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GUARD RING AND METHOD OF MAKING

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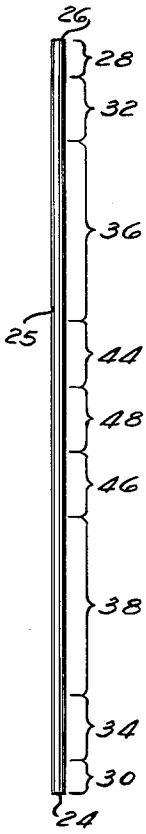


Fig. 4

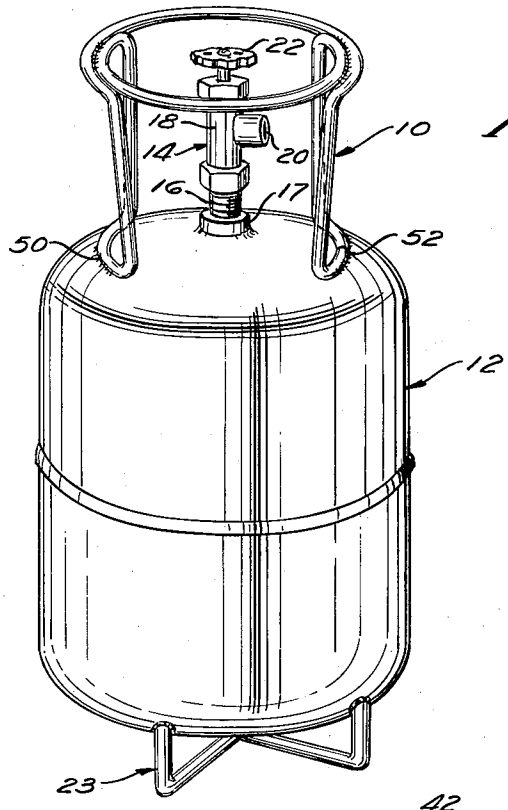


Fig. 1

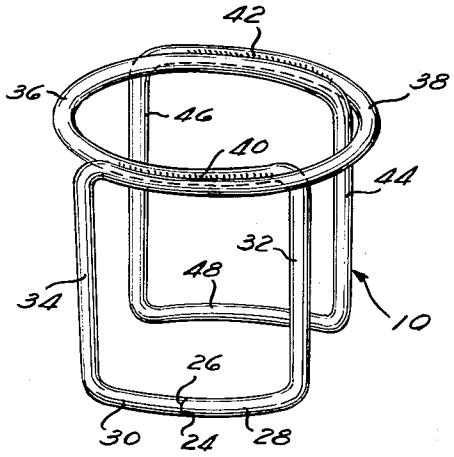


Fig. 2

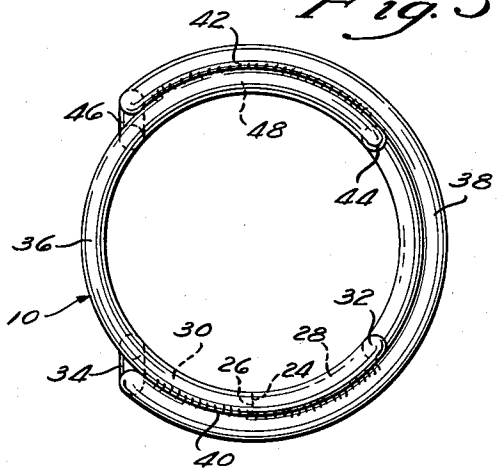


Fig. 3

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GUARD RING AND METHOD OF MAKING

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This invention relates to a container and more particularly to a protective guard applicable to such container for preventing damage to more fragile parts associated therewith.

In the provision of liquified petroleum gas for domestic applications it has become customary to contain the same in manually portable steel containers having a filling and dispensing valve mounted thereon. For protecting such valve against damage resulting from impact it has been customary to provide a continuous cylindrical member enclosing the valve and secured at one end as by welding to the container, with the remaining end open for accessibility to the valve. Such a cylindrical member is apertured to accommodate gas lines leading from the tank.

In accordance with this invention a simplified guard is established by a single straight rod of material formed to provide base portions attachable to a tank along the length thereof and a pair of mating portions to form a circumferentially continuous guard ring spaced from the base portions by a plurality of stanchions also formed from the rod. The more fragile portions of the valve apparatus of the invention are disposed within the region circumscribed by the guard ring and adjacent stanchions whereby impact against the valve apparatus by large, blunt objects is prevented since the guard ring or stanchions are interposed into any possible path of such objects.

