

C. B. BURROWS.
NON-REFILLABLE BOTTLE.
APPLICATION FILED AUG. 18, 1908.

1,032,357.

Patented July 9, 1912.

Fig. 1

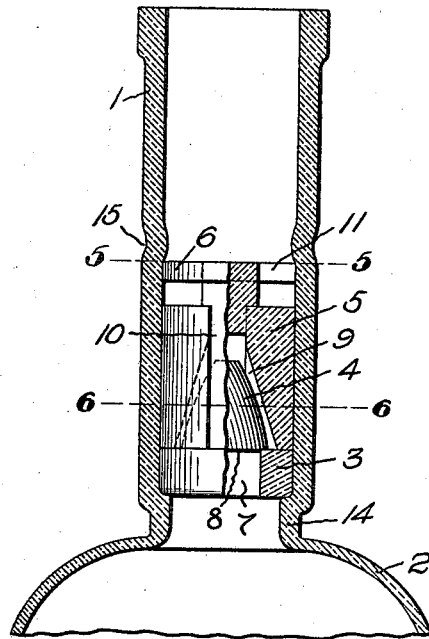


Fig. 4

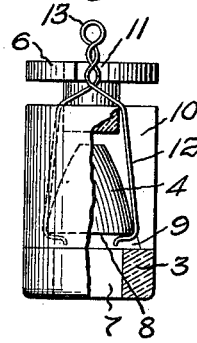


Fig. 5

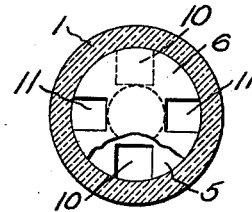


Fig. 6

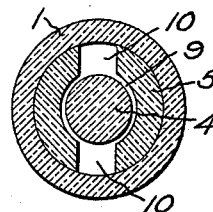


Fig. 2

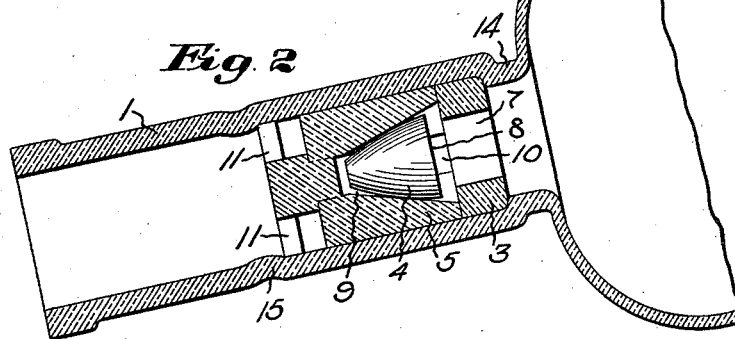
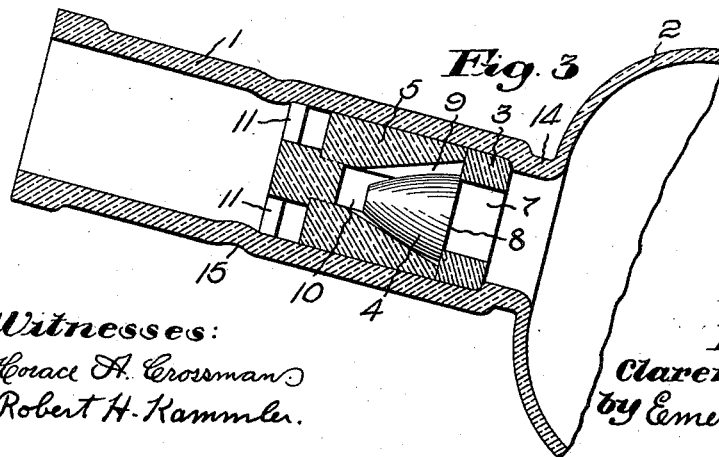


Fig. 3



Witnesses:
Horace A. Crossman
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Inventor:
Clarence B. Burrows
by Emery & Roth Attys

UNITED STATES PATENT OFFICE.

CLARENCE B. BURROWS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF FIVE-TWELFTHS TO CHARLES F. BURROWS, ONE-TWELFTH TO MICHAEL E. JENKINS, AND ONE-TWELFTH TO JESSIE C. JOHNSON, ALL OF BALTIMORE, MARYLAND, AND TWO-TWELFTHS TO THOMAS H. PIM, OF MERCHANTVILLE, NEW JERSEY.

NON-REFILLABLE BOTTLE.

1,032,357.

Specification of Letters Patent.

Patented July 9, 1912.

Application filed August 18, 1908. Serial No. 449,024.

To all whom it may concern:

Be it known that I, CLARENCE B. BURROWS, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improvement in Non-Refillable Bottles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to non-refillable bottles, being more particularly concerned with the provision of an improved and automatically actuated valve for effecting the closure of the bottle when the latter is moved to a liquid-receiving position.

My invention will be best understood by reference to the following description, when taken in connection with the accompanying illustration of one specific embodiment thereof while its scope will be more particularly pointed out in the appended claim.

