisture-excluding viscous adhesive and provided with an outer armor envelop of spirally wound wire, said armor envelop being further provided with an

exterior coating of corrosion-resisting and moisture-excluding material; substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES ALBERT ROSE.
GUSTAVE MONRATH.

Witnesses:

JOHN C. PENNIE,
G. W. JÖRGENSEN.