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OUTLET CONNECTOR FOR TANKS

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Fig. 1.

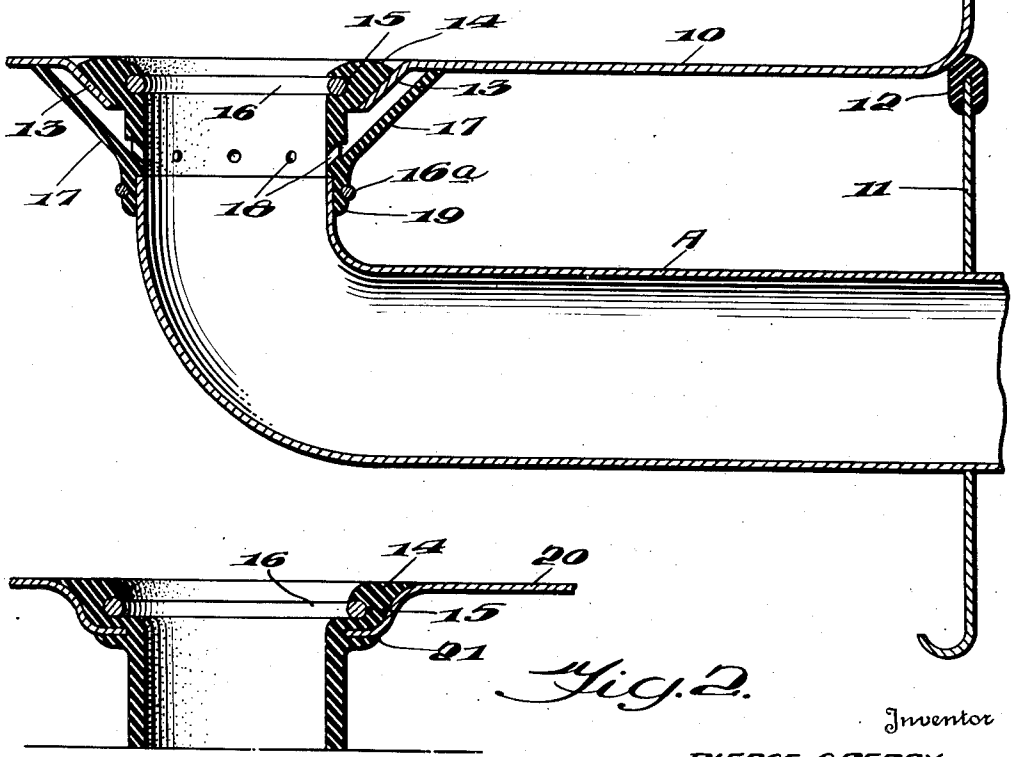


Fig. 2.

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OUTLET CONNECTOR FOR TANKS

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3 Claims. (Cl. 285—90)

This invention relates to connectors for connecting liquid tanks of various kinds to outlet connections such as pipes, valves and the like.

It will be appreciated that such tanks are usually associated or connected with apparatus in which the liquid in the tanks is used. Further, it will be appreciated that often such tanks are used apart from the apparatus and are supported independently or by means not always in accurate alignment with the associated apparatus.

The comparative recent development in ceramics in which the physical properties of vitreous enamel have been vastly improved has provided tanks of light steel covered with vitreous enamel which has largely replaced tanks of copper, zinc and cast iron of higher costs and lower utility. Such tanks have invaded the plumbing field and have been utilized for such plumbing fixtures as bath tubs, sinks and lavatories. These tanks of light steel covered with thin coatings of vitreous enamel have one serious weakness—that is, their liability to chip when subjected to sharp bending stresses and shocks. This weakness frequently is encountered as a result of the outlet piping connections which, as aforesaid, are not always mounted in accurate relationship with the associated apparatus. The condition is further aggravated by the fact that tanks of light steel when coated with vitreous enamel often are warped or distorted as a result of the necessary high enamelling heat.

To combat the conditions as above outlined, designers and engineers have developed connector structures wherein the connections are made on a tapered wall outlet opening in the tank. The connector contacts have been usually made by soft lead washers associated with zinc die castings. This connection provides considerable structural adaptability and fit in the joint between the comparatively fragile vitreous tank and the connections. However, even with all this ingenuous high cost construction expensive failures have occurred, that is, the enamel in the tank is cracked at the joint and rust and failure ensue.

