June 20, 1933. C. T. DRAPER 1,914,409

CLOSURE FOR METALLIC CONTAINERS

Filed Dec. 21, 1931

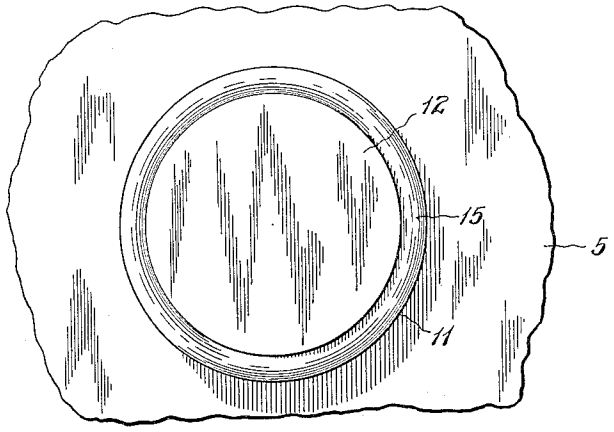


FIG. 2

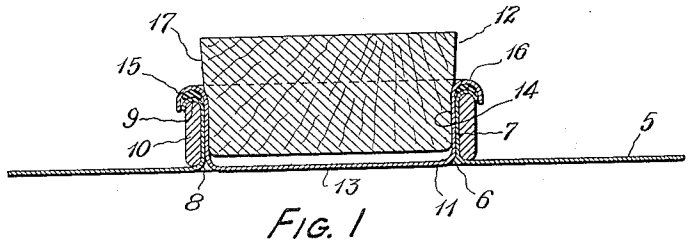


FIG. 1

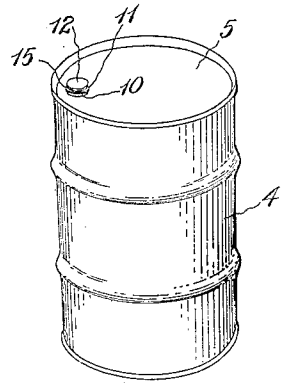


FIG. 4

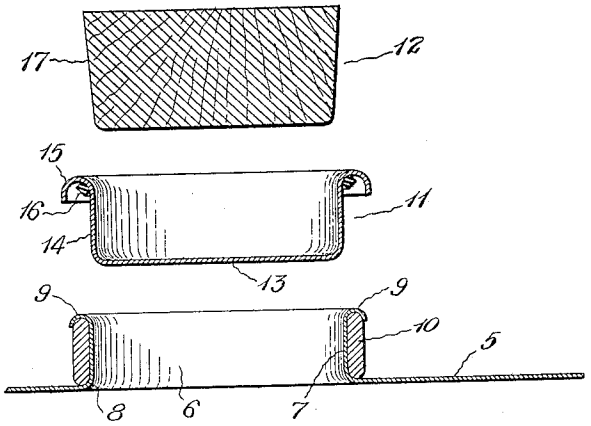


FIG. 3

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UNITED STATES PATENT OFFICE

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CLOSURE FOR METALLIC CONTAINERS

Application filed December 21, 1931. Serial No. 582,354.

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

One of the objects of the present invention is to combine, in a simplified construction, a closure which permits the contents of a container to be completely drained, which may be sealed against theft of contents, which may be sealed against leakage, which may be readily opened and/or renewed by an authorized person, which may be reinforced against distortion or damage, which has great strength, which is very inexpensive to manufacture, and which may be used on large containers heretofore requiring much more expensive closure constructions; and the present invention is a specific improvement upon the construction shown in my copending application, Serial No. 491,687, filed October 28, 1930, matured in Patent No. 1,838,136, dated December 29, 1931.

The construction shown in my prior application, although combining some of the present desiderata, does not permit the container to be completely drained because the bung opening flange projects inwardly of the container, and does not have its bung opening flange reinforced per se.

A further object of the present invention is to provide a reinforced container closure construction adapted for completely draining the container, utilizing a removable preferably cup-shaped metal closure member with side walls having a substantial expansibility for closing a reinforced bung opening, and a tapered rigid plug member driven into the cup-shaped member to expand, seat and clamp its walls in liquid-tight sealing relation within and against the walls of the reinforced bung opening, the plug member protecting the cup-shaped member against being accidentally punctured and strengthening the bung opening against distortion.

