(No Model.)

# D. T. PHILLIPS.

## BOTTLE STOPPER.

No. 588,775. Patented Aug. 24, 1897.

Fig. 1.

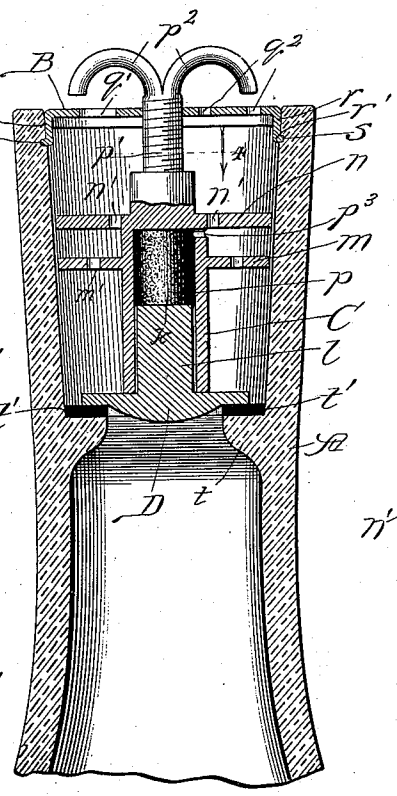



Fig. 2.

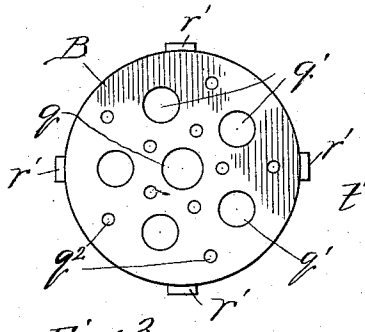



Fig. 3.

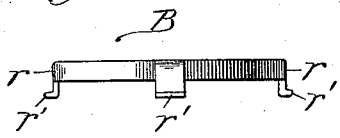



Fig. 4.

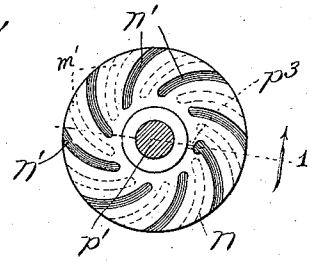
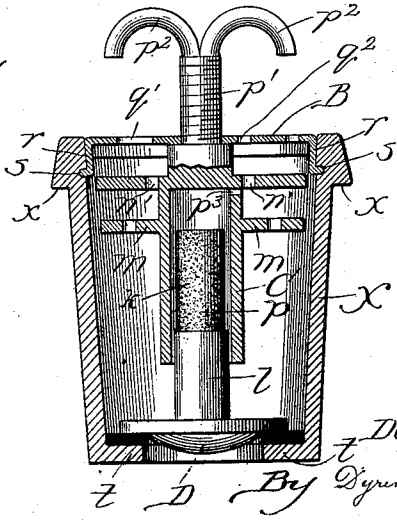



Fig. 5.




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# UNITED STATES PATENT OFFICE.

DARIUS T. PHILLIPS, OF CHICAGO, ILLINOIS.

## BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 588,775, dated August 24, 1897.

Application filed October 8, 1896. Serial No. 608,218. (No model.)

*To all whom it may concern:*

Be it known that I, DARIUS T. PHILLIPS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bottle-Stoppers, of which the following is a specification.

My invention relates to improvements in bottle-stoppers for original packages and of the class adapted to prevent refilling of the bottle without rendering the fact apparent.

My object is to provide stopper mechanism of this class of a particularly simple and cheap construction which while permitting original liquid contents to be easily poured will operate as an effective safeguard against the surreptitious use of the bottle a second time without such injury to the parts as will lead to easy detection.

In the drawings, Figure 1 is a broken section of the upper part of a bottle, showing my improvements, wherein the neck of the bottle forms a part of the stopper mechanism, the stopper being closed and the section being taken on line 1 of Fig. 4; Figs. 2 and 3, top and side views, respectively, of a perforated cap; Fig. 4, a plan section taken on line 4 of Fig. 1, and Fig. 5 a sectional view of a stopper involving my improvements and adapted to be cemented in the neck of a bottle as ordinarily constructed.

A is the neck portion of a glass bottle, which in the construction shown in Fig. 1 operates as the stopper-casing, formed with an inner annular shoulder or seat $t$ in the position shown and with sockets or shoulders $s$ at any convenient location. A cap B is provided with an annular circumferential flange $r$, just capable of passing into the mouth of the bottle or stopper casing and having projecting lips $r'$ to fit into and engage the sockets or shoulders $s$. In the center of the cap B is a threaded opening $q$, and the cap is also provided with a series of comparatively large outlet-openings $q'$ and a series of comparatively small vent-openings $q^2$.

C is a stem, formed in its lower end portion with a socket affording a chamber $p$ and hava threaded shank portion $p'$, which fits and works through the threaded opening $q$. On the upper end of the stem is a handle $p^2$, which may be formed, as shown, by splitting and bending the stem material. Formed preferably integral with the stem C is a disk $n$, having openings through it, $n'$, which may be spiral slots, as shown. Below the disk $n$ and also preferably integral with the stem C is a disk $m$, formed with openings $m'$ like the openings $n'$, but intermediate of the latter.

