Nov. 12, 1929. A. S. CUSHMAN 1,735,732

PROCESS OF PROTECTING METAL CULVERTS

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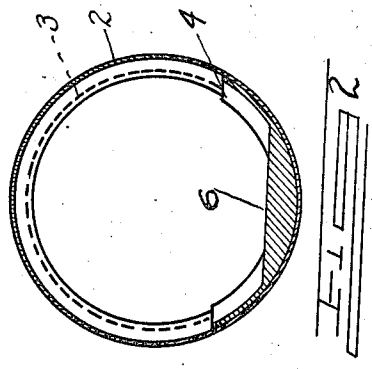


FIG. 2

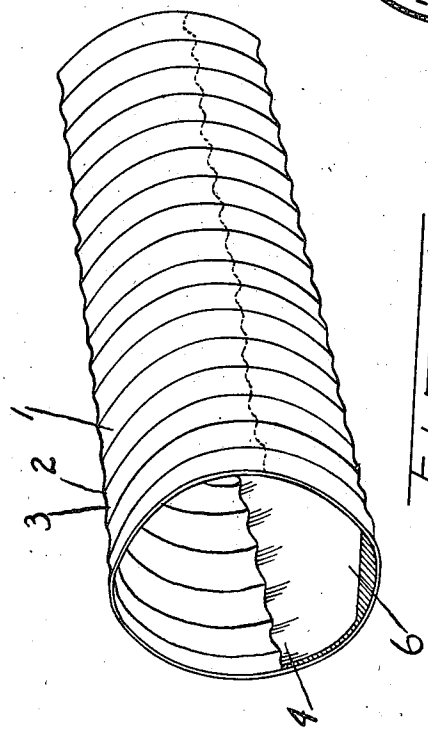


FIG. 1

INVENTOR.

BY

ATTORNEYS.

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1,735,732

UNITED STATES PATENT OFFICE

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PROCESS OF PROTECTING METAL CULVERTS

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My invention relates to the protection of sheet metal culverts of the corrugated cylindrical type.

In a study of the causes of defects in corrugated sheet metal culverts, particularly where the same are protected by a galvanized coating, it has been discovered that the defects arise not through deformation of the pipe, which of itself enables the pipe to sustain the unequal load of a fill of earth and rock, but through a failure of the pipe along the bottom central line thereof, from erosion and corrosion. At this line, particularly along the crests of the corrugations toward the side from which flow comes into the culvert, the result of abrasion and chemical action of waters, wears away and corrodes the metal. In galvanized culverts the galvanizing is first worn off along the crests of the corrugations resulting in an abrasion from which progressive deterioration starts.

Efforts have been made to eliminate the corrugated lower portion of a culvert pipe of the type noted, by casting or molding a lining into the pipe of concrete, or other cementitious material, and also by placing smooth surfaced inserts of metal into the corrugated pipes, thereby avoiding the interruptions of the corrugations to the stream in the pipe.

I have developed a type of culvert in which an asphaltic paint of elastic, and closely adherent nature is employed for the purpose of protecting the inside of such a pipe, and have discovered a process of applying protective layers of adhesive, resilient substances to the insides of pipes which permits of the rapid, and inexpensive protection of the same, at the points of wear and nowhere else.

I accomplish my objects by that certain process to be hereinafter more specifically pointed out and claimed.

In the drawing, Figure 1 is an illustration of a culvert in perspective illustrating the product of my invention.

Figure 2 is a cross section of the culvert.

It will be noted of the culvert that it has a body 1, with corrugations having crests 2, and depressions 3, said corrugations formed circumferentially of the pipe. The protective layer is confined to the lowermost portions of the culvert, and lies in a thin film 4, at the sides, while at the base of the culvert lengthwise thereof, it forms a level floor 6, which fills the depressions of the corrugations leaving a non-obstructive surface to the flow of water and abrasive materials through the pipe.

By employing an asphaltic substance which is quite liquid when hot, and a suitable spray pipe I flow the liquid asphaltic substance into the pipe so as to impinge across the area to be covered. The pipe is naturally comparatively cool, and the asphalt when it strikes the pipe adheres to it in a film, permitting the excess to flow to the bottom of the pipe.

The pipe is supported horizontally during this spraying or sprinkling, and the excess thus forms in a pool lengthwise of the pipe.

The material is so cooled by the culvert pipe itself that it rapidly becomes sufficiently solid to permit of the pipe being removed, and placed to one side until the asphaltic substance is completely cooled and solid. The essential of my process is the fact that the pipe is corrugated circumferentially and is held horizontally while the bitumen solidifies. It cannot run out of the corrugations in such conditions. The spraying or flowing or dipping may be used as convenient.

In some instance I may dust the surface of the asphaltic body with a suitable lubricant dust, such as mica, in order to protect it in shipment from adhering to nested bodies and the like.

In this simple way I am enabled to fully protect the culvert against abrasion from particles carried in the waters which are conducted thereby, and in addition protect the metal or the galvanized coating thereon from chemical action and corrosion, without use of any more materials than are necessary.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A process of protecting circumferentially corrugated culverts of sheet metal which consists in flowing into the culvert when laid horizontally, a heat liquefied body consisting of an asphaltic substance in suf-

ficient quantities and of a consistency to flow and collect in a pool or pools along the bottom center line of the culvert, of sufficient depth to level off the corrugations along said bottom center line, and then permitting the asphaltic substance to solidify, while holding the corrugated culvert horizontally.

2. A process of protecting circumferentially corrugated culverts of sheet metal which consists in flowing into the culvert when laid horizontally, a heat liquefied body consisting of an asphaltic substance, in sufficient quantities and of a consistency to flow and collect in a pool or pools along the bottom center line of the culvert of sufficient depth to level off the corrugations along said bottom center line, and then permitting the asphaltic substance to solidify, while holding the corrugated culvert horizontally, the area of original contact of the asphaltic substance being sufficient to leave the lower portion of the sides of the culvert adjacent to the pool or pools covered with an adherent film of said asphaltic substance from which the excess has flowed to the center.

ALLERTON S. CUSHMAN.