

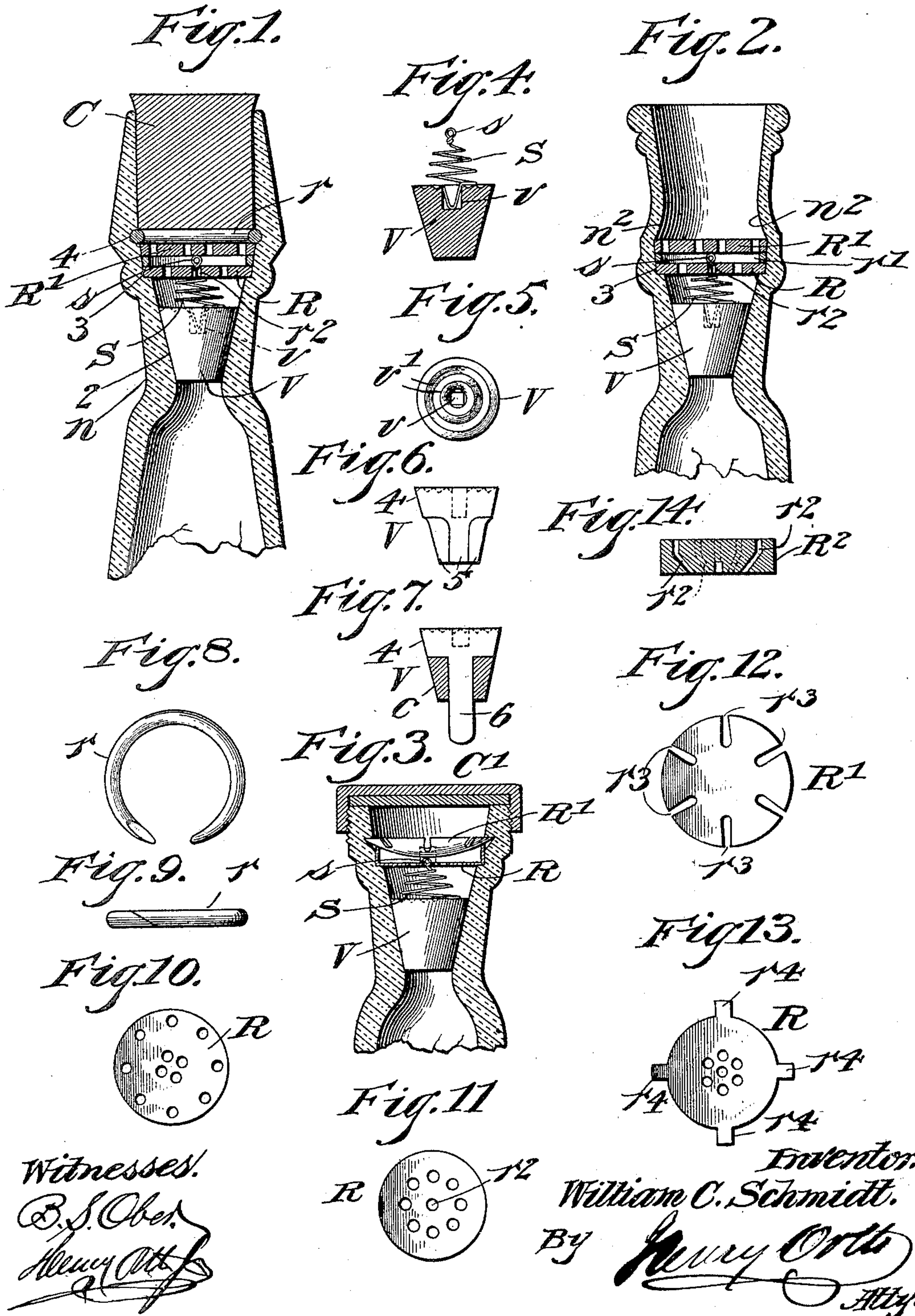
(No Model.)

W. C. SCHMIDT.

VALVE FOR PREVENTING REFILLING OF BOTTLES.

No. 581,774.

Patented May 4, 1897.





# UNITED STATES PATENT OFFICE.

WILLIAM C. SCHMIDT, OF RICHMOND, VIRGINIA.

