Sept. 6, 1932. C. H. DRAPER 1,875,428

CLOSURE CONSTRUCTION FOR METALLIC CONTAINERS

Filed Nov. 26, 1930

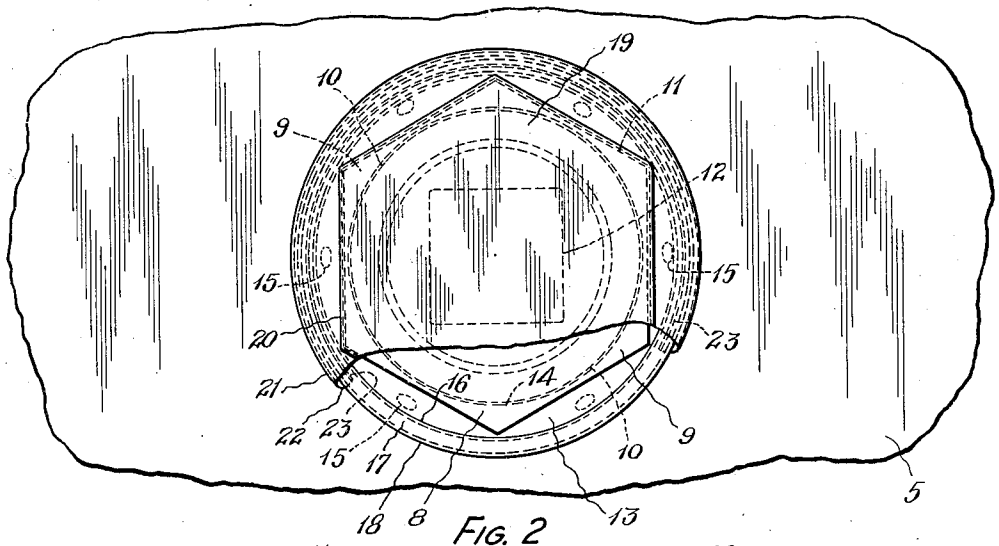


FIG. 2

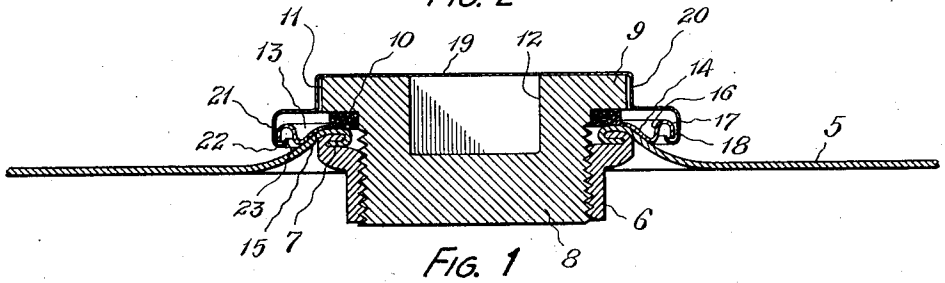


FIG. 1

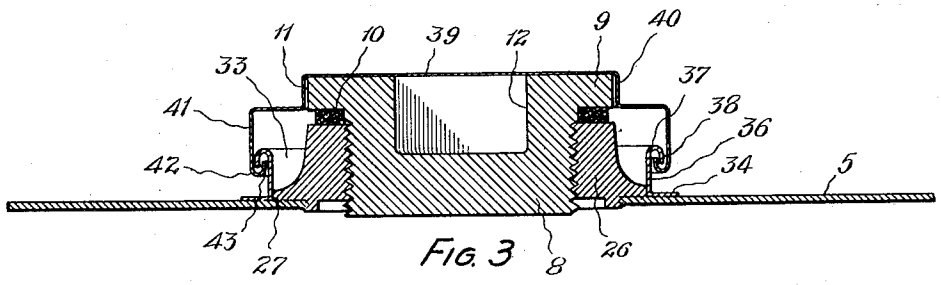


FIG. 3

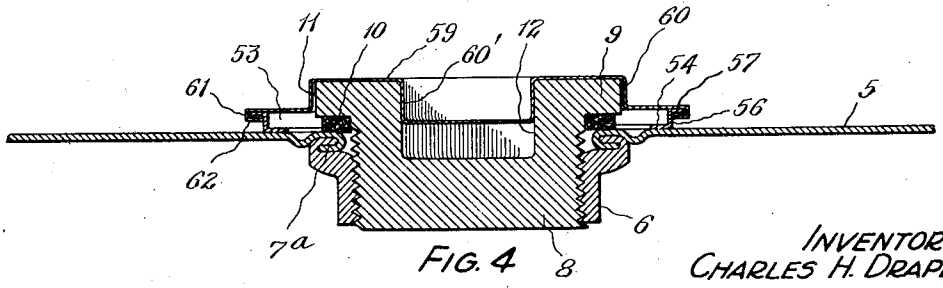


FIG. 4

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CLOSURE CONSTRUCTION FOR METALLIC CONTAINERS

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The invention relates to closures for metallic barrels, drums, vessels, packages or containers utilized for shipping or storing liquid or semi-solid substances.

The invention relates more particularly to containers which are provided with means for preventing undetectable removal of a plug secured in an opening provided in a wall of the container.

Prior closure constructions have been provided which prevent undetectable access to a container bung hole opening plug by enclosing the outer end of the plug with a sealing cap or hood which must be mutilated or destroyed before the plug can be removed.

But it has been found that a plug threaded into a container opening frequently becomes loosened by vibration and jarring during shipment, so that the contents of the container leak out at the joint between the container opening and plug. Accordingly, when a plug is provided with a sealing cap preventing undetectable access to the plug, the plug cannot be tightened to prevent leakage at the container opening without destroying the cap.

However, the consignee of a container frequently will refuse to receive the same from the shipper if the container opening is leaking, or if the cap enclosing the plug has been mutilated or destroyed.

Accordingly, it is an object of the present invention to provide closure construction for a container which prevents undetectable removal of a plug from its opening but which permits the plug to be tightened in liquid sealing relation in the container opening without destruction of the cap.

A further object of the present invention is to provide a closure construction for metallic containers which permits the container to be used time after time, after its sealing cap has been mutilated, merely by requiring a new sealing cap to be locked in sealing relation around the closure plug each time the container is used, thus giving the container a very high salvage value.

And finally, it is an object of the present invention to provide closure construction for a metallic container which will accomplish all of the above objects, and yet have a very simplified design and low fabricating cost.

