Feb. 13, 1934. L. K. SNELL 1,946,768

CLOSURE

Filed Aug. 26, 1930 2 Sheets-Sheet 1

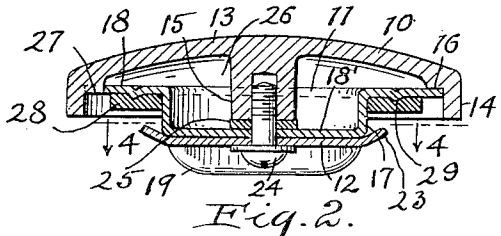


Fig. 2.

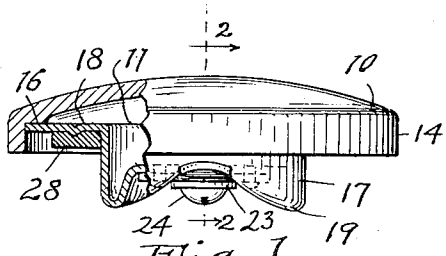


Fig. 1.

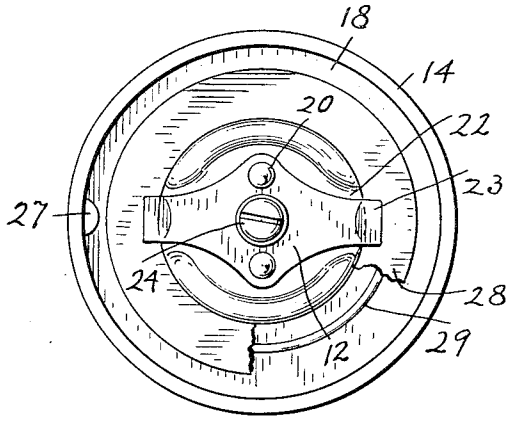


Fig. 3.

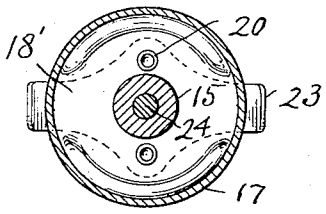


Fig. 4.

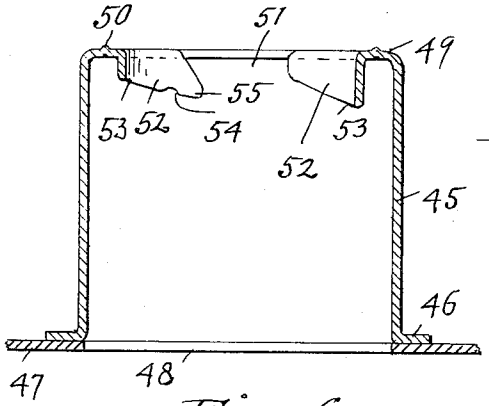


Fig. 6.

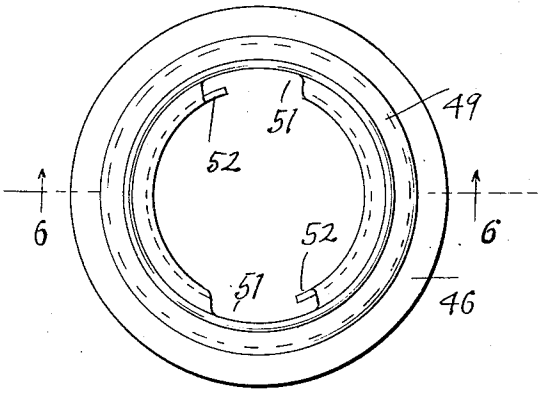


Fig. 5.

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CLOSURE

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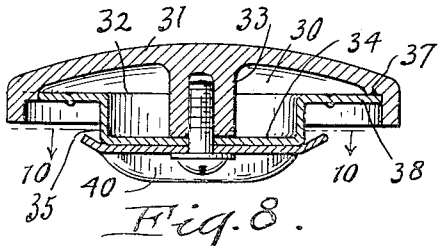


Fig. 8.

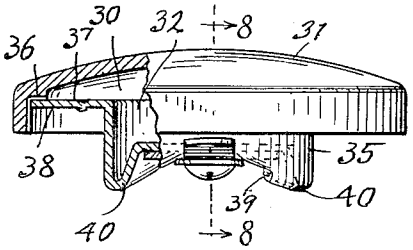


Fig. 7.

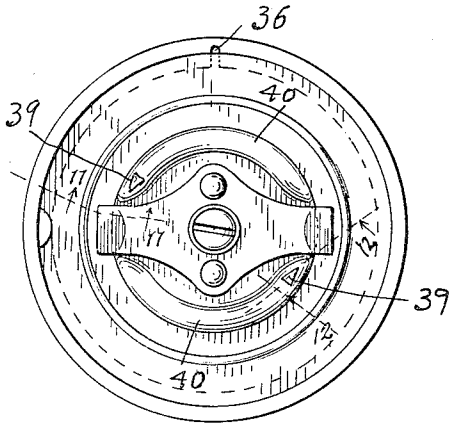


Fig. 9.

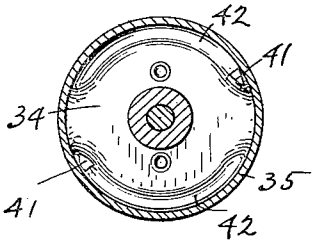


Fig. 10.

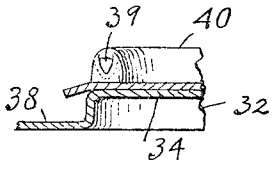


Fig. 11.

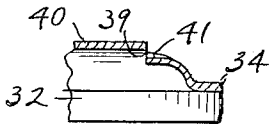


Fig. 12.

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Patented Feb. 13, 1934 1,946,768

UNITED STATES PATENT OFFICE

1,946,768

CLOSURE

Lyle K. Snell, Detroit, Mich., assignor, by mesne assignments, to Eaton Detroit Metal Company, Cleveland, Ohio, a corporation of Ohio

Application August 26, 1930. Serial No. 477,872

8 Claims. (Cl. 220—40)

This invention relates to closure devices, and more particularly to a quick detachable bayonet type closure for use on the filler necks of fluid containers, such as vehicle gasoline tanks, radiators or the like.

As an object of my invention I aim to provide an improved form of construction for closures of the type mentioned.

Another object of this invention is to provide a closure having novel venting means.

The invention may be further briefly summarized as consisting in certain novel combinations and arrangements of parts hereinafter described and particularly set out in the appended claims.

In the accompanying sheets of drawings,

Fig. 1 is a side elevational view with parts broken away, showing a closure constructed according to my invention,

Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view thereof.

Fig. 4 is a sectional plan view taken on line 4—4 of Fig. 2.

Fig. 5 is a top plan view of a filler neck with which my closure may be used.

Fig. 6 is a sectional elevation taken on line 6—6 of Fig. 5.

Fig. 7 is a side elevational view, with parts broken away, showing another closure constructed according to my invention.

Fig. 8 is a sectional elevation thereof taken on line 8—8 of Fig. 7.

Fig. 9 is a bottom plan view thereof.

Fig. 10 is a sectional plan view taken on line 10—10 of Fig. 8.

Fig. 11 is a detail sectional elevation taken on line 11—11 of Fig. 9, and

Fig. 12 is a detail sectional elevation taken on line 12—12 of Fig. 9.

In the drawings which illustrate my invention, and to which detailed reference will now be made, I have shown a bayonet type closure adapted for quick detachable assembly with a filler neck by relative rotation therebetween. This closure comprises outer and inner wall structures or body members 10 and 11, and a resilient locking member 12 carried by the inner wall structure or body member. The outer wall structure is preferably constructed in the form of a casting, such as a die casting, and in external appearance may assume any desirable shape or form. As herein illustrated, however, this outer wall structure is substantially circular in form having a rounded top wall portion 13 and a marginal flange or skirt 14 depending around the outer edge thereof. While the outer wall structure may be constructed according to any desired pattern or shape, it is essential to my invention, however, that this part of the closure be provided with a depending central boss 15 and an annular shoulder 16, which cooperate with the inner wall structure in securing the latter in assembled position.

The inner wall structure is commonly referred to as an "insert", and is preferably constructed as a sheet metal stamping. This member is provided with a substantially cylindrical hollow central portion 17 having an outwardly extending lateral flange 18 around its upper end. The cylindrical central portion of the inner wall structure, which is closed at its lower end by the bottom wall 18', is commonly referred to as a "pilot cup", since it performs a guiding and centering function when the closure is applied to a filler neck. To give this pilot cup sufficient depth to efficiently perform its guiding and centering function, I provide the bottom wall thereof with depending arcuate lips or extensions 19 which extend below that portion of the bottom wall to which the locking member 12 is secured. The side walls of these extensions are spaced relatively close together, as indicated in Fig. 1, the outer wall being continuous and substantially flush with the outer wall of the cylindrical pilot cup. The arrangement of the extensions in this manner leaves a large portion of the bottom wall of the pilot cup undistorted to form a bearing surface against which the substantially flat resilient locking member 12 is secured by means of the rivets 20. It will be noted that the arcuate extensions are not continuous, but are arranged with their inclined ends spaced apart to provide the diametrically opposed recesses 22 through which the finger portions 23 of the locking member extend.

When the inner wall structure, having the locking member secured thereto, is assembled into the outer wall structure, the laterally extending flange 18 engages or abuts against the annular shoulder 16, while the central boss 15 extends into the opening of the pilot cup so as to bring the lower end of the boss into proximity with the bottom wall 18'. To retain these parts in assembled relation I employ a suitable connecting member such as the screw 24 which extends through the locking member 12 and through the bottom wall of the pilot cup and engages in a threaded opening provided in the boss 15. Suitable sealing or packing means, such

as the rubber washer 25, may be inserted between the bottom wall of the pilot cup and the lower end of the boss to prevent corrosive fluid, such as the hot water of a vehicle cooling system, from entering the chamber 26 formed between the assembled inner and outer wall structures. For preventing relative rotation between the inner and outer wall structures, so that the outer wall structure may be used as a driving means for rotating the locking member, I provide the shoulder 16 with an integral lug 27 which engages in a correspondingly shaped recess formed in the flange 18.

The closure is preferably provided with a suitable gasket 28 which surrounds the pilot cup and bears against the laterally extending flange 18. If desired this flange may be formed with an annular ridge or bead 29 which presses into the gasket and tends to increase the efficiency of the seal produced thereby.

When a closure of the form which I have just described, is intended for use with fluid containers, such as vehicle fuel tanks which require venting to the atmosphere to prevent the formation of a vacuum therein as fluid is withdrawn, I provide the construction illustrated in Figs. 7 to 12 inclusive, which is identical with the closure described in detail in connection with Figs. 1 to 4 of the drawings, except that in this instance the chamber 30 formed between the outer and inner wall structures 31 and 32 is vented to atmosphere, and is vented to the interior of the container by a novel form of venting means. Since the chamber 30 is not maintained fluid tight, packing means, such as the washer 25 of Fig. 2 is not needed, but instead the boss 33 of the outer wall structure is made somewhat longer so that it engages the bottom wall 34 of the pilot cup 35.

For venting the chamber 30 to atmosphere a passage 36 may be formed in the shoulder 37 of the outer wall structure, so as to extend around the outer edge of the flange 38, when the inner and outer wall structures are secured together. This passage can be formed at no additional cost, since it can readily be formed during the operation of casting the outer wall structure.

For venting the chamber 30 to the interior of the device to which the closure is applied, I provide vent openings 39 through the bottom wall of the arcuate extensions 40 which depend below the bottom wall 34 of the pilot cup. In order that fluid splashed into the pilot cup through these openings may be deflected and thereby prevented from escaping through the vent passage 36, I form the vent openings by shearing the metal of the bottom wall of the extensions along radii of the cylindrical pilot cup, and press the sheared metal inwardly toward the chamber 30 to form the hood-like and substantially gable-shaped baffles 41. These vent openings, it will be noted, do not lead directly into the chamber 30, but lead into the elongated relatively narrow arcuate recesses 42 of the depending extensions 40, and these recesses, in turn, communicate with the chamber 30. Thus fluid splashed through these openings, upon surging of the fluid in the container, does not pass directly into the chamber 30, but first enters the recesses 42, and in entering these recesses is deflected laterally by the hood-like baffles 41. It will be seen from this arrangement that fluid entering the pilot cup does not move in the direction of the vent passage 36, and consequently very little of the fluid can escape through this passage.

It should be noted that the vent openings 39 are located at substantially the lowest point of the pilot cup, so that during the intervals between the surges of the fluid in the container, any fluid within the pilot cup can be drained back into the container through these openings. The size of these openings is such that all of the fluid forced into the pilot cup by the surges will be drained back into the container between the surges. These openings thus prevent an accumulation of fluid in the pilot cup, which accumulated fluid would flow out through the passage 36 into the hand of the operator when the cap is inverted, as frequently happens with many forms of closures now in use.

As an example of a filler neck with which my closures may be used, I have illustrated a device of this kind in Figs. 5 and 6 of the drawings. This filler neck comprises a tubular member 45, provided at one end thereof with an annular flange 46, adapted to be secured to the wall of the container 47, so as to surround the opening 48. At its other end the tubular member is turned radially inwardly to form the laterally extending flange 49 which serves as a gasket seat. This gasket seat, if desired, may be provided with an annular bead 50, similar to the annular bead 29 of the closure shown in Fig. 2.

