Sept. 30, 1952 J. R. SNYDER 2,612,284

CLOSURE CONSTRUCTION FOR METALLIC CONTAINERS

Filed May 28, 1949

Fig. 1

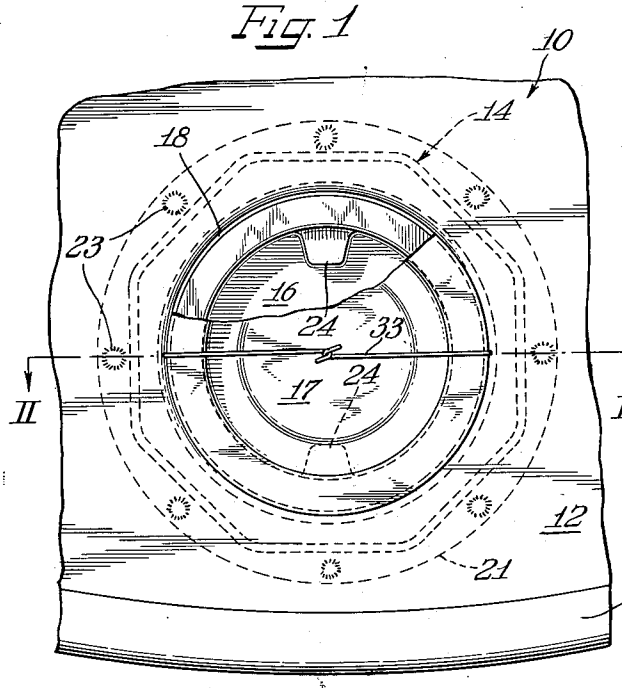


Fig. 2

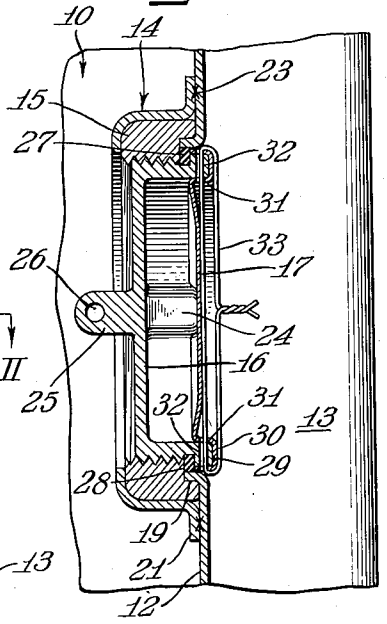


Fig. 3

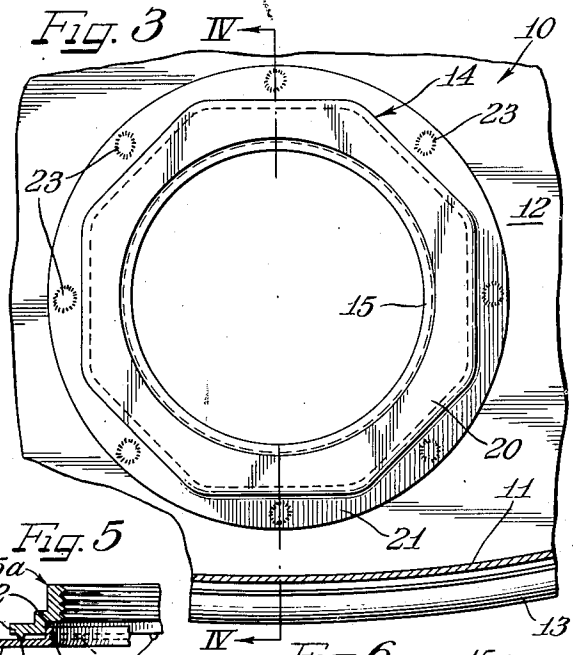


Fig. 4

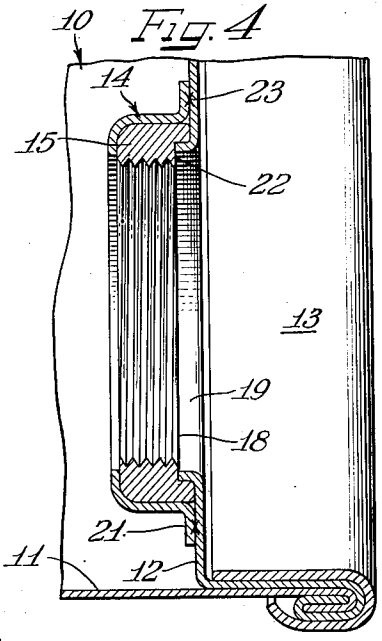


Fig. 5

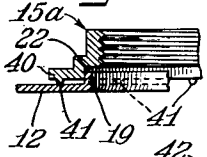
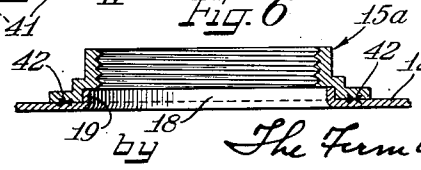


Fig. 6



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CLOSURE CONSTRUCTION FOR METALLIC CONTAINERS

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6 Claims. (Cl. 220—39)

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This invention relates generally to a bung bushing construction for the filling and discharge opening of metallic containers such as drums, and the like, and it has to do especially with the construction of the bushing and the supporting member therefor in order that a bung bushing construction may be assembled to a drum head more economically than other known forms of bung bushing constructions.

This invention is particularly useful in connection with containers used for the transportation and storage of gasoline, oil, and the like.

Prior to my invention, it has been customary to form the bung bushing construction on the exterior of the drum head, making it very difficult to form the drum head chime with rollers unless the closure bushing was spaced a considerable distance away from the edge of the drum to provide room for the chime rollers. Also, in transit and storage with the prior type of bung bushing construction formed on the outside of the drum head, the adapter cover is easily damaged by carelessly rolling and stacking one drum upon another. It is also necessary with the prior art type of bung bushing construction to tip the drum to remove the fluid because of the distance of the bung bushing construction from the drum head chime.

The present invention now provides an internal bung bushing for drum heads. This bushing comprises an internally threaded bushing ring seated in a polygonal stamped housing or adapter that is welded to the inside face of the drum head. The drum hole in the drum head is provided with an inwardly projecting flange receiving a portion of the bushing ring therearound for centering the ring in the hole. A single gasket or seal ring positioned on the bushing ring seals the closure plug to the ring and the ring to the drum head flange. Since the resulting construction is inside the drum, no chime ring roller interference is encountered and the drum hole can be very close to the side wall of the drum.