And finally, it is an object of the present invention to provide a closure construction which has an extremely simple design, which is very inexpensive to manufacture, and which attains the aforesaid combined objects.

These and other objects may be attained by providing a closure construction, a preferred embodiment of which is shown in the accompanying drawing and hereinafter described in detail, which may be stated in general terms as including in a container, a wall provided with an outwardly projecting integral annular rim flange forming a bung opening and terminating in a reversely bent preferably curled flange extending laterally outwardly from the rim flange and spaced from the container wall, a reinforcing ring surrounding the outer peripheral surface of said annular rim flange clamped in contact with the same by and between the said container wall and bent flange, a metallic closure cup having a bottom and a side wall within and surrounded by said rim flange, the side wall having a substantial expansibility to secure an increased liquid-tight sealing contact between said wall and rim flange and terminating in a reversely bent preferably curled flange extending laterally outwardly from the side wall and surrounding said container wall bent flange, a tapered rigid plug driven into the cup to expand, seat and clamp the cup side wall against the container wall rim flange, and liquid sealing means preferably interposed between and clamped between said bent flanges.

In the accompanying drawing, which shows the present improvements:—

Figure 1 is a vertical section through a container wall provided with the improved closure construction;

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

Fig. 3 is a vertical section through the improved closure parts prior to assembling the same; and

Fig. 4 is a perspective view of a metallic container equipped with the improved closure construction.

Similar numerals of reference indicate corresponding parts throughout the various figures of the drawing.

A wall of a metallic container or vessel 4 of any well known type is generally indicated at 5; and the lower surface of the wall 5 (Figs. 1 and 3) is an inner surface of the con-

tainer, whether the wall is a side wall or an end wall of the container.

A bung opening 6 is provided in the container wall 5 by forming an annular rim flange 7 to project outwardly from the wall 5, and the flange 7 is formed integrally from the container wall metal and extends from the preferably curved fillet 8. The annular flange 7 terminates in a reversely bent preferably curled flange 9 extending laterally outwardly from the rim flange 7, and a bung opening reinforcing ring 10 surrounds the outer surface of the container wall annular rim flange 7 and is clamped in contact with the same by and between the bent flange 9 and the container wall 5.

The bung opening 6 is provided with closure means which includes a metallic closure cup-shaped member generally indicated at 11, and a substantially rigid tapered plug member 12 formed preferably of wood, hard rubber, or other distortion resisting, but unbreakable material, referred to herein as a "rigid" plug.

The metallic closure cup 11 has a bottom wall 13 and an annular side wall 14, which terminates in a reversely bent preferably curled flange 15 extending laterally outwardly from the side wall. The cup-shaped member 11 is inserted in the container opening 6 preferably with a liquid sealing gasket 16 carried under its curled rim 15 as shown just prior to assembly in Fig. 3.

The rigid plug member 12, provided with a tapered peripheral surface 17, is then driven into the cup-shaped member 11 to the position shown in Fig. 1, so that the wedging pressure of the tapered plug expands the wall 14 of the cup 11 outwardly against the surrounding rim flange 7 to securely seat and clamp the outer peripheral surface of the wall 14 against the inner peripheral surface of the rim flange 7 in a liquid-tight sealing manner.

The rigid plug 12 upon being driven into the cup-shaped member likewise forces the cup-shaped member inwardly into the bung opening 6 to compress and clamp the gasket 16 between the extending flanges 9 and 15, respectively, of the rim flange 7 and cup member 11, as shown in Fig. 1.

The cup member 11 is preferably made of thinner metal than the metal forming the container wall 5 so as to aid in an easy removal of the cup-shaped member by an authorized person, but the cup member 11 need not be made to extreme limits of accuracy as regards size and roundness, because in seating the same within the bung opening the rigid plug member 12 extends the wall 14 to secure a liquid sealing contact between the wall 14 and rim flange 7. Accordingly, the cup-shaped member, which has a very simple design, may be most inexpensively manufactured, while the plug member 12 also has a simple design and a very inexpensive cost of manufacture.

The reinforcing ring 10 securely backs up the rim flange 7 so as to give a more or less unyielding rigidity to the rim flange against which the annular wall 14 of the cup-shaped member 11 is seated by the plug member 17.

