

**J. H. WITTEKIND.**  
**BOTTLE STOPPER.**

Patented Feb. 23, 1897.



# UNITED STATES PATENT OFFICE.

JULIUS H. WITTEKIND, OF ROSLINDALE, MASSACHUSETTS.

## BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 577,546, dated February 23, 1897.

Application filed March 26, 1896. Serial No. 584,951. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS H. WITTEKIND, of Roslindale, county of Suffolk, and State of Massachusetts, have invented an Improvement in Bottle-Stoppers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to bottle-closures, particularly to stoppers designed to prevent the refilling of the bottle after the original contents have been used.

It is very desirable in some classes of bottled goods that the fraudulent reuse of the bottle after it has been emptied of its original contents shall be absolutely prevented, and endeavors to accomplish this end have heretofore been made by providing peculiar stoppers to prevent the refilling of the bottle, and also by providing devices that will insure the breaking of the bottle in instances. So far as I am aware, however, none of these devices have been found to answer the purpose for which they were invented and are not in use. Accordingly I have invented the improvements as hereinafter more particularly set forth in detail for the purpose of meeting the above-mentioned requirements and absolutely preventing the fraudulent refilling of the bottle, making it positively certain, therefore, that the bottle can only be used for its originally-intended purpose. The bottle is filled in the ordinary manner, my improved stopper being then inserted in place, and when thus once inserted it cannot possibly be removed without breaking the bottle, and so long as it is in place it insures that the bottle cannot be refilled, while at the same time permitting the ready escape of the original contents, as desired.

In the accompanying drawings, illustrative of my invention, Figure 1 is a central vertical section of the neck portion of a bottle, showing my improved stopper in operative position. Figs. 2 and 3 are similar sectional views showing slight modifications in various details. Fig. 4 is a similar sectional view showing a further detail of the upper part of the stopper. Fig. 5 is a similar sectional view showing one form of securing means for retaining the stopper in proper position. Fig. 6

is a horizontal section on the line 6 6, Fig. 1. Fig. 7 is a horizontal section on the line 7 7, Fig. 1, and Fig. 8 is a top plan view of a modified form of stopper shown in Fig. 3.

Referring to the details of construction as shown in the drawings, A indicates the upper portion or neck of any ordinary bottle, and B indicates the usual cork or other stopper shown as inserted in the usual manner in the upper extremity of the bottle-neck. Within the bottle-neck and preferably below the normal position of the cork B, I insert my improved bottle-stopper C.

The present construction is particularly designed so that it may be made entirely of glass, although other material may be used instead of glass, if preferred.

C' designates a tubular portion partially closed at its lower end, where it is centrally apertured to form a valve-seat *c*, conformed in shape to receive the valve D in snugly-closing contact therewith. At its upper end the tube C' is provided with a disk C<sup>2</sup>, having, preferably, a plurality of openings *c'* peripherally arranged about its center, these openings being shown to best advantage in Fig. 6, where they are in the form of ellipses. Depending centrally from the disk portion C<sup>2</sup> is a solid post *c*<sup>2</sup>, recessed at its lower end to provide a socket *c*<sup>3</sup> to receive the upper end of the valve-stem *d*. Within the tubular portion and preferably about midway of the length thereof I provide a bar *e*, centrally apertured to permit the free movement of the valve-stem *d*. Directly above the bar *e* is a protector *e'* in the form of an inverted funnel truncated at its upper end to provide an aperture *e*<sup>2</sup> for the flow of the liquid in escaping from the bottle. This aperture *a*<sup>2</sup> is considerably larger in diameter than the valve-stem *d*, but is yet not so large as the lower portion of the post *c*<sup>2</sup>, which preferably extends down in close proximity thereto. The valve-stem *d* has a projection or guide-plate *d'* preferably secured thereto and conveniently located between the valve portion *d* and the bar *e*, a spring *s* being interposed between this guide-plate and the bar *e* to normally maintain the valve in tightly-closed position against its valve-seat. The guide-plate *d'* extends laterally at either side of the

valve-stem in close proximity to the walls of the tubular portion  $C'$ , being preferably in the form of a cross or star, as shown in Fig. 7.

