

(Model.)

W. H. BATE.

BOTTLE STOPPER AND FASTENING.

No. 273,935.

Patented Mar. 13, 1883.

Fig. 1.

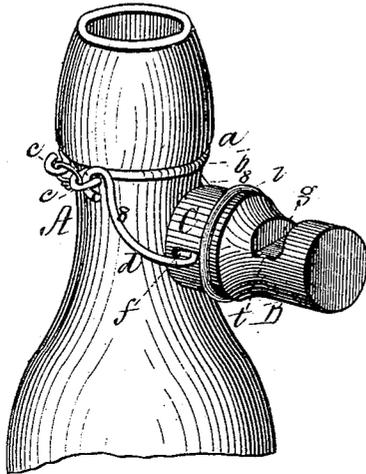


Fig. 2.

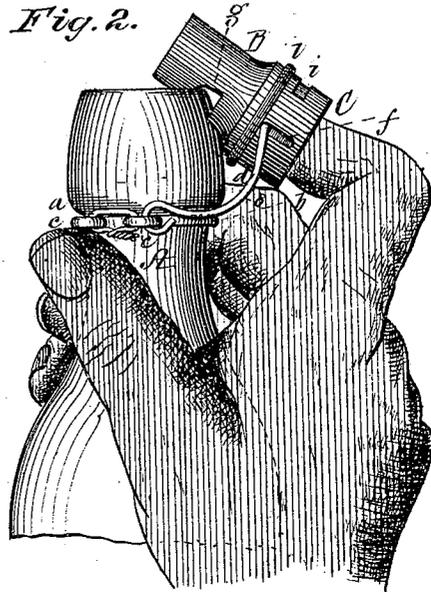


Fig. 5.

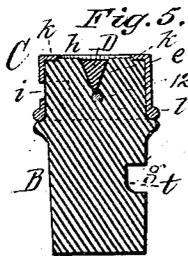


Fig. 3.

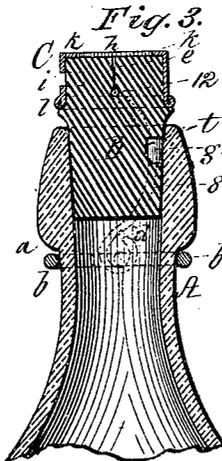
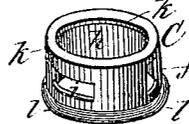


Fig. 4.



WITNESSES

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INVENTOR

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 per *Norman W. Stearns,*
 Attorney.

UNITED STATES PATENT OFFICE.

WALLACE H. BATE, OF BOSTON, MASS., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO WEBSTER E. PIERCE, TRUSTEE, OF SAME PLACE.

BOTTLE STOPPER AND FASTENING.

SPECIFICATION forming part of Letters Patent No. 273,935, dated March 13, 1883.

Application filed February 27, 1882. (Model.)

To all whom it may concern:

Be it known that I, WALLACE H. BATE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Bottle-Stoppers and their Fastenings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a bottle stopper and its fastening constructed in accordance with my invention and applied to the mouth and neck of a bottle. Fig. 2 is a perspective view, representing the position of the hand as applied to the bottle and its stopper when in the act of closing the mouth of the bottle. Fig. 3 is a central vertical section, showing the stopper in place. Fig. 4 is a view of the metal cap which surrounds the head of the stopper; Fig. 5, a sectional detail to be referred to.

My present invention consists in an elastic stopper having a notch formed in that portion of its exterior surface opposite that against which pressure is applied to remove the same, in combination with a means of securing it to the neck of the bottle, the location of the notch being such as to admit of the use of a stopper sufficiently elongated below the notch as to reach down to a considerable distance into the neck of the bottle and have an extended bearing therein, both above and below the notch, thereby tightly sealing its contents and permitting a gradual or partial withdrawal of the stopper without leakage, said notch adding to the natural resiliency of an elastic stopper while being operated, and insuring the necessary contraction and expansion of the different portions thereof as they are successively brought into contact with the edge and interior of the mouth of the bottle, whereby the lower end of the stopper is free to bend or curve toward the entering side, the said notched stopper performing the office of a spring-hook, which grasps, catches over, and retains its hold upon the contiguous edge of the mouth, and enables the stopper to be promptly and accurately guided to and from its seat with the minimum arc of swing on its

bail and of the swing of the bail on its pivotal points.