It is therefore a principal object of the present invention to provide an internal drum head bushing construction.

Another object of the present invention is to provide an improved bung bushing construction that does not extend beyond the outside surface of the drum head so that there is no interference to the rollers that form the drum head chime.

Another object of the invention is to provide a bung bushing construction in which the center of the bushing is very close to the drum head chime and permits full drainage of the drum from a horizontal position.

Another object of the invention is to provide a bushing for a bung bushing construction which may be die cast, stamped, or forged and assembled

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to the drum head more economically than other forms of bushings.

Another object of the invention is to provide a support stamping for the bushing which may be projection, spot or seam welded, making the application thereof to the drum head very low in cost.

Another object of the invention is to provide a single seal which seals both the conventional closure plug and/or adapter mounted in the closure bushing and the bushing.

Other and further objects of the invention will be apparent from the following description of the annexed sheet of drawings, which illustrate the preferred embodiments of the invention.

On the drawings:

Figure 1 is an external elevational view with a part broken away to show underlying structure illustrating the improved bung bushing construction and tamper proof cap for the closure plug thereof;

Figure 2 is a sectional view taken along the line II—II of Figure 1;

Figure 3 is an inside elevational view of the supporting member for the bushing of the improved bung bushing construction of Figure 1;

Figure 4 is a vertical sectional view taken along line IV—IV of Figure 3 showing the bung bushing construction with the closure plug removed;

Figure 5 is a fragmentary sectional view illustrating another form of internal bushing and the projections for welding the bushing directly to the drum head; and

Figure 6 is a sectional view illustrating the bushing of Figure 5 welded in position to the drum head.

As shown on the drawings:

Referring to Figure 1, the reference character 10 designates generally a conventional metal drum including a cylindrical side wall or shell 11 to which the drum head 12 is affixed by a drum head chime 13. The drum head 12 is secured to the drum side wall 11 by the interlocking flanges as shown sectionally in Figure 4 over which is rolled the drum head chime to seal the drum.

