

L. B. ZARING.
 STOPPER FOR NON-REFILLABLE BOTTLES.
 APPLICATION FILED FEB. 6, 1912.

1,035,068.

Patented Aug. 6, 1912.

Fig. 1.

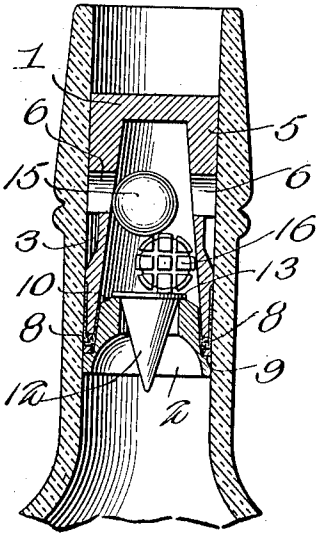


Fig. 3.

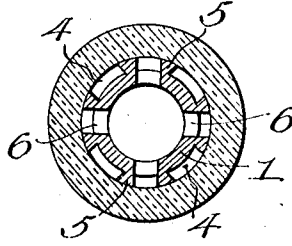


Fig. 4.

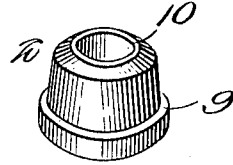


Fig. 6.

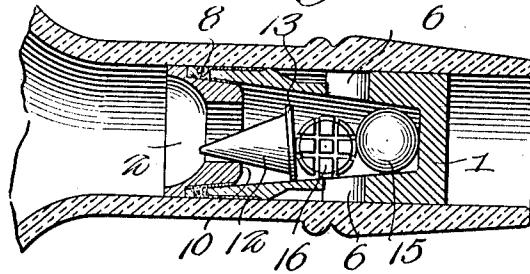


Fig. 7.

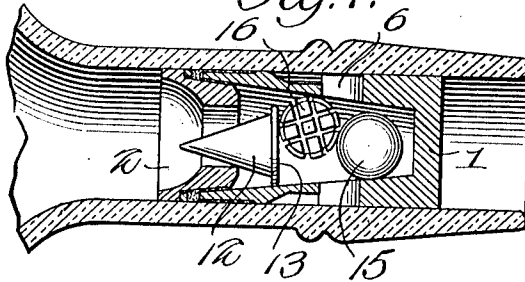
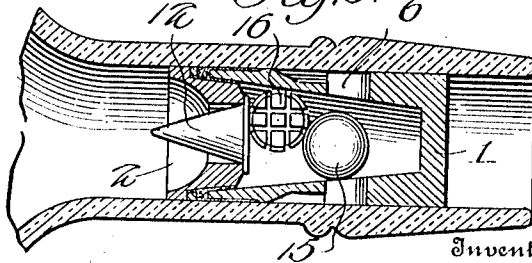


Fig. 8.



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Fig. 10.

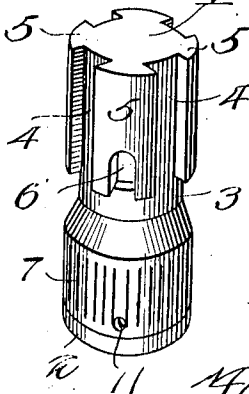
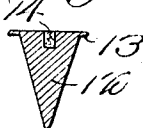


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

LEANDER B. ZARING, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-THIRD TO JOSEPH B. WILKINS AND ONE-THIRD TO MORDECAI E. JORDAN, BOTH OF INDIANAPOLIS, INDIANA.

STOPPER FOR NON-REFILLABLE BOTTLES.

1,035,068.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed February 6, 1912. Serial No. 675,758.

To all whom it may concern:

Be it known that I, LEANDER B. ZARING, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Stoppers for Non-Refillable Bottles, of which the following is a specification.

The present invention relates to stoppers for non-refillable bottles of that class upon which United States Letters-Patent No. 856,902, was granted on June 11, 1907, and may be considered in the nature of an improvement thereon.

