

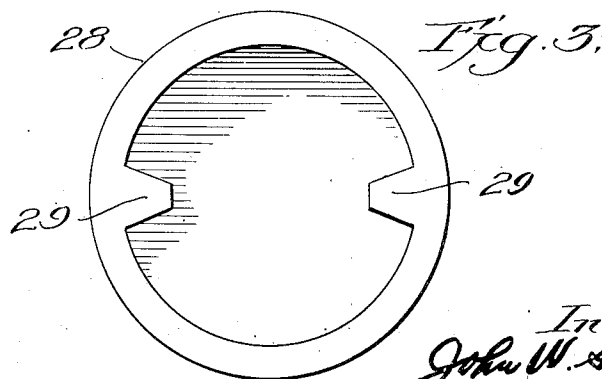
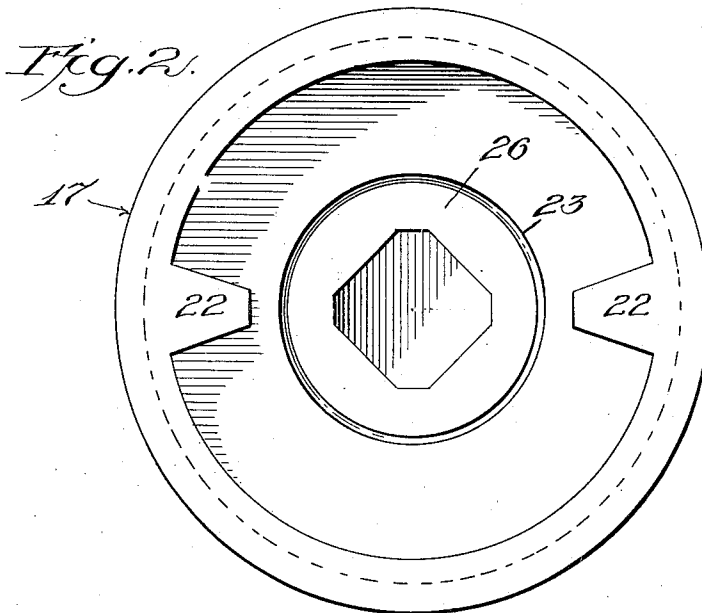
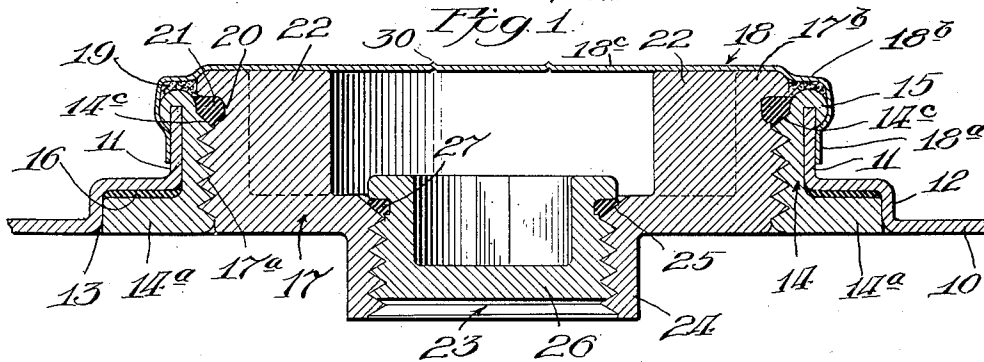
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J. W. SHERA

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CLOSURE DEVICE

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Inventor
John W. Shera
 By *Rector, Hibben, Davis & Macaulay*
 Attorneys

UNITED STATES PATENT OFFICE

JOHN W. SHERA, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN FLANGE & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

CLOSURE DEVICE

Application filed January 6, 1932. Serial No. 585,091.

My invention relates generally to closure devices for the filling and/or discharge openings of metallic containers such as drums, barrels and the like, and it has to do especially with closure plugs therefor. My invention is particularly, although not exclusively, useful in connection with containers suited for the transportation and storage of oil, gasoline, etc.

One of the objects of my invention is to provide an improved closure plug which is light in weight, cheap to manufacture, serves to reduce shipping and storage costs, and which may be easily and quickly applied to or removed from the container opening without the use of special tools.

Another object is to provide a novel plug device of the foregoing character having a body portion which serves as a primary closure for the main fill and/or discharge opening of the container, which plug device is provided with a secondary fill and/or discharge opening and readily accessible and removable closure means therefor, all contained within the dimensional limits of the plug body portion.

