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DOMESTIC WATER HEATER

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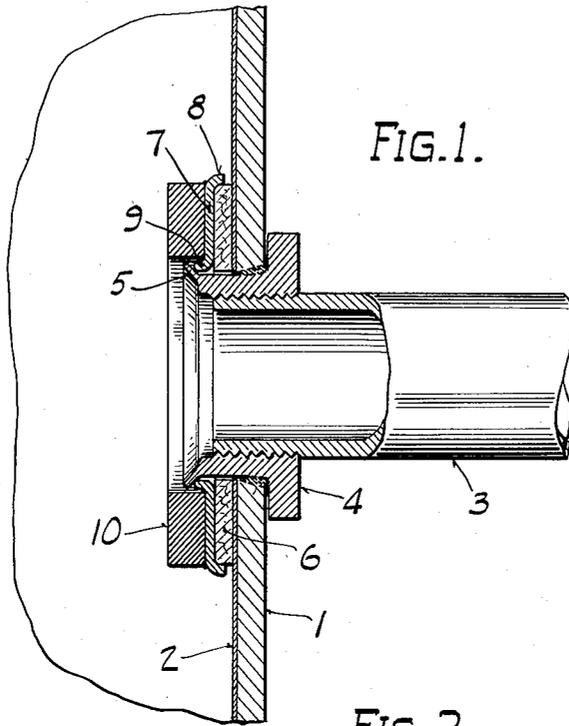
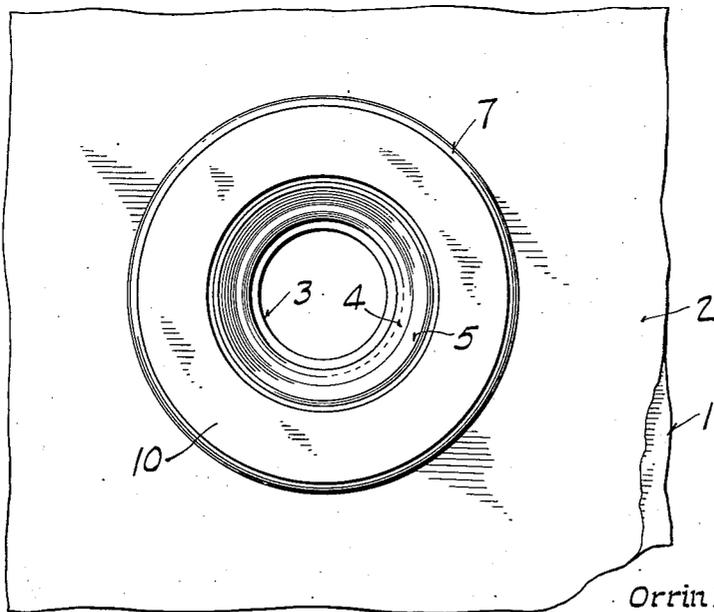


FIG. 1.

FIG. 2.



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## DOMESTIC WATER HEATER

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Application May 15, 1941, Serial No. 393,606

4 Claims. (Cl. 204—197)

This invention relates to a domestic water heater and more particularly to the protection of the tank against corrosion.

It has been specifically applied in the protecting of vitreous enamel lined tanks from corrosion at or near to the openings where a possible contact is established between the hot water and the metal of the tank. It utilizes the principle of cathodic protection set forth in my co-pending application, Serial No. 15,146, filed April 6, 1935, for Corrosion resistant metallic structures, and upon which Patent No. 2,267,361 was granted December 23, 1941.

The principal object of the invention is to provide a simple and economic means for establishing the required electrical potential in the metal wall of the tank for preventing electrolytic corrosion at possible points of exposure of the metal to the hot water.

Another object of the invention is to provide, adjacent to a pipe connection to the tank, a body of metal in electrical contact with the metal of the tank wall, and which has a higher potential in the presence of hot water as the electrolyte than the potential of metal of the tank thereby causing current to flow toward the metal of the tank through the water.

An embodiment of the invention is illustrated in the accompanying drawing in which:

Figure 1 is a section through a tank wall showing a pipe connection and anode; and

Fig. 2 is an elevation taken from inside the tank and looking directly at the anode.

