

(No Model.)

P. H. McGRATH.
NON-REFILLABLE BOTTLE.

No. 580,830.

Patented Apr. 13, 1897.

Fig. 1.

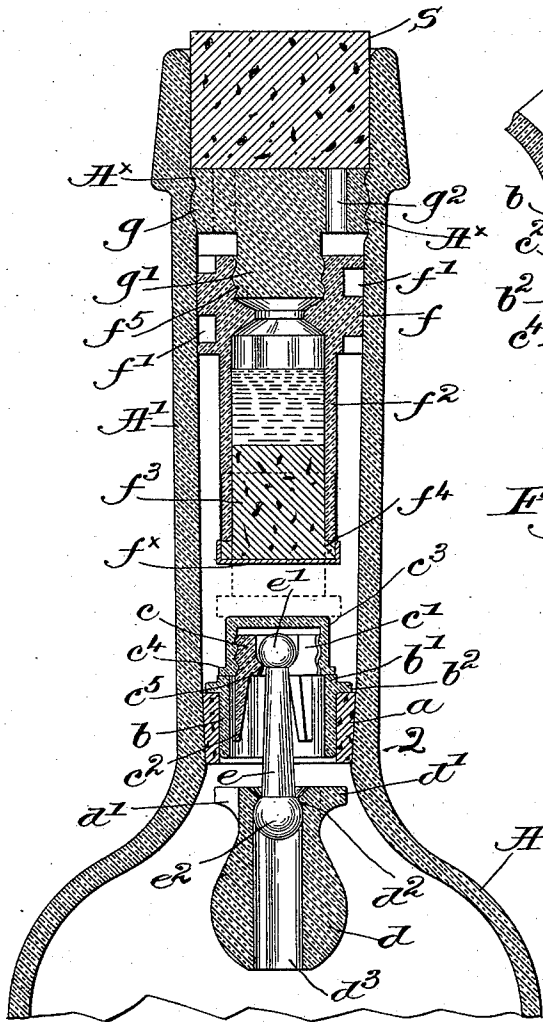


Fig. 2.

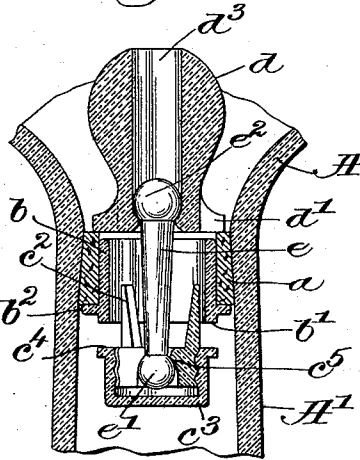


Fig. 4.

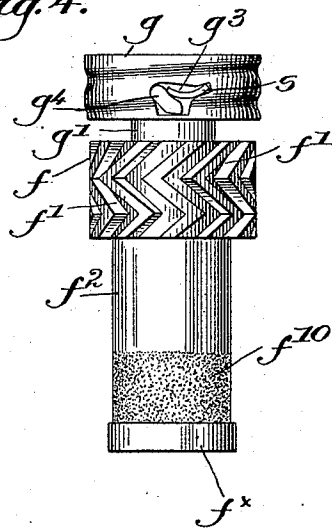


Fig. 3.

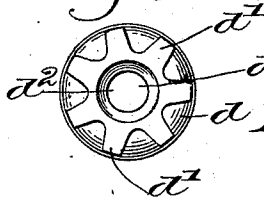
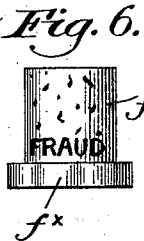
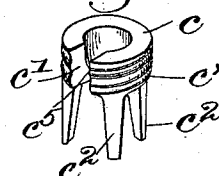


Fig. 5.



Witnesses:
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Inventor:
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by Crosby & Gregory, Attys.

UNITED STATES PATENT OFFICE.

PATRICK H. McGRATH, OF RANDOLPH, MASSACHUSETTS, ASSIGNOR OF
THREE-EIGHTHS TO MICHAEL F. CUNNINGHAM, OF SAME PLACE.

NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 580,830, dated April 13, 1897.

Application filed November 2, 1896. Serial No. 610,802. (No model.)

To all whom it may concern:

Be it known that I, PATRICK H. McGRATH, of Randolph, county of Norfolk, State of Massachusetts, have invented an Improvement in Non-Refillable Bottles, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention relates to bottles which cannot be refilled after the original contents or a portion thereof is removed; and my invention has for its particular object the further improvement of a non-refillable bottle forming the subject-matter of another application, Serial No. 582,096, filed by me, whereby all the parts of the closure may be made, preferably, of vitreous material. In the invention shown in said application it might be possible to partially refill the bottle by the use of an air-pump and so to a certain extent nullify the object of the invention, but I have in my present invention combined with the devices forming a part of my former invention suitable means to positively and absolutely prevent refilling by the use of an air-pump or otherwise.

Figure 1 is a vertical sectional view of the neck and upper portion of a bottle with my invention applied thereto. Fig. 2 is a similar view showing the bottle reversed to empty it with the valve-controller inoperative. Fig. 3 is a top or plan view of the valve-controller. Fig. 4 is a side elevation of the locking device for the valve, detached. Fig. 5 is a perspective view of the valve-carrier; and Fig. 6, in elevation, represents the movable member of the locking device.

The bottle A is provided with an internally-tapered neck A' to about the point 2 to receive tightly a preferably cock-bushing a, through which is extended a tubular lining b, of glass, porcelain, or other similar material, the upper end of the tube forming the valve-seat b', a shoulder b², resting on the top of the bushing, holding the lining in place.

The valve is made, preferably, in two parts in order that it may be constructed of glass, porcelain, or the like, and consists of a support comprising an annular portion c, slotted

at c' and provided with guiding-prongs c², which enter the lining b.

I prefer to thread the annulus c exteriorly at c^x to engage the threaded interior of the cup-like valve c³, the laterally-extended annular base c⁴ of which coöperates with the valve-seat b', as shown in Fig. 1.

The valve is normally held seated by a gravity-controller, comprising an elongated heavy body d, substantially pear-shaped, annularly enlarged at its neck by a series of fingers d', which rest on the inner end of the bushing when the bottle is turned upside down, as in Fig. 2.

A link e, having ball-like ends e' and e², detachably connects the valve-controller and valve by a ball-and-socket joint with each, the valve-support having an internal bearing-shoulder c⁵ to engage the ball e', while a similar shoulder d² in the upper end of a longitudinal bore d³ of the controller engages the ball e². The ball e' is the smaller, and in assembling the parts the small end of the link is passed through the controller, and then sideways it is inserted through the slot c' into the part c of the support, after which the valve member c³ is screwed on, and the parts are securely connected, yet allowing pivotal movement of the link and controller.

The upper end of the bore d³ is preferably outwardly beveled, as at d⁴, to permit free pivotal movement of the controller, the construction described permitting all the parts to be made of glass, porcelain, &c.

When it is desired to remove the contents of the bottle, the suitable removable stopper S is withdrawn and the bottle turned nearly or quite upside down, so that the fingers d' of the controller will rest on the bushing a, letting the force of the fluid passing between the fingers open or push the valve c⁴ from its seat.

If the bottle is only slightly inclined, the outer ends of some of the fingers will impinge against the inner end of the bushing and the part d of the controller will act as a lever, fulcrumed at the point of contact of the fingers and bushing, so that the controller is effective to seat the valve, unless the bottle is inverted, as in Fig. 2, or inclined sufficiently

to permit the force of the discharging contents to maintain the valve open.

In my application referred to I made use of a float to act upon and seat the valve by the force of the entering liquid should it be attempted to refill the bottle; but herein I have dispensed with the float and have devised a positively-operated lock for the valve should an air-pump be employed.

It may be stated that the air in the emptied bottle would prevent the entrance of liquid therein without artificial external pressure upon said liquid, and with such pressure the valve would be closed. By resorting to an air-pump, however, to first exhaust the air in the bottle and then admitting liquid it would fill the exhausted bottle, and this latter procedure I have herein guarded against.

Referring to Figs. 1 and 4, I have shown a plug-like guard f , having tortuous or indirect exit-passages f' therein for the fluid, said guard fitting tightly in the bottle-neck above the valve and having as a part thereof an inwardly-extended tubular portion f^2 , ending a short distance from the top of the valve member c^3 . A cork f^3 , having an annularly-flanged head f^4 , is fitted snugly, yet easily, in the inner end of the tube f^2 , with the flange resting against the end thereof, a vitreous cap f^x surrounding the exposed portion of the cork, which constitutes the movable member of the locking device for the valve. The upper end of the guard f is interiorly threaded at f^5 and is open into the tubular extension f^2 , (see Fig. 1,) the threaded portion receiving therein the correspondingly-threaded stem g' of a guard-retainer g , having liquid-exit openings g^2 .

A thread A^x is formed on the interior of the bottle-neck to engage the threaded exterior of the retainer g , the latter having a socket g^3 in its threaded exterior, (see Fig. 4,) with a locking-detent g^4 therein, held normally across the path of the thread by a spring s , of wood, cork, or other suitable material.

Now when the retainer is screwed into the bottle-neck the detent g^4 will yield to permit the leading end of the thread A^x to pass and will be thrown back into normal position by its spring s across the spiral path after the terminal or inner end of the thread A^x passes, so that it is impossible to withdraw the retainer without fracturing the bottle.

When the bottle is filled with its liquid, the valve-seat, valve, and controller are inserted in the bottle-neck and then the valve-locking device, but before the retainer g is screwed into the guard f a small quantity of liquid is poured into the tube f^2 above the movable member f^3 , after which the retainer is screwed into place and locked permanently by the detent.