A further and more specific object is to provide a cylindrical, relatively thin-walled, cup-shaped closure plug body having a pair of internal, diametrically opposed lugs extending radially inward from its inner wall and extending from the top to the bottom of the interior of the body, which lugs are adapted to be engaged by any suitable and available object (for example, the jaws of a monkey wrench, a bar of metal, etc.) for application and removal of the plug. This arrangement of lugs permits of the use of a secondary closure means contained within the main plug without interfering with the application and removal of either the main or the secondary closure.

Additional objects are to provide unitary plug structure embodying the foregoing features which may be die-cast substantially complete at a single operation; to provide a plug which may be readily and easily packed in large quantities for shipment without danger of injuring the threads thereof; to provide a double plug structure arranged to be

applied to the container without parts thereof projecting from the container wall in such a way as to be struck and injured during shipment and storage; to provide a plug structure requiring less packing space; and to provide a closure means adapted to reduce shipping cost by making possible the shipment of a greater number of containers (as in marine shipping) where tonnage limits must be adhered to.

Other objects and advantages will become apparent as this description progresses and by reference to the drawing, wherein—

Figure 1 is a sectional view of a closure assembly embodying my invention;

Fig. 2 is an enlarged plan view of the plug (in separated relation) shown in Fig. 1; and Fig. 3 is a view similar to Fig. 2 of a plug in which the secondary closure means is omitted.

My invention is well suited for use in connection with closure structure of the form disclosed in my co-pending application, Serial No. 573,675, filed November 7, 1931, wherein there is employed an outer seal cap concealing the closure plug and guarding the same against undetectable tampering. In Fig. 1, I have shown such a closure structure applied to an opening in the wall 10 of a container.

More particularly, the container wall 10 is provided with a circular opening surrounded by an outwardly projecting, circular flange 11 struck, preferably, from the metal of the wall 10. The wall 10 around the opening is shaped to provide an upwardly extending, annular boss 12 of irregular (preferably, but not necessarily, octagonal) contour forming an irregularly-shaped pocket 13 which receives a similarly shaped flange 14^a of a bushing 14. The bushing 14 has a cylindrical, internally-threaded body portion fitting snugly within the flange 11; and the bushing is firmly secured in place by rolling its gradually-thinned outer edge over the free edge of the flange 11 to form a bead 15 thereat. The bushing mounting is of a leak-proof character but, if desired, a gasket 16 (or some suitable leak-proof material) may be interposed between the bushing flange 14^a

and the adjacent wall of the flange pocket 13.

The opening defined by the bushing 14 is adapted to be closed by a plug 17 which will be described more fully hereinafter. After the plug is screwed into the position (or approximately the position) shown in Fig. 1, a seal cap 18 is applied over the bead 14 and flange 11. This cap has a comparatively long skirt 18^a which passes down over and is secured behind the bead 15 to secure the cap firmly in place. The peripheral rim 18^b of the cap is slightly depressed, providing a raised central portion 18^c which engages the top of the plug rim 17^b and insures against loosening of the plug 17 when the container is subjected to vibration, jars, shocks, etc. A gasket 19 is compressed between the cap rim 18^a and the bead top 15 to further insure against leakage, making the complete closure positively air-tight and leak-proof. The cap 18 is formed, preferably, of relatively thin metal and once it is secured over the bead, it cannot be removed without detection and, in fact, without destroying its further usefulness. The cap is applied, preferably, by the use of a tool (not shown) having clamp elements movable radially to engage the cap skirt 18^a to, in turn, move the cap skirt inwardly against and along the side of the bead 15, depressing the cap upon the bead by translation of the radial movement of the tool into axial movement due to the engagement with the bead, as more fully explained in my aforementioned copending application, Serial No. 573,675.

Now referring more particularly to the plug structure, it takes the form of a cylindrical, relatively-thin walled, cup-shaped body externally threaded at 17^a for engagement with the internal threads of the bushing 14. The plug is, preferably, formed by die casting, and the form of the plug as a whole, lends itself to die casting as a substantially complete unit at a single operation. Near the outer end of the plug and adjacent the outermost of its external threads, I provide an annular groove 20 adapted to receive and support a gasket 21 of any suitable material. The groove 20 is so located that when the plug is screwed into the bushing 14, it aligns with a seat 14^c at the top of the bushing threads upon which the gasket 21 is seated and compressed.

