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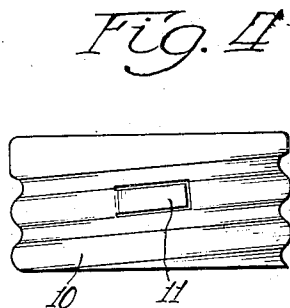
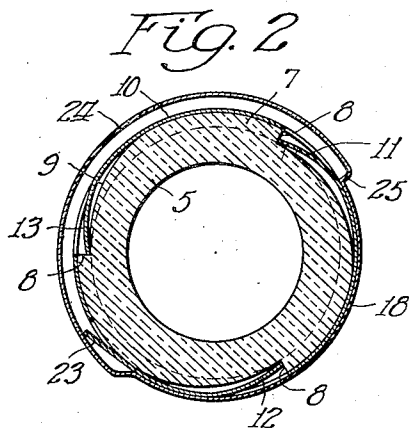
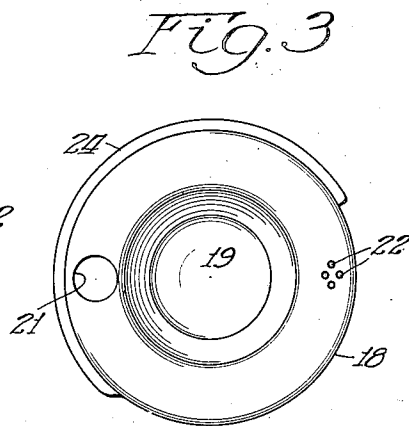
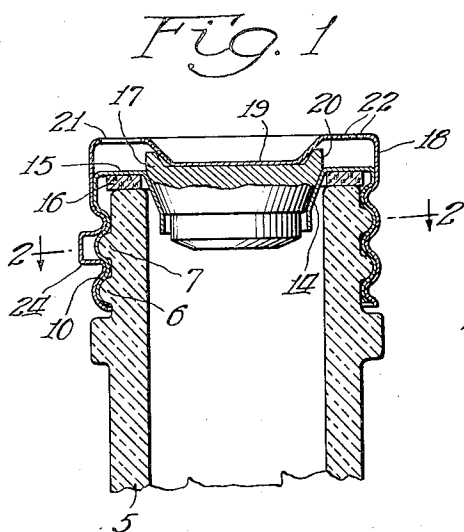
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NONREFILLABLE CONTAINER

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2 Sheets-Sheet 1



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NONREFILLABLE CONTAINER

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Application July 16, 1932, Serial No. 622,910

4 Claims. (Cl. 215-23)

Our invention relates to a non-refillable liquid container and cap structure and has for its principal object the provision of a device of this character in which once the caps are applied to the container it is impossible to refill the container without practical destruction of the cap so that it is readily apparent that the container has been tampered with.

Furthermore, it is a purpose of this invention to provide a structure of this character employing an inner and an outer cap with novel means for locking the inner cap on the container neck.

It is also a purpose of this invention to provide a loose closure structure in cooperation with the inner cap so that the closure will not stick, and, when permitted by the outer cap, will readily drop away from its seat in the inner cap to permit the contents of the container to flow out.

A further object of the invention is to provide a novel means for locking the outer cap in position to cover the locking device for the inner cap while enabling the outer cap to be moved up and down on the container neck a limited amount to provide space for the release of the closure.

It is also an object of the invention to provide a novel guide means between the outer cap and the closure which insures the closure against becoming displaced so as to stick and not go back into its seat when the container is placed upright.

A further object of the invention is to provide a novel closure structure which requires the container to be tipped substantially beyond horizontal position before the closure opens to permit discharge of the contents of the container.

We will describe the preferred form of our invention by reference to the accompanying drawings wherein—

Fig. 1 is a vertical cross sectional view through the top of a bottle cap structure embodying our invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the bottle cap;

Fig. 4 is a side view of a portion of the inner cap;

Fig. 5 is a section similar to Fig. 1 showing a modified form of the invention;

Fig. 6 is a section similar to Fig. 5 illustrating the manner in which the container must be tipped to release the closure;

Fig. 7 is a detailed section through the weight used with the closures in Figs. 5 and 6; and

