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A. J. KERCHER
METHOD OF MAKING TANKS

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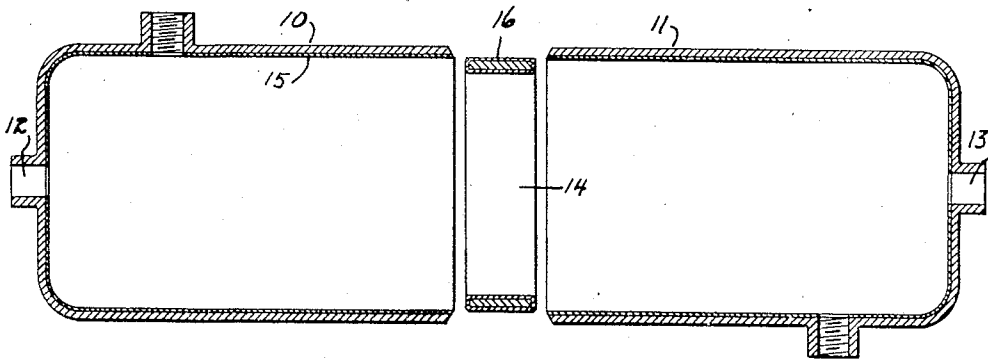


Fig. 1.

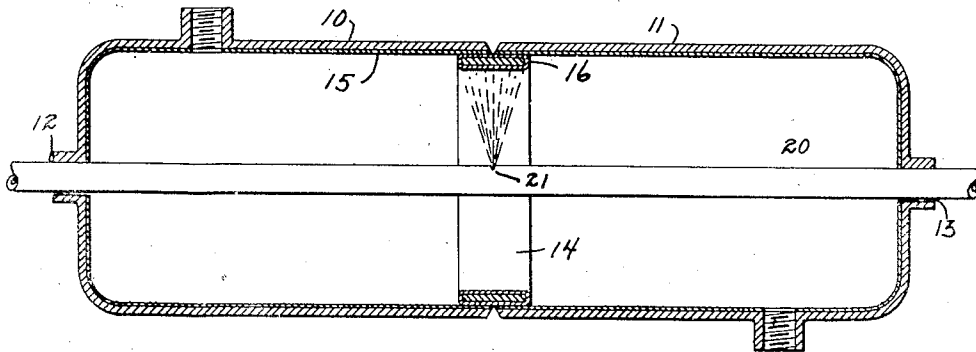


Fig. 2.

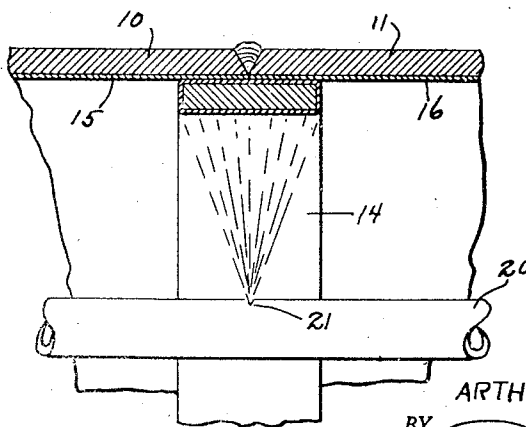


Fig. 3.

INVENTOR.
ARTHUR J. KERCHER.

BY

Paul D. Fisher
ATTORNEY.

UNITED STATES PATENT OFFICE

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METHOD OF MAKING TANKS

Arthur J. Kercher, Berkeley, Calif.

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2 Claims. (Cl. 28-143.2)

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This invention relates generally to the manufacture and construction of metal tanks and containers, and is of value where the use to which such tanks are subjected is apt to cause detrimental corrosion.

In the past non-corrodible tanks and containers have been made from relatively expensive metals and metal alloys which, as distinguished from ordinary steel, are substantially non-corrodible for the service desired. For example, copper, brass or bronze have been used to a considerable extent and more recently the so-called stainless alloys, such as Monel metal. All such metals or alloys are comparatively expensive, and, in addition, their use involves manufacturing difficulties.

It has been attempted to provide non-corrodible liners for metal tanks by enamelling the interior of the same but the same has not met with notable success. The difficulty of enamelling the interior of a metal tank after the same has been fabricated is obvious, as it is impossible to insure an even coating on the interior and inspection is difficult, if not impossible.

It is an object of the present invention to provide a simple metal tank or container which will make use of any suitable metal from which a tank or container may be made and which may be coated with an inner lining of enamel or other elastic non-corrodible material.

It is another object of the invention to provide a simple metal tank which will make use of any suitable material from which a tank or container may be made and which may be lined or coated with a metallic non-corrodible lining.

It has been attempted to provide a liner of such non-corrodible metals but the same have not met with notable success because of the manufacturing difficulties involved.

It is another object of the invention to provide a novel method of manufacture, whereby such tanks or containers can be simply made in quantities with a high degree of uniformity and without the possibility of undue stresses being applied to the lining or any defects being created in the lining during the manufacture of the tank.

It is a further object of the invention to provide a method of manufacture whereby the interior may be easily examined for purposes of inspection of the non-corrodible surface.

Further objects of the invention will appear from the following description in which the preferred embodiment of the invention has been set forth in detail in conjunction with the accompanying drawing.

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Referring to the drawing:

Fig. 1 is a cross sectional view, of the portions of a tank adapted to be joined according to the method of the present invention.

Fig. 2 is a cross sectional view of the portions of a tank which have been joined according to the method of the present invention.