Supposing the bottle to have been emptied of all or a part of its original contents and it is desired to refill it, the valve is only open when the bottle is inverted, and then liquid cannot be introduced without exhausting the air

from the bottle. If recourse is had to an air-exhausting device, the equilibrium of pressure on the inner and outer ends of the movable locking member f^3 is destroyed, and the expansive force of the confined air in tube f^2 will force out said member f^3 against the valve member c^3 , positively seating the valve c^4 and absolutely closing all communication thereafter with the interior of the bottle. The liquid h , Fig. 1, in the tubular extension f^2 of the guard acts to retain the locking member f^3 moist and prevent its shrinkage, so that the confined air cannot escape even after many months, and the cap f^x , covering the normally-exposed part of the member f^3 , prevents it from becoming dry.

If desired, some word, such as "Fraud," may be formed on the main part of the member f^3 , (see Fig. 6,) normally concealed by the lower end of the tube f^2 , which may be rendered opaque, as at f^{10} , Fig. 4, if necessary, the word appearing in sight when the locking member has moved into abnormal locking position. (Indicated by dotted lines, Fig. 1.) Any one can then see at a glance that the bottle has been tampered with and its unauthorized refilling attempted.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a non-refillable bottle, a valve in the neck thereof, a valve-seat for said valve, a valve-controller connected with the valve and arranged below said valve and its seat, within the body of the bottle, said controller acting by gravity to retain the valve closed when the bottle is upright or canted, and a pneumatic valve-locking device to positively move the valve to and retain it upon its seat, substantially as described.

2. In a non-refillable bottle, a valve in the neck thereof, a valve-seat for said valve, a valve-controller connected with the valve and acting by gravity to retain the valve closed when the bottle is upright or canted, and a normally inoperative valve-locking device, including a fixed tubular member and a movable member therein, to engage and positively close the valve upon reduction of air-pressure upon the exposed external portion of the movable member, substantially as described.

3. In a non-refillable bottle, a valve-seat in the lower part of the neck, a two-part valve to cooperate therewith, comprising a supporting member and a detachable valve member, a valve-controller consisting of a weighted body within the bottle and having radially-extended fingers at its upper end, and a link connected by a ball-and-socket joint with said valve and the upper end of the weighted body respectively, whereby when the bottle is canted the fingers retain the body out of contact with the bottle side and operative to maintain the valve seated, substantially as described.

4. In a non-refillable bottle, an annular valve in the neck thereof, a valve-seat, a

valve-controller connected by a ball-and-socket joint with the valve and arranged below it and its seat within the body of the bottle, said controller closing the valve when the bottle is upright or canted, and a valve-locking device comprising a fixed guard having a tubular extension, and a movable member held therein and adapted to engage and seat the valve upon reduction of air-pressure upon the exposed portion of said member, substantially as described.

5. In a non-refillable bottle, an annular valve in the neck thereof, a valve-seat, a valve-controller connected with the valve and acting by gravity to normally retain the valve closed, a guard in the neck above the valve, having a liquid-passage, means to retain said guard in place, and a pneumatic locking device between said valve and guard, operative upon reduction of external air-pressure thereupon to engage and positively close the valve, substantially as described.

6. In a non-refillable bottle, an annular valve in the neck thereof, a valve-seat, a valve-controller connected with the valve and acting by gravity to normally retain the valve closed, a guard in the neck above the valve, having a liquid-passage, a threaded retainer for the guard, to engage a thread in the bottle-neck, a detent to prevent removal of the retainer, and a locking device operative upon reduction of external air-pressure thereupon to positively close the valve, substantially as described.

7. In a non-refillable bottle, an annular valve in the neck thereof, a valve-seat, a valve-controller connected with the valve and

acting by gravity to normally retain the valve closed, a guard in the neck above the valve and having an air-chamber closed at its outer end, and a movable locking member closing the inner end of said chamber, reduction of external pressure upon said member permitting the air in said chamber to expand and force the locking member against and to close the valve, substantially as described.

8. In a non-refillable bottle, a guard provided with a liquid-exit, adapted to be inserted in the bottle-neck, and having an air-chamber, a retainer for said guard, adapted to screw into the bottle-neck and to close the outer end of the air-chamber, and a valve-locking member inserted in and closing the inner end of said chamber, reduction of external pressure upon said member permitting the air in the chamber to expand and move said member into position to close the valve, substantially as described.

9. In a non-refillable bottle, a valve within the neck thereof, a valve-seat for said valve, and a pneumatically-controlled valve-closer, adapted to operate upon reduction of external air-pressure thereupon, said valve-closer having a normally-concealed warning, to indicate fraudulent manipulation when exposed in abnormal position, substantially as described.

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

PATRICK H. McGRATH.

Witnesses:

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