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FILLER OPENING FOR CONTAINERS

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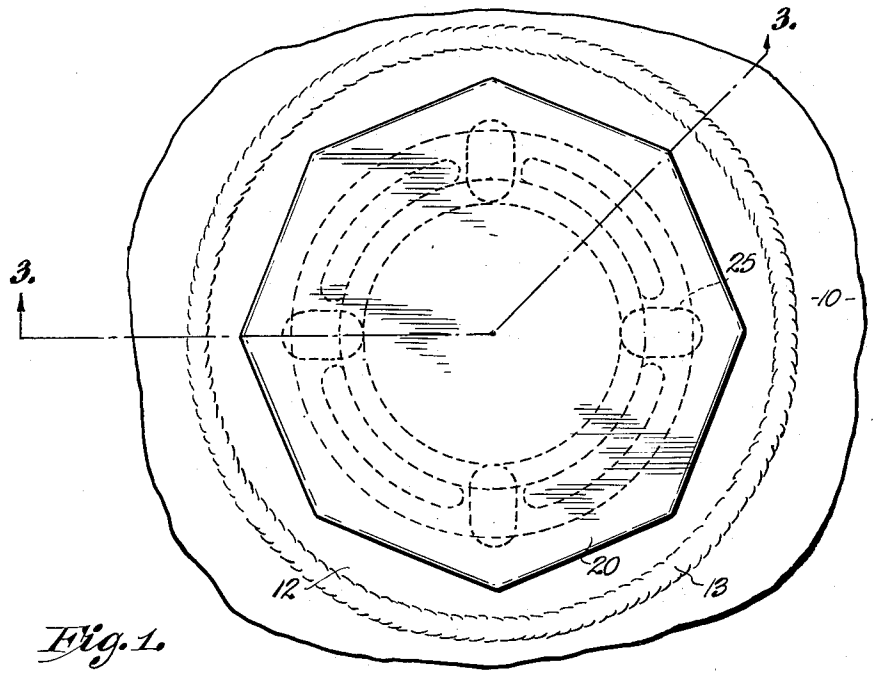


Fig. 1.

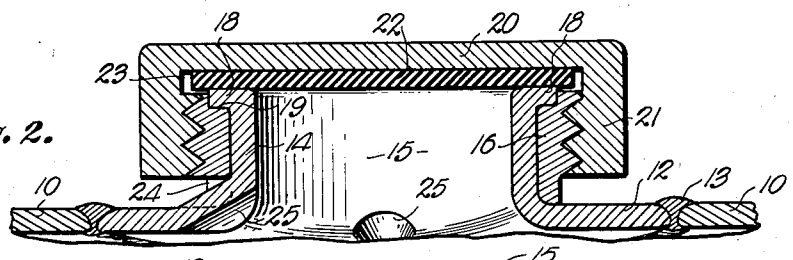


Fig. 2.

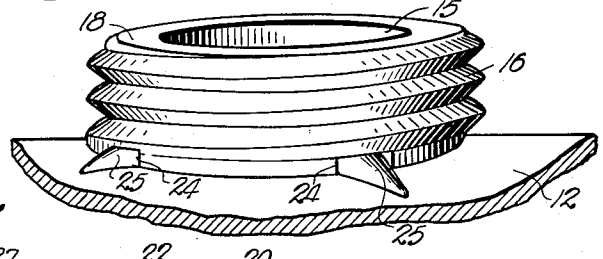


Fig. 3.

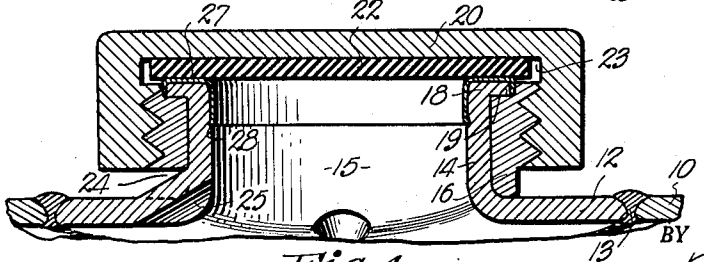


Fig. 4.

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FILLER OPENING FOR CONTAINERS

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8 Claims. (Cl. 220—39)

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The present invention relates in general to filler openings for drums, barrels, casks and analogous vessels, and it deals more particularly with an improved filler opening or spout for vessels constructed of aluminum or similar light metal.

Containers constructed of such material have a number of advantages that make them highly desirable for the storage and transportation of various liquids. Their lightness in weight facilitates handling and is an important factor in reducing transportation costs. Being relatively immune to breakage, they require very little maintenance. Also of considerable importance is the fact that aluminum and similar light metals are highly resistant to corrosion by chemicals and liquids of acid nature, and thus result in virtually no contamination of the contained liquids through reaction therewith.