Weight of parts, manufacturing cost, facility in packaging and handling in shipment and storage are material factors to be taken into consideration in the design of structure of this character. The hollow interior and relatively thin walls of the plug body aid in this. With this arrangement the saving in shipping cost is considerable; and, in instances where tonnage limits are imposed on large shipment lots (like in marine shipping) the saving in weight permits of the shipment of greater number containers. It

is also customary, in certain instances to ship the plugs alone in large lots and in the use of a plug embodying my invention a considerable saving in shipping cost is effected. Further, such plugs can be readily and easily packed for shipment without danger of injury to the threads thereof; thereby eliminating the use of thread protectors as has been customary in certain instances heretofore.

Since the plug is screwed inwardly substantially within the limits of the bushing 14 and is of cylindrical shape, a problem arises with respect to its ready application and removal from the bushing 14. To that end, I provide a pair of preferably, wedge-shaped, diametrically-opposed lugs 22 which extend integrally from and radially inward of the inner wall of the plug and terminate short of the central portion thereof. These lugs extend from the top to the bottom of the plug-interior and are so related that various objects, such as the jaws of a monkey wrench, a rectangularly-shaped bar, etc., may be inserted in the plug and rotated to engage the lugs and, in turn, rotate the plug 17. A special tool is not required for setting or removing the plug which is a feature of no little importance because of the convenience to the user. With this arrangement the plug may easily and quickly be drawn up to the proper extent to compress the gasket 21 and may be unscrewed with like ease.

It is customary at times to provide a secondary fill and/or discharge opening in the main closure plug with closure means therefor for use of the container without removal of the main closure plug except for filling or rapid emptying purposes. To accomplish this feature, I provide an opening 23 in the relatively thin walled plug bottom and surround this opening with a depending annular, and internally-threaded flange 24. The upper edge of opening 23 is slightly beveled to provide a seat 25. Opening 23 is closed normally by a secondary plug 26 of form similar to the plug 17. This plug 26 is provided with an annular groove near its upper end which supports a gasket 27 adapted to be compressed upon the seat 25 for sure seal purposes. The lugs 22 lend themselves well to this arrangement. The plug 26 may be inserted and removed without interference. Also, notwithstanding, the use of the secondary closure, the lugs are readily accessible for application and removal of the main plug 17. In Fig. 3 I have shown a plug 28 which does not embody the secondary closure; however, in this case I also employ lugs 29 which are identical with the lugs 22. This plug 28, like plug 17, is formed by die casting, the form of the plug making possible the formation of the complete plug at a single operation and at a comparatively low cost.

The advantages of my invention will be appreciated from the foregoing. A positively sealed closure giving maximum efficiency is provided at a low manufacturing cost. Shipping and storage costs are reduced to the minimum. The plugs per se of the form of Fig. 1 may be packed in large quantities in nested relation, thus reducing packing space. The secondary closure is contained wholly within the dimensional limits of the main plug (rather than projecting therebeyond), thereby facilitating packing of the containers and reducing to a minimum the possibility of injury to the closure in the packing, shipping and storing of the containers. The cap 18 may be provided with tear strip section defined by transverse scored lines 30, and the hollow plugs 17 and 28 readily permit of breaking through the scored section for removal of the cap.

It will be understood that while I have shown only two forms of my invention, other changes in details and arrangements of parts may be made without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. A closure plug for structure of the class described which comprises a cylindrical body externally threaded, said body having a cylindrical open-top chamber formed therein and extending into close proximity to the bottom thereof providing a relatively thin-walled, cup-shaped structure, and two diametrically opposite lugs extending inwardly from the circular chamber wall and integral therewith, the lugs being of triangular shape in plan view to permit a tool or object to be inserted between the ends of the lugs and engage oppositely-facing and non-aligned sides of the lugs.

2. A closure plug for structure of the class described which comprises a cylindrical body externally threaded, said body having a cylindrical open-top chamber formed therein, and two diametrically opposed lugs extending inwardly from the circular chamber wall and integral therewith, each lug being widest at the wall and having converging plain sides, each of said plain sides of one lug being parallel to, but in a different plane than, one of the plain sides of the other lug to permit a tool to be inserted between the ends of the lugs and engage one plain side on each lug.

In testimony whereof, I have subscribed my name.

JOHN W. SHERA.