July 9, 1929. J. S. REID 1,720,349

CLOSURE

Filed March 14, 1927

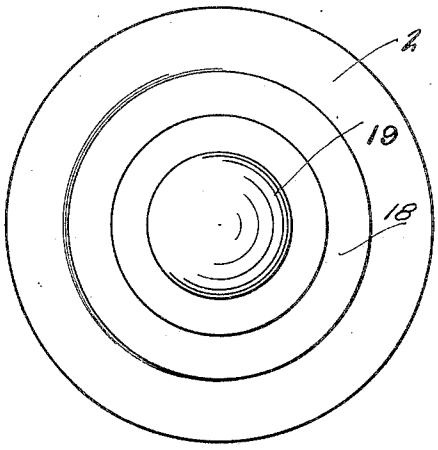


FIG.-1

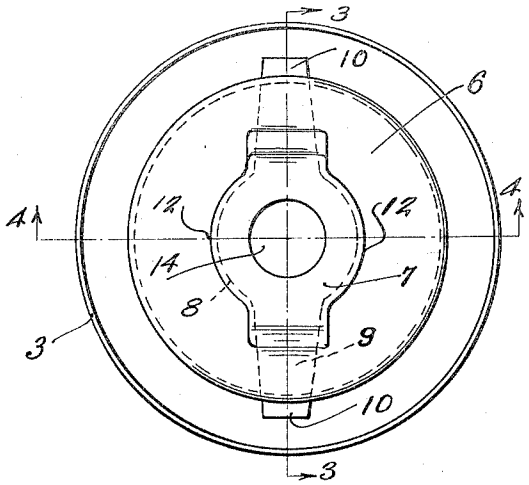


FIG.-2

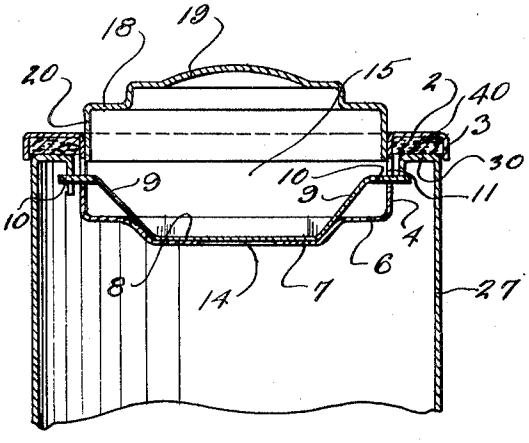


FIG.-3

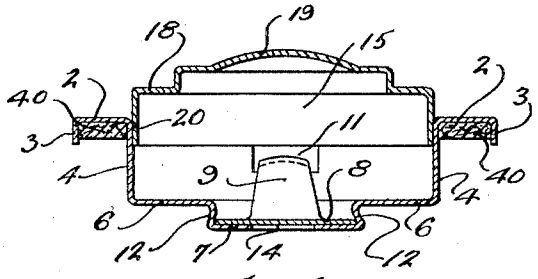


FIG.-4

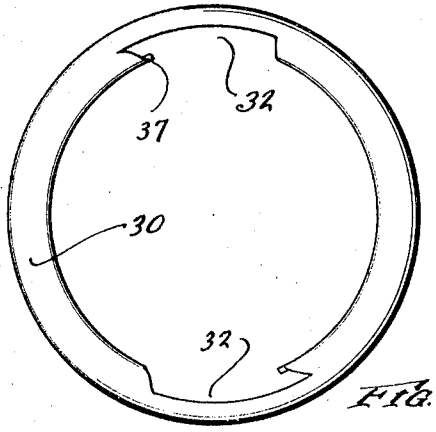


FIG.-5

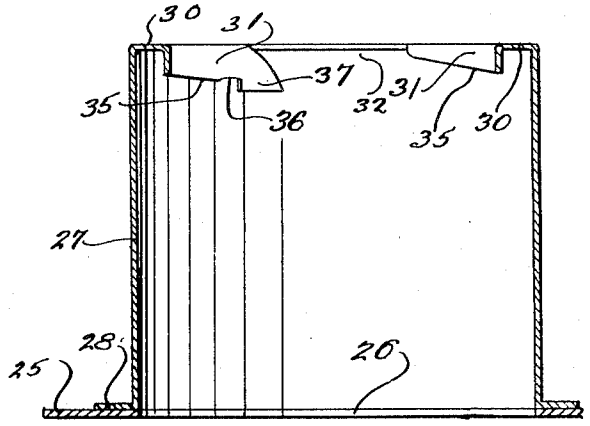


FIG-6

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UNITED STATES PATENT OFFICE.

JAMES S. REID, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE EATON AXLE & SPRING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CLOSURE.

Application filed March 14, 1927. Serial No. 175,256.

This invention relates to improvements in closures of the type provided with opposed locking fingers for cooperation with opposed cam portions of the device to be closed.

The object of the present invention is the provision of an improved closure of this type which comprises a minimum number of inexpensively formed and readily assembled parts, and in which closure the locking fingers are secured to the part to which rotary movement is directly imparted for applying and removing the closure, thereby providing an exceptionally strong and sturdy closure structure.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

In the drawings, which represent one suitable embodiment of the invention, Fig. 1 is a top plan view of the closure; Fig. 2 is a bottom plan view thereof; Fig. 3 is a vertical sectional view thereof on the line 3—3, Fig. 2; Fig. 4 is a vertical sectional view of the closure on the line 4—4, Fig. 2, with the closure applied to the tubular filler neck of a tank; and Figs. 5 and 6 are respectively a plan view and a vertical sectional view of said filler neck.

The closure illustrated in the drawings includes an integral body member comprising a central cup-shaped portion, a horizontal flange portion 2 of annular form extending outwardly from the top of the cup-shaped portion, and a cylindrical flange or skirt portion 3 depending from the outer edge of said horizontal flange portion 2 and preferably having its outer surface knurled to enable it to be more easily held when imparting rotary movement thereto, as will later appear.