Fig. 8 is a section on the line 8—8 of Fig. 5. Referring now in detail to the drawings, the

bottle neck is indicated by the numeral 5 and may be of the usual material, glass, or any other suitable substance. Also, the container may or may not be a bottle as the invention is applicable to other types of containers. The neck of the bottle is screw threaded by means of the threads such as 6 and 7, and, as shown more clearly in Fig. 2, at spaced intervals about the bottle neck, sharp shoulders such as 8 are provided by cutting away the threads. Opposite the shoulders 8, the threads slope gradually upward as indicated at 9. The shoulders 8 face in such a direction that a cap may be screw threaded onto them without going against the shoulders. However, when the cap is screwed in the other direction, any projection inward from the cap surface can engage against the shoulders and oppose rotation. The inner cap 10 shown most clearly in Figs. 2 and 4 has a plurality of inwardly extending projections such as 11, 12, and 13 which, owing to the resiliency of the material from which cap 10 is made, can bend out to pass over the threads and after the inner cap is applied they can be bent directly inward into the position shown in Fig. 2. As shown, these projections 11, 12, and 13 are integral with the cap 10, but it is obvious that they might be in the form of pins placed therein after the cap 10 is screwed upon the bottle. Also, any other suitable locking mechanism may be employed to lock the cap against the shoulders 8. The inner cap 10 has a central valve seated at 14 which extends slightly down into the neck of the bottle, and between the valve seat and the screw threaded portion there is provided the bearing surface 15 on which the sealing member 16 rests. This sealing member is the usual washer and may be of any suitable material.

From the above description, it is believed to be clear that when the inner cap is screwed down onto the bottle neck it may be firmly locked into position thereon and thus prevents leakage except through the valve opening 14. The material of the valve seat 14 is preferably quite hard for a purpose which will presently appear.

A valve member 17 consisting of a loose plug is seated in the seat 14 as shown in Fig. 1. This valve member is also preferably of a hard substance. The reason for this hardness of the valve and its seat is to give substantial weight to the valve member 17 and to aid in preventing the valve from sticking on its seat so that it cannot drop away when the bottle is turned wrong side up. If soft materials are used and the valve is wedged rather tightly into its seat, it will fail to come out when pressure is released. By con-

structing the valve and its seat of relatively hard material, the slope of the seat 14 can be made such that it acts to guide the valve at one end and prevents it from becoming tipped.

5 In order to further insure this valve against faulty seating, we provide the outer cap 18 and the valve 17 with the cooperating portions 19 and 20. The depressed portion 19 on the cap is seated in the recess 20 in the top of the valve
10 so that, when the valve moves away from its seat 14, the portions 19 and 20 will guide its movement and keep it centered with respect to the seat 14. The cap 18 constitutes the outer cap and is provided with an outlet opening at 21 and a series
15 of small vent openings at 22. This cap screw threads onto the inner cap 10 so as to cover the locking means for the inner cap and thus prevent tampering with the locking means so long as the outer cap is in place.

20 The outer cap, however, must move up and down a limited amount to enable the valve 17 to move toward or away from its seat. This movement must necessarily take place without making it possible to take the outer cap off. If the outer
25 cap is removed, it is obvious that the bottle can be refilled. We, therefore, provide a novel locking means which locks the outer cap against removal but permits it to be screwed down tight against the valve 17 or unscrewed slightly so as
30 to enable the valve to move away from its seat. In order to do this, we provide an outwardly projecting means 23 on the inner cap and raise one of the threads such for example as thread 24 of the outer cap making the sharp shoulder at 25
35 where the thread is raised. The length of the raised thread, of course, depends upon the space desired for opening the valve 17. We have shown it as substantially a half revolution of the thread length; it is obvious that it may be made longer or shorter if desired.

40 When the outer cap is screwed on, it will pass over the projection 23 until it is tightened up, but, in unscrewing the outer cap when the projection 23 strikes against the shoulder 25, the
45 cap can be loosened no further.

50 In order to prevent the projection 23 from being too rigidly bent down, we prefer to make the threads on the outer cap between the raised portion 24 and the open end of the cap somewhat larger than the other threads so that they will
55 not press 23 down sufficiently to prevent its engaging with the shoulder 25. It is, of course, not necessary that 23 be formed directly from the material of the inner cap as the inner cap and the outer cap may be placed together prior to
the placing of the assembly on the bottle and 23 then may take the form of any suitable projection capable of engaging the shoulder 25.