In order to take full advantage of the latter characteristic, it is essential, of course, that all inner surfaces of the container and all appurtenant surfaces which come into contact with the liquid should be formed of the same chemically inert metal, and it is an important object of the present invention to provide a filler opening whose liquid-engaging surface satisfies these requirements.

More particularly it is an object of the invention to provide a filler opening having a neck to receive a removable closure cap, the neck being lined with relatively light, soft metal such as aluminum yet being mechanically strong and protected against injury such as might otherwise occur, for example, through the alternate tightening and loosening of the cap in normal service.

To this end the invention contemplates the provision of (1) a neck-type filler opening or spout integral with the body of the container and made of the same material, and (2) a reinforcing collar of relatively stronger, wear resistant material closely encircling the neck, the collar being externally threaded to receive the closure cap, or the cap and collar having other suitable intermeshing elements for drawing the cap into closing relation with the neck. Because of the torque and other stresses imposed upon the collar in the course of tightening and loosening the cap, an important feature resides in the structural arrangement for securely anchoring the collar to the neck.

It is sometimes found that where the upper edges of a neck-type filler opening are of soft metal, the gasket of a screw cap used to close the opening will, over a period of time, cause sufficient abrasive wear on those edges to prevent proper

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sealing. Moreover, the soft metal is subject to scoring, denting or deformation as a result of the insertion of a funnel, hose or nozzle in the course of filling or draining the container. Accordingly, a further object of the invention is to provide a filler opening having its upper edges and adjacent inner surfaces protected from abrasive wear and other damage incident to normal use of the container. A feature in this connection resides in the provision of a wear resistant facing and lining member for the filler opening.

Other and further objects of my invention together with the features of novelty will appear in the course of the following description.

In the accompanying drawings which form a part of the specification and are to be read in conjunction therewith, and in which like reference numerals are employed to identify like parts of the various views:

Fig. 1 is a plan view of a filler opening for a metal drum or like vessel sealed with a screw cap, only a fragmentary portion of a vessel wall being shown,

Fig. 2 is a cross section taken along the line 2—2 of Fig. 1 in the direction of the arrows,

Fig. 3 is a perspective view of the filler opening or spout with the cap removed, and

Fig. 4 is a cross section similar to Fig. 2 showing a modified form of the invention.

Referring more particularly to Figs. 1 to 3, the numeral 10 identifies a small section of the wall of a drum, barrel, cask or the like, this wall preferably being made of aluminum or other light metal which is chemically inert to the material to be stored or shipped in the vessel. A plate 12 formed of similar material is set into an opening in the wall 10 and welded to the wall about its margin as shown at 13. This plate has an outturned annular flange or neck 14 forming a filler opening or spout 15 for the vessel.

Around the neck and snugly embracing same is an externally threaded, rigid, reinforcing collar 16 made of stainless steel or other suitably hard, wear resistant material. The bottom of the collar abuts against the outer surface of plate 12 and the collar is held against axial movement on the neck by a out-turned annular lip 18 projecting radially from the end of the neck into a recess or rabbet 19 formed in the upper end of the collar.

A conventional closure cap 20 is provided for the filler opening, this having an internally threaded flange 21 adapted to mesh with the external threads on the collar 16. Lining this cap is a gasket 22 which seats against the lip 18 as

shown in Fig. 3 and seals the opening when the cap is tightened down. The gasket material preferably is slightly compressible and it will be noted that the cap and neck are formed to provide a small space 23 around the margin of the gasket to accommodate flow of the gasket material when compressed against the lip.

Alternate tightening and loosening of the cap (for example, by means of a wrench) in the course of the normal use of the vessel subjects the collar to considerable torque. In view of this, the bottom of the collar is notched as shown at 24, and bosses 25 formed in the vessel extend into these notches to secure the collar against rotation on the neck as the cap is tightened or loosened. It will be noted that the bosses are situated at the juncture of the neck 14 and plate 12, being so inclined as to permit free discharge of the contents of the vessel into opening 15 when the vessel is inverted.

The parts may be fabricated in any desired manner, but it has been found most convenient to attach collar 16 to the neck before plate 12 is inserted in the wall 10 and welded about its margin. Preferably neck 14 and bosses 25 are formed in the plate by a preliminary power press operation; the threaded and notched collar next is slipped over the neck and anchored by spinning or pressing the end of the neck outwardly over the end of the collar as shown. This assembly then is welded into the wall of the vessel as indicated at 13.

