June 24, 1930. C. H. BELL 1,767,040

CLOSURE

Filed July 19, 1928

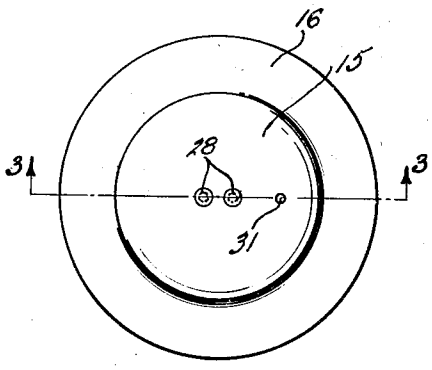


FIG. -1

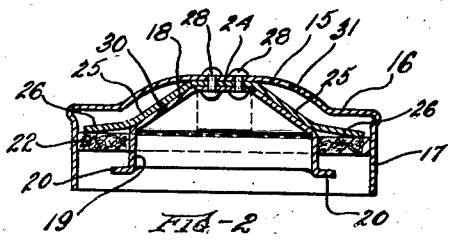


FIG. -2

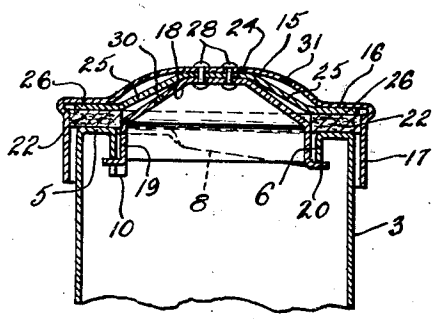


FIG. -3

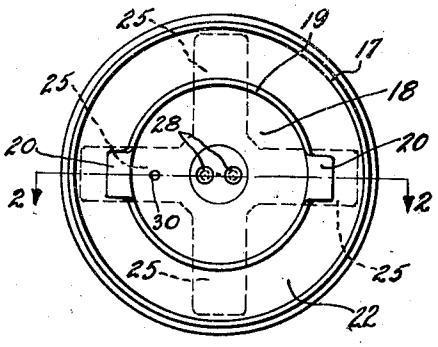


FIG. -4

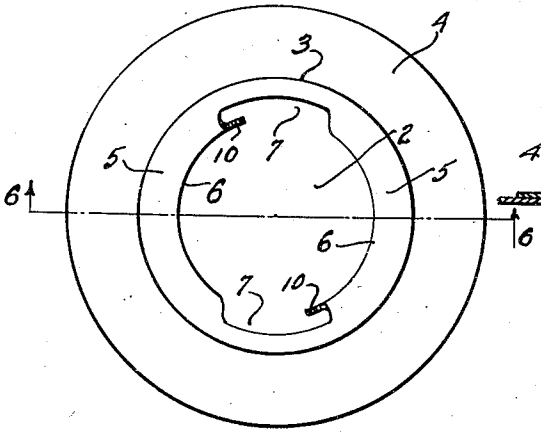


FIG. -5

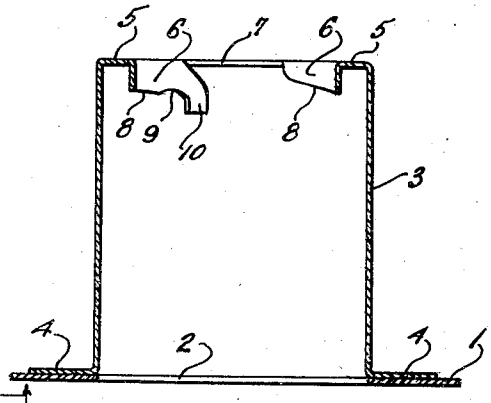


FIG. -6

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1,767,040

UNITED STATES PATENT OFFICE

CHARLES H. BELL, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE EATON AXLE & SPRING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

CLOSURE

Application filed July 19, 1928. Serial No. 293,851.