In the preferred construction of my improved stopper the tubular portion  $C'$  is made in one piece, the disk  $C^2$ , the protector  $e'$ , and the bar  $e$  being made separately and cemented or otherwise secured in place, substantially as shown. The parts are then assembled in the following manner: The valve portion is inserted through the upper end, being maintained in proper vertical alinement by means of the projecting arms of the guide-plate  $d'$ , resting against the walls of the tube  $C'$ . The spring  $s$  is then slipped over the valve-stem  $d$ . The bar  $e$  and the protector  $e'$  are then coated with cement and properly adjusted in place. These parts having been adjusted as stated the disk  $C^2$  and its post  $c^2$  are likewise cemented or otherwise suitably fixed in place, preferably flush with the top of the tube  $e'$ , as shown in Fig. 1. However I do not restrict myself to making the various parts of my improved stopper in separate parts, as they may be formed in part or in whole, as desired.

Referring to Fig. 2, it will be seen that I have provided the lower end of the valve  $D$  with a guide  $d^2$  therein, shown in the form of a wedge. This guide is for the purpose of maintaining the valve in vertical alinement coöperating with the aperture in the bar  $e$  and to a certain extent taking the place of the guide-plate  $d'$ , the latter being shown in this figure as resting loosely against the valve-stem  $d$  and the valve  $D$ . I have here shown the preferred manner of forming the valve member of my improved stopper, the valve  $D$  being cast separately from the valve-stem and provided at its upper end with a recess  $d^2$ , into which the valve-stem is inserted and cemented. This means of forming the valve member is much cheaper and simpler than forming it in one piece, as shown in Fig. 1; also in Fig. 2 I have shown a bell-shaped member  $c^{20}$  instead of the solid post  $c^2$ , this bell-shaped member being preferably secured to the disk  $C^2$  by the screw-threaded stud  $c^4$ , which is cast or otherwise formed on the disk  $C^2$ . This construction is much lighter than the construction in Fig. 1 and is to be preferred in some instances, being more difficult of access from the outside to the valve member, the lower portion of the member  $c^{20}$  being preferably extended below the upper extremity of the protector  $e'$  and the latter being curved upwardly somewhat, substantially as shown.

In Fig. 3 I have shown further modifications, the general construction remaining the same. The valve  $D$  is made in the form of an inverted cone, the lower portion thereof serving as a guide, the same as the wedge-shaped portion  $d^2$  serves in the construction shown in Fig. 2; also the post  $c^2$  is shown as considerably smaller than in Fig. 1, the lower portion  $c^5$  thereof being laterally extended to project over the opening  $e^2$  with the same

function as the lower end of the larger post shown in Fig. 1. Instead of the disk portion being strictly circular, as is shown in Figs. 1 and 6, I have shown it in Fig. 3 simply in the form of a bar  $c^6$ , (see also Fig. 8,) the liquid being permitted to escape at either side of this bar  $c^6$ .

Referring to Fig. 4, it will be seen that the post  $c^2$  is somewhat tapering and provided with a deep spiral groove  $c^7$ , a corresponding groove  $c^8$  being formed in the opposite walls of the tube  $C'$ . The purpose of this groove is to aid the liquid in escaping from the bottle, the spiral arrangement of the groove causing the liquid to rotate with more or less rapidity and to thereby agitate the same sufficiently to permit the ready inlet of the air necessary to displace the escaping liquid within the bottle.

In Fig. 1 I have shown my improved stopper as secured by means of annular bands  $m$  of expansible material, which rest in annular grooves  $m'$ , formed in the external walls of the tube  $C'$ , being compressed therein as the tube is inserted into the bottle-neck and then springing out into the corresponding annular groove  $m^2$ , formed in the inner walls of the bottle-neck on account of the resilient or expansible nature of the band as soon as the stopper has been inserted to the required extent within the neck.

I am aware that expansive rings of wood have been before used for this purpose. These rings are, however, expensive and difficult to make, and because of the tendency of wood to warp and become distorted under changing humidity of the atmosphere are exceedingly objectionable for this purpose. Accordingly I have devised the improvement shown in Fig. 5, which consists in perforating the walls of the tube  $C'$  at  $c^9$  in the bottom of the groove  $m'$ , and using instead of a ring or annular band a strip of compressed wood or other suitable material, the two ends of the strip being inserted in the perforation  $c^9$  and conveniently inclosed therein, substantially as shown in Fig. 5. This construction permits the band to expand and contract somewhat without destroying its usefulness as a securing means, and at the same time the strips are much cheaper as well as more serviceable than the rings or bands previously used.