At diametrically opposed points the laterally extending flange 49 is provided with openings 51, which admit the locking fingers of the closure when the latter is applied to the filler neck. Intermediate the openings 51, portions of the laterally extending flange 49 are bent inwardly axially of the filler neck to form the depending locking extensions 52. The inner edges or surfaces of these extensions are provided with inclined cam surfaces 53, which are adapted to be engaged by the locking fingers of the closure upon rotation thereof relative to the filler neck. These cam surfaces terminate at one end in the openings 51 and at their other ends merge into the dwells 54 which are formed adjacent the depending stops 55. Upon application of the closure to the filler neck the locking fingers pass through the openings 51, and upon rotation of the closure these fingers engage and follow the inclined cam surfaces and draw the closure into sealing engagement with the gasket seat of the neck. Further rotation of the closure toward locking position brings the fingers into engagement with the dwells 54 and with the stops 55 which limit further rotational movement of the closure, and retain the same in the locked position. Upon reverse rotary movement the fingers disengage the cam surfaces and release the closure from the neck.

It will now be readily seen from the foregoing description that I have provided a form of closure which is simple and compact in construction, having relatively few parts, all of which are adapted to be cheaply manufactured. It will also be seen that the closure which I have devised embodies novel venting means, which reduces the loss of fluid from the container to a minimum.

While I have shown and described the device of my invention in a detailed manner, it should be understood, however, that I do not intend to limit myself to the precise details shown and described, but regard my invention as including such changes and modifications as do not involve

a departure from the spirit of the invention and the scope of the appended claims.

Having thus described my invention what I claim is:

1. In closure devices the combination of a cast metal body member having a depending central boss and an annular shoulder portion, and a sheet metal body member having an annular flange in engagement with said annular shoulder portion and a central recess into which said boss extends, locking means associated with said sheet metal body member, a lug on said annular shoulder portion extending into a recess of said flange for preventing relative rotation between said body members, and means securing said sheet metal body member to said boss.

2. In closure devices the combination of a cast metal body member having a depending central boss and an annular shoulder portion, and a sheet metal body member having an annular flange in engagement with said annular shoulder portion and a central recess into which said boss extends, locking means associated with said sheet metal body member, a lug on said annular shoulder portion extending into a recess of said flange for preventing relative rotation between said body members, means extending through a wall of said sheet metal body member for securing the same to said boss, and packing means associated with said securing means.

3. In closure devices the combination of inner and outer body members having therebetween an air chamber vented to atmosphere, said inner body member being provided with an extension depending therefrom and having a recess communicating with said chamber, and said extension having a portion of the wall thereof sheared and deflected to provide a passage for venting said chamber to the interior of the device to which the closure is applied and to provide a baffle for directing fluid away from the first mentioned passage.

4. In clsure devices the combination of inner and outer body members having therebetween an air chamber vented to atmosphere, said inner body member being provided with an arcuate extension depending therefrom and having a recess communicating with said chamber, said extension being formed with an inclined end wall having a portion thereof sheared and deflected into said recess thereby forming a vent opening for the device to which the closure is applied and also forming a hood for directing the flow of fluid passing through said opening.

5. In closure devices the combination of inner and outer body members having therebetween an air chamber vented to atmosphere, said inner body member being provided with an extension depending below the bottom wall thereof and having a recess communicating with said chamber, and said extension having a vent and drain passage through the wall thereof at substantially the lowest point of said recess.

6. In closure devices the combination of inner and outer body members having therebetween an air chamber vented to atmosphere, said inner body member being provided with an arcuate extension depending below the bottom wall thereof and having the side walls thereof spaced relatively close together to form an elongated narrow arcuate recess communicating with said chamber, and said extension having a portion of the bottom wall thereof sheared on a radial line and deflected to provide a vent and drain passage into the device to which the closure is applied and to provide an integral hood for said vent extending into said recess between said side walls.

7. A closure comprising an outer wall structure and an inner wall structure connected thereto, said inner wall structure having a substantially cylindrical hollow portion provided with arcuately extending hollow projections depending therefrom, said projections having the walls thereof spaced relatively close together with the outer wall constituting a continuation of the outer wall of the cylindrical portion, said projections being disposed in substantially circumferentially extending arrangement with their ends in spaced relation, and a locking member carried by the inner wall structure and having locking fingers projecting outwardly between the spaced ends of the depending arcuate projections.

8. A closure comprising an outer wall structure and an inner wall structure connected thereto, said inner wall structure having a substantially cylindrical cup portion provided with a transverse bottom wall and with arcuately extending projections depending therefrom, said projections being disposed in substantially circumferentially extending arrangement around the perimeter of said bottom wall with their ends in spaced relation and with a relatively large area of the bottom wall exposed between the projections, and a locking member having a relatively wide body portion disposed between said projections and secured against the exposed large area portion of said bottom wall, said locking member also having locking fingers projecting outwardly between the spaced ends of said projections.

LYLE K. SNELL.