It can readily be seen that my filler opening embodies several important advantages. First, it provides a spout which avoids spillage in pouring and is desirable in a container for heavy liquids or chemicals. It is closed by a screw-on cap which is convenient to use and which provides in connection with the compression of the gasket against the lip 18 a more effective means of sealing the opening. The collar 16 reinforces and protects the soft metal flange 14 against deformation and provides suitable surface for threads which cannot easily be stripped by tightening of the cap. Finally, the construction provides a spout sub-assembly which can easily be inserted in and welded to the body wall of a barrel or the like, providing therein a filler opening which is capable of withstanding the wear and rough handling of normal usage but whose inner contact surfaces are of the same material as the body of the barrel, thereby preventing contamination of the contained liquid.

The modification of my invention shown in Fig. 4 embodies a construction that is fundamentally like that described above except that the lip 18 is covered and protected by a relatively thin facing ring 27 of stainless steel or like material. The outer edge of the facing ring is turned down and clamped between the outer margin of the lip 18 and the vertical wall of the recess or rabbet 19; the inner portion of the ring is pressed axially inward along the bore of the spout 14 which is provided with a shallow annular groove 28 into which the edge of the facing material is pressed. The facing member thus is securely anchored along both edges and protects the upper surfaces of the spout, not only against abrasive wear caused by rubbing of the gasket in the course of tightening and loosening the cap, but also against denting, deformation or scoring as might otherwise be caused by insertion of funnels, nozzles and like devices in the course of filling or draining the container.

From the foregoing it will be seen that my invention is well adapted to attain all of the ends and objects hereinbefore set forth, together with other advantages which are obvious and which are inherent to the invention.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of the claims.

Inasmuch as many possible embodiments of the invention may be made without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In an article of the character described, a wall having an opening therethrough with an integral outwardly extending annular flange encircling the opening, a concentric collar encircling and closely circumscribing the flange and having one end seated against said wall, a radial lip on the outer extremity of said annular flange overlaying and abutting the opposite end of said collar, an annulus of thin facing material covering said lip, said annulus having its outer margin secured between said lip and collar and its inner margin turned axially inward to hug the bore of said annular flange, a closure cap adapted to be positioned against said facing material, and intermeshing elements on said cap and collar for drawing said cap tightly against said facing material responsive to rotation of the cap relative to the collar.

2. An article as in claim 1 wherein said facing material is relatively harder than the material forming said annular flange.

3. An article as in claim 1 wherein the bore of said annular flange contains a peripheral groove spaced intermediate the ends of the flange, and the inner edge of said annulus of facing material is seated in said groove.

4. In an article of the character described, a wall having an opening therethrough with an integral outwardly extending annular flange encircling said opening, a concentric collar encircling and closely circumscribing said flange, one end of the collar being seated against said wall and the other end having a circumferential rabbet at the juncture of said other end and the bore of the collar, the outermost end of said annular flange having a lip projecting radially into said rabbet to secure said collar against axial movement away from said wall, a sleeve of thin material lining the bore of said annular flange at least at the outer end thereof, said sleeve having a portion turned radially outward over said lip to form an annular facing therefor with a marginal portion turned inwardly over the marginal edge of the lip and extending into said rabbet, said last portion being clamped between the marginal edge of said lip and the inner edge of the rabbet to anchor said sleeve.

5. An article as in claim 4 wherein said sleeve is formed of material relatively harder than the material forming said flange.

6. In an article of the character described, a wall having an opening therethrough with an integral outwardly extending annular flange encircling said opening, a concentric collar encircling and closely circumscribing said flange, one end of the collar being seated against said wall and the other end having a circumferential rabbet at the juncture of said other end and the bore of the collar, the outermost end of said an-

nular flange having a lip projecting radially into said rabbet to secure said collar against axial movement away from said wall, the bore of said flange having an annular groove intermediate the ends of the bore, a sleeve of thin material lining the portion of the bore of the flange between said groove and the outer end of the bore, said sleeve having at one end an outturned rim seated in said groove, the other end of said sleeve having an integral portion turned radially outward over said lip to form an annular facing therefor with a marginal portion turned inwardly over the marginal edge of the lip and extending into said rabbet, said last portion being clamped between the marginal edge of said lip and the inner edge of the rabbet to anchor said sleeve.

7. In an article of the character described, a wall having an opening therethrough with an integral outwardly extending annular flange encircling said opening, a concentric collar encircling and closely circumscribing said flange, one end of said collar being seated against said wall, the outermost end of said annular flange having a lip projecting radially over the other end of said collar to secure the collar against axial movement away from said wall, the bore of said flange having an annular groove intermediate the ends of said bore, a sleeve of thin material lining the portion of said bore between said groove and the outer end of the bore, said sleeve having at one end an outturned rim seated in said groove, the other end of said sleeve having an integral portion turned radially outward over said lip to form an annular facing therefor with a marginal portion turned inwardly over the marginal edge of the lip and clamped between the lip and the outermost end of said collar thereby to anchor said sleeve.

8. An article as in claim 7 wherein said sleeve is formed of material relatively harder than the material forming said flange.

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