Jan. 17, 1939. F. H. GLEASON 2,144,584

CAP CLOSURE

Filed April 6, 1931

FIG. 1.

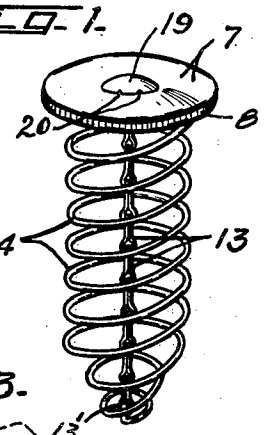


FIG. 2.

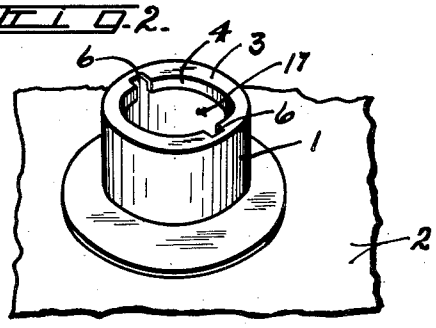


FIG. 3.

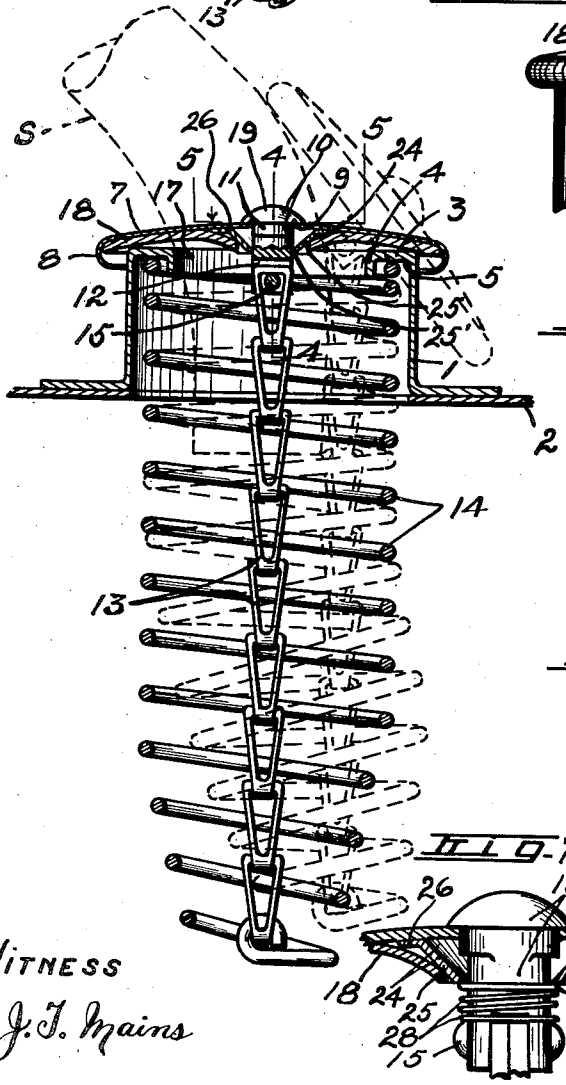


FIG. 4.

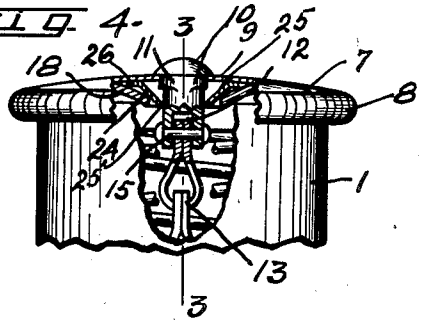


FIG. 5.

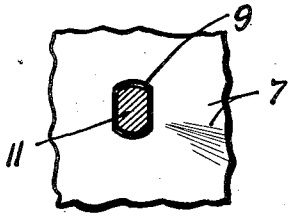


FIG. 6.

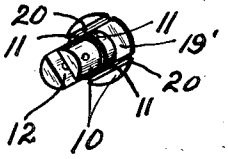


FIG. 7.

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CAP CLOSURE

Frederick H. Gleason, Auburn, N. Y., assignor, by mesne assignments, to Doray Lamp Co., Inc., Chicago, Ill., a corporation of Illinois

Application April 6, 1931, Serial No. 528,102

12 Claims. (Cl. 220—86)

This invention relates to cap closures and pertains more particularly to closures for filler openings for automobile gasoline tanks, automobile radiators and the like.