Said cup-shaped portion includes a cylindrical side wall 4 and a circular bottom wall 6 provided with a centrally disposed depending dome 7 forming a recess to receive the substantially circular base or body portion 8 of a locking member. Said locking member is provided with two opposed locking spring fingers 9 extending upwardly and outwardly from said base or body portion and terminating in directly outwardly extending cam engaging end portions 10 which project through opposed openings 11 in the cylindrical side wall 4. While the base or body portion of said locking member may be secured within said recess by any suitable means, it is preferably crimped therein, and in the present embodiment of the invention, two opposed side edge portions 12 of the dome 7 are crimped about the corresponding side edge portions of the locking member base or body portion 8, as clearly indicated in Figs. 2 and 3. Preferably, and as shown, a circular opening 14 is provided at the center of the depending dome 7 for facilitating the manufacture of the closure, as will be readily understood.

The air chamber 15 formed by the cup-shaped portion of the body member is closed by a simple inverted cup-shaped top member having a substantially circular top portion 18 which may be provided with a dome 19 for strengthening and ornamental purposes and having a cylindrical depending skirt portion 20 of slightly less diameter than the diameter of the cylindrical side wall 4 of the cup-shaped portion of the body member, so that the inverted cup-shaped top member may be pressed into the cup-shaped portion of the body member with more or less secure frictional connection therebetween.

In the present illustration of the invention, the device to be closed is a tank 25 which may be an automobile fuel tank. Surrounding the filling opening 26 of said tank is an upwardly extending filler neck having a cylindrical body wall 27. Said body wall may be an integral part of the tank or separate therefrom and provided with a laterally extending base flange 28 for securement thereto.