This invention relates to improvements in closures, such as are used for closing the openings of radiators and fuel tanks of automobiles, etc. More particularly, the invention relates to improvements in closures of the bayonet joint type.

The general object of the present invention is the provision of a closure of the type described which is of simple and inexpensive construction and highly efficient in use.

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

In the drawing, Fig. 1 is a plan view of a closure embodying my invention; Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 4; Fig. 3 is a cross-sectional view of the closure detachably connected to a tubular neck surrounding the opening to be closed, the section through the closure being on the line 3—3, Fig. 1; Fig. 4 is a bottom plan view of the closure; Fig. 5 is a top plan view of the neck shown in Fig. 3; and Fig. 6 is a vertical sectional view of said neck on the line 6—6, Fig. 5.

In the present illustration of the invention, 1 represents an automobile radiator, fuel tank or other object having an opening 2 to be closed, which opening is surrounded by a tubular neck to which the closure is adapted to be detachably secured by a bayonet joint connection. Said neck includes a cylindrical body portion 3 which may be an integral part of member 1 or separated therefrom and suitably secured thereto, the latter arrangement being here shown with said body portion provided with an outwardly extending, annular base flange 4 for welding or other suitable securement to member 1. Said body portion is provided at its upper end with an inwardly extending annular flange 5 which terminates in a depending flange 6, and at two diametrically opposed points, parts of flanges 5 and 6 are cut away to provide two passage-ways 7 for the locking fingers of the closure, as will later appear. The cutting away of said flange parts provides two depending flange portions 6 of substantially semi-circular form and the two lower edges of these flange portions are inclined to provide two cam surfaces 8 with which the closure locking fingers are adapted to cooperate in effecting a detachable connection of the closure to the neck. Preferably, a recess or dwell 9 is provided at the rear end of each cam surface and adjacent each dwell each flange portion 6 is provided with a depending projection 10 to form stops for the closure locking fingers and thus limit rotary movement thereof relative to the neck, all as will appear hereinafter.

The closure of the present application includes a one-piece body member having a central dome-shaped portion 15, a marginal portion 16 of annular form and a depending skirt portion 17 of cylindrical form, said skirt portion being preferably but slightly larger in diameter than that of the neck body portion 3 with which it is adapted for telescopic relation. Arranged within this body member is the locking member of the closure, which is here shown as of inverted, substantially cup shape. It includes a dome-shaped top portion 18 and a cylindrical side wall portion 19 which is provided at its lower end with two outwardly extending, diametrically opposed finger portions 20 adapted for locking engagement with the came surfaces 8 of the neck, as will later appear.

Arranged between said body and locking members is a resilient member to enable the closure locking fingers to engage the cam surfaces 8 of the neck with yielding effect and thus prevent undue wear of the gasket 22 with which the closure is usually provided. As here shown, this resilient member is of metal and includes a central securing portion 24 and two or more downwardly and outwardly extending resilient arms 25, four circumferentially spaced arms being here shown which terminate in outwardly extending gasket engaging end portions 26. While the present locking member is provided with arms, which may be corrugated, if desired, to increase their resiliency, a complete disk might obviously be employed.

Any suitable means may be used to connect the locking member and the resilient

member to the closure body member, but in the embodiment here shown, a couple of rivets 28 are employed, which pass through the central portions of these three members, as clearly indicated in Figs. 2 and 3.

The closure is detachably connected to the neck by passing the closure locking finger portions 20 down through the passage-ways 7 of the neck and then imparting clockwise rotary movement to the closure so as to cause said finger portions to ride up the cam surfaces 8 until they reach the dwells 9, further rotary movement of said finger portions being prevented by the stop projections 10. The movement of said finger portions up along said cam surfaces causes the closure to be drawn down upon the neck with resilient effect, the arm end portions 26 of the resilient member and the gasket 22 moving up against the marginal portion 16 of the closure body member, as clearly indicated in Fig. 3. During the connection of the closure to the neck, the gasket 22 lies between the top flange 5 of the neck and the arm end portions 26 of the resilient member, and tightly seals the opening being closed.