The present defense armament program has limited the use of certain strategic materials and among these zinc is most critical. This has had the effect of seriously handicapping many non-defense industries whose products involve the use of such materials.

It is the principal object of this invention to provide more effective connector means for light vitreous enamel tanks or the like not utilizing zinc or non-ferrous metal parts, and at the same time providing greater adaptability to non-uniform conditions and less liability to damage from dangerous stresses.

Other objects and benefits will be disclosed in the various descriptions and drawing showing my novel connector adapted to a conventional washing machine tub as illustrative of my invention.

Figure 1 is a broken cross sectional elevation view of the corner of a washing machine tub showing a drain opening and my novel rubber connector; and

Figure 2 is a broken cross sectional elevational view of another form of connector as will later be explained.

Now, referring to Figure 1, I designate the washing machine tub by the numeral 10. This tub is normally about 23 inches in diameter and 15 inches high. The drain openings are usually about 6 inches inward from the wall of the tub as is well shown in Figure 1. The common practice from the drain openings in the bottom of the tub is by a conical wall opening 13. In this conical opening I insert my rubber connector consisting of an upper section 14 having a recess 15 to accommodate a metal lock ring 16. On the outer side of the connector is a conical outer wall 17 and on the bottom is a ring section 19. In the opening of the section 17 and the main body of the connector are drain holes 18 which serve to drain any leakage between the section 14 and the conical wall opening 13. In the rim section 19 I show a light steel pipe fitting A which is firmly attached to the connector by means of a grip ring 16a as shown. This drain tube A passes through an opening in a base band 11 which supports the tub 10 by contact with the rubber ring 12, as shown. The entire washing machine structure is supported from the base band 11 by conventional legs not shown, and it will be appreciated that any stresses from the legs transmitted through the member A would have no effect on my rubber connector because of the flexibility of the mounting. Contrarywise, if such connections were made by the conventional method, that is, by zinc die castings, such stresses would be immediately transmitted to the connection and liability of damage by chipping enamel from the conical walls 13 would ensue.

Now, referring to Figure 2, I show another form of connector wherein a tank 20 is provided with a flat drain hole section 21. The section 21 being joined to the bottom of the tank 20 by

easy curves as shown. The rubber connector member is somewhat differently formed, but has the conventional upper section 14, the ring opening 15 to accommodate an expanding steel grip ring 16. As is the case in Figure 1, the entire cross sectional area of my connector is formed in such a manner that installation of the connector with the drain opening is easily made by collapsing the connector. In Figure 2 I have shown no drain connection to the connector, and it will be understood that I contemplate various forms of connections to adapt my connector to many types of apparatus as will be well understood.

It will be appreciated that I design my connector member in a form whereby as the connector expands after being collapsed in the drain opening, the flange sections firmly grip the walls of the outlet to make a tight connection therewith.

Having thus explained the invention, I now claim as new:

1. In a connector for attachment to flanged outlets of tanks, a flexible tubular connector member adapted to be collapsed and inserted within the outlet, flanges on the tubular member adapted to expand from collapsed condition to open condition with the flanges in gripped, sealed contact with both sides of the tank outlet flange, an inner recess in one of the connector flanges accessible from inside of the tank, and an expansion ring adapted to be collapsed and inserted within the recess to lock the flanges in sealing contact with the tank outlet flange when expanded.

2. In a connector for attachment to flanged outlets to tanks, a flexible tubular connector member adapted to be collapsed and inserted within the outlet, flanges on the tubular member adapted to expand from collapsed condition to open condition with the flanges in gripping, sealed contact with both sides of the tank flange, and an expansion ring insertable from inside the tank to lock the connector flanges in sealing contact with the tank outlet.

3. In a connector for attachment to walled outlets of tanks, a pliable tubular member adapted to be collapsed and inserted within the outlet, flanges on the tubular member adapted to expand from collapsed condition to open condition with the flanges in gripping, sealed contact with both inside and outside of the tank outlet walls, and expansion ring means appliable after connetcion of the tubular member with the walled outlet to lock the flanges in sealed contact with the tank outlet walls.

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