The main object of this invention is to produce a cap closure of the above-mentioned class which may be quickly, easily and permanently secured to the container in operative relation with the filler opening so as to prevent any possibility of the cap being lost or mislaid, and at the same time, permit the ready displacement of the cap for filling purposes.

A further object is to provide a cap which will be automatically replaced in closing relation with the filler opening as soon as the nozzle, spout or other instrument used in filling the container or tank is removed.

Still another object is to provide in such a closure, baffled air vents for permitting the entrance of air to the container, and at the same time, prevent the contents thereof being splashed out when being agitated.

Other objects and advantages relating to the structure and form and relation of the parts thereof, will more fully appear in the following description, taken in connection with the accompanying drawing in which:—

Figure 1 is a perspective view of a closure embodying the various features of this invention.

Figure 2 is a perspective view of that portion of a tank or container having the tubular inlet member to which the closure is attached.

Figure 3 is a vertical sectional view of the container inlet member with the closure attached, taken in the plane of the line 3—3, Figure 4.

Figure 4 is a side elevation, partly broken away, of the upper end of the inlet member, taken in the plane of the line 4—4, Figure 3.

Figure 5 is a detail horizontal sectional view taken on line 5—5, Figure 3.

Figure 6 is a perspective view of the retaining stud for the cap showing the air vent grooves in the under-surface of the head thereof.

Figure 7 is an enlarged detail vertical section of the central portion of the cap illustrating a modified means for maintaining the baffle plate in contact with the cap.

As illustrated in the drawing, the inlet member as 1 is a tubular piece of sheet metal which may be secured to or made integral with the tank or container 2 and has the upper end thereof formed with an inwardly extending flange 3 which, in turn, is provided with an inner depending marginal flange 4, thereby forming an annular recess or groove 5 at the underside of the flange portion 3 between the depending flange 4 and the side wall of the inlet member 1, said recess being adapted to form a seat for the upper end of a spring-locking member which will hereinafter be more fully explained.

The flanges 3 and 4 as shown are provided with diametrically opposed outwardly extending recesses 6 usually provided for receiving the locking element of a conventional cap and which may be utilized during the entrance of the spring member into the annular recess 5 in a manner presently described.

The closure comprises a cap member 7, circular in plan view and formed with a downwardly and inwardly curved peripheral edge 8 which may be knurled to assist in turning the cap while assembling the closure in position on the inlet member 1.

The cap 7 is of greater diameter than the inlet member 1 so that the curved edge 8 thereof will extend a short distance beyond said inlet member thus permitting the underface of the cap to engage the inlet when assembled in position therewith. The cap 7 is provided at its center with an elongated opening 9, as shown in Figure 5, for receiving therethrough a retaining stud 10 which has a similar formed shank 11 but of slightly less cross-sectional area for preventing relative turning movements of the cap and stud, and at the same time, forming an air space therebetween.

The stud 10 extends a short distance within the cap 7 and has the inner end thereof provided with a diametrically extending slot 12 for receiving the upper end of a flexible tie rod such as the chain 13 or other similar means for connecting the cap 7 with the spring retaining member 14. In this instance, the upper end of the chain 13 is pivotally connected with the stud 10 by means of a pin 15 which passes through the eye of the upper link of the chain and which has the ends thereof secured in the depending portion of the stud at respective sides of the slot 12.

The lower end of the chain 13 may be secured to the lower end of the spring member 14 in any suitable manner as by passing the end of the spring through the eye or loop 13' formed by the lowermost chain link, as shown more clearly in Figures 1 and 3. The retaining member 14, in this instance, is a helical spring having the upper portion of substantially the same diameter as the recess 5 in the inlet member 1 and the lower portion of the spring has a conical formation so as to maintain the tie chain 13 substantially co-axial with the spring under normal con-

ditions, that is, when the cap is in operative closing relation with the inlet member 1.

In order to apply my improved closure to the inlet member 1, the lower conical end of the spring 14 is first inserted in the inlet opening 17 of the member 1, with one of the spring helices registering in a recess 6 and then by turning the cap 7, the spring may be screw-threaded into the flange 3 of the inlet member until the upper end of the spring has passed entirely through said flange, whereupon the upper end of the spring will be positioned and retained in the recess 5 of the inlet member, with the cap engaging the upper end of said inlet member, as shown in Figure 3.

