No. 755,276. PATENTED MAR. 22, 1904.

F. W. H. CLAY.

BOTTLE CLOSURE.

APPLICATION FILED OCT. 7, 1903.

NO MODEL.

Fig. 1

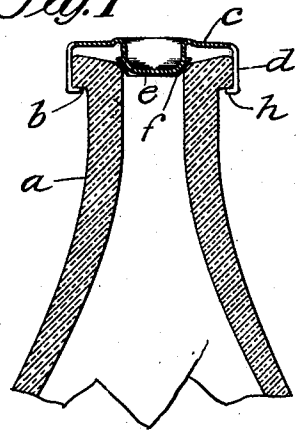


Fig. 2

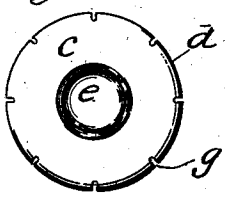


Fig. 3

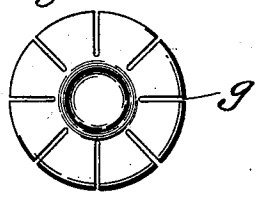


Fig. 4

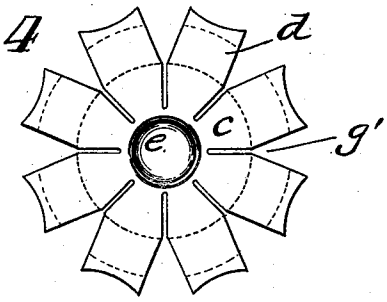


Fig. 5

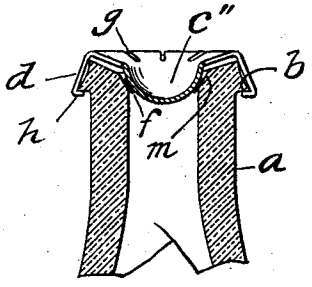


Fig. 6

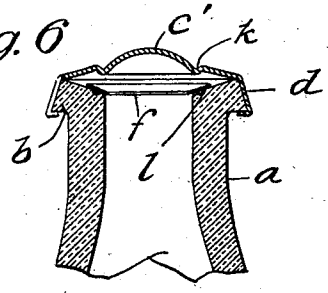


Fig. 8

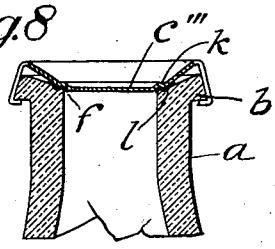
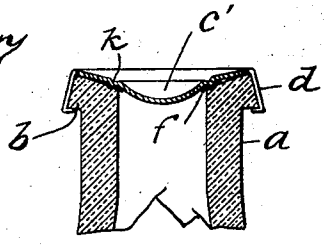


Fig. 7



Witness:
Chas. H. Ebert
Herman Lechner

Inventor,
Francis W. H. Clay

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 755,276. Patented March 22, 1904.

UNITED STATES PATENT OFFICE.

FRANCIS W. H. CLAY, OF PITTSBURG, PENNSYLVANIA.

BOTTLE-CLOSURE.

SPECIFICATION forming part of Letters Patent No. 755,276, dated March 22, 1904.

Application filed October 7, 1903. Serial No. 176,040. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. H. CLAY, a citizen of the United States, residing at Pittsburg, in the State of Pennsylvania, have invented a certain new and useful Bottle-Closure, of which the following is a specification.

My invention relates to means for hermetically closing and sealing bottles, jars, and the like, and has for its principal object to provide metallic rather than rubber or cork resilience to maintain the necessary pressure on the packing for making a tight joint.

The object is also to provide an easily attached and removable bottle-stopper, to cheapen the manufacture, increase the safety, and generally improve the means for closing the mouths of vessels, such as bottles.

I attain these and other advantages, which will hereinafter appear, by the constructions illustrated in preferred forms in the accompanying drawings, wherein—

Figure 1 is a central vertical section of a bottle neck and mouth with one form of the stopper thereon. Figs. 2 and 3 are plan views, respectively, showing the closure-cap as solid on top and as split for greater flexibility. Fig. 4 represents a blank for making the cap. Fig. 5 shows a modified form of the cap and neck with a different seating-surface for the former. Figs. 6 and 7 show another form of the closure, in which the seating-surface is a groove, the two figures, respectively, showing the cap before and after buckling in to seat the cap in place. Fig. 8 is still another form of the closure, in which the cap is indented before applying for stiffness and the seating-surface is a groove similar to that of Fig. 6.

This invention is an improvement upon the broad idea of means set forth in my copending application, Serial No. 152,319, and is intended to provide for using an external cap more easily removed and to avoid the interiorly-undercut form of the bottle-neck therein. The inward buckling of the metallic cap to give strength against internal pressure may be made either before or after seating the cap on the packing.

