Nov. 7, 1933. J. M. SCHUMANN 1,934,334

CLOSURE RETAINER

Filed June 1, 1931

FIG. 1.

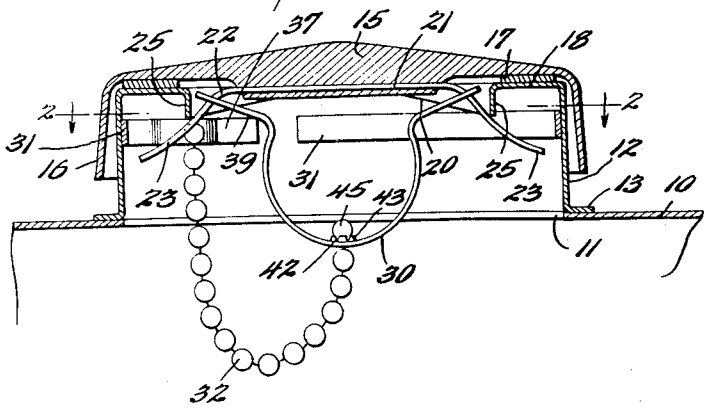


FIG. 2.

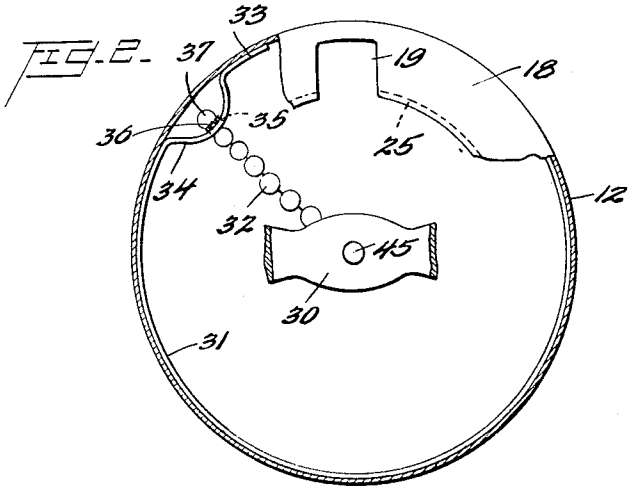


FIG. 3.

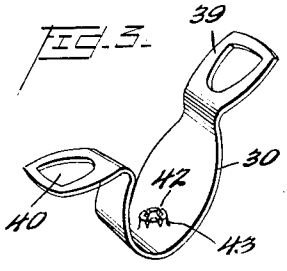
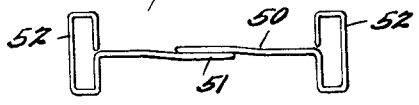


FIG. 4.



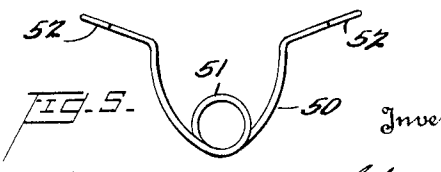


FIG. 5.

Inventor

Joseph M. Schumann,

By Watson, Cole, Morse & Grindle

Attorneys

Patented Nov. 7, 1933 1,934,334

UNITED STATES PATENT OFFICE

1,934,334

CLOSURE RETAINER

Joseph M. Schumann, San Marino, Calif.

Application June 1, 1931. Serial No. 541,405

6 Claims. (Cl. 220—24)

This invention relates to closure retainers and more particularly to devices of this type which are adapted to be applied to removable closures and the receptacles with which they are associated to prevent the complete separation thereof and the possible consequent loss of such closures.

Although the device forming the subject of the present invention may obviously be applied to any type of receptacle closure, such as that used in connection with tanks, cans, jars, automobile radiators, or the like, it will be described herein with reference to its exemplary application to an automobile fuel tank closure or cap. Very frequently, after such tanks are filled, the replacement of the cap is carelessly omitted and loss of the cap and some of the contents of the tank often results, so that it will be readily perceived that these particular conditions provide a special field of usefulness for my invention.

Therefore, the principal object of the invention is to provide novel retaining means which may be readily applied to a receptacle and closure of this general type without alteration of either the receptacle or the closure; and, more particularly, to provide means of this character which is adapted to be associated with a common form of locking device found in such closures for securing them in position to cover the filling opening of the tank.