In the drawing, Figure 1 is a sectional view of the neck portion of a bottle having my improved stopper to prevent the refilling of the bottle. Fig. 2 is a perspective view of the stopper complete as an article of manufacture. Fig. 3 is a horizontal sectional view of the same taken through the exit openings. Fig. 4 is a view of the valve seating member of the stopper. Fig. 5 is a longitudinal sectional view of the float valve. Fig. 6 is a sectional view of so much of the bottle laid on its side with the valve open to illustrate the position of the valve when an attempt is made at refilling the bottle. Fig. 7 is a similar view showing the employment of the agitating member acting upon the weighted ball and the valve after liquid has been inserted within the bottle neck in an attempt to refill the bottle. Fig. 8 is a similar view showing the valve in position having been floated and closed by the inflow to prevent refilling.

In the Patent No. 856,902, above referred to, it has been found by experiments that when a bottle provided with the said stopper is immersed in liquid the said liquid is free to flow within the bottle for the reason that the ball, which is adapted to act in conjunction with the float valve does not perform its function and remains stationary. As a consequence the float valve is not properly directed to its seat. It has also been found that the suction or partial vacuum between the liquid and the valve when the valve is upon its seat, and even the pressure of the liquid upon the valve, when the bottle is tilted for the discharge of the liquid, is not sufficient to unseat the valve. These defects are effectively overcome by

the construction illustrated in the drawings and described herein.

Referring now to the drawing in detail, the numeral 1 designates the upper portion or body of the stopper, and 2 the lower portion or valve seating member which is adapted to be secured to and inclosed within the lower portion of the body 1. The body is hollow and closed at its upper end and is formed with a horizontal circumferential depression 3, which is intersected by a plurality of vertical wall channels 4 which open at the outer end of the stopper. The ribs 5 which are arranged between the vertical channels and which are adapted to contact and engage with the bottle neck when the stopper is inserted therein, are formed adjacent their lower edges, (which terminate at the circumferential depression 3) with ports or openings 6, the same passing through the bottle stopper proper to provide communication with the interior thereof. The lower portion of the body or stopper 1, below the circumferential depression 3 is roughened as at 7 to provide for the reception of an adhesive material 8 whereby the stopper is effectively retained with the bottle neck.

The valve seating member 2 has tubular openings at both ends and formed with a circumferential shoulder 9 at its lower end, while its valve seat port extends up within the body and terminates at its upper inner end in an outwardly flared or rounded valve seat 10, while its shouldered end fits and closes the open end of the stopper. The interior of the stopper is conical as is the interior of the valve seating member, and the lower extremity of the stopper is provided with a plurality of openings 11 which are adapted to receive an injection of cement which is adapted to also engage with the outer wall of the valve seating member. The valve seating member may be loosely arranged within the stopper before the cement is applied thereto and after the cement is inserted within the openings the valve seating member may be rotated upon the stopper so that the cement may be brought into engagement with the entire face of the said valve seating member adjacent the openings of the stopper. The valve seating member terminates a distance below the

ports 6, and the numeral 12 designates the float valve for the seat. This valve has its body cone-shaped and its top provided with a flange or head 13. The flange is of a sufficient area to snugly engage with the valve seat to close the opening thereof. The valve is of some suitable light material and is provided with a centrally arranged bore or depression which is open at the head 13 thereof, the said bore being adapted to receive a weighted member 14. The cone-shaped portion of the valve is adapted to serve as a guide for seating the said valve, and the said cone-shaped portion or stem is of such a length as to prevent its entire withdrawal from the valve seating member regardless of the angle at which the bottle may be tilted.

While the valve freely opens when the bottle is tilted to allow the discharge of its contents through the wall channels 4, the valve cannot be opened and held open by external means to allow the refilling of the bottle because there is no means of access to the valve, as it is impossible for an instrument to reach the valve through the circumferential vertical wall channels and discharge openings, because the openings are out of line with the vertical wall channels. The numeral 15 designates a weighted ball and the numeral 16 designates a light enlarged or corrugated ball which is arranged between the ball 15 and the head 13 of the valve. The ball 15 when resting upon the inclined wall of the cone-shaped interior of the stopper is adapted to roll upon the said wall toward the valve seat and, co-acting with the corrugated light ball 16 at all times exerts a certain amount of pressure upon the valve 12, the said pressure being toward the valve seat.