These and other objects may be obtained by providing a construction, preferred embodiments of which are shown in the drawing and hereinafter described in detail, which may be stated in general terms as including in combination with a container having a wall provided with an opening, a plug for the opening, means for securing the plug in the opening, a cap for the plug sealing the plug against removal without destruction of the cap, and means for tightening the plug in the opening when the cap is in sealing position.

Several embodiments of the invention are shown in the drawing, in which:

Figure 1 is a vertical section illustrating a container wall equipped with one form of improved closure construction;

Fig. 2 is a fragmentary plan view of the construction shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing another form of improved closure construction; and

Fig. 4 is a view similar to Fig. 1 showing still another form of improved closure construction.

Similar numerals refer to similar parts throughout the drawing.

In the embodiment of the invention shown in Figs. 1 and 2, the wall 5 of the container is provided with an opening formed by the interiorly threaded bung ring bushing 6, joined to the container wall 5, by the seam 7. An exteriorly threaded closure plug 8 is screwed into the bushing 6, and is formed with a flange 9 which laps the seam 7, formed between the bushing 6, and wall 5. An annular sealing gasket 10 is interposed between the flange 9, and seam 7, to render the joint between the plug 8 and bushing 6 fluid tight.

The flange 9 is provided with a polygonal or hexagonal formation 11, while a preferably squared recess formation 12 extends into the body of the plug 8. These formations 11 and 12 in the outer end of the plug provide two tool engaging portions for screwing the plug into or out of the bushing ring 6.

An annular sealing cap retaining ring 13 surrounds and is spaced from the container opening and from the seam 7 between the bung ring 6 and wall 5 and preferably has its inturned flange 14 permanently fixed, joined or secured directly to the container wall 5 by spot welds 15. The annular retaining ring 13 has a preferably cylindrical wall 16, extending upwardly from the inturned flange 14, terminating in an outturned annular bead flange 17, preferably provided with a downturned cylindrical portion 18 at its outer edge.

A cup-shaped plug sealing cap, generally indicated at 19, is preferably provided with a polygonal recessed portion or formation 20 which matches the contour of and telescopes the outer polygonal formation 11 of the plug flange 9 and fits over and encloses the same as shown in Fig. 1.