D is a liquid-discharge valve which seats upon the valve-seat $t$ and has a central upward-projecting guide-lug $l$, which fits closely and slides in the lower end portion of the chamber $p$. By preference I provide a cushion $t'$ upon the seat $t$ for the valve to bear against, which cushion may be a ring of cork or any suitable material. Extending through one side of the stem to the chamber $p$ is a small opening $p^3$, and in the chamber above the end of the lug $l$ I provide a block or quantity of material $k$ which readily absorbs a liquid and expands materially under such absorption. I prefer to provide sponge for the absorbent material $k$, though other suitable substance may be used.

In practice the cap B may be of sheet metal, stamped to shape and sufficiently brittle to prevent its being removed without breaking the lips and so injuring it that it cannot be replaced.

The stem C may be of cast metal, and the valve D of glass. When manufactured in quantities, the cost of the parts named would be under one cent.

The parts are all fastened in position, when the bottle has been filled, by inserting the cap into the mouth of the neck portion and springing the projections $r'$ into the sockets $s$ or forcing with a suitable tool. By screwing down the stem, which tightens the valve against its seat, the liquid contents of the bottle are hermetically sealed. To pour out the contents, the stem is screwed outward in the cap, as shown in Fig. 5, when tilting of the bottle will cause the liquid to open the valve D and flow through liquid-discharge passage about the stem and through the openings in the disks and cap. The opening $p^3$ should, I have found, be about one sixty-fourth of an inch in diameter, which causes the liquid to flow readily over it without entering the chamber $p$ to any material extent

while being poured or in its backflow as the bottle is righted, and this is particularly the case when an opening through the disk $n$ is provided at the opening $p^3$, as shown in Fig. 4, sufficiently large to permit a rapid flow of the liquid past the opening $p^3$ in the pouring operation.

The valve D is a shielded valve, in the sense that it cannot be tampered with, because the cap and disks make it impossible to insert a wire or other instrument through the liquid-discharge passage to engage and hold the valve open for the purpose of refilling the bottle. While the opening $p^3$ will not cause liquid to enter the chamber $p$ in any material quantity during the necessarily rapid flow of the liquid while pouring it out, any attempt to refill the bottle while it is tipped over far enough to hold the valve open will, owing to the necessarily slow movement of the liquid, cause the latter to enter the chamber $p$ through the opening $p^3$ and swell the sponge to such an extent as to seat the valve.

Numerous and exhaustive tests which I have made prove that while the bottle may be emptied quickly or by pouring out its contents a little at a time and at long intervals without sufficient liquid entering the chamber $p$ to swell the sponge to any material extent there is no way of getting any material quantity of liquid back into the bottle without causing the sponge to swell and seat the valve so firmly that such liquid as may have entered the bottle cannot be poured out.

The construction shown in Fig. 1 of course requires that the neck of the bottle be especially constructed with the seat $t$ and sockets $s$.

In Fig. 5 I show a complete stopper formed with a glass shell or casing X, distinct from the neck of a bottle, and having the valve-seat $t$ and sockets $s$ for the same purpose as in the construction shown in Fig. 1. The shell X may fit into and be cemented in a bottle having the usual smooth neck portion, and it is provided toward its upper end with an outer circumferential shoulder $x$ to fit over the edge at the mouth of the bottle.

By providing a disk $n$ with openings sufficiently small to prevent the insertion through it of a wire or the like which could be employed to hold the valve open the disk $m$ may be dispensed with. Even without the employment of material expansible under absorption of liquid in the chamber $p$ my improved stopper affords a very desirable and inexpensive construction which will render the operation of refilling the bottle without exposing the fact very difficult to accomplish.

While I prefer to construct my improvements throughout as shown and described, they may be modified in the matter of details without departing from the spirit of my invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a bottle-stopper, the combination with a liquid-discharge valve and its seat, and an outlet-passage for liquid leading from the valve-seat through the stopper, of a chamber at said valve, communicating with said passage, material, expansive under absorption of liquid, confined in said chamber, and acting upon said valve when expanded to seat the same, substantially as and for the purpose set forth.

2. In a bottle-stopper a casing provided with a valve-seat, a cap on the casing having a bearing-opening, a shielded valve at said seat, a stem provided with a chamber at its inner end, and extending through and working in said bearing-opening and movable against said valve to seat the same, a small opening in the side of the stem leading to the chamber, and material, expansive under absorption of liquid, confined in said chamber and acting upon said valve, when expanded, to seat the same, all constructed and arranged to operate substantially as and for the purpose set forth.

3. In a bottle-stopper, the combination of a casing, having a valve-seat $t$ and affording a liquid-outlet passage, a shielded liquid-discharge valve D at said seat provided with a central projection $l$, a stem C having a threaded shank portion, and a socket in its end to fit over the projection $l$ and afford a chamber $p$, an opening $p^3$ in the stem affording communication between the liquid-outlet passage and chamber $p$, material, expansive under absorption of liquid, confined in said chamber and acting upon said valve, when expanded, to seat the same, and a cap fitting the mouth of said passage and permanently fastened therein, and provided with openings for the passage of liquid and for venting, one said opening affording a bearing for the threaded shank portion of the stem, substantially as and for the purpose set forth.

DARIUS T. PHILLIPS.

In presence of—
R. T. SPENCER,
M. J. FROST.