My present invention also consists in a notched elastic stopper and a cap or collar surrounding its head, in combination with a spring-connection for attaching the same to the neck of the bottle, the said connection having its upper portion so confined to bearings in or about the head of the stopper that the latter can have no lateral play thereon and no lost motion occurs when swinging in its entering or withdrawing plane, whereby after the stopper is removed it is always left in a convenient position to be returned by a single simple operation of the finger.

My present invention also consists in the combination, with a notched elastic stopper, a spring-bail, and a yoke or neck-band, of a metal cap or collar surrounding its head, and having an opening in its top to render the elastic material accessible for the application of the finger thereto in closing the bottle, and with the elastic material exposed on its withdrawing side to admit of the application of the thumb thereon in removing the stopper, the upper portion of the bail passing through openings in its head or in or upon the cap or collar surrounding it; and my present invention also consists in a certain wedge to be used in connection with said metal cap or collar, and the elastic stopper having a diametrical groove in its head, for a purpose hereinafter to be described.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, Δ represents the neck of a bottle, around which, under its shoulder a , is secured a rigid yoke or collar, b , provided at two of its diametrically-opposite sides with loops $c c$, to which are hooked or otherwise secured the lower ends of a metal bail, d , which is free to swing on the loops $c c$ as pivots. Each of the opposite upright portions $8 8$ of the bail d is bent for the purpose of enabling the bail to spring or yield when force is applied to remove the stopper B from the mouth of the bottle and to exert a pressure down-

ward on the stopper to insure its retention therein when closed.

The stopper B is formed of rubber or other suitable elastic material, may be either cylindrical or slightly conical to correspond with the interior of the neck of the bottle, and is of sufficient length to extend down some distance therein. This elastic stopper is provided with a deep notch, *g*, having square or nearly square shoulders made in that portion of its exterior curved surface which comes into contact with the upper edge of the mouth of the bottle in opening or closing the same, the object of said notch and its relation and effect in the operations of introducing and removing the stopper being presently to be described. The head of the stopper is provided with a groove, *e*, made diametrically across it, and of sufficient depth to receive the horizontal portion 12 of the spring-bail *d*, and around the outside of the head is snugly fitted a metal cap, C, having two slots, *ff*, opposite each other, Fig. 4, for the reception of the bail *d*, which is first passed through these slots, and then the head of the stopper introduced within the cap in such manner that the horizontal portion 12 of the bail will be seated on the metal bearings formed by the bottoms of the slots *ff*, the width of these slots corresponding to the diameter of the horizontal portion of the spring-bail, the elasticity of the rubber at the bottom of the groove or slit *e* in the head of the stopper causing it to close around and exert a pressure on the top or outside of the horizontal portion of said bail, and as the latter, during the swinging of the stopper, does not exert a counter-pressure—*i. e.*, in the direction of the length of the slots *ff*—this action of the rubber against the bail keeps it confined and in fixed bearings at the bottoms of the slots, whereby all lateral play or lost motion of the stopper on its bail is thus prevented. The top of the cap is preferably provided with an opening, *h*, through which the head of the stopper is exposed and made accessible for the application thereto of the finger, Fig. 2, in entering the stopper within the neck of the bottle, the adhesive surface of the rubber preventing the slipping of the finger, which would likely occur if the metal of the cap extended over its top. An opening, *i*, is also formed in the side of the cap to render the rubber accessible to the thumb for the same purpose when the stopper is being forced out or removed. If it is desired to reduce the amount of the rubber, and consequently the expense of the stopper, the groove *e* in its head may be made wider at its top for the reception of a wedge, D, Fig. 5, the cap C in such case being provided with an inwardly-projecting flange, *k*, for the ends of the wedge to rest thereunder and thereby be kept in place, the rubber being compressed outwardly by the wedge to insure a tight fit of the head of the stopper within the cap. The groove or slit *e* in the head of the stopper may, however, be

omitted and a simple aperture made therein, and the loop on the entering end of the horizontal portion of the bail formed after its passage through it. At the bottom of the cap I form an outwardly-projecting flange, *l*, to prevent the rubber from being cut or injured.

