July 2, 1929. C. H. BELL 1,718,940

CLOSURE

Filed Aug. 30, 1928

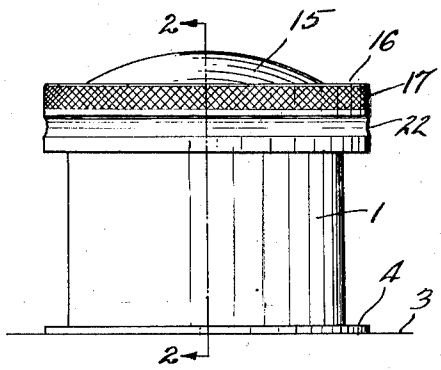


FIG. 1

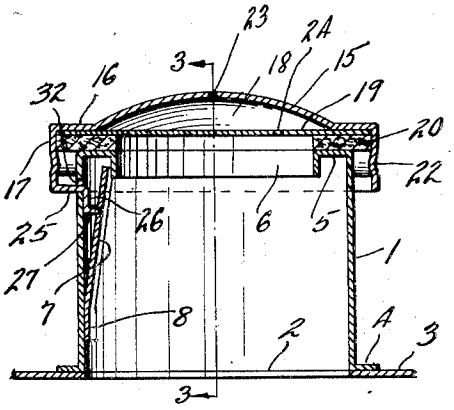


FIG. 2

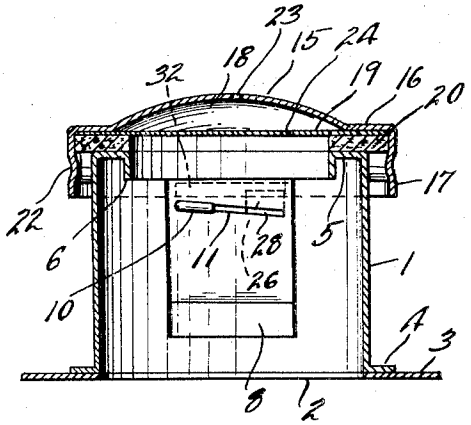


FIG. 3

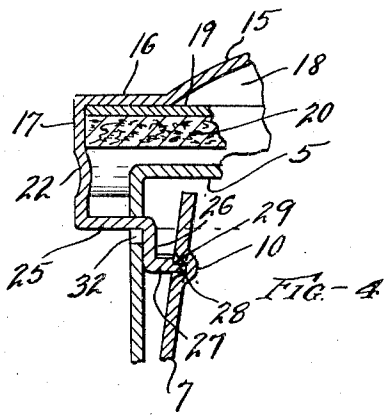


FIG. 4

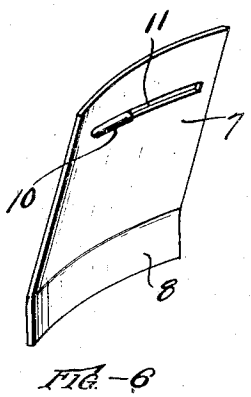


FIG. 6

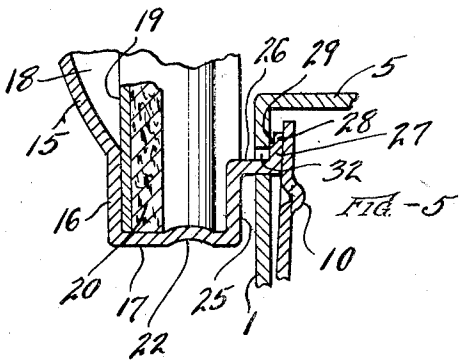


FIG. 5

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Patented July 2, 1929. 1,718,940

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 August 30, 1928. Serial No. 302,958.

This invention relates to improvements in neck and closure structures, such as are used, for example, with the radiators and the fuel tanks of automobiles.

The general object of the present invention is the provision of a neck and closure structure having simple and improved means which enable the closure to be easily and quickly attached to the tubular neck, and after such attachment, enable the closure to be readily swung to one side of the neck so as to expose the entire neck opening, the closure being readily removable from the neck when desired.

A further object of the present invention is the provision of a neck and closure structure of the character 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 side elevation of my improved neck and closure structure; Fig. 2 is a central vertical sectional view on the line 2—2, Fig. 1; Fig. 3 is a similar view taken on the line 3—3, Fig. 2; Fig. 4 is a detail vertical sectional view showing the closure partially connected to the neck; Fig. 5 is a detail vertical sectional view of the structure with the closure swung to one side of the neck; and Fig. 6 is a perspective view of the neck locking member.

The neck of the present structure includes a tubular body member 1 arranged about an opening 2 in a receptacle or other object 3, said tubular body member being either an integral part of the receptacle 3 or separate therefrom and suitably secured thereto. The latter arrangement is here shown with said body member provided with an outwardly extending base flange 4 for welding or other suitable securement to the receptacle 3. At its upper end, the tubular body member 1 is provided with an inwardly extending substantially horizontal flange 5 of annular form which terminates in a depending cylindrical flange 6, although, if desired, said depending flange may be omitted.

Arranged within the tubular body member of the neck is the locking member thereof, which is here shown as in the form of a generally rectangular resilient metal plate 7 having its transversely curved lower end portion 8 welded or otherwise suitably secured to the inner surface of the neck body member. The inner surface of the upper end portion of said locking plate is provided with a downwardly inclined groove 10 extending from a point near one side edge of the plate to the upper end of a correspondingly inclined slot 11 terminating at a point near the other side edge of the plate. This groove and this slot are adapted to receive a locking projection of the closure, and thereby enable the closure to be firmly but detachably connected to the neck, and after such connection, to be readily swung to one side of the neck so as to expose the opening thereof, all as will appear hereinafter.