The utilizing of one or the other of the recesses 6 during the assembling of the spring with the inlet is only necessary when the relative diameters of the spring 14, inlet opening 17 and the interior of the inlet member 1 are so closely related, as shown in Figure 3 of the drawing, that there is very little room for lateral movement of the spring relative to the flanges 3 and 4, but where a more liberal relation exists between the wall of the opening 17 and that of the interior of the member 1, it is obvious that the spring may be readily screw-threaded through the opening without utilizing a recess 6.

The lengths of the spring 14 and tie chain 13 are such that the spring will be maintained under compression by the cap 7 and chain 13 at all times for yieldingly maintaining the cap in liquid-tight relation with the upper end of the inlet member 1. In order to insure a sealed connection between the cap and inlet, I have provided the cap with a gasket 18 composed of leather, cork, or other suitable material, which is adapted to engage the upper end of the inlet member 1 and has a central opening therein for receiving the stud 10.

The head 19 of the stud 10, in this instance, has the upper surface formed circular in cross section, and the lower portion 19' thereof is formed with a flat smooth surface for engaging the upper face of the cap 7. This flat surface 19' is provided with a pair of spaced parallel grooves or ducts 20, one adjacent each flattened side of the stud shank 11 and, therefore, in registration with the corresponding portion of the aperture 9 in the cap 7, thus providing a means for the entrance of atmospheric air to the interior of the container.

In order that liquid, such as gasoline, in the container 2 may not be splashed out through the cap opening 9 around the stud 10 and through the grooves 20, I have provided a baffle plate 24 positioned at the under-side of the cap 7 adjacent the opening 9 thereof. This baffle plate 24 has its central portion formed with a downwardly extending conical portion 25 which has the lower end thereof provided with a central opening 25' of substantially the same size as the lower end of the stud 10 for receiving said stud.

The upper portion of the plate is formed with an outwardly extending flat peripheral ring portion 26 which is positioned between the cap 7 and gasket 18 so that the gasket will maintain the baffle plate in the operative position with the ring portion 26 of the plate in contact with the cap.

It is thus seen that the liquid is prevented from being splashed past the baffle plate 24 and stud 10 due to the close fit of the stud in the baffle plate opening 25', and to the pressure of the gasket 18 upon the baffle plate in maintaining said plate in contact with the cap being sufficient to prevent the escape of the liquid around the upper portion of the baffle plate, but at the same time, permits air to be forced by atmospheric pressure through the duct 20 and around the stud and baffle plate into the tank or container as the contents of said container are being withdrawn. I may, however, employ additional means for maintaining the baffle plate in contact with the cap which, in this instance, consists of a relatively light tension spring member 28, as illustrated in Figure 7. This member may, as shown, be coiled about the lower end of the stud 10 between the lower end of the central portion 25 of the baffle plate 24 and the pivotal pin 15, with the lower end of the spring resting upon the extended ends of the pin which maintains said spring in operative relation with the baffle plate.

It is also evident that the closure is normally yieldingly maintained in liquid-tight relation with the inlet member 1 by the action of the spring 14, and when it is desired to supply the container with liquid, it is only necessary to lift the cap 7 against the action of the spring 14 and place said cap in a tilting position at one side of the inlet, which action is permitted by the spring and the pivotal connection 15 which the tie chain 13 has with the retaining stud 10.

A nozzle or spout as S may then be inserted in the inlet opening 17 and within the spring member 14, and when the nozzle is in said position, the cap 7 will be maintained thereby in the tilted position at one side of the opening 17 as illustrated by dotted lines in Figure 3, until such time as the nozzle is removed, whereupon the cap will be brought into partial closing or eccentric relation with the upper end of the inlet member by the action of the spring 14, after which it requires only a slight readjustment of the cap to again bring it into position for closing the inlet opening 17 and effectively preventing the entrance of dust or other foreign matter.

Although I have shown and particularly described the preferred embodiment of this invention, I do not wish to be limited to the exact construction shown, as various changes may readily be made, without departing from the spirit of this invention as set forth in the appended claims.

I claim:

1. In a closure device, in combination, a container having an inlet, spaced slots in the container opening into said inlet, a cap member for the inlet and a retaining member including a helical spring adapted to enter said slots and engage said container upon relative rotation of said spring and container, and means connecting the cap with said spring.

2. In a closure device, in combination, a container having an inlet, a recess adjacent said inlet and slots entering said recess, a cap member for said inlet and a retaining member including a helical spring adapted to enter said slots and engage said recess upon relative rotation of said spring and container, and means connecting the cap with said spring.

