

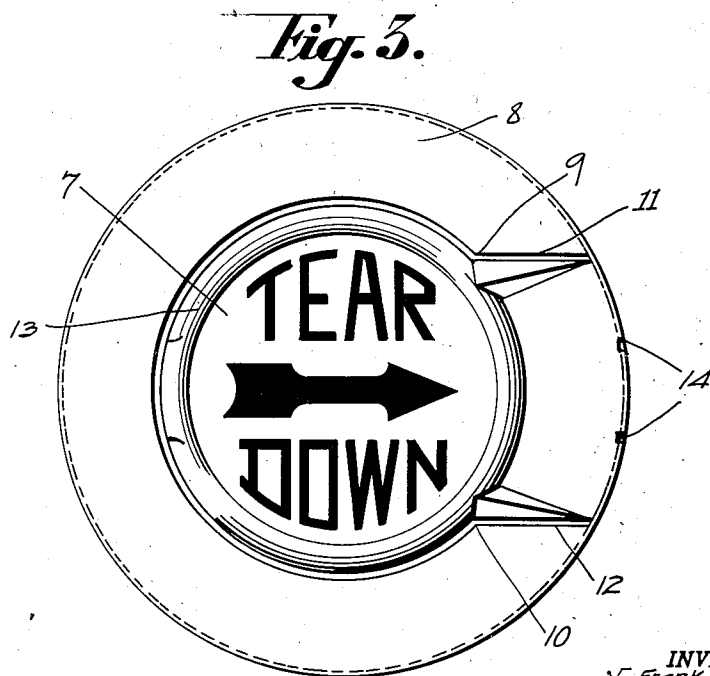
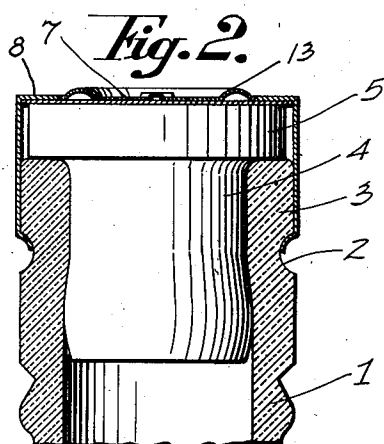
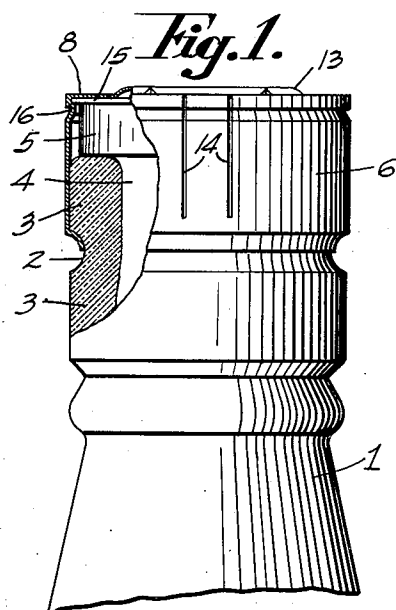
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CLOSURE

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CLOSURE

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This invention relates to closures for containers, and more particularly it relates to closures for bottles and other containers having neck portions of reduced cross section.

Many substances, and particularly liquids, that are offered to the trade in bottles or other containers are consumed during a considerable period of time by only occasional use, and it is essential, therefore, that closures be provided that are capable of resealing the receptacles. Too, it is eminently desirable that a closure be used that will reveal attempts to alter the contents before opening of the container by the ultimate purchaser. This characteristic is generally described as tamper-proof. Closures having one or another of these qualities have hitherto been provided, but in expensive forms that have prevented widespread adoption. Consequently it is an object of our invention to secure all of these qualities in a new and inexpensive combination entirely satisfactory to the trade by means of a closure consisting of an internal friction stopper and an external metallic capsule having weakened portions to permit removal through the agency of a tear-off tab.

While capsule closures having tear-off tabs adapted to be digitally or otherwise raