(No Model.)

N. F. T. HUNT.

NON-REFILLING BOTTLE.

No. 589,435. Patented Sept. 7, 1897.

Fig. 1.

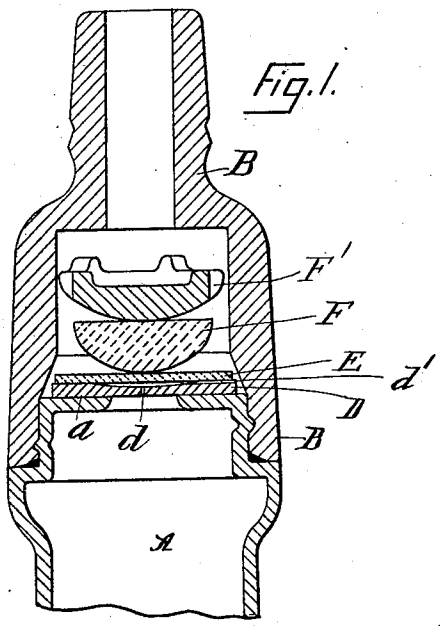


Fig. 2.

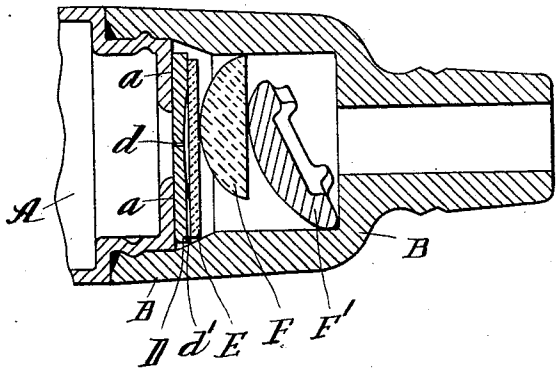


Fig. 3.

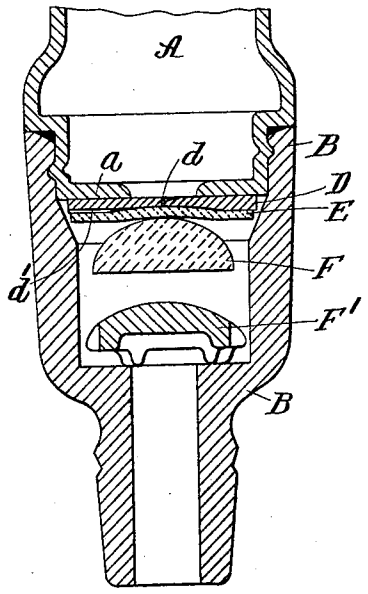
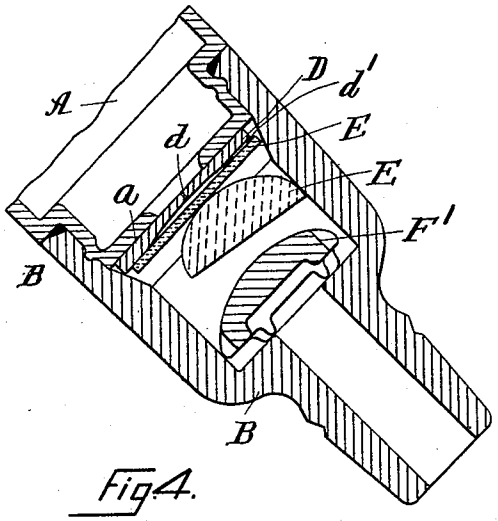


Fig. 4.



WITNESSES:

H. P. Guillo.

John R. Snow.

INVENTOR

Nathaniel F. T. Hunt

BY

Maynadier & Mitchell,

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NATHANIEL FREDERICK THAYER HUNT, OF BRAINTREE, MASSACHUSETTS.

NON-REFILLING BOTTLE.

SPECIFICATION forming part of Letters Patent No. 589,435, dated September 7, 1897.

Application filed March 16, 1896. Serial No. 583,304. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL FREDERICK THAYER HUNT, of Braintree, county of Norfolk, State of Massachusetts, have invented an Improved Non-Refilling Bottle, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation, the bottle being upright. Figs. 2, 3, and 4 are like elevations, the bottle being in the positions indicated and the neck being supposed to be full of liquid, forced in by pressure.

My invention is an improvement upon the invention described in my Patent No. 515,879, dated March 6, 1894, and in my Patent No. 561,228, dated June 8, 1896.

In my patent of June 8, 1896, I have described a main valve having a vent-hole and an auxiliary valve, which is also a tumbler, to close that vent-hole.

My present invention relates to means for closing the main valve with absolute certainty under all conditions when it is attempted to refill the bottle, and also to means for closing the vent-hole of the main valve.

In the drawings, A is a portion of the body of the bottle, secured to which is the cap B. The neck of the bottle forms a seat *a* for the valve D. Through the valve D there is a vent-hole *d*, and upon the upper surface of the valve is a slight depression about the center. In other words, the valve is slitghly dished out. A disk E of cork or other flexible and resilient material is over the valve D, and above the disk E is a tumbler F of cork or other buoyant material and a second tumbler F′ of glass or other non-buoyant material, the valve, disk, and tumblers being all inclosed within the chamber formed by the bottle A and cap B.

The first feature of my invention is the combination, with the main valve, of a floating tumbler—that is, a float so shaped and arranged that when it is floated against the wall of its chamber it will swing upon its edge and be pressed by its buoyancy against the main valve, as clearly shown in Fig. 4.

I am aware that a float intended to close the main valve is not new with me. See, for example, Patent No. 554,805, dated February 18, 1896, to Wainwright; but the float in that patent is not a "tumbler"—that is, it cannot swing when floated against the wall of its chamber—so that if a bottle with the float marked C^2 in the Wainwright patent were held in the position shown in Fig. 4 and the chamber filled with liquid the buoyancy of the float C^2 of the Wainwright patent would force the float flatwise against the upper wall of its chamber, the pressure due to its buoyancy being mainly direct against the wall of its chamber and tending in a slight degree only to slide the float endwise upon the wall of its chamber, but not tending in any degree to tilt or swing the float against the valve, so that the float C^2 is in no sense a tumbler.

If the bottle, being empty, be placed in the position shown in Fig. 4, the main valve D will open, the upper edge falling against the slanting portion of the interior of cap B, while the floating tumbler F will lie against the heavy tumbler F′. Suppose now that liquid under very slight pressure be forced into the chamber. The floating tumbler F′ will rise upon the liquid until it comes in contact with the upper wall of the chamber formed by cap B and the neck of the bottle A, and after the edge of the floating tumbler strikes the upper wall of the chamber the tumbler will swing upward and forward, closing valve D and rendering it practically impossible, however much care be exercised and however carefully the pressure may be regulated, to get liquid past the main valve by partially inverting the bottle, so as to make the heavy tumbler F′ inoperative.

If the bottle be wholly inverted, as in Fig. 3, the liquid under pressure will cause the floating tumbler to close valve D, as the tumbler F is floated by the entering liquid. If the bottle be on its side, both tumblers F and F′ will coöperate to close valve D. If the bottle be held upright, heavy tumbler F′ will prevent floating tumbler F from floating.

Floating tumbler F must be of such a diameter with relation to the interior diameter of the chamber that it will slant across the chamber, as shown in Fig. 4.

This combination effectually prevents all attempts to refill the bottle except through the vent-hole *d* of valve D; but as that vent-hole is practically necessary to equalize the air-pressures on opposite sides of valve D, I

use disk E as a means to prevent the liquid from leaking slowly through the vent-hole, and this is a second feature of my invention.

If liquid be poured into the neck, the bottle being in the position shown in Fig. 1, the liquid will not pass through the vent-hole owing to the smallness of the hole *d* and the groove *d'* leading to it, the attraction of cohesion and the obstruction of disk E serving to prevent the flow of the liquid downward and the air within the bottle from passing out through the vent-hole. If now pressure be applied sufficient to force the liquid through the groove *d'* and vent-hole *d*, the pressure upon the flexible disk E will force it down, effectually preventing leaking of the liquid through vent-hole *d*. If the bottle be placed in the positions shown in Figs. 2, 3, and 4, the parts will assume the positions shown in those figures, but the liquid-pressure will act as before to prevent leaking through vent-hole *d*.

The main feature of my invention is best illustrated in Fig. 4, which shows a tumbler F of such material, as cork, that it will be floated by the liquid introduced into the chamber and of such shape that after the tumbler is floated by the liquid until its edge strikes the upper wall of the chamber the tumbler will swing slantwise across the chamber and close the passage from the chamber into the bottle.

If the tumbler F were so shaped that its center of buoyancy would not tend to make it swing after its edge brought up against the wall of its chamber, its buoyancy would simply press it harder against the wall of its chamber when the bottle was held as in Fig. 4 and hold the tumbler from moving further, so that it would then have no tendency to close the passage from the chamber to the bottle; and this tendency of the floating tumbler to swing toward the passage when its edge is against the wall of the chamber, due to the fact that its center of buoyancy is nearer the passage than is the edge of the tumbler, is the distinguishing characteristic of this feature of my invention.

What I claim is—

1. In a non-refilling bottle the combination with the main valve of a floating tumbler shaped substantially as shown, whereby liquid forced into the mouth of the bottle when the bottle is inverted and inclined will cause the edge of the floating tumbler to strike against the wall of its chamber and thereby swing the tumbler on that edge against the main valve, substantially as described.

2. In a non-refilling bottle the combination of a main valve with a vent-hole through it; a floating tumbler whose buoyancy swings it toward the main valve when its edge is against the wall of its chamber; a valve covering the vent-hole through the main valve placed between the main valve and the floating tumbler; and a non-buoyant tumbler above the floating tumbler, substantially as described.

NATHANIEL FREDERICK THAYER HUNT.

Witnesses:
WM. MAYNADIER,
JOHN R. SNOW.