In Fig. 6 of the drawing, the position of the bottle is illustrated when an attempt is made to refill the said bottle by laying the bottle in a quantity of liquid. The inflow of the liquid through the stopper channels which opens at the outer end of the stopper will pass into the horizontal intersecting channel and from thence through the openings into the stopper. In this position of the bottle it will be noted that the valve is caused to open by sliding out of its seat with its stem resting on the inner wall of the valve forming part and its head resting on the inner inclined wall of the stopper and if maintained in such position would allow the bottle to be refilled by the liquid running in under the valve and through the valve seating member. This however, is prevented by the inflow of the liquid into the hollow portion of the stopper causing the corrugated ball to rise as well as the float valve, the said ball contacting with the weighted ball to cause the same to roll upon the incline or beveled interior of the stopper

and assist in forcing the valve upon its seat to prevent the inflow of the fluid into the bottle as illustrated in Figs. 7 and 8. If an attempt be made to refill the bottle by fluid under pressure, it will, on entering the hollow stopper drive the valve to its seat and prevent the refilling of the bottle.

The weight in the valve 12 is not sufficient to interfere with the floating of the said valve, but is sufficient to prevent the valve adhering to its seat either as a consequence of the moistening of the valve or the suction of the liquid from the interior of the bottle. The balls 15 and 16 serve as a stop to limit the downward movement of the valve the stem of which, being cone-shaped is free to allow it to have a lateral movement when the valve is placed in horizontal position, and the said shape of the valve materially assists in causing the valve to be automatically seated by the inflow of the liquid to prevent the refilling of the bottle.

Having thus described the invention what I claim is:—

1. A stopper for non-refillable bottles including a tubular section having a circumferential base rim and terminating in its upper end in a valve seat, and an upper hollow section closed at its top supported upon the circumferential base rim, and having a circumferential recess and channels leading from the recess to the closed end, ribs between the channels being provided with ports arranged adjacent the circumferential recess, a cement filling between the inner walls of the top section and the outer walls of the valve section to unite the sections, of a cone-shaped float valve for the seat, a corrugated light ball within the hollow section and normally contacting with the head of the valve and a weighted ball also within the hollow section and normally contacting with the light ball substantially as and for the purpose set forth.

2. A bottle stopper comprising a hollow member closed at one of its ends and a valve seating member secured to its open end and means for connecting the members together, the said hollow member being centrally provided with a circumferential depression and having a plurality of channels providing spaced ribs leading from the depression to the closed end of the stopper, the ribs between the channels being provided with openings arranged adjacent the circumferential depression, a cone-shaped headed float valve for the valve seat, the said valve having its head weighted, a heavy ball within the hollow stopper and a light ball also within the stopper and arranged between the heavy ball and the head of the valve.

3. A stopper for non-refillable bottles comprising an upper member having a closed head and a cone-shaped interior, the said member being provided with a circumferen-

tial depression providing spaced ribs and having channels intersecting the depression and leading therefrom to the closed end of the member, the ribs between the channels
5 being provided with openings arranged adjacent the circumferential depression and communicating therewith, and with the interior of the member, a valve seating member connected with the upper member, a
10 cone-shaped valve having an annular head for the valve seat, the said valve being provided at its head with a centrally arranged depression, a weight within the depression, a heavy ball within the cone-shaped bore of
15 the upper member and a corrugated light ball between the heavy ball and the head of the valve.

4. A stopper for non-refillable bottles em-

bodiment a hollow member having a closed top and a valve seat at its lower end, the
20 said hollow member having its sides provided with depressed portions and being further provided with inlet ports arranged out of the line of the depressed portions, a
25 cone-shaped headed float valve for the valve seat, a weighted spherical member within the hollow member, and a light buoyant member also within the hollow member and arranged between the weighted spherical
30 member and the valve.

In testimony whereof I affix my signature in presence of two witnesses.

LEANDER B. ZARING.

Witnesses:

JOSEPH B. WILKINS,

EDNA J. FOLTZENLOGEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."