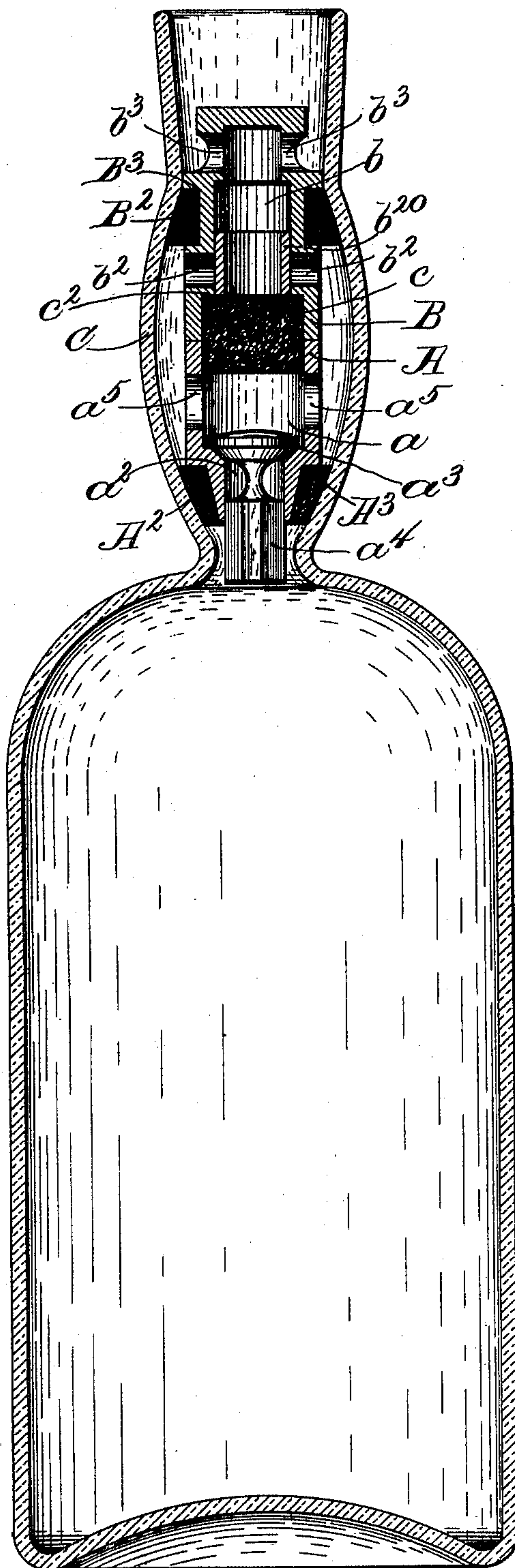


(No Model.)

G. E. SMITH.  
NON-REFILLABLE BOTTLE.

No. 592,576.

Patented Oct. 26, 1897.



*Witnesses.*

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*Traverter,*

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Htly.



# UNITED STATES PATENT OFFICE.

GEORGE E. SMITH, OF BOSTON, MASSACHUSETTS.

## NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 592,576, dated October 26, 1897.

Application filed November 13, 1896. Serial No. 611,966. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. SMITH, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Non-Refillable Bottles, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

The present invention relates to a non-refillable bottle and is embodied in a bottle having an antirefilling device comprising a plug or stopper which contains controlling devices adapted to prevent liquid from entering the bottle, but to allow the contents to flow out of the bottle, the stopper being complete in itself and capable of being applied to any bottle of suitable shape, but not removable therefrom after it is placed in position without destroying the bottle.

The stopper or controlling device embodying the invention consists of a substantially tubular plug adapted to be inserted in the neck of the bottle, the said plug being provided near the top and bottom thereof with shoulders adapted to support annular packing-rings of yielding material, such as cork, surrounding the outside of the plug and interposed between the same and the inner wall of the neck of the bottle, which is tapered above and below, this being an important feature of the invention. The plug is thus supported without the use of cement and is easily inserted, it being practically impossible, however, to remove it without destroying the bottle, although it can be removed without injury to itself after the bottle has been used by breaking the neck of the bottle, the yielding packing-rings serving to protect the plug itself from injury, so that the same plug can be used again with another bottle. The said plug is provided at its lower end with an inlet communicating with the interior of the bottle, said inlet being controlled by a valve cooperating with the valve-seat on the upper side of said inlet and having a guide-stem extending through the said inlet to guide the valve to and from its seat. Above the said valve the tubular plug is shown as divided into two chambers by means of a wall or partition extending across the same, the said chambers having lateral openings communicating with the annular space between

the plug and the neck of the bottle, which is closed above and below by the annular packing-rings above described. The liquid which enters the lower chamber, therefore, when the valve controlling the inlet thereto is unseated will flow into the said chamber and out through the lateral opening into the space aforesaid, and in order to flow out of the bottle it must flow into the upper chamber through the openings in the wall thereof, the said upper chamber having outlets leading to the exterior of the bottle, said outlets being preferably arranged to open laterally, the top of the chamber being closed. The openings which lead from the annular space around the tubular plug to the said upper chamber are shown as controlled by a valve comprising a tubular slide, the exterior of which fits the interior wall of said upper chamber, the openings in which are so arranged that when said slide is in its normal position—viz., resting upon the upper surface of the dividing-wall—it will close the lateral openings to the upper chamber and prevent fluid introduced in said chamber from flowing into the annular space around the plug.