The bung bushing construction 14, as illustrated in Figures 1–4, is mounted in the drum 10 upon the interior face of the drum head 12. The construction 14 includes a closure bushing or bushing ring 15 receiving a conventional closure plug 16 which can be covered with a conventional tamper-proof cap 17. Inasmuch as the bung bushing construction 14 with the closure plug and cap does not extend beyond the outside surface of the drum head 12, there is no interference to the rollers which form the drum head chime 13, and the drain hole 18 can be closer to the chime 13 by substantially 1 inch as compared with the conventional external type of bung bushing construction.

Referring particularly to the structure of my invention as shown on the drawings, the drum head drain hole or opening 18 is flanged inwardly at 19 to seat the closure bushing 15 (Figures 2 and 4). The closure bushing 15 is preferably die cast or forged to the octagonal shape as shown in Figure 3 and complementally shaped with respect to a supporting member or adapter 20, as illustrated in Figures 3 and 4, with the octagonal portions to receive the bushing and with a flanged portion 21 affixed against the interior face of the drum head. The bushing is threaded as in Figure 4 to receive the closure plug 16 (Figure 2) and is also formed with an annular recess 22 to receive the inwardly extending flange 19 of the drum head to assure positive centering during the welding operation. In the welding operation, the supporting member 20, which is preferably formed of a metal stamping, may be spot-welded as at 23 (Figures 1 and 3) to the drum head 12. Following this procedure, the assembly of the closure bushing 15 and supporting member 20 of the drum head is a simple and very low cost operation. Although it is preferred to spot weld the member 20 to the drum head, it is within the scope of the invention that this member may be a projection or seam welded to the drum head.

Although the closure bushing 15 and the supporting member 20 therefore are preferably formed to prevent turning of the bushing with respect to its supporting member, it is also to be understood that it is within the scope of this invention that any suitable shape may be utilized for the member as long as the shape of the members are so formed that there is no relative turning of the bushing with respect to its supporting member.

In Figures 1 and 2, a preferred form of closure plug 16 is illustrated which may be used for a closure for the bung bushing 15. The plug 16, as the bushing 15, may be formed by die casting or forging and is threaded complementally to the bushing 15 and is provided with a recessed or depressed outerface as shown in Figure 2. Diametrically opposed lugs 24 are also provided for securing the cap in position as shown in Figure 2 with a suitably formed tool engaging the lugs 24.

The closure plug is also provided with an inwardly extending projection 25 provided with a hole 26 to which a suitable locking chain may be attached, as is well understood in the art, to prevent loss of the closure plug when the plug is detached for emptying the drum.

The single seal construction which is preferred for the closure assembly to positively seal the container opening against leakage is provided by a resilient O-ring type seal 27. The material from which the seal is preferably formed is a suitable synthetic rubber-like material not affected by the gasoline or other types of high volatile fluids disposed within the container and holds gasoline when tested under the most severe specifications. The seal is positioned to be supported by a surface 28 formed by the annular recess 22 of the bushing 15, the inwardly flanged portion 19 of the drum head 12 and the annular flange 29 of the closure plug 16.

Referring to Figure 2, it is evident that when the O-ring 27 is in position as shown; and, upon the plug being secured in place, the O ring, which is usually mounted upon the plug, is positioned into its sealing relationship with the rest of the bung bushing construction. The O-ring seals any leakage path formed by the threads of the bushing and the plug and also provides a seal for any leakage path between the surface of the bushing 15 and the inner peripheral surface of the supporting member 20 and also any leakage path between the flanged portion 21 and the bushing 15 where they engage the drum head in assembled position, for example, as shown in Figure 2. With this construction of my invention, it is evident that there is eliminated the heretofore conventional expensive spinning operation to seal the outer end of the closure bushing over the outturned drum head flange and the heretofore necessary additional sealing gasket.

Undesirable tampering of the contents of the drum is prevented by covering the closure plug 16 with the tamper-proof cap 17. Referring to Figures 1 and 2, a tamper-proof cap 17 is illustrated having an annular U-shaped flange 30 complementally formed with respect to the flange 29 of the closure plug. The closure plug is provided with diametrically opposed holes 31 which extend through both legs of the flange 30 and are complementally formed with respect to holes 32 formed in the closure plug. A wire 33 passes through the holes 31 and 32, as shown in Figure 2, thus securing the tamper-proof cap in position.