In Fig. 2 I have shown an additional means of securing the stopper which may be used alone, although I prefer to use it in connection with the securing means  $m$  just described. This additional securing device consists of one or more spring-clips  $n$ , secured to the lower end of the stopper  $C$ , the bottle-neck near its lower end being internally provided with an annular rib or projection  $a$ , conforming in shape substantially to the curvature of the springs  $n$ , so that the springs  $n$  click or snap over the rib  $a$  at the same time that the strips  $m$  spring out into the grooves  $m^2$ , as the stopper is pressed down into place.

As an additional precaution against any attempt to remove the bottle-stopper I have provided an annular depression *a'* in the glass of the bottle-neck, so that the wall of the bottle at that point is considerably thinner and therefore more fragile than at any other point. Accordingly, should any one, by inserting a hook within one of the openings *c'* of the stopper, attempt to remove the bottle-stopper the spring-clips *n*, as well as the strain on the entire neck of the bottle, will cause the neck to break off at the line of easy fracture adjacent the depression *a'*, thereby positively preventing any subsequent use of the bottle with a view to misleading users into supposing they are getting the goods of the original brand or manufacture.

I do not intend to limit myself to the precise details of construction herein shown and described, inasmuch as many changes in form, proportion, and arrangement of parts may be resorted to within the spirit and scope of my invention.

What I claim is—

1. A bottle-stopper, comprising a tubular portion having at its lower end a valve-seat and at its upper end a disk perforated to permit the escape of liquid from the bottle, said disk being provided with a depending portion secured thereto, combined with a valve adapted to close tightly against said valve-seat, and having a valve-stem extending upwardly within the said tubular portion, a perforated bar fixed within and approximately midway of the length of said tubular portion to receive said upper end of said valve-stem, a protector in the form of an inverted funnel immediately above said bar and provided with a central aperture surrounding said valve-stem, for the escape of the liquid therethrough, said valve-stem operating through the aperture of said inverted funnel, and a spring interposed between said bar and said valve, normally tending to hold the latter in closed position against its seat, substantially as described.

2. A bottle-stopper, comprising a tubular portion having at its lower end a valve-seat and at its upper end a disk perforated to permit the escape of liquid from the bottle, said disk being provided with a depending portion secured thereto, combined with a valve adapted to close tightly against said valve-seat, and having a valve-stem extending upwardly within the said tubular portion, a perforated bar fixed within and approximately midway of the length of said tubular portion to receive said upper end of said valve-stem, a protector in the form of an inverted funnel immediately above said bar and provided with a central aperture surrounding said valve-stem for the escape of the liquid therethrough, said protector extending at its upper end within said depending portion, a guide-plate mounted on said valve-stem and having a plurality of arms extending in close proximity to

the wall of said tubular portion, and a spring interposed between said bar and said valve normally tending to hold the latter in closed position against its seat, substantially as described.

3. A bottle-stopper, comprising a tubular portion having at its lower end a valve-seat and at its upper end a disk having a plurality of openings to permit the escape of liquid from the bottle, said disk being provided with a depending bell-shaped portion secured thereto, combined with a valve adapted to close tightly against said seat, a guide-plate, a valve-stem extending upwardly within the said tubular portion, a perforated bar fixed within and approximately midway of the length of said tubular portion to receive said upper end of said valve-stem, a protector in the form of an inverted funnel immediately above said bar and provided with a central aperture surrounding said valve-stem, for the escape of the liquid therethrough, said protector extending within said bell-shaped portion and a spring interposed between said bar and said valve normally tending to hold the latter in closed position against its seat, substantially as described.

4. In a bottle-stopper, comprising a tubular portion having a perforated disk secured integrally thereto at its upper end, and a post centrally depending therefrom within said tubular portion, said post being provided externally with a spiral groove, said tubular portion being provided with an internal spiral groove opposite and corresponding to said first-mentioned groove, substantially as described.

5. In a bottle-stopper, a tubular portion provided with an external annular groove adapted to align with a corresponding internal annular groove formed in the bottle-neck, said stopper having a perforation extending through said tubular portion in the bottom of the said annular groove thereof, combined with a strip of compressible material adapted to rest in said last-mentioned groove having its ends inserted through said perforation, substantially as described.

6. The combination with a bottle having an internal annular projection or rib, and also provided with a relatively thin annular portion or line of easy fracture immediately below and adjacent said internal projection or rib, of a bottle-stopper provided with one or more hooked spring-clips adapted to snap over said projection or rib and thereby properly retain the stopper, substantially as described.

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

JULIUS H. WITTEKIND.

Witnesses:

FRED. K. DAGGETT,  
JOHN C. EDWARDS.