The sealing cap 19 is likewise provided at its outer edge with a downturned cylindrical portion 21, which terminates in an inturned bead flange 22, preferably provided with an upturned cylindrical portion 23, which extends upward into the annular recess formed by the portions 16, 17 and 18 of the retaining ring 13.

By reason of the above construction, the cup-shaped sealing cap 19 is rotatably attached to the container and to the retaining ring 13, and the retaining ring 13 is always secured to and forms a part of the barrel. Moreover, the sealing cap 19 is preferably made of thinner metal than the retaining ring 13 for a purpose which will be hereinafter described.

In the embodiment of the invention shown in Fig. 3, the wall 5 of the container is provided with an opening formed by the interiorly threaded bung ring bushing 26, joined to the container wall 5 preferably by welding at 27. An exteriorly threaded closure plug 8 is screwed into the bushing 26, and is formed with a flange 9 which laps the bushing 26. An annular sealing gasket 10 is interposed between the flange 9 and bushing 26, to render the joint between the plug 8 and bushing 26 fluid tight.

The flange 9 is provided with a polygonal or hexagonal formation 11, while a preferably squared recess formation 12 extends into the body of the plug 8. These formations 11 and 12 in the outer end of the plug provide two tool engaging portions for screwing the plug into or out of the bushing ring 26.

An annular sealing cap retaining ring 33 surrounds and is spaced from the container opening and from the connection between the bung ring 26 and wall 5 and preferably has its outturned flange 34 permanently fixed, joined or secured directly to the container wall 5 by spot welds. The annular retaining ring 33 has a preferably cylindrical wall 36, extending upwardly from the outturned flange 34, terminating in an outturned annular bead flange 37, preferably provided with a downturned cylindrical portion 38 at its outer edge.

A cup-shaped plug sealing cap, generally indicated at 39, is preferably provided with a polygonally shaped recessed portion 40 which matches the contour of the outer polygonal formation 11 of the plug flange 9, and fits over and encloses the same as shown in Fig. 3.

The sealing cap 39 is likewise provided at its outer edge with a downturned cylindrical portion 41, which terminates in an inturned bead flange 42, preferably provided with an upturned cylindrical portion 43, which extends upward into the annular recess formed by the portions 36, 37 and 38 of the retaining ring 33.

Thus, the sealing cap 39, which is preferably made of thinner metal than the retaining ring 33 is rotatably secured to the container wall and to the retaining ring which is always secured to and forms a part of the container. It is pointed out that the bushing 26, plug 8 and sealing cap 39 project outwardly from the container wall 5 a greater distance than the corresponding parts in the embodiment of the invention shown in Figs. 1 and 2.

In the embodiment of the invention shown in Fig. 4, the wall 5 of the container is provided with an opening formed by the interiorly threaded bung ring bushing 6, joined to the container wall 5, by the seam 7*a*. An exteriorly threaded closure plug 8 is screwed into the bushing 6 and is formed with a flange 9 which laps the seam 7*a*, formed between the bushing 6 and wall 5. An annular sealing gasket 10 is interposed between the flange 9, and seam 7*a*, to render the joint between the plug 8 and bushing 6 fluid tight.

The flange 9 is provided with a polygonal or hexagonal formation 11, while a preferably squared recess formation 12 extends into the body of the plug 8. These formations 11 and 12 in the outer end of the plug provide two tool engaging portions for screwing the plug into or out of the bushing ring 6.

An annular sealing cap retaining ring 53 surrounds and is spaced from the container opening and from the seam 7*a* between the bung ring 6 and wall 5 and preferably has its inturned flange 54 permanently fixed, joined or secured directly to the container wall 5 by spot welds. The annular retaining ring 53 has a preferably cylindrical wall 56, extending upwardly from the inturned flange 54 and terminating in an outturned flange 57.

A cup-shaped plug sealing cap, generally indicated at 59, is preferably provided with a polygonally shaped recessed portion 60

which matches the contour of the outer polygonal formation 11 of the plug flange 9, and may be provided with a squared recess 60′ which matches the contour of the squared recess 12 of the plug body 9, and the sealing cap 59 fits over and encloses the plug 8 as shown in Fig. 4.

The sealing cap 59, is likewise provided at its outer edge with a downturned cylindrical portion 61 and terminates in an inturned annular flange 62 which extends beneath the outturned flange 57 of the retaining ring 53.

The sealing cap 59 is preferably made of thinner metal than the retaining ring 53, and the cap is rotatably secured to the container wall and to the retaining ring which always remains connected to and forms a part of the container. It is pointed out that in the embodiment of the invention shown in Fig. 4, the plug 8 and sealing cap 59 do not project outwardly from the container wall 5 as far as the corresponding parts contained in the construction shown in Figs. 1 and 2.