In its preferred embodiment, the invention contemplates the provision of two resilient metallic members, one adapted to be removably connected with the closure locking element and the other adapted to be similarly associated with the receptacle, and a flexible freely running element adapted to connect said members.

A further object of the invention is to provide novel means by which the flexible connecting element may be secured to the members which are associated with the receptacle and the closure cap.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawing in which certain embodiments of my invention are illustrated by way of example.

In the drawing:

Figure 1 is a vertical cross sectional view of a portion of a receptacle and a closure cap disposed over the opening thereof, showing the manner of applying my improved retaining device;

Figure 2 is a horizontal cross sectional view taken on line 2—2 of Figure 1, with a portion of the margin of the filling opening shown in plan;

Figure 3 is a perspective view of the closure cap clip employed in the device illustrated in Figures 1 and 2; and

Figures 4 and 5 are views in plan and side elevation respectively of another form of closure retaining clip.

In Figure 1 of the drawing, the numeral 10 designates generally a metal receptacle or tank, such as for example the fuel tank of an automobile. The tank 10 is provided with a filling opening 11 around the margin of which is provided the raised neck portion 12 which is preferably formed of sheet metal of the same nature as that of which the tank 10 is constructed, and is provided with a lower outwardly extending flange 13 which may be rigidly secured to the tank in any suitable manner as by welding, brazing, or the like.

The closure or cap which is adapted to be applied to the tank opening is designated by the numeral 15 and is provided with the downwardly extending flange or skirt 16, which is adapted to surround the neck 12. The body portion of the cap 15 is provided on its underside near its margin with a suitable annular gasket 17 which is adapted to contact with the inwardly directed flange 18 provided around the upper portion of the neck 12, in order to effect a substantially fluid-tight seal when the cap 15 is applied.

The central part of the underside of the cap is provided with a raised portion 20 through which passes a diametrically disposed slot 21. This slot 21 is adapted to receive the locking bar 22 which is generally formed of a strip of relatively heavy resilient sheet metal. The locking bar 22 is provided with radially outwardly and downwardly projecting ends 23 which, when the closure cap is applied, enter the diametrically opposite disposed slots 19 provided in the flange 18, one of which is shown in Figure 2. The inner margin of the flange 18 is provided with the down-turned beveled cam portion 25, the lowest part of which is disposed adjacent the slot 19 and the highest portion preferably about a quarter turn away from slot 19. The closure cap 15 is adapted to be applied to the neck 12 with the ends 23 of the locking bar 22 in position to enter the slot 19; then the cap is rotated through a quarter turn or until the locking bar ends 23 move along the progressively deepening cam portion 25 so that the cap is firmly clamped upon the neck 12 of the tank opening 11, in the well-known manner.

The particular embodiment of my improved closure retaining device illustrated in the drawings is seen to comprise essentially a generally U-shaped clip 30, a resilient expansible band 31, and a flexible connecting element 32. The member 31 is preferably formed of a strip of resilient sheet metal which is adapted to be wound into a circular form and contracted so as to be capable of insertion within the opening provided by the inner margins of the flange 18, and it is then permitted to expand or spring outwardly into a parti-annular form shown in Figure 1 of the drawing, so as to frictionally contact with the inner wall of the neck 12 and to be effectively retained beneath the upper flange 18 of the wall 12. A portion of the band or strip 31 near one end is bent inwardly as at 34, and the end 33 is bent outwardly into close contact with the wall of the neck 12 so that it cannot by any chance be pulled through one of the slots 19. The bent portion 34 is perforated as at 35 in such a manner as to form a series of spurs or projections 36 upon one side of the band around said perforation. The opening 35 as thus formed is adapted to provide means for connecting the flexible member 32 to the band 31. This element 32 may be formed of any freely running flexible material but preferably comprises a beaded chain similar to the type widely used in the construction of pull chains for electrical or plumbing devices. This particular construction provides a very freely running element which is not liable to tangle or to be caught on any sharp edges or projections during the application and removal of the cap. The opening 35 within the rim or raised serrated edge 36 may be of slightly smaller diameter than that of the beads 37 forming the chain 32 so that the terminal bead 37 must be forced or sprung through the opening 35 and may be retained in position by the projections 36, which may, if necessary, be bent downwardly toward the plane of the portion 34, behind the end bead 37.