The closure of the structure includes a body member having a central dome-shaped top portion 15, a flat marginal top portion 16 of annular form and a depending skirt or side wall portion 17 of cylindrical form and appreciably larger in diameter than the neck body member. The bottom of the air chamber 18 formed by the dome-shaped top portion 15 is covered by a transversely extending disc 19 just below which is an annular gasket 20 of cork or other yielding material. Said disc and said gasket are maintained in assembled relation with an annular rib 22 extending inwardly beneath the gasket, as clearly shown in the drawings. The closure air chamber 18 is vented to the atmosphere by an opening 23 in the top portion 15 and to the interior of the neck, when the closure is applied thereto, by an opening 24 in the central portion of the transverse disc 19.

The locking projection of the closure is here shown as an integral extension of the skirt portion 17 of the closure body member. It includes an inwardly extending portion 25, a depending portion 26 and a second inwardly extending portion 27 transversely inclined and having its inner end 28 of reduced thickness so as to provide a transverse shoulder 29. The width of each of said portions is substantially the same as the length of said groove 10, with which groove and the slot 11 the reduced end 28 of said extension is adapted to cooperate. To afford access for such cooperation, the tubular body member 1 of the neck is provided with a transversely extending slot 32 adjacent the groove 10 and

the slot 11 of the neck locking plate 7, as clearly shown in Fig. 3.

The closure is detachably connected to the neck by passing the portions 26 and 27 of the closure locking extension inwardly through the slot 32 of the neck body member. If such passage is made through the left end of said slot 32, as viewed in Fig. 3, the reduced end 28 of the extension portion 27 will enter the groove 10 of the neck locking plate 7, as clearly shown in Fig. 4. Then by simply turning said closure in a clockwise direction, said end 28 will enter the slot 11 of said plate and will travel downwardly therein to the lower end thereof, the closure meanwhile being firmly drawn down upon the neck body member, the closure gasket 20 being more or less compressed between the closure disc 19 and the neck flange 5, as shown in either Figs. 2 or 3.

If, however, the extension portions 26, 27 are passed inwardly through the middle or the right end of the neck body member slot 32, as viewed in Fig. 3, and the closure is pressed downwardly relative to the neck, the reduced end 28 of the extension portion 27 will directly enter the neck plate slot 11, and the closure will be secured to the neck as before, as will be readily understood.

The engagement of the shoulder 28 of the extension portion 27 with the neck plate 7, as shown in Fig. 2, causes the closure to be firmly held on the neck, sufficient pressure for the purpose being exerted on that part of the closure diametrically opposed to the locking extension thereof.

If after connection of the closure to the neck, it is desired to expose the neck opening, for filling purposes, for example, the closure can be readily swung to one side of the neck, as clearly shown in Fig. 5. Such a result is accomplished by turning the closure in a counter-clockwise direction so as to cause the extension end 28 to leave the neck plate slot 11 and enter the groove 10 thereof, such position of the parts being shown in Fig. 4. Then by simply swinging the closure upwardly to the left, as viewed in Fig. 4, said extension end 28 leaves said groove and the closure is swung to and held at one side of the neck, as in Fig. 5. From this position, it may be swung back down above the neck and again firmly connected thereto or completely removed from the neck, as will be readily understood.

I claim—

1. A structure of the character described, comprising a hollow neck and a closure therefor, said neck comprising a tubular body member and a resilient locking plate arranged therein and having its lower end portion secured thereto, said locking plate being provided with a downwardly inclined projection receiving means and said body member being provided in its side wall with an opening to afford access to said means, and said closure comprising a body member and a locking projection carried thereby, said projection being adapted to be passed through the opening of said neck body member and enter the means of the neck locking plate, whereby there is effected a detachable connection of the closure to the neck.

2. A structure as set forth in claim 1 characterized in that the projection receiving means of the neck locking plate is spaced from the edges thereof.

3. A structure as set forth in claim 1 characterized in that the projection receiving means of the neck locking plate is a groove.

4. A structure as set forth in claim 1 characterized in that the projection receiving means of the neck locking plate is a downwardly inclined groove and a correspondingly inclined slot having its upper end adjacent the lower end of said groove and constituting substantially a continuation thereof.

5. A structure as set forth in claim 1 characterized in that the projection of the closure is provided with means for normally resisting swinging movement of the closure while seated on the neck in fully connected relation therewith.

6. A structure as set forth in claim 1 characterized in that the projection of the closure is provided with means cooperating with the neck locking plate for normally resisting swinging movement of the closure while seated on the neck in fully connected relation therewith.

7. A structure as set forth in claim 1 characterized in that the projection of the closure is provided with a shoulder for normally resisting swinging movement of the closure while seated on the neck in fully connected relation therewith.

8. A structure as set forth in claim 1 characterized in that the projection receiving means of the neck locking plate includes a slot and in that the projection of the closure is provided with a reduced end adapted to enter said slot, the reduction of said projection end providing a shoulder which normally resists swinging movement of the closure while seated on the neck with said projection end in said slot.

9. A structure as set forth in claim 1 characterized in that the projection of the closure includes an inwardly extending portion adapted to extend through the neck opening, a depending portion and a second inwardly extending portion, said depending portion and said second inwardly extending portion being adapted to lie within the neck body member when the closure is applied to the neck.

10. A structure as set forth in claim 1 characterized in that the projection receiving means of the neck locking member includes a slot and in that the projection of the clo-

sure includes an inwardly extending portion adapted to extend through the neck opening, a depending portion and a second inwardly extending portion, said depending portion and said second inwardly extending portion being adapted to lie within the neck body member when the closure is applied to the neck and said second inwardly extending portion being provided with a reduced end for locking engagement in the slot of the neck locking plate.

In testimony whereof I hereby affix my signature.

CHARLES H. BELL.