The parts being in the position seen in Fig. 2, and it being desired to enter the stopper to seal the contents of the bottle, the forefinger is pressed upon the elastic head accessible and exposed to view at the top of the annular cap C, surrounding it, when the lower side of the notch *g* slides forward over the smooth edge of the mouth of the bottle until the bottom *t* of the notch is brought into contact with and catches over it, at which time the lower end of the stopper abuts against the opposite edge of the mouth, and simultaneously the stopper bends at the point where the notch is located, which causes the lower end of the stopper to curve inward and be guided promptly and reliably down into the neck, the portion of the stopper below the notch being sufficiently elongated to have an extended bearing therein, the spring-bail yielding and straightening out to allow of the riding up of the stopper over the edge of the bottle, and after the stopper is seated the bail contracts and returns to its normal position, exerting sufficient pressure to retain it in place, the horizontal portion of the bail, during the above-described operation, having no lost motion on its fixed pivotal bearings within the cap C. The contact or bearing of the portion of the stopper both above and below the notch within the neck of the bottle is of such extent that the stopper may be gradually and partially withdrawn without affording a passage for the escape of the liquid contents, whereas with other constructions of stoppers the sealing portion of the elastic material either simply rests upon the top or upper edge of the mouth or extends down so short a distance within the neck as to form a limited bearing therein, which is not sufficient to prevent the escape of the contents of the bottle should the stopper be loosened by the accidental contact of its head with another bottle or object during transportation or while being handled.

It will be seen that by means of the notch I am enabled to employ a stopper having an elongated bearing within the neck, as the notch endows the stopper with a greater capacity to yield or bend over the edge than that due solely to the elasticity of the material, thereby admitting of the use of a spring-bail having the shortest movement or arc of swing on its pivots, while the connection of the bail with the head of the stopper or the cap or collar surrounding it is such that no transverse movement on the horizontal portion of the bail is permitted, and the stopper, when removed, is consequently at all times in a convenient position to be instantly returned (without "flopping") in a direct line to its seat.

I am aware that a spring-bail is shown in

Patent No. 217,159; but the connection of its horizontal portion with the metal cap is such that when the stopper is removed it flops on the bail, owing to the latter not being confined in or on pivotal bearings, three distinct operations being necessary in securely sealing the bottle, viz: first, in entering the stopper; second, in turning it around so that the "saddle" with its notch, shall be in a plane at right angles to that passing through the horizontal portion of the bail; and, third, in bringing the bail up over the saddle and into the notch therein, whereas my bail, being confined within or fixed in pivotal bearings, moves at all times with the stopper without any independent motion, and requires no separate adjustment on its cap incident to the construction set forth in the patent referred to, whereby I am enabled to use a shorter bail with a longer stopper, one simple pressure of the finger securely seating the stopper, and but one simple pressure of the thumb being required to remove it.

I claim—

1. An elastic stopper, B, having a notch, *g*, formed in that portion of its exterior surface opposite that against which pressure is applied to remove the same, in combination with a means of connecting it with the bottle, con-

structed to operate as and for the purpose set forth.

2. In combination, a metal cap or collar, C, a notched elastic stopper, B, and a spring-connection for attaching the same to the neck of the bottle, substantially as and for the purpose described.

3. In combination, an elastic stopper, B, with its notch *g*, a yoke, *b*, a spring-bail, *d*, and a metallic cap, C, having a side opening, *i*, to render the elastic material accessible for the application of the thumb thereto, and with an opening, *h*, at its top to admit of the application of the finger thereon, as specified.

4. In combination, an elastic stopper having a diametrical groove, *e*, extending down from the upper surface of its head, a metallic cap, C, having an inwardly-projecting flange, *k*, at its top, and the wedge D, fitting and held in place in said groove by the extension of said flange over the ends of the wedge, as and for the purpose explained.

Witness my hand this 3d day of January, 1882.

WALLACE H. BATE.

Witnesses:

N. W. STEARNS,
E. H. OSBORN.