The clip 30 is likewise formed of resilient sheet metal, is preferably of generally U-shaped construction, and is provided with the outwardly flared end portions 39, each of which is provided with suitable openings 40 for the reception of the projecting ends 23 of the locking bar 22. The application of the clip to the locking bar will be readily understood from an inspection of Figure 1 of the drawing. The clip 30 is merely spread or expanded until the ends 23 may be inserted in the openings 40, and the clip is then permitted to resume its normal contracted position, as shown in Figure 1, wherein it is suspended from the inner portions of the locking bar 22. The intermediate or bight portion of the clip 30 is provided with a perforation 42 which is surrounded by a series of spurs or projections 43, as in the case of the corresponding elements 35 and 36 of the member 31. The other terminal bead 45 at the opposite end of the chain 32 is adapted to be forced or sprung through the opening 42 and retained by the projecting rim 43. The chain 32 is, of course, of sufficient length to enable the cap 15 to be removed and conveniently disposed upon the tank or suspended from the neck of the tank opening by means of the chain.

An alternative form of closure retaining clip is illustrated in Figures 4 and 5 of the drawing and comprises a resilient wire bent so as to conform generally to the shape of the clip 30 which has been described. This wire clip, designated by the numeral 50, is provided with a coil or convolution 51 centrally of its bight portion, and loops or eyes 52 are formed in the outwardly projecting ends of the clip. The loops 52 are preferably of rectangular shape so as to conform more closely to the outline of the locking bar 22, and the intermediate coil 51 is adapted to be connected in any suitable manner by a chain or other suitable flexible member to a receptacle connected element such as the member 31 described in connection with the other figures of the drawing.

It will be readily perceived that by means of the present invention there has been provided a novel and simply constructed retaining device for closures which may be easily applied without alteration of the receptacle or the closure cap. It will also be understood that various changes and modifications may be made in the embodiments illustrated and described without departing from the scope of the invention as defined in the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:—

1. A retaining device for removable closures for the openings of hollow receptacles comprising, in combination, an expansible resilient parti-annular band adapted to be detachably disposed within said opening, a resilient clip adapted to be detachably secured to a portion of the underside of said closure, and a flexible member connecting said clip and band.

2. The combination, with a hollow receptacle provided with an opening and a removable closure therefor provided with means for locking it in position to cover said opening, of retaining means for said closure comprising an element adapted to be attached to said receptacle, an element adapted to be attached to said locking means, and a flexible member connecting said elements.

3. The combination, with a hollow receptacle provided with an opening having a raised marginal portion or a neck around its periphery and a removable closure therefor provided with means for locking it in position to cover said opening, of retaining means for said closure comprising a resilient expansible parti-annular metallic band adapted to be sprung into position within said neck, an element adapted to be attached to said locking means and a flexible member connecting said element and said band.

4. A retaining device for removable caps adapted to be applied to the filling openings of hollow receptacles comprising, in combination, a sheet metal element adapted for attachment to said cap, a sheet metal element for attachment to said receptacle, each of said elements provided with a punched opening therein, said punched openings having marginal projections produced by the punching operation surrounding the same, and a beaded chain adapted to connect said elements, the end beads of said chain adapted to be passed through said openings and to be retained by said projections.

5. The combination, with a hollow receptacle provided with a filling opening and a removable closure cap for said opening provided with a diametrically extending locking bar having oppositely projecting ends adapted to engage portions of the margin of said opening to secure said cap in position to close said opening, of retaining means for said cap comprising a generally U-shaped clip, the arms of which are provided with openings adapted to receive the projecting ends of said

locking bar, and flexible means for connecting said clip to said receptacle.

6. The combination with a hollow receptacle provided with an opening and a removable cover for said opening, of cover retaining means comprising a resilient metal band adapted to be contracted and sprung into position within said opening, a resilient clip adapted to be quickly detachably connected to a portion of the underside of said closure, and a flexible member for connecting said band and said clip.

JOSEPH M. SCHUMANN.