60 Referring now to the modified forms in Figs. 5 to 8, the cap locking structure is the same as in Figs. 1 to 4. The closure structure, however, is considerably different in detail from that already described. The inner cap 10' has the skirt 26 formed thereon by pressing the metal outwardly
65 into a cone shape. Openings 27 and 28 are provided to facilitate the flow of liquid from the bottle, and the closure itself consists of a flat disk 29 which is connected by any suitable loose connection such as the pin 30 and eye 31 to a weight
70 or bottle 32.

75 An inspection of Figs. 5 and 6 will illustrate clearly how the closure operates in preventing flow of fluid out of the container until the container is tipped up. When the container is horizontal as shown in Fig. 5, the weight of the

bottle 32 is sufficient to hold the disk 29 tightly against the top surface of the inner cap so as to seal the openings 28 and the large central opening. Therefore, the bottle is practically closed
80 until it is tipped beyond the horizontal point. When the outer cap 18' is unscrewed sufficiently to allow the disk 29 to move away from its bearing on the top of the inner cap, the disk still remains in position until the bottle is tipped up into
85 a position such as that shown in Fig. 6 or at a somewhat less angle with the horizontal. The liquid pressure and the weight of the disk then overcomes the weight of the ball 32 and allows the disk to tip away from the top of the inner cap into the position shown in Fig. 6 which
90 permits the liquid to flow out of the bottle through the openings in the inner cap and through the opening 21' of the outer cap. The ball 32 is preferably slotted as indicated, for example, at 33 so that it will not form any obstruction to the flow
95 of the liquid through the opening in the inner cap.

100 In order to further protect the ball against refilling which might be accomplished by raising the disk 29 by means of a pin inserted through such openings as 21 and 22, I preferably fix a transverse plate 34 in the top of the outer cap so that it effectually blocks any straight path from these openings that would enable one to
105 raise the disk 29 and thus pour liquid into the container. This plate 34 may take any suitable form capable of accomplishing this blocking action, but we prefer to use a simple transverse plate as shown in Figs. 5, 6, and 8.

110 From the above description, it is believed that the construction and advantages of this device will be clear to those skilled in this art. It is also believed to be obvious that various minor modifications may be made without departing from the scope of the invention as defined by
115 the claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a non-refillable container, an inner cap 120 and an outer cap screw-threaded on the container neck, means covered by the outer cap locking the inner cap against screwing off the container, means covered by the outer cap preventing screwing of the outer cap off the inner cap but
125 permitting a partial unscrewing of the cap, a valve seated on the inner cap, and movable away from the seat to permit the container to empty when the outer cap is partially unscrewed, and outlet and vent openings in the outer cap, said
130 last named means comprising a member projecting out from the inner cap, and a raised thread portion on the outer cap having an abrupt shoulder at one end thereof against which said member engages to limit the movement of the outer
135 cap in one direction.

2. In a non-refillable container, an inner cap and an outer cap screw-threaded on the container neck, means covered by the outer cap locking the inner cap against screwing off the container, means covered by the outer cap preventing screwing of the outer cap off the inner cap but
140 permitting a partial unscrewing of the cap, a valve seated on the inner cap, and movable away from the seat to permit the container to empty when the outer cap is partially unscrewed, and outlet and vent openings in the outer cap, together with means interposed between said openings and the valve for preventing insertion of a tool to lift
145 the valve from its seat.

3. In a non-refillable container, an inner cap and an outer cap screw-threaded on the container neck, means covered by the outer cap locking the inner cap against screwing off the container, means covered by the outer cap preventing screwing of the outer cap off the inner cap but permitting a partial unscrewing of the cap, said inner cap being apertured in the top, a valve member between the two caps for closing said apertures, and a weight within the inner cap secured to said valve member to prevent its leaving its seat until the container is tipped to horizontal position, said outer cap having an outlet opening therein, and said inner cap having an inturned flange forming a bearing for said weight.

4. In a non-refillable container, an inner cap and an outer cap screw-threaded on the con-

tainer neck, means covered by the outer cap locking the inner cap against screwing off the container, means covered by the outer cap preventing screwing of the outer cap off the inner cap but permitting a partial unscrewing of the cap, said inner cap being apertured in the top, a valve member between the two caps for closing said apertures, and a weight within the inner cap secured to said valve member to prevent its leaving its seat until the container is tipped to horizontal position, said outer cap having an outlet opening therein, and said inner cap having an inturned flange forming a bearing for said weight, and said weight being rounded and loosely secured to the valve members so as to ride freely on the flange.

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