3. In a closure device, in combination, a container having an inlet, a recess adjacent said inlet and slots entering said recess, a cap member for said inlet and a retaining member including a helical spring adapted to enter said slots and engage said recess with one end thereof upon relative rotation of said spring and container, and means connecting the cap with the free end of said spring.

4. In a closure structure for a container having an inlet opening in the wall thereof, a cap member adapted to engage the surface adjacent

the opening on one side for closing said opening, a retaining means including a helical spring having a portion of greater diameter than that of said opening for engaging the surface at the side of the opening from the cap, the axial distance between adjacent helices of the spring being substantially equal to or greater than the length of the opening whereby the spring may be passed through the opening into engagement with said last-mentioned surface upon relative rotation of the spring and container, and means connecting the cap member with the spring.

5. In a closure structure for a container having an inlet opening in the wall thereof, a cap member adapted to engage the surface of the container adjacent the opening on one side for closing said opening, a retaining means including a helical spring having a portion of greater diameter than that of said opening for engaging the surface of the container at the side of the opening from the cap, and means connecting the cap member with the spring adapted to transmit rotary motion of the cap to the spring whereby the spring may be screw-threaded through the inlet opening by turning the cap.

6. In a closure structure for a container having an inlet opening in the wall thereof, a cap member adapted to engage the surface of the container adjacent the opening on one side for closing said opening, a retaining means including a helical spring having a portion of greater diameter than that of said opening for engaging the surface of the container at the side of the opening from the cap, and means connecting the cap member with the spring, said connecting means being non-rotatably connected to the cap and to the spring whereby said spring may be rotated by the cap to screw-thread the same through said inlet.

7. In a closure cap structure for an automobile gasoline tank filling spout having an inwardly and downwardly turned flange at its upper end, the combination of an elongated closure member secured underneath said inwardly and downwardly directed flange and comprising at its lower end portion a downwardly tapered tempered steel spiral spring, a cap for closing the upper end of said spout above said spiral spring, and means for attaching said cap to said spring.

8. In a closure cap structure for an automobile gasoline tank filling spout having an inwardly and downwardly turned flange at its upper end, the combination of an elongated closure member comprising at its upper end portion means adapted when the member is forced downwardly into the spout to engage the flange on the spout and by said engagement to prevent removal of the member from the spout and comprising at its lower end portion a downwardly tapered spiral part having its several plies in laterally spaced relation to each other, a cap for closing the upper end of said spout above said spiral part, and means for attaching said cap to said spiral part.

9. In a closure cap structure for an automobile gasoline tank filling spout having at its upper end an inwardly and downwardly turned flange which is provided with spaced slots opening inwardly, the combination of an elongated closure member comprising at its upper end portion means adapted when the member is forced downwardly into the spout to project through at least one of said slots and to engage the under side of the flange on the spout and by said engagement to prevent removal of the member from the spout and comprising at its lower end portion a downwardly tapered spiral part, a cap for closing the upper end of said spout above said spiral part, and means for attaching said cap to said spiral part.

10. In a closure device, in combination, a container having an inlet, spaced slots in the container opening into said inlet, a cap member for the inlet and a retaining device including a helical spring, said device having a portion adapted to enter one of said slots and engage said container upon relative rotation of said device and container, and means connecting the cap with said spring.

11. In a closure device for the gasoline tank of an automobile, the combination of a cap adapted to seat on the inwardly turned flange at the upper end of the filling spout of a tank, a spiral spring member mounted below said flange across said filling spout effectively closing the spout against insertion of a siphoning tube therethrough but permitting free entrance of gasoline through the spout, and means connecting said cap with said spiral spring member serving to maintain at least a portion of said spring member under tension for holding the cap yieldingly in its closed position and adapted when said cap is raised into an open position to hold said spring member under increased tension.

12. In a closure device for the gasoline tank of an automobile, the combination of a cap adapted to seat on the inwardly turned flange at the upper end of the filling spout of a tank, a spiral spring member mounted below said flange across said filling spout effectively closing the spout against insertion of a siphoning tube therethrough but permitting free entrance of gasoline through the spout, and a link pivotally connected at one end with said spiral spring member and pivotally connected at its opposite end with said cap on its inner face serving to maintain at least a portion of said spiral spring member under tension for holding the cap yieldingly in its closed position and adapted when said cap is raised into an open position to hold said spring member under increased tension.

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