The drawing is a vertical section of a bottle with the non-refilling device embodying the present invention applied thereto, the main controlling-valve being shown in elevation.

The stopper or controlling device embodying the invention consists of a tubular plug having a suitable controlling-valve and adapted to be inserted in the neck of the bottle C, which is tapered above and below and wholly supported by means of the annular packing-rings A<sup>2</sup> and B<sup>2</sup>, which are of yielding material, preferably cork, adapted to surround the said plug and lie in engagement with the shoulders A<sup>3</sup> and B<sup>3</sup> at or near the top and bottom thereof, so as to be interposed between the said shoulders and the tapered walls of the bottle and thereby support the plug and at the same time form a closed annular space surrounding the same. The said plug contains lower and upper chambers a and b, separated from each other by a wall or partition c, and is shown as made of two members A and B, while the partition c is shown as consisting of cork or similar material, which serves to secure the two members A



and B together, as well as to separate the chambers, one of which is shown as formed in each member.

The chamber *a*, or lower chamber, is provided with an inlet-passage *a*<sup>2</sup>, communicating with the interior of the bottle, the said passage being controlled by a valve *a*<sup>3</sup>, having a feathered guide-stem *a*<sup>4</sup> longitudinally movable in the inlet-passage *a*<sup>2</sup>, the valve preferably having a beveled valve portion cooperating with a correspondingly - beveled valve-seat formed in the interior of the chamber *a*. The said valve *a*<sup>3</sup> is normally seated by gravity to close the inlet to the chamber *a* and prevent liquid in said chamber from entering the bottle, it being obvious, however, that when the bottle is tipped up the said valve will leave its seat and allow liquid within the bottle to enter the chamber *a*. The said chamber *a* is provided with one or more outlet-passages *a*<sup>5</sup>, herein shown as openings through the side walls thereof, communicating with the annular space between the main portion of the plug A B and the neck C of the bottle to which the device is applied.

In order that the liquid which has passed through the chamber *a* into the annular space around the plug may flow out of the bottle, the chamber *b* is provided with one or more inlet-openings *b*<sup>2</sup> and outlet-openings *b*<sup>3</sup>, the inlet-openings being controlled by a normally-closed valve, herein shown as a tubular slide *b*<sup>20</sup>, normally supported upon the partition *c*, in which position, as shown, the said slide fits over the openings *b*<sup>2</sup>, thus cutting off communication between the chamber *b* and the annular space around the stopper. When the bottle is tipped up, therefore, so that the valve *a*<sup>3</sup> becomes unseated and permits the liquid to flow through the chamber *a* to the annular space around the plug, it is obvious that the valve *b*<sup>20</sup> will also move from its seat, uncovering the openings *b*<sup>2</sup>, so that the liquid can flow into the chamber *b* and thence through the outlets *b*<sup>3</sup> to the exterior of the bottle.

The outlets *b*<sup>3</sup> are shown as arranged to open laterally, the upper end of the tubular plug or top of the chamber *b* being closed, so that the valve *b*<sup>20</sup> is inaccessible and cannot be opened while the bottle is in its upright position.

In applying the plug to a bottle the member A, having the packing-ring A<sup>2</sup> placed in position thereon, is inserted into the neck of the bottle, which is contracted above and below, the opening at the top being of such size as to easily admit said member A, the said opening, in other words, being at least equal in size to the opening below and preferably somewhat larger, as shown. The said member A is then forced downward until the packing-ring becomes seated on the tapering wall of the neck above the lower contracted opening therein, and the upper member B, with the separating-wall *c* inserted therein and sup-

ported by the shoulders *c*<sup>2</sup>, is then forced into the neck of the bottle until the projecting portion of the wall *c* enters the mouth of the chamber *a*, the said parts being adapted to fit tightly, so that the portions A and B are held together, the said portion B being locked in position by the packing-ring B<sup>2</sup>, which, after being forced through, expands and becomes seated against the tapering wall at the contracted upper portion of the bottle-neck, as shown.