Fig. 3 is an enlarged cross sectional detail of Fig. 2 showing the welding together of the two halves of the container and the method of conducting away the welding heat.

In the preferred embodiment of my invention, I have shown the tank portion as being composed of two halves or shells 10 and 11. Sections 10 and 11 may be of any suitable metal and may be formed in any conventional manner such as riveting, welding, spinning, drawing or pressing. In the end of each of halves 10 and 11 I have provided orifices 12 and 13 respectively which may be threaded for suitable connection to the piping system of which the tank is to be a unit. I have also provided an annular ring 14 made of any suitable material, preferably, however, of the same material of which the two halves 10 and 11 are made, said annular ring however being of substantially greater gauge and thickness.

The inner surfaces of shells 10 and 11 are thoroughly coated or lined with a suitable non-corrodible material to provide a non-corrodible surface 15. A suitable coating material may be enamel or any one of several materials which will form an elastic non-corrodible surface and which may be applied by brush or as a spray, including vitreous enamel. I also contemplate that a ductile non-corrodible metal lining may be used. For example, when the two halves 10 and 11 are drawn, a sheet of copper or other ductile non-corrodible metal may be drawn with them, forming a bonded metal lining. The annular ring 14 is also thoroughly coated with the same material to provide a similar surface 16, and the two halves 10 and 11 and the annular ring 14 are allowed to dry or cool depending on the non-corrodible material used. Where vitreous enamel is used the parts are treated in a suitable vitrifying oven. The non-corrodible surfaces may be inspected thoroughly during and at the conclusion of the coating operation. It is evident that when a non-corrodible metal lining is used rather than an enamel or elastic non-corrodible lining, inner ring 14 may either be coated with or may be made entirely from the non-corrodible metal.

The two halves 10 and 11 and the annular ring 14 should be so constructed that when the coating material has been applied the outside diame-

ter of annular ring 14 will be slightly greater than the inside diameter of shells 10 and 11 at their lips.

The lips of shells 10 and 11 are then heated sufficiently so that they will expand in such a manner that their inside diameter is slightly greater than the outside diameter of annular ring 14. The two shells 10 and 11 are then gently urged over ring 14 until they meet approximately as shown in Fig. 2. Care should be taken during the heating operation that the characteristics of the particular non-corrodible material are observed in order that said material will suffer no deleterious effect or lose its non-corrodible characteristic upon cooling.

The two halves 10 and 11 are then allowed to cool and their lips to contract snugly about annular ring 14. As shown, all of the surfaces with which water or other liquid placed within the tank may come in contact, are surfaced with non-corrodible material.

I then mount the semi-finished tank upon a pipe 20 which is of slightly smaller diameter than the inside diameter of orifices 12 and 13. Pipe 20 has an orifice 21 through which water under pressure may be sprayed. The tank is then slowly rotated on pipe 20 and water is forced through orifice 21 in such a manner that it will impinge against the inner surface of annular ring 14, as shown, preferably at its uppermost point. The two shells 10 and 11 are then welded together as the tank rotates. The welding torch or other welding medium is preferably operated just in advance of, in the path of rotation, the water spray from orifice 21. The purpose of the water spray is to cool the annular ring 14 and thereby conduct away the welding heat.

When the weld has been completed, a cross section thereof will resemble Fig. 3 as shown. It will be noted that the two halves 10 and 11 have been welded together and that the weld has not destroyed any of the non-corrodible surface. If, perchance, some of the non-corrodible surface immediately adjacent the weld should be damaged, the material immediately adjacent thereto will fuse and unite with the surface of the annular ring 14 thereby presenting a non-corrodible surface at all points within the tank.

The water entering through orifice 21 may possibly be sufficient to fill the tank. However, it should be noted that orifices 12 and 13 are slightly larger than pipe 20 and the surplus

water may vent through the orifices 12 and 13.

In the design of particular tanks, other orifices 25 and 26 may be provided but their provision in no way alters the manufacture of tanks according to my invention.

It is to be understood that the particular shape or form of tank manufactured in no way affects the application of my invention and that the same may be used in any number of ways according to shop practice and mechanical expediency.

I claim:

1. In a method of manufacturing enclosed tanks, lining two portions adapted to be joined with an elastic non-corrodible material to form a complete tank, each portion consisting of an end wall and a cylindrical side wall, coating with a non-corrodible material an annular member adapted to fit within said portions at their joint, the inner diameter of said lined portions being less than the outer diameter of said coated member, heating the open ends of said portions to expand the same and fitting them over said annular member whereby when cooled they will form a tight bond therewith and present a seam adapted to be welded, cooling and contracting said open ends snugly about said annular member, mounting said assembly for rotation, rotating said assembly, welding the said portions at their seam, and spraying water upon said annular member immediately behind the point in the path of rotation at which the welding heat is applied to dissipate said welding heat to prevent said non-corrodible lining from being heated to its fusing point.

2. In a method of manufacturing enclosed containers, lining two portions adapted to be joined with an elastic non-corrodible material, coating with a non-corrodible material an annular member adapted to fit within said portions at their joint, the inner diameter of said lined portions being less than the outer diameter of said coated member, heating and expanding the open ends of said portions and fitting the same over said annular member whereby when cooled they will form a tight bond therewith, cooling and contracting said open ends snugly about said annular member and finally welding said portions where they join over said annular member and cooling said welded portions and dissipating the welding heat whereby said non-corrodible lining and coating will not be injuriously affected.

ARTHUR J. KERCHER.