In the drawings,—Figure 1 is an elevation, partly in section, showing a closing device embodying one form of my invention and applied to a bottle; Fig. 2 shows the position of the valve when the bottle is moved to a liquid discharging inclination; Fig. 3 is a similar view, showing the valve when moved to a liquid receiving inclination; Fig. 4 is a side elevation, partly in section, of the closure shown in Fig. 1, but in a plane at right angles thereto; Fig. 5 is a section on the line 5—5 in Fig. 1, showing the baffle plate in plan and partially broken away; and Fig. 6 is a section on the line 6—6 in Fig. 1.

Referring to the drawings, and to the embodiment of my invention which I have selected for illustration, the closure for the exit passage in the neck 1 of the bottle 2 comprises a valve seat 3, located near the juncture of the neck with the bottle, a valve 4, a casing or surrounding body 5 constituting a runway for the valve, and a baffle plate 6 formed at the end of the casing 5.

The seat 3 is provided with a seat opening 7, which is normally closed by the flat face 8 of the valve, which is of greater diameter than the diameter of the seat opening. In order that the valve may be automatically actuated to close the seat opening on movement of the bottle from a liquid discharging

position to a horizontal or other liquid receiving position, I have so constructed the valve that it is sensitively responsive to gravity and quickly falls back to close the seat opening immediately on the approach of the bottle neck to a horizontal position. While this may be accomplished in various ways, in the present embodiment of my invention I have formed the valve 4 with a convex taper, as shown, so that the upper or forward end is of reduced cross section and constitutes a solid piece, the surface of which is made up of curved elements. Co-operating with the valve, I have formed in the surrounding casing 5 a tapered recess 9, having a V shaped longitudinal cross section. The recess 9 presents to the valve an inclined runway such that when the bottle neck is moved to a liquid receiving position, either horizontal or inclined, the valve is caused to slide down the runway and drops back of its own weight against the seat 3, closing the seat opening 7. If the bottle neck is tipped to a liquid discharging position, past the horizontal, the valve of its own weight drops away from the seat as represented in Fig. 2.

In order to permit the escape of the liquid when the bottle is moved to a liquid discharging position, the casing is provided with longitudinal passages 10, formed in the outer walls of the casing and preferably, as shown in Fig. 4, by cutting through the walls of the casing to the recess 9. With the valve in the position shown in Fig. 2, this provides a passage from the interior of the bottle through the seat opening 7, thence laterally to the passages 9 and lengthwise through the said passages to and beneath the baffle plate 6.

In order to prevent access to the valve and tampering with the same after it has been installed, the baffle plate is provided with openings 11, which are offset as shown in Fig. 5 from the longitudinal passages 10, making it therefore impossible for the valve to be reached from the exterior after the closure has been installed in the neck of the bottle.

As the bottle is tipped to a horizontal position from a liquid discharging position and the valve moves toward the position shown in Fig. 3, it moves toward the seat,

with its larger flat face maintained parallel with the valve seat so that it effects a perfect closure as soon as it contacts therewith. A closing device, constructed as disclosed, constitutes in practice an extremely sensitive automatic closure, and, since its actuation is dependent on gravity, it responds instantly to the movements of the bottle from a liquid discharging to a liquid receiving position.

10 In the initial installation of the described form of closure the parts described, which may be formed of molded glass, are preferably held with the valve unseated by some such means as represented in Fig. 4. As
15 there shown, prior to insertion in the bottle neck a semi-flexible member, such as a small piece of wire 12, is doubled on itself and, with the common end projecting through one of the baffle plate openings 10, the two
20 branched ends of the wire are laid into the longitudinal passages 10 and the tips of the wire bent beneath the valve 4, so as to lift it off its seat. In this condition the entire closure can be inserted in the neck of the bottle,
25 and after the bottle is filled the semi-flexible wire can be readily withdrawn by engaging the twisted or looped end 13 by an appropriate tool. The withdrawal of the wire releases the valve and places it in an active
30 and operative condition.

In its initial formation the bottle 2 is provided with an inwardly projecting, shouldered portion 14 and a straight neck. The closure, when inserted, seats against the
35 shoulder 14 and, after insertion, a depression 15 is formed in the neck just above the baffle plate 6, thereby forming a shoulder to retain the closure against subsequent removal.

40 It will be noticed that the tapered convex shape of the valve not only provides a single point of contact only for the valve upon its

inclined runway, thereby reducing the friction to a minimum and making it delicately responsive to gravity, but also brings the
45 center of gravity of the valve back of or below the plane of contact, thereby causing it to act immediately and move toward the seat upon movement of the bottle to a liquid receiving position.

50 While I have shown and described for purposes of illustration one specific embodiment of my invention, it is to be understood that the same is not limited to the details of construction or relative arrangement of
55 parts herein shown, but that extensive deviations may be made from the described embodiment without departing from the spirit of the invention.

Claim:

60 A non-refillable bottle having a closure for the discharge passage comprising a seat provided with an opening, a valve having a base of greater diameter than the diameter
65 of the seat opening and having a tapered end, an inclined runway for the valve consisting of a chamber provided with tapered walls surrounding the valve, the tapered
70 walls of said chamber and valve being formed to diverge lengthwise the valve, and said valve being formed to have contact with the chamber walls while still seated and to
75 present its center of gravity at the rear of the point of contact, thereby to permit a rocking or sliding movement of the valve to its seat when the bottle is moved to a liquid receiving position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CLARENCE B. BURROWS.

Witnesses:

THOMAS B. BOOTH,
EVERETT S. EMERY.