In the construction illustrated, the tank wall of ordinary sheet steel has a vitreous enamel or other protective non-metallic lining coating its inner surface.

The pipe may be secured to the tank by a threaded nipple which is welded to the edge of the tank wall at an opening therethrough similar to the connection set forth in the co-pending application of Wesley G. Martin, and John H. Crider, Serial No. 335,998, filed May 18, 1940, which was issued as Patent No. 2,266,611 on December 16, 1941, and assigned to the same assignee as the present application.

The nipple has an inner lip which is bent outwardly to provide a flange holding a packing ring in place around the nipple inside the tank. The packing ring is of asbestos or other suitable material and is compressed against the enamel by a stainless steel washer, having a curved outer edge partially enclosing the edge of ring, and an oppositely curved inner edge against which flange lip presses.

For the purpose of providing the cathodic protection referred to, a large zinc ring is soldered or otherwise secured to the washer and extends out into the water in the tank, presenting a substantial area of surface exposure. Instead of zinc, other suitable anodic metals or alloys might be employed.

The zinc ring is in electrical contact with the wall of the tank through the washer and nipple. The nipple is usually of stainless steel or other non-corroding material.

The size of the zinc washer should be sufficient to last either for the life time of the tank, or until suitable replacement can be made. It is preferable not to have too much surface exposure of the nipple adjacent the zinc since such exposure has a tendency to effect a corroding away or dissolving of the zinc. To this end, it is preferable to galvanize the washer and the nipple including lip with zinc so that they present substantially the same surface potential as the zinc ring. If desired, the pipe may be insulated from the nipple by employing a flanged connection utilizing the principle of my Patent No. 2,179,476, granted November 14, 1939.

The wall is protected from corrosion by reason of the counter electromotive force set up at the surface of any exposed area of the wall, tending to counteract the flow of current resulting from the chemical reactions of corrosion. By counteracting such current flow, corrosion of the wall is prevented.

In the process of establishing the counter potential a chemical reaction occurs at the surface of the zinc tending to corrode the latter.

The relative length of life of the zinc in any instance will vary with the impurities in the water, since different electrolytes result in different potentials for the respective metals exposed, and different rates of corrosion.

Instead of soldering the zinc ring to the washer, the ring might be threaded onto the inner end of nipple or be otherwise secured to the tank wall to provide the required protection.

Various embodiments of the invention may be employed within the scope of the accompanying claims.

I claim:

1. In a domestic water heater, a tank wall of a metal cathodic to zinc subject to corrosion when exposed to hot water and having an opening therethrough for a pipe connection, means for connecting a pipe to the wall at said opening, a non-metallic lining to protect the metal wall of the tank from corrosion, a quantity of

zinc secured to said connecting means on the inside of the tank and exposed to the water in the tank, said zinc being electrically connected to the tank wall by said connecting means, and zinc galvanizing material coating said pipe connecting means to prevent waste of the zinc from differences in electrical potential.

2. In a domestic water heater or the like, a tank wall of a metal cathodic to zinc subject to corrosion when exposed to the contents of the tank and having an opening therethrough for a pipe connection, means for connecting a pipe to the well at said opening, a non-metallic lining to protect the metal wall of the tank from corrosion, and a quantity of zinc secured to said connecting means on the inside of the tank and exposed to the fluid contents of the tank, said zinc being electrically connected to the tank wall by said connecting means.

3. In a domestic water heater or the like, a metal tank wall subject to corrosion when exposed to the contents of the tank and having an opening therethrough for a pipe connection,

means for connecting a pipe to the wall at said opening, a non-metallic lining to protect the metal wall of the tank from corrosion, and a quantity of a metal anodic to the metal of said wall secured to said connecting means around said opening on the inside of the tank and exposed to the fluid contents of the tank, said anodic metal being electrically connected to the tank wall by said connecting means.

4. In a domestic water heater or the like, a metal tank wall subject to corrosion when exposed to the contents of the tank and having an opening therethrough for a pipe connection, means for connecting a pipe to the wall at said opening, a lining of vitreous enamel for said tank to protect the wall thereof from corrosion, and a quantity of a metal anodic to the metal of said wall secured to said connecting means around said opening on the inside of the tank and exposed to the fluid contents of the tank, said anodic metal being electrically connected to the tank wall by said connecting means.

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