In utilizing the invention, a container is filled with the desired contents through the opening formed by the bung ring bushing, after which a plug is screwed into the bung ring bushing in fluid tight relation therewith. A sealing cap, provided with a polygonal formation corresponding to one of the wrench receiving formations of the cap, is then fitted over the cap to enclose the same, after which an inturned bead or flange is formed at the outer peripheral edge of the cap to project beneath an outturned bead or flange formed on a retaining ring secured to the container wall.

If the bung hole plug should become loosened for any reason, the plug may be tightened by applying a wrench to the matched wrench receiving portions of the plug and sealing cap and coincidently rotating the plug and cap.

However, the plug cannot be removed from its bung hole opening without mutilating and destroying the sealing cap, and such mutilation or destruction of the sealing cap gives a visible indication that the contents of the container has been tampered with.

However, any authorized person can easily mutilate and remove the sealing cap without harming the retainer ring or container wall because the sealing cap is made of thinner metal than the retaining ring and/or container wall. The plug can then be removed to gain access to the contents of the container.

If it is desired to again fill and seal the container, the desired contents is introduced into the container through its bung hole opening, a plug is inserted in the bung hole opening, and a new sealing cap is provided for the plug and has its outer edge formed with an inturned flange or bead to project beneath the outturned flange or bead of the retaining ring.

Accordingly, a very simplified form of closure construction is provided for metallic containers which permits the bung hole plug to be tightened but which prevents undetectable removal of the plug from its bung hole opening. Moreover, the improved construction permits a reuse of the container equipped with a sealing cap, thus giving the container a high salvage value.

I claim:

1. In combination with a container having a wall provided with a threaded opening, a threaded plug screwed into the opening having a tool engaging formation at its outer end, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a formation telescoping the plug tool engaging formation, cap retaining means projecting from the container wall, and the cap being provided with means rotatably connected to said retaining means whereby the plug may be tightened in the threaded opening without destruction of the cap.

2. In combination with a container having a wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug having a tool engaging formation at its outer end, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a formation matching and telescoping the plug tool engaging formation, cap retaining means projecting from the container wall, and the cap being provided with means rotatably connected to said retaining means whereby the plug may be tightened in the opening without destruction of the cap.

3. In combination with a container having a wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug having a tool engaging formation at its outer end, a flanged retaining ring permanently secured directly to the container wall surrounding and spaced from the opening, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a formation matching and telescoping the plug tool engaging formation, and the cap being provided with an inturned flange projecting beneath the retaining ring flange rotatably connecting the cap to the retaining ring whereby the plug may be tightened in the opening without destruction of the cap.

4. In combination with a container having a wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug being provided with a wrench engaging portion, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a recessed wrench engaging portion matching

the contour of the wrench engaging portion of the plug, cap retaining means projecting from the container wall, and the cap being provided with means rotatably connected to said retaining means whereby a wrench may be applied to the matched wrench engaging portions of the cap and plug to tighten the plug in the opening.

5. In combination with a container having a wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug being provided with a polygonally shaped wrench engaging portion, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a polygonally shaped wrench receiving portion matching the contour of the wrench engaging portion of the plug, cap retaining means projecting from the container wall, and the cap being provided with means rotatably connected to said retaining means whereby a wrench may be applied to the matched polygonally shaped portions of the cap and plug to tighten the plug in the opening.

6. In combination with a container wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug having a tool engaging formation at its outer end, a retaining ring surrounding the opening, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a formation matching and telescoping the plug tool engaging formation, the cap being provided with means rotatably connected to said retaining ring, and the cap being made of thinner metal than the retaining ring whereby the cap may be mutilated without destruction of the retaining ring.

7. Closure construction for a container including a container wall, a bung ring seamed to the container wall provided with an opening, a plug for the opening, means for securing the plug in the opening, the plug having a tool engaging formation at its outer end, a cap enclosing the plug sealing the plug against removal without destruction of the cap provided with a formation matching and telescoping the plug tool engaging formation, cap retaining means projecting from the container wall, the cap being provided with means rotatably connected to said retaining means, and sealing means interposed between the plug and container wall providing a liquid tight seal for the closure.

In testimony that I claim the above, I have hereunto subscribed my name.

CHARLES H. DRAPER.