The members A and B may be made of glass or porcelain, the annular valve-seat in the member A being preferably ground, and the valve itself is also ground, so that the two parts make a perfect non-leaking fit, while both the valve-seat and the valve itself are entirely independent of the bottle itself.

It is practically impossible to remove the plug or stopper after it has been forced into position without breaking the bottle, and as the plug may be made much stronger than the bottle it is obvious that any attempt to destroy the plug will result in the destruction of the bottle, so that the proprietor of the bottled article is amply protected against fraud. If, however, the bottle after its contents have been used is returned to the proprietor, it is obvious that the plug may be removed without injury to itself by breaking the neck of the bottle, since the said plug is wholly out of contact therewith and protected from injury by the yielding packing-rings, and the plug may then be inserted in a new bottle to be used again.

It is manifestly impossible to refill the bottle while the plug is in place, since any attempt to "pick" the valves is frustrated by the zigzag path afforded by the lateral outlets, it being obvious that even if one succeeded in opening the upper valve the lower valve would still be inaccessible. Furthermore, if the bottle is held in a position to open the valves and the attempt made to force liquid in under pressure it is obvious that the relation of the opening *a*<sup>5</sup> to the valve *a*<sup>3</sup> is such that liquid entering said opening under pressure will at once seat the said valve and close the opening to the interior of the bottle. The said valve is shown as having a contracted neck below the valve proper, the diameter of which is less than that of the opening, so that the upper surfaces of the feather-guides extend beyond said neck, the said upper surfaces being so arranged with relation to the mouth of the opening as not to rise substantially above the same when the valve is wholly open, it being obvious, therefore, that any liquid entering the chamber and seeking to escape through the opening *a*<sup>2</sup> will exert a pressure upon the upper surfaces of the feathers, tending to close the valve, the closure being at once completed by the pressure upon the outside of the valve itself as it approaches its seat.

I claim—

1. In a non-refillable bottle, the combina-



tion with the neck of the bottle, of a tubular plug inserted in said neck and secured near its ends by packing-rings, whereby a closed annular space is provided between said plug and the neck of the bottle, a chamber in the lower portion of said plug provided with an inlet communicating with the interior of the bottle, a valve controlling said inlet, an outlet from said chamber communicating with the annular space around the plug, a second chamber within the plug provided with lateral inlets from said annular space, a valve controlling said inlets, and an outlet from said outer chamber, substantially as described.

2. A device for preventing the refilling of bottles, consisting of a tubular plug containing lower and upper chambers separated from each other, packing-rings around said plug near the ends thereof to support the same in the neck of the bottle, and to provide a closed annular space around said plug, a vertical inlet to the lower chamber at the bottom thereof provided with an annular beveled valve-seat, a valve having an annular beveled face cooperating with said seat and having a feathered guide-stem extending downward through said opening, a lateral outlet from said lower chamber, a lateral inlet for the upper chamber, a valve controlling said lateral inlet consisting of a tubular slide longitudinally movable in said chamber, and lateral outlets from said upper chamber, substantially as described.

3. In a non-refillable bottle, a plug or stopper made of two substantially tubular members, a wall or partition of yielding material interposed between said parts and adapted to enter both, an inlet-opening at the lower end of the lower part, a valve-seat formed at the upper side of said opening, a valve cooperating with said seat, a lateral opening in said lower member, a lateral opening in the upper member, and packing-rings surrounding said parts respectively, whereby a closed annular space is provided within the neck of the bottle, substantially as described.

4. The combination with the bottle having a neck contracted near the top and bottom, of a plug or stopper provided with external shoulders near the ends thereof, packing-rings of yielding material surrounding said plug and interposed between said shoulders and the tapered inner walls of the said neck whereby said plug is supported and a closed annular space is afforded around the outside thereof, a chamber within said plug closed at the top, a tubular inlet-opening to said chamber, a valve-seat at the mouth of said inlet, a valve cooperating with said seat, a stem for said valve having a contracted neck, feathers below said neck extending toward the wall of the opening to guide the valve, lateral openings from said chamber communicating with the annular space around the same, and suitable outlets from said annular space, substantially as described.

5. The combination with the bottle having a neck contracted near the top and bottom thereof, the opening at the top being equal to or greater than that at the bottom; of a tubular plug inserted in said neck and provided near its ends with external shoulders; packing-rings of yielding material surrounding the said plug and interposed between said shoulders and the tapered walls of said neck, whereby said plug is wholly supported within said neck, and a closed annular space formed around the same; a chamber in the lower portion of said plug provided with an inlet communicating with the interior of the bottle; a valve controlling said inlet; outlets from said chamber communicating with the closed annular space aforesaid; and an outlet from said annular space through the upper portion of the plug, substantially as described.

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

GEORGE E. SMITH.

Witnesses:

H. J. LIVERMORE,  
N. P. FORD.