Moreover, the rigid plug 12 and reinforcing ring 10 prevent any distortion of the closure even though the container may be dropped on a hard surface so as to badly distort its wall 5; and the plug member 12 prevents the thin bottom wall 13 of the cup member 11 from being punctured by accidental contact with a sharp instrument or object.

When it is desired to gain access to the contents of the container, the plug member 12 is removed by tapping or prying the same out of the cup-shaped member 11, whereupon the cup-shaped member 11, which is made of thinner metal than the container wall 5, may be distorted and removed from the opening 6. However, the rim flange 7, having been maintained in circular form during shipment and use, due to the presence of the plug 12 and reinforcing ring 10, maintains its original shape during the removal of the cup member 11, and permits the container to be subsequently filled and sealed from time to time by an authorized person by inserting new cup members 11 in the opening 6 and driving the plug member 12 therein.

Upon removal of the plug 12 and cup-shaped member 11 from the bung opening 6, the entire contents of the container 4 may be drained therefrom because the inner surface of the container wall 5 is smooth and unbroken and no part of the closure projects into the container at or adjacent the bung opening.

A container equipped with the improved closure construction is absolutely leak-proof, even though the wall 5 may be seriously distorted; and the closure construction may be utilized in connection with large containers, such as fifty-five gallon drums, which have usually required more expensively constructed threaded openings and screw plugs.

It is pointed out that there is only one joint in the closure which must be sealed in a liquid-tight manner because the container wall per se forms the rim flange of the opening, and a liquid-tight seal is provided at that joint directly between the rim flange 7 and the cup-shaped closure element 11.

Moreover, the cup-shaped member, in requiring distortion for removing the same, provides a theft indicating seal for the container opening, so that if a container is received with its cup-shaped member distorted, a visible indication is given that some unauthorized person has been attempting to gain access to, or tamper with the contents of the container.

Accordingly, a container closure is pro-

vided in which a simplified combined construction enables the complete contents of the container to be drained, enables the container to be sealed against theft of the contents and against leakage, and enables the closure to be readily opened and/or renewed by an authorized person. Likewise, the closure is reinforced against distortion or damage, has great strength, is very inexpensive to manufacture, and may be used on large containers heretofore requiring much more expensive closure constructions.

I claim:—

1. In a metallic container, a wall provided with an outwardly projecting integral annular rim flange forming a bung opening, said rim flange terminating in a reversely bent flange extending laterally outwardly from the rim, a reinforcing ring surrounding the outer peripheral surface of said rim flange clamped in contact with the same by and between said bent flange and container wall, a metallic closure cup having a bottom and a side wall within and surrounded by the rim flange, the side wall having a substantial expansibility to secure a liquid-tight sealing contact between said wall and rim flange, and a tapered rigid plug driven into the cup to expand, seat and clamp its wall against the surrounding rim flange.

2. In a metallic container, a wall provided with an outwardly projecting integral annular rim flange forming a bung opening, said rim flange terminating in a reversely bent flange extending laterally outwardly from the rim flange, a reinforcing ring surrounding the outer peripheral surface of said rim flange clamped in contact with the same by and between said bent flange and container wall, a metallic closure cup having a bottom and a side wall within and surrounded by the rim flange, the side wall having a substantial expansibility to secure a liquid-tight sealing contact between said wall and rim flange and terminating in a reversely bent flange extending laterally outwardly therefrom surrounding said container wall bent flange, and a tapered rigid plug driven into the cup to expand, seat and clamp its wall against the surrounding rim flange.

3. In a metallic container, a wall provided with an outwardly projecting integral annular rim flange forming a bung opening, said rim flange terminating in a reversely bent flange extending laterally outwardly from the rim flange, a reinforcing ring surrounding the outer peripheral surface of said rim flange clamped in contact with the same by and between said bent flange and container wall, a metallic closure cup having a bottom and a side wall within and surrounded by the rim flange, the side wall having a substantial expansibility to secure a liquid-tight sealing contact between said wall and rim flange and terminating in a reversely bent flange extending laterally outwardly therefrom surrounding said container wall bent flange, a tapered rigid plug driven into the cup to expand, seat and clamp its wall against the surrounding rim flange, and a liquid sealing gasket interposed between said bent flanges, said gasket being clamped between said bent flanges by driving the plug into the cup.

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

CHARLES T. DRAPER.