## VALVE FOR PREVENTING REFILLING OF BOTTLES.

SPECIFICATION forming part of Letters Patent No. 581,774, dated May 4, 1897.

Application filed April 11, 1895. Serial No. 545,395. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. SCHMIDT, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Valves for Preventing the Refilling of Bottles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to valves for bottles; and it has for its object certain improvements in the means for preventing the refilling of a bottle after its contents have been exhausted, as will now be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the neck of a bottle provided with my improvements. Figs. 2 and 3 are like views illustrating a modification in the mode of securing the accessories to the valve against removal and a modified construction of said accessories, respectively. Fig. 4 is a vertical section, and Fig. 5 a top plan view, of one form of conical valve. Figs. 6 and 7 show in side elevation and vertical section other forms of valve. Fig. 8 is a vertical section illustrating a further modification in the construction of the valve, and Figs. 9 to 14 are detail views.

Similar symbols of reference indicate like parts wherever such may occur in the figures of drawings above described.

Referring to Figs. 1, 8, 9, 10, and 11, the neck *n* of the bottle is provided with a conical or downwardly-tapering valve-seat 2 for a spring-seated conical valve *V*, provided in its upper face with a socket *v*, that is preferably polygonal in cross-section. The said neck is further provided with seats 3 and 4, respectively, for a perforated disk *R* and locking-ring *r*, the inner wall of the neck *n* of the bottle between seats 3 and 4 being preferably straight. Above the disk *R* is arranged a

disk *R'*, that is also perforated, a spacing-ring *r'* being inserted between said rings *R* and *R'* to form a chamber between them. The locking-ring *r* is by preference a split steel ring, Figs. 8 and 9, of such diameter as to form a practically solid ring when sprung into its seat 4 in the neck *n* of the bottle, the split being at such an angle to a horizontal as to form a smooth joint when brought together, as shown at Fig. 10, so as to leave no projection that would provide a hold for a tool or the fingers, whereby said ring may be removed. In practice I employ a sufficiently strong steel ring to prevent its removal, either by means of a tool or by hand.

The spacing-ring *r'* may be of any desired more or less elastic material, as rubber or cork, and is preferably of a slightly-greater height than the space between the disks *R* and *R'*, so that when the locking-ring *r* is inserted and sprung into its seat said spacing-ring will pack the disks *R* and *R'* tightly together, said disks being constructed of a hard substance, as glass, metal, hard rubber, or the like.

The disk *R* has a central aperture *r*<sup>2</sup>, Figs. 1 and 11, for one end of a spring *S*, which, after being passed through said aperture, is looped and twisted, as shown at *s*, Fig. 1, the other end of said spring being doubled or bent upon itself and sprung into diagonally opposite corners of the polygonal aperture *v* in valve *V*, Fig. 4. The power of the spring *S* is such as to about balance the weight of the valve, so that the latter cannot be unseated except by pressure on its bottom face, so that when the bottle is empty and turned upside down the spring will hold the valve to its seat, which will effectually prevent the filling of the bottle by placing it upside down in a liquid, as the pressure of such liquid will then assist the spring in holding the valve to its seat. It is obvious, however, that if but one guard-disk *R* were employed a wire might be inserted through one of the holes thereof before the bottle is quite empty and the bottle inverted and the wire pushed between the valve and its seat and held in an open position until the bottle is refilled. This, however, is absolutely prevented by the use of two perforated



guard-disks R and R', the perforations of which are out of register with each other, as shown in Figs. 1, 10, and 11.

As an additional safeguard against the introduction of a wire for the purpose stated I form in the upper face of the valve V concentric annular grooves  $v'$ , which will effectually prevent the introduction of a wire between the valve-seat and valve, especially when the outer concentric row of perforations in one of the disks is out of line with the annular space formed in the chamber below the lower disk by the valve when unseated, so that one of the guard-disks may, in fact, be dispensed with, the other being used simply as an additional protection against refilling. As will be readily seen and understood from Fig. 14, the same result may be obtained by replacing the guard-disks R and R' by a single disk R<sup>2</sup> of a thickness about equal to said disks R and R' and the height of the intervening space and providing said disk R<sup>2</sup> with apertures  $r^2$ , that converge toward the axis of the disk, so that a wire could not possibly be introduced between the valve and its seat.

Instead of locking the guard disk or disks in position by means of a locking-ring  $r$ , as shown in Fig. 1, the ring may be dispensed with and the neck of the bottle contracted by reheating and pressure after the valve and disks have been positioned as shown at  $n^2$  in Fig. 2, thereby insuring the impossibility of removal of the disks R and R' and the valve V for refilling. Furthermore, the upper guard-disk R' may be dished or of concavo-convex form and provided with radial slots, Fig. 12, extending inwardly from the periphery, and then sprung into its seat. On the other hand, the lower guard-disk R may be provided with peripheral lugs  $r^4$ , Fig. 13, which when turned at an angle to said disk form seats for the disk R', as shown in Fig. 3, whereby the locking-ring  $r$  and the spacing and packing ring  $r'$  are dispensed with, said disk being provided with a perforation or other suitable means for connecting the outer end of spring S thereto.

It will be observed that the taper-valve is considerably shorter than its seat and fits the inner end thereof, thus affording ample play for said valve and a suitable passage around the same for the outflowing liquid, while the guard-disk seated in the enlarged portion of the passage in the neck of the bottle also limits the movement of said valve from its seat.

The valve V may be of any other suitable material, as metal, glass, hard rubber, or other suitable material. It is well known, however, that a conical valve is liable to stick to its seat, especially when made of glass, but this can be obviated in a great measure or entirely in various ways—for instance, by reducing the seat area 4 of the valve and providing guide-ribs 5, as shown in Fig. 6; or the valve may be made of two different materi-

als, a hard or non-elastic and a more or less elastic material, the body thereof being of a hard material, such as hereinbefore referred to, and provided with a stem 6, on which is fitted a valve-section  $c$  of a more or less elastic material, as cork, as shown in Fig. 7, the latter material being not as liable to stick as glass or the like.

It is obvious that by means of the improvements described the refilling of a bottle becomes practically impossible without destroying some of the valve-protecting devices.

In Fig. 1 I have shown the neck  $n$  of the bottle constructed to receive a cork C, instead of which said neck may be screw-threaded exteriorly and provided with a screw-cap C', Fig. 3, whereby I am enabled to shorten the neck very materially, and consequently facilitate the positioning of the valve and its auxiliaries, and this whether the guard-disks are locked by a locking-ring or by contraction of the neck of the bottle.

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

1. The combination with a bottle provided in its neck with a conical valve-seat, and having the passage in said neck enlarged at a point between the outlet thereof and said valve-seat, the upper end of said enlarged portion being bounded by an annular groove; of one or more spaced guard-disks and a split locking-ring respectively seated in the aforementioned enlarged portion and annular groove, and a spring-seated plug-valve fitting the valve-seat below said enlarged portion, for the purposes set forth.

2. The combination with a bottle having a neck tapering from its lower end to an enlarged portion in the neck, an annular groove above the enlarged portion and a taper-valve fitting the lower smaller part of said taper in the neck; of two superposed guard-disks having openings out of register with each other, a spring connected with the lower guard-disk and having bearing on the upper face of the valve, and a split locking-ring said disks and ring respectively seated in the aforementioned enlarged portion and annular groove, substantially as and for the purpose set forth.

3. The combination with a bottle provided with a tapering neck and an enlarged portion above the taper in the neck, and an annular groove above the enlarged portion; of a spring-actuated taper-valve shorter than and seated in the tapering portion of the neck, guard-disks fitting into the enlarged portion, and a locking-ring fitting in the groove, all substantially as and for the purpose set forth.

4. The combination with a bottle provided in its neck with a conical valve-seat, a spring-seated conical valve therefor having a valve-face made up of an inelastic and a more or less elastic material, of two perforated spaced guard-disks arranged above the valve, the



perforations in said disks being out of register with one another, and means for locking the disks against removal, for the purpose set forth.

5 5. The combination with a bottle provided in its neck with a valve-seat, and the spring-seated valve V, of a perforated disk R seated in said neck above the valve and provided

with upturned peripheral lugs, and a second concavo-convex guard-disk R' sprung into a seat in said neck above said disk R, substantially as and for the purpose set forth. 10

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Witnesses:

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