To remove the closure from the neck, it is only necessary to turn the closure in a counter-clockwise direction which causes the finger portions thereof to leave the dwells 9 and ride down the cam surfaces 8 until they reach the passage-ways 7, whereupon the closure can be readily lifted from the neck. When the closure is removed from the neck, said gasket is prevented from becoming disassembled from the closure by the locking fingers 20 thereof which extend outwardly beneath said gasket.

To vent to the atmosphere the interior of the neck and hence the interior of member 1 when the closure is connected to the neck, suitable vent apertures are provided in the closure. In the present embodiment of the invention, an aperture 30 is provided in the top portion 18 of the locking member and an aperture 31 is provided in the dome-shaped portion 15 of the body member, thereby providing a circuitous vent means which prevents the contents of member 1 from splashing out if a short neck is used.

What I claim is:

1. A closure for necks having opposed rigid cam portions, comprising a body member, a locking member having rigid locking fingers for cooperative locking engagement with the cam portions of a neck, and an inherently resilient member having the central part thereof rigidly secured between said body member and said locking member and having other parts thereof arranged to press against the outer end of a neck, whereby said fingers engage said cam portions with yielding effect.

2. A closure for necks having opposed rigid cam portions, comprising a body member, a locking member having rigid locking fingers for cooperative locking engagement with the cam portions of a neck, an inherently resilient member having the central portion thereof rigidly secured between said body member and said locking member and having other parts thereof arranged to be engaged when the closure is applied to a neck, whereby said fingers engage said cam portions with yielding effect, and a single means for maintaining said three members, in assembled relation.

3. A closure for necks having opposed rigid cam portions, comprising a body member, a locking member having rigid locking fingers for cooperative locking engagement with the cam portions of a neck, means clamping said locking member for rotation with said body member, and an inherently resilient member having a central securing portion interposed between said locking member and said body member and through which portion the clamping means for said locking member extends, said resilient member also having outer gasket engaging means arranged substantially concentric with said central securing portion whereby said rigid locking fingers yieldingly engage said cam portions when the closure is applied to the neck.

4. A closure for necks having opposed rigid cam portions, comprising a one-piece body member having a top portion and a depending skirt portion, a one-piece locking member having a top portion and a depending side wall portion provided at its lower edge with opposed outwardly extending rigid locking extensions for cooperative locking engagement with the cam portions of a neck, the top portion of said locking member being less in width than the top portion of said body member, and a one-piece member having inherently resilient portions including a central securing portion clamped between top portions of said body and locking members, whereby said extensions engage said cam portions with yielding effect.

5. A closure for necks having opposed rigid cam portions, comprising a one-piece body member having a top portion and a depending skirt portion, a one-piece locking member having a top portion and a depending side wall portion provided at its lower edge with opposed outwardly extending rigid locking extensions for cooperative locking engagement with the cam portions of a neck, the top portion of said locking member being less in width than the top portion of said body member, and a one-piece member having a central securing portion and opposed outwardly and downwardly extending inherently resilient arms lying between the top portions of said body and locking

members, whereby said extensions engage said cam portions with yielding effect.

6. A closure for necks having opposed rigid cam portions, comprising a one-piece body member having a top portion and a depending skirt portion, a one-piece locking member having a top portion and a depending side wall portion provided at its lower edge with opposed outwardly extending rigid locking extensions for cooperative locking engagement with the cam portions of a neck, the top portion of said locking member being less in width than the top portion of said body member, a one-piece member having a central securing portion and opposed outwardly and downwardly extending inherently resilient arms lying between the top portions of said body and locking members, whereby said extensions engage said cam portions with yielding effect, and a single means for maintaining the top portions of said body and locking members and the securing portion of said intermediate member in assembled relation.

In testimony whereof I hereby affix my signature.

CHARLES H. BELL.