In Figs. 1, 2, and 3 is shown a form in which the bottle-neck *a* is provided with an exterior annular ledge *b*. A cap *c* has a central depression *e*, which seats closely upon the edge of the opening into the bottle, and has a flange extending outward to the side of the bottle-head and is provided with downward-extending legs *d*, having hooked ends to catch under the ledge *b*. The hooks *h* may either be formed on the cap beforehand and snapped over the ledge, (in which case the side of the bottle-head is slanting, as in Fig. 6,) or the cap may be put in place first, the edges pressed downward to spring the top of the cap, and the hooks then bent in under the ledge before releasing the pressure on top. In the former case the cap *c* is preferably split, as shown in the blank of Fig. 4, or merely the side legs *d* are split, as in Figs. 1 and 2, while in case the attachment to ledge *b* is made by a separate operation the whole cap may be a solid-walled cup. In order to insure an air-tight joint along the contacting surfaces of the cap and bottle-neck under the depression *e*, I prefer to use a thin strip of oiled paper *f*; but it is not material what is used for this packing, and it is to be noted that this packing does not require to have any elasticity, and in case of a seating-groove, such as in Fig. 6, it may be made of wax or the like. The metal of the cap should be resilient, and it may be of any required thickness, varied at pleasure, according to the inside pressure to be withstood. The top part of the metal of the cap having been sprung out of normal position in engaging the hooks *h* under the ledge *b*, there is a constant tendency to regain its former position, and hence a constant pressure is exerted on the packing *f*, and the packing might swell and contract indefinitely without in any manner affecting the closure or seal. A blow upon the top of the cap sufficient to alter the form of the same or force the depressed portion *e* farther inward will cause the hooks *h* to disengage, when the cap is easily removed; otherwise the legs *d* may be released by inserting a sharp tool behind them or forcing a special tool behind the hooks *h*.

To allow of the use of a less accurately formed bottle-neck and to increase the ease with which the cap may be applied, the form in Fig. 5 has a spherical body fitting on a conical surface of the bottle, and the hooks *h* being formed

on the cap beforehand the cap is fixed in place by merely pushing it down on the neck, when the hooks snap into place under the ledge *b*, while pressure is exerted on the top edge of the legs *d* to spring the metal firmly down on its packing. This form is more readily removed by striking the cap a blow on top or by spreading the upper shoulders of the depressed portion *c''*.

A very rigid form of the cap and one very easy to be removed when desired by spreading it with a hammer-blow is shown in Fig. 8. In this case the packing is seated in a groove *l* and the annular ridge *k* lends rigidity to insure a correct alinement on the bottle-neck even when the legs of the cap happen to be under different strains, as will be clear.

In Figs. 6 and 7 I have shown a form of the cap which is essentially the same as that in my former application referred to, except that the anchorage is outside the bottle. The cap having been put in place, as shown in Fig. 6, the dome of the cap *c'* is buckled inward, so that this part of the metal is depressed below the line of the ridge *k*, when the tendency of the resilient metal is to move further inward, and thus a powerful pressure is maintained on the packing *l*. The indented form of the cap also makes it very rigid against the internal pressure.

The principle of these several forms of the metallic cap is the same, and it will be seen that the elasticity of the packing is not essential at all; but the pressure is constantly maintained by the resiliency of the metallic cap itself. Consequently it is not necessary to use an elastic packing, as in all bottle-closures heretofore used, and the shrinking or deterioration of the packing will not break the seal. In the case of bottles to contain acid and the like the metallic cap will be simply covered underneath with a coating of some gum, such as shellac, to protect it, and usually this gum alone will form sufficient packing to seal the seating-surfaces of the closure. In such cases it improves the device very much to grind the seat on the glass; but this is not necessary.

Having thus described my invention and illustrated its use, what I claim, and desire to secure by Letters Patent, is the following:

1. In combination with a bottle-neck having retaining means for the cap, a metallic stopper-cap sprung out of normal position and exerting a self-induced pressure on the surface of the bottle surrounding the mouth thereof, substantially as described.

2. A bottle-closing cap having an anchorage on the bottle-neck, a portion engaging the mouth of the bottle to close it, and being under a constant stress exerting a pressure by its own resiliency upon said engaging portion.

3. The combination of a bottle having a seating-surface, a packing, an anchorage-ledge, and a resilient metallic cap bent out of normal position and engaging the ledge and the seating-surface whereby it presses on the packing by a self-induced elasticity, substantially as described.

4. The combination with a bottle having a seating-surface and an annular anchorage-ledge, of a resilient metallic cap having a part engaging the bottle-seating surface, a flange outside said part, and depending legs engaging said ledge.

5. The combination with a bottle having an anchorage-ledge sloping on the outside, and a seating-surface, of a cap having a seating portion and a divided annular depending flange to engage said anchorage when the cap is pressed on the neck.

In testimony whereof I have hereunder signed my name in the presence of the subscribed witnesses.

FRANCIS W. H. CLAY.

Witnesses:
PAUL SYNNESTVEDT,
CHAS. H. EBERT.