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NECK AND CLOSURE STRUCTURE

Filed July 19, 1928

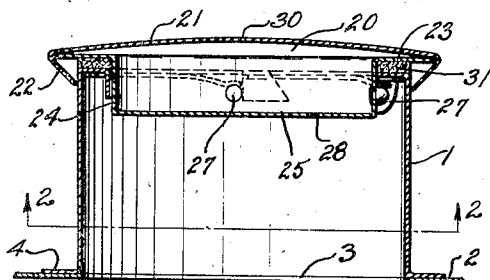


Fig. 1

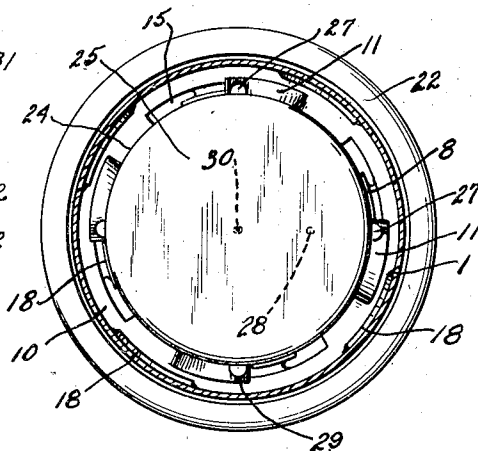


Fig. 2

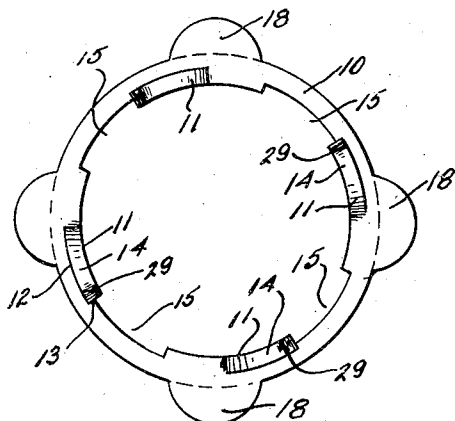


Fig. 3

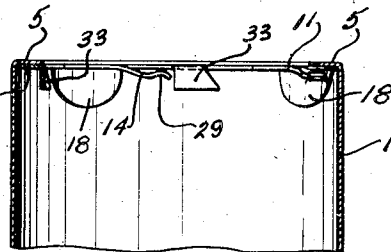


Fig. 5

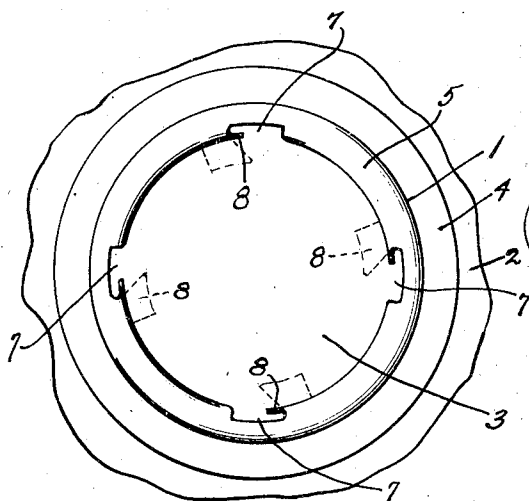


Fig. 4

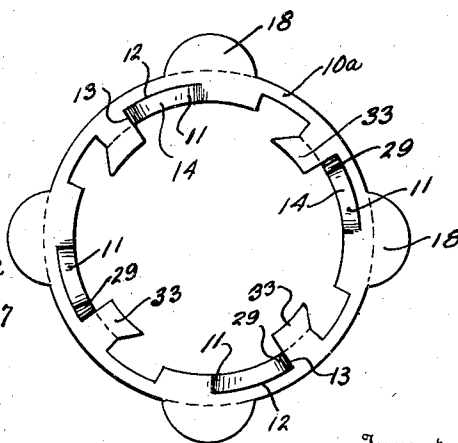


Fig. 6

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NECK AND CLOSURE STRUCTURE

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This invention relates to improvements in neck and closure structures, such as are used, for example, with the fuel tanks and the radiators of automobiles. More particularly, the invention relates to a structure of the character described in which the closure is adapted to be detachably secured to the neck by a bayonet joint connection.

The general object of the present invention is the provision of a neck and closure structure of the character described which is simple in construction and inexpensive to manufacture, the neck thereof comprising a simple tubular member within which is secured a ring having inherently resilient cam portions with which cooperate rigid projections of a simple closure.

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

In the drawings, Fig. 1 is a central vertical sectional view of a neck and closure structure embodying my invention; Fig. 2 is a cross-sectional view thereof on the line 2—2, Fig. 1; Fig. 3 is a bottom plan view of the cam ring of the neck; Fig. 4 is a plan view of the neck; Fig. 5 is a vertical sectional view of the neck on the line 5—5, Fig. 4; and Fig. 6 is a bottom plan view of a slightly modified neck cam ring.

The neck of the present structure includes a tubular body member 1 formed either as an integral part of a member 2, such as a fuel tank, around the opening 3 thereof, or as a separate part and suitably secured thereto, the latter arrangement being here shown with the body member 1 provided with an annular, outwardly extending base flange 4 for securement purposes.

The upper end of this tubular body member is turned inwardly to provide a horizontally disposed annular flange 5, although, if desired, said flange may be dispensed with. At four circumferentially spaced points, portions of flange 5 are cut away to

provide four passage-ways 7 for the locking projections of the closure, and just to one side of each of said passage-ways, to the left, as viewed in Figs. 1, 4 and 5, is a depending projection 8 formed as an integral part of flange 5 and adapted to limit rotary movement of the closure projections relative to the neck, all as will later appear.

Adapted to be welded or otherwise suitably secured to the inner surface of the tubular body member 1 just below the top flange 5 thereof is a resilient sheet metal ring 10 which is provided at its inner edge with four circumferentially spaced and circumferentially extending tongues 11, formed by shearing the metal of member 10 along the lines 12 and 13, Fig. 3. The free end portions of said tongues are inclined downwardly so that the lower surfaces thereof form cams 14 with which the locking projections of the closure cooperate in effecting detachable connection of the closure to the neck, as will appear hereinafter.

Just to one side of each of the free ends of said tongues, portions of member 10 are cut away to provide passage-ways 15 for the closure locking projections, and member 10 is so mounted in the neck body member 1 that said passage-ways 15 will be in vertical alignment with the passage-ways 7 of the top flange 5 of said body member, thereby bringing the free end of each cam tongue 11 adjacent one of the depending stop projections 8 of flange 5, all as clearly shown in Fig. 5.

While member 10 may be secured within the body member 1 by any suitable means, in the present embodiment of the invention, said member 10 is provided at its outer edge with a plurality of opposed ears, two pairs of diametrically opposed ears 18 being here shown, which ears are adapted to be welded or otherwise suitably secured to the inner surface of said body member so as to posi-

tion member 10 in contact or substantial contact with the lower surface of the neck top flange 5.

The closure for the neck includes an outer wall and an inner wall having portions thereof separated to provide an air chamber 20 therebetween. Said outer wall includes a slightly dome-shaped top portion 21 and a depending marginal skirt portion 22 and said inner wall includes a central cup shaped portion at the top of which is an outwardly extending flange portion 23 of annular form, said cup shaped portion including a cylindrical side part 24 and a circular bottom part 25. These two walls are maintained in assembled relation by bending inwardly beneath the flange 23 of the inner wall the depending skirt portion 22 of the outer wall, as clearly indicated in Fig. 1.

The closure is, of course, provided with suitable locking projections for cooperation with the cams 14 of the neck tongues 11, and since said tongues are resilient, said projections may be rigid and therefore of simpler and less expensive construction. In the embodiment of the invention here illustrated, the side part 24 of the cup shaped portion of the closure inner wall is provided with four circumferentially arranged pins 27 extending outwardly through and suitably mounted in openings in said side part.

The closure is detachably connected to the neck by passing the closure pins 27 downwardly through the vertically aligned passage-ways 7 and 15 of the neck, which brings said pins to the starting ends of the cams 14. Clockwise movement of said closure causes said pins to ride along said cams until they reach the dwells or recesses 29 therein at the rear ends thereof, further movement of said pins in such direction being limited by the depending projections 8 of the neck flange 5. The closure is therefore yieldingly but firmly drawn onto its seat on the neck so that it will not become detached by shocks or jars imparted thereto. If desired and as shown, a gasket 31 of cork, leather or other yielding material may be interposed between the inner wall flange portion 23 of the closure and the top flange 5 of the neck, said gasket being prevented from becoming separated from the closure when the latter is removed from the neck by the outwardly extending closure locking pins 27. To remove the closure, it is only necessary to impart counter-clockwise movement thereto, which causes the closure locking projections 27 to leave the cam dwells 29 and ride down the cams until they reach the neck passage-ways 15 and 7, whereupon the closure can be readily lifted from the neck.

To vent to the outside atmosphere the interior of the neck and hence the interior of member 2 when the closure is secured to

the neck, the closure is provided with suitable air openings. In the present embodiment, the bottom part 25 of the closure inner wall is provided with an opening 28 and the dome-shaped portion 21 of the closure outer wall is provided with an opening 30, preferably out of alignment with opening 28 so that the vent is not direct and the contents of member 1, if of liquid form, will not splash out if a short neck is employed.

In the modification shown in Fig. 6, the cam ring 10a is provided at its inner edge with four inwardly extending projections 33 arranged at the left of the free end of each cam tongue 11. These projections are adapted to be bent downwardly when the ring is arranged within the neck body portion so that they will correspond to the projections 8 of the neck flange 5 of Figs. 4 and 5 and thus limit rotary movement of the closure locking projections. With the cam ring of Fig. 6, the top flange 5 of the neck body portion can be dispensed with, as will be readily understood.

What I claim is:

1. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a rigid tubular body member and a separate ring member mounted within the upper end portion thereof, said ring member being provided with a laterally extending flange portion having a pair of opposed inherently resilient axially movable sheared cam portions with which the locking projections of a closure are adapted to cooperate in effecting detachable connection of the closure to the neck.

2. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a tubular body member and a separate ring member mounted within the upper end portion thereof, said ring member being slotted circumferentially and transversely to provide downwardly inclined tongues forming yielding cam portions with which the locking projections of a closure are adapted to cooperate in effecting detachable connection of the closure to the neck.

3. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a tubular body member and a separate ring member mounted within the upper end portion thereof, said ring member being provided with sheared ribbon-like strips forming circumferentially extending yielding cam portions with which the locking projections of a closure are adapted to cooperate in effecting detachable

connection of the closure to the neck, said ring member being also provided with opposed recesses to afford access for said closure projections to said cam portions.

4. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a tubular body member and a separate ring member mounted within the upper end portion thereof, said ring member being provided with opposed inherently resilient circumferentially extending cam portions along which the locking projections of a closure are adapted to rotatably move from the starting to the ending points thereof, said cam portions being integral with said ring member at the starting points thereof and at the ending points thereof being provided with reversely curved portions forming latch means for releasably retaining the projections of the closure in locked position, said ring member being also provided adjacent the ending points of said cam portions with depending projections forming stops to limit rotary movement of the closure projections relative to said cam portions.

5. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a tubular body member and a separate ring member mounted within the upper end portion thereof, said ring member being provided with opposed inherently resilient circumferentially extending cam portions along which the locking projections of a closure are adapted to rotatably move from the starting to the ending points thereof, said ring member being also provided adjacent the ending points of said cam portions with depending projections forming stops to limit rotary movement of the closure projections relative to said cam portions and being further provided with depending ears for securement to the body member of the neck.

6. In a structure of the character described, a neck adapted to have its upper end closed by a detachable closure having opposed locking projections of rigid character, comprising a tubular body member and a separate ring member mounted within the upper end portions thereof, said ring member being provided with opposed inherently resilient circumferentially extending cam portions along which the locking projections of a closure are adapted to rotatably move from the starting to the ending points thereof, said ring member being also provided with opposed recesses to provide access for the closure projections to the starting points of said cam portions and with depending projections adjacent the

ending points of said cam portions to form stops to limit rotary movement of the closure projections relative to said cam portions, said cam portions, recesses and stop projections being located at the inner periphery of said ring member and said ring member being provided at its outer periphery with depending ears adapted for securement to the body member of the neck.

In testimony whereof I hereby affix my signature.

JAMES S. REID.

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