In the modified embodiment of the invention shown in Figures 5 and 6, the supporting member or adapter 20 is eliminated and a forged bushing 15*a* is directly spot welded to the inside face of the drum head 12 around the inturned flange 19 thereof. As shown in Figure 5, the recess 22 of the bushing 15*a* receives the head flange 19 and is surrounded by an outturned flange 40 having a plurality of small teats or projections 41 at spaced intervals bottomed on the drum head 12. These projections are flattened flush with the flange during a spot welding operation and form weld bonds 42 shown in Figure 6 integrally joining the drum head and bushing 15*a*. This welded on bushing 15*a* receives a seal and threaded in closure plug in the same manner as the bushing 15.

From the above description, it is obvious that there has been described a low cost bung bushing construction, and the parts thereof may be readily formed in production by die casting or the like or by metal stamping. The drum head is also formed by a suitable stamping operation with an inwardly flared opening to locate the bushing in position, whereupon it may be secured in position by welding the support member therefor to the drum head prior to the assembly of the drum head into the drum.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a threaded bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will

be concealed behind the drum head in position for receiving a closure bung.

2. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will be concealed behind the drum head in position for receiving a closure bung, and a substantially cup-shaped externally threaded closure plug in the bore of the bushing ring.

3. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a threaded bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will be concealed behind the drum head in position for receiving a closure bung, and a substantially cup-shaped externally threaded closure plug threaded in the bore of the bushing ring, said plug having a non-threaded reduced diameter cylindrical portion terminating in a radially extending flanged rim, the rim adapted to lie substantially flush with the drum head when the plug is assembled in the bushing.

4. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a threaded bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will be concealed behind the drum head in position for receiving a closure bung, and a substantially cup-shaped externally threaded closure plug in the bore of the bushing ring, said plug having a non-threaded reduced diameter cylindrical portion terminating in a radially extending flanged rim, the rim adapted to lie substantially flush with the drum head when the plug is assembled in the bushing, and a gasket surrounding the cylindrical portion of the plug, abutting the drum head flange and lying between said flanged rim and the bushing ring to effect a seal between the interior of the drum and the atmosphere.

5. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a threaded bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will be concealed behind the drum head in position for receiving a closure bung, and a substantially cup-shaped externally threaded closure plug in the bore of the bushing ring, said plug having a non-threaded reduced diameter cylindrical portion terminating in a radially extending flanged rim, the rim adapted to lie substantially flush with the drum head when the plug is assembled in the bushing, and a gasket surrounding the cylindrical portion of the plug, abutting the drum head flange and lying between said flanged rim and bushing ring to effect a seal between the interior of the drum and the atmosphere, said plug defining a pair of lugs in the hollow portion thereof cooperable with an actuating tool.

6. A bung bushing assembly comprising a drum head defining a bung hole, said drum head having an inwardly extending flange surrounding the bung hole, a polygonal-sided bushing ring defining a threaded bore and a counterbore, said counterbore snugly receiving said flange, and a generally cup-shaped polygonal-sided housing snugly surrounding the bushing ring, said housing defining an aperture in registry with the said bung hole and having a peripheral flange attached in abutting assembly on the inside of the drum head, whereby the bushing ring will be concealed behind the drum head in position for receiving a closure bung, and a substantially cup-shaped externally threaded closure plug in the bore of the bushing ring, said plug having a non-threaded reduced diameter cylindrical portion terminating in a radially extending flanged rim, the rim adapted to lie substantially flush with the drum head when the plug is assembled in the bushing, and a gasket surrounding the cylindrical portion of the plug, abutting the drum head flange and lying between said flanged rim and bushing ring to effect a seal between the interior of the drum and the atmosphere, said plug defining a pair of lugs in the hollow portion thereof cooperable with an actuating tool, said flanged rim defining a pair of diametrically opposed apertures, a tamper-indicating disc adapted to be crimped over said rim, and a sealing wire passing through said disc and said apertures, whereby the closure plug may not be withdrawn from the bushing ring without disturbing the tamper-indicating disc and the sealing wire.

JACOB RUSH SNYDER.

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