At its upper end, said body wall is provided with an inwardly extending, substantially horizontal flange 30 terminating in a depending flange 31. At two diametrically opposite points, portions of flanges 30 and 31 are cut away so as to provide two openings or passageways 32 through which the end portions 10 of the locking spring fingers 9 of the closure are adapted to be passed, as will later appear. The cutting away of said flanges provides two depending flange portions 31 of substantially semi-circular form, and the bottom edges of these flange portions are inclined to provide cam portions 35 with which the end portions 10 of the locking fingers are adapted to cooperate in effecting detachable locking connection of the closure with the filler neck. In the rear ends of the cam portions are provided recessed dwell portions 36, in which the end portions 10 of the locking

fingers are adapted to rest when the closure is in fully seated position on the filler neck. Just beyond said dwell portions, the depending flange portions 31 are provided with depending lugs or projections 37 which provide stops for the locking fingers of the closure when said fingers are traveling up the cam portions 35.

The closure is applied to the filler neck in the usual manner of bayonet joint connections, the locking spring fingers of the closure being passed down through the passageways of the filler neck. The closure is then turned in a clockwise direction, which causes the locking fingers thereof to ride up the cam portions 35 with yielding effect, the rotary movement of the closure being continued until said fingers strike the stop portions 37 which denotes full seating position of the closure. To remove the closure, it is only necessary to turn it in the reverse direction, whereupon the spring fingers will leave the dwell portions 36 and will ride down the cam portions 35, finally reaching the passageways 32. The closure can then be removed from the filler neck, the locking fingers of the closure being passed through passageways 32, as before.

Preferably, the closure is provided with a yielding gasket 40 which is adapted to lie between the top horizontal flange 30 of the filler neck and the top flange 2 of the closure body member when the closure is applied to the filler neck. The gasket is of slightly greater width than the annular chamber of the body member formed by the cylindrical side wall 4 and the depending skirt portion 3 thereof, and the gasket is therefore frictionally maintained in said chamber, even when the closure is removed from the filler neck. If the gasket should leave said chamber, it would be prevented from becoming separated from the closure by the outwardly extending end portions 10 of the locking spring fingers.

The air chamber 15 of the closure is vented to the inside of the filler neck body 27 and hence to the inside of the tank 25 by the openings 11 in the cylindrical side wall 4 of the cup shaped portion of the closure body member. While some air will escape from said chamber 15 to the atmosphere between the depending skirt portion 20 of the top member and the cylindrical side wall 4 of the body member, a suitable opening may be provided in the top portion 18 of the top member.

It will thus be seen that I have provided a bayonet joint closure which comprises a minimum number of inexpensively formed and readily assembled parts, and that the locking member of the closure is directly secured to the body member which is the part to which rotary movement is directly imparted in applying the closure to and removing it from the filler neck. An exceptionally strong and sturdy closure structure is therefore provided.

What I claim is:

A closure for one end of a tubular neck provided at said end with a transverse gasket engaging wall and with opposed cam portions adjacent said wall, comprising a one-piece body member; a one-piece locking member; and a one-piece cover member for said body member; said body member including a central cup-shaped portion adapted to fit within the opening of said neck end, and also including an annular gasket engaging wall extending outwardly from the top of said cup-shaped portion and adapted to overlie the gasket engaging wall of said neck end and also including a cylindrical flange depending from the outer edge of said body member wall and adapted to be grasped by the operator in applying the closure to and removing it from said neck end, said cup-shaped portion being provided in its circular bottom wall with a circular cavity and in its cylindrical side wall with two opposed openings; said locking member including a circular base portion secured in the cavity of said cup-shaped portion and two opposed inherently resilient locking fingers extending outwardly from said base portion through the opposed openings of said cup-shaped portion, the free or outer ends of said locking fingers being adapted for locking cooperation with said neck cam portions; and said cover member including a top portion adapted to cover the chamber of said cup-shaped portion and a depending flange portion for frictional securing engagement with the cylindrical side wall of said cup-shaped portion.

In testimony whereof I hereby affix my signature.

JAMES S. REID.