Aug. 28, 1951 C. M. OSTERHELD 2,566,138

ANTICORROSION TANK

Filed Nov. 20, 1944

Fig. 1

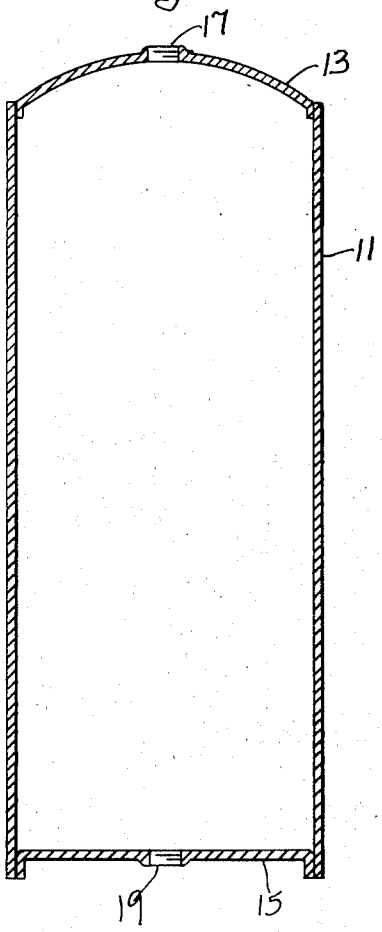
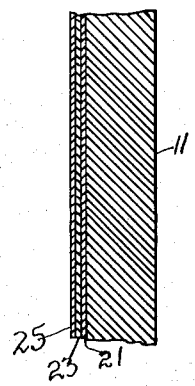


Fig. 2



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ANTICORROSION TANK

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2 Claims. (Cl. 117—71)

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My invention relates to iron hot water tanks and particularly to means for rendering the same resistant to corrosion.

One object of my invention is to provide relatively simple, but effective, means for preventing corrosion of an iron hot water tank adapted to contain potable water.

Other objects of my invention will either be evident from a description of one form of tank embodying my invention, or will be pointed out in the course of such description and set forth in the appended claims.

In the drawings,

Figure 1 is a vertical, sectional view through an ordinary domestic hot water tank, and,

Fig. 2 is a fragmentary view of an enlarged scale, showing a plurality of coats of paint applied to the inside surface of the tank.

At the present time an ordinary domestic hot water tank installed in homes is provided with a coating of galvanized zinc applied to the inner surface, as well as to the outer surface, by the so-called "hot dip" method. It is very difficult, if not impossible, to provide an imperforate zinc coating on the inner surface of a tank for the reason that the molten zinc contains other ingredients in the form of impurities, and further that a flux is provided to cover the surface of the molten zinc in the tank, and the result is that the zinc coating is perforate.

The water, while potable, may be acidic, or alkaline, or saline; and the degree of acidity, or alkalinity, or salinity, while variable, is still small enough to make the water potable. If now the tank is filled with any one or a combination of the three different kinds of water, a galvanic action will occur between the zinc at the edge of the zinc coating surrounding a perforation where the iron is not covered by the zinc. This will cause dissociation of the zinc, which will continue with an attendant increase in the size of the opening where the water contacts directly the iron surface of the tank. Since the zinc coating is in direct contact with the inner surface of the iron tank, there is little, if any, resistance to the flow of current from the zinc through the water, and into and then through the tank at any or all perforations in the zinc coating. As the zinc is dissociated, with a consequent increase in the size of the perforations in the zinc, the flow of current from the zinc is through only a relatively very short distance from the edge of the zinc coating to the iron, whereby the flow of protective ions from the zinc to the iron will not occur except at the edge of the zinc, so that a flow of iron ions into the liquid will take place.

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Referring now to Fig. 1 of the drawings, I have there shown an ordinary hot water tank 11, made of iron, have a closure member 13 secured to the upper end thereof, with an opening 17 centrally therein for a hot water outlet pipe. I provide further a lower closure member 15, having a central opening 19 therein to receive a cold water inlet pipe, all in the usual manner.

Referring now to Fig. 2 of the drawings, I have there shown a small part of the wall of tank 11, and I have further shown the inner layer of hot-dipped galvanized zinc 21. It is obvious that zinc is anodic to the iron of tank 11, so that the hereinbefore described effects would take place in case only a single coating of a metal anodic to iron were provided.

I provide a second coating 23 made of an aluminum paint; and I then provide thereover a third coating 25 of a magnesium paint. Coatings 23 (of aluminum) and 25 (of magnesium) are of a metallic paint and may either be sprayed on, or may be applied in substantially the following manner: the tank 11 is positioned wtih its longitudinal axis in substantially horizontal position on means permitting of rotation of the tank; a certain amount of metallic paint, comprising first aluminum, is placed within the tank 11, which is then rotated for a certain length of time.

After the application of the first layer 23 of aluminum paint, the excess is permitted to run out through either opening 19 or 17, after which the paint is permitted to dry and is then baked on at a temperature on the order of 300° F. for a length of time on the order of 30 to 45 minutes.

After this, a second coating of magnesium paint may be applied in substantially the same manner and is then baked on in substantially the same manner as was hereinbefore described for coating 23.

The thickness of any one coating of paint may be on the order of several thousandths of an inch, and I may use several layers of coatings in succession, drying and baking them on one after the other. I may also use a plurality of layers of aluminum paint, applied as described above, instead of a plurality of layers of different kinds of metallic paint.

As has been hereinbefore stated, zinc is anodic to iron, and so also is aluminum, which is also anodic to zinc. Magnesium is anodic not only to iron, but also to zinc, as well as to aluminum. The requisition being that the successive layers of metallic paint are anodic to the coating to which they are applied.

It may be here pointed out that aluminum is self-protecting when subjected to potable acidic

water; that is, it will have provided thereon a layer of aluminum oxide, which is in itself a protection against dissociation. This, of course, will occur in case of a perforation or perforations in the outermost magnesium layer, and particularly in the presence of potable, acidic water.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and all such modifications coming clearly within the scope of the appended claims shall be considered as part of my invention.

I claim as my invention:

1. An iron hot water tank having in direct contact with the interior iron surface thereof a protective lining for preventing corrosion of the interior by alkaline and acidic potable waters under varying temperature conditions, said lining consisting of a metal coating of zinc on the tank interior iron surface, an intermediate coating of aluminum paint on said zinc coating and an outer coating of magnesium paint on said aluminum coating.

2. An iron hot water tank having in direct contact with the interior iron surface thereof a protective lining for preventing corrosion of the interior by alkaline and acidic potable waters under varying temperature conditions, said lining consisting of a metal coating of zinc on the tank interior iron surface, an intermediate coating of aluminum paint on said zinc coating and an outer coating of magnesium paint on said aluminum coating, each of said aluminum and magnesium coatings having a thickness of substantially several thousandths of an inch.

CLARK M. OSTERHELD.

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