It is an object of this invention to form a composite member to facilitate handling of liquified petroleum containers and to provide a simplified and effective guard for fragile parts associated therewith.

It is another object of the invention to provide a novel construction for a composite handle and guard member for a liquefied petroleum container.

It is another object of this invention to provide an open framework guard member for a liquified petroleum container providing complete peripheral protection for the fragile elements thereof against impact with large objects.

It is another object of this invention to facilitate the construction of a protective guard for a liquified petroleum container from a single length of rod stock.

Other and further objects and advantages of this invention will become apparent from a detailed description thereof taken with the accompanying drawings in which:

Figure 1 is a perspective view showing the guard of this invention as applied to a pressure tank,

Figure 2 is an enlarged perspective showing the guard of this invention as the same is applied to a liquified petroleum container,

Figure 3 is a plan view of the guard of this invention, and

Figure 4 is a side view of a straight piece of stock material from which the guard member is formed and is labeled to indicate the corresponding guard member portions.

Referring now to the drawings, 10 represents generally

the guard member of this invention applied to a liquified petroleum container represented generally at 12 and having a filling and dispensing valve apparatus shown generally at 14 which is enclosed and protected by the guard member 10. The valve apparatus includes a nipple 16 threadedly engaging a raised internally threaded base 17 which is welded into an opening of the container 12. Nipple 16 provides communication between the interior of the container 12 and a valve 18 which is provided with an opening 20 selectively made communicable with a source line for receiving liquified petroleum under the control of valve 18 actuated by a handle 22 or which may be made communicable with a receiving line for dispensing liquified petroleum for final use thereof. Container 12 is preferably provided with a base 23 constructed in accordance with the invention disclosed in patent application of Louis B. Courtot and George E. Tanker, Serial No. 665,761, filed June 14, 1957 and assigned to The Weatherhead Company, Cleveland, Ohio.

The length of nipple 16 as it extends away from the body of the container is large as compared with the length thereof in engagement with the wall of the container. Accordingly, lateral forces against the handle 22 or valve 18 would tend to break the nipple 16 across the threads therein or cause a leak through the threads by distorting same. Guard member 10, completely surrounding the valve apparatus provides a highly desirable and protective guard about the valve apparatus to prevent damage that may be wrought thereto by any impact or other force thereagainst.

As seen clearly in Figure 4 of the drawings guard member 10 is formed from a single length of rod 25 bent to form the several arcuate and straight portions of the guard member shown in Figures 1, 2 and 3. In forming guard member 10, the respective ends 24 and 26 of rod 25 are in endwise abutment with each other and the remaining portions of the rod are curved and formed to provide the finished guard member as shown. Portions 28 and 30 near respective ends 24, 26 of the rod are curved slightly through an arc of approximately 45 degrees whereby the two portions together form an arcuate base portion of approximately 90 degrees extent. At each end of the base portion 28 and 30, the rod extends upwardly to form a pair of stanchions 32 and 34 the respective upper ends of which are curved to form the ends of respective mating arcuate guard ring components 36 and 38 each of approximately 270 degrees extent. Each of the guard ring components has a non-overlapping portion of approximately 90 degrees extent substantially diametrically opposed. Along overlapping portions, the guard ring components are preferably secured together as by welding along portions 40 and 42 thereof to provide added strength and rigidity thereto. Each end of the guard ring components remote from the stanchions 32 and 34 extends downwardly to form another pair of stanchions 44 and 46 which terminate in the ends of another integral base portion 48 diametrically opposed from base portions 28 and 30 and of approximately 90 degrees arcuate extent.

As seen more clearly in Figure 3 of the drawings, portions 28, 30, 36 and 48 are concentric and have the same radius of curvature and portion 38 is concentric with portions 28, 30, 36 and 48 but of a larger radius of curvature whereby stanchions 32 and 44 extending between portion 36 and portions 28 and 48, respectively, are substantially vertical. Stanchions 34 and 46, however, extend between portions of unlike radii of curvature and deviate from a perpendicular position slightly.

According to the method of this invention, the rod 25 is bent to form mid-portion 48 and the same is arcuately formed to contact the tank 12 about an upper portion

thereof and the ends of the rod 25 extending away from portion 48 are bent at right angles upwardly and away from the plane of mid-portion 48 to form the two stanchions 44 and 46. As the next step in this method, the two remaining portions of the rod adjacent to the stanchions 44 and 46 are bent into intermediate arcuate portions 36 and 38 which are of substantially 270 degrees extent and portions thereof are in overlapping relation with respect to each other and lie in the same plane whereby portion 38 is of slightly greater radius of curvature than portion 36. Continuing with the formation of the guard ring, the remote ends of the arcuate portions 36 and 38 are bent downwardly away from the plane of these portions and extend in substantially a straight line to the plane of portion 48 to form stanchions 32 and 34 and where the same are further bent and formed into portions 28 and 30 extending along an arcuate path symmetrically disposed with respect to portion 48 and of the same radius of curvature. The portions 28 and 30 are of substantially equal length and are brought into endwise abutment with each other. As final steps of this method, the overlapping portions of 36 and 38 are welded together as at 40 and 42 and the portions 48 and 28, 30 are welded to the tank 12.

In assembled position of guard member 10, the base portions 28, 30 and 48 are secured as by welding to the container 12 as shown at 50 and 52 in Figure 1. In this position, ready access to the valve apparatus is facilitated while the same is protected in the manner already pointed out. The guard member also provides a convenient handle for carrying the container.

In the forming of the guard member 10, the rod ends need not be secured together since the base portion is secured to the container. The junctions between arcuate portions and stanchions are well rounded to facilitate formation of the guard to improve the appearance of the guard.

It is observed that a protective guard for pressure tanks made in accordance with the herein disclosed invention is effective in shielding or protecting the valve apparatus of such a pressure tank and furthermore that such a guard provides an effective handle for carrying or otherwise manipulating the tank.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. A guard member for an upstanding valve mounted on a domed space of a tank comprising a pair of curved portions each of substantially 270 degrees extent in radial overlapping engagement with each other, said curved portions having a circumferentially continuous surface in a plane, a plurality of stanchions integral with the ends of said curved portions extending away from the plane of said surface and into engagement with said tank, a pair of said stanchions being integrally joined along an arcuate base of substantially the same radius of curvature as one of said portions, another pair of said stanchions terminating in a base along an arc of substantially the same radius of curvature as said one base and each of said bases being secured to said tank.

2. A valve guard ring for a metal tank having a valve projecting from one end thereof comprising a length of rod stock having a mid-portion thereof bent in arcuate form to provide a base connected to the tank, a pair of intermediate portions of said rod spaced from respective ends of said mid-portion and bent in overlapping arcuate form to provide a ring in a plane adjacent the projecting end of the valve, a pair of sections adjacent respective ends of said rod being bent to form another arcuate base connected to the tank in the plane of said mid-portion and a plurality of further substantially straight portions of said rod extending between the ends of said intermediate portions and the ends of said bases formed by said mid-portion and said end sections to form stanchions to support said ring.

3. A valve guard ring according to claim 2 wherein said intermediate portions lie in arcs of concentric circles and said pair of said stanchions are substantially perpendicular to the plane of said ring.

4. A valve guard ring according to claim 2 wherein the radius of curvature of said bases formed by said mid-portion and said end portions is substantially equal to the radius of curvature of one of said intermediate portions.

5. A valve guard ring according to claim 2 wherein said intermediate portions of said rod overlap along symmetric and diametrically opposed lengths and the arcuate extent of said overlapping lengths is approximately 90 degrees.

6. A method of forming a guard ring for a metal tank having an outwardly disposed valve comprising the steps of bending a mid-portion of a straight rod into an arcuate section in a predetermined plane, extending the sections of said rod on each side of said mid-portion in the same direction away from said plane to a predetermined distance to form a pair of stanchions, bending the portions of said rod adjacent to said stanchions in opposite directions along arcuate paths of substantially 270° lying in a plane parallel to said predetermined plane to form a ring, extending the portions of said rod adjacent to said ring away from the plane of said ring and toward said predetermined plane to form another pair of stanchions and extending the remaining portions of said rod adjacent to the other pair of stanchions along an arcuate path in said predetermined plane and into endwise abutment with each other.

7. A method of forming a guard ring for a metal tank having an outwardly disposed valve comprising the steps of forming a mid-portion of a straight rod into an arcuate section in a predetermined plane, extending portions of said rod between said mid-portion and respective ends thereof in the same direction along substantially straight lines and away from said plane a predetermined distance, bending portions of said rod between said straight portions and respective ends thereof in opposite directions along overlapping arcs in a plane parallel to said predetermined plane, bending the portions of said rod between said overlapping arcs and the ends thereof away from the plane of said arcs and toward said predetermined plane, bending the remaining portions of said rod along an arcuate path in said predetermined plane and into abutment with each other and securing said overlapping portions to each other and securing said arcuate portions in said predetermined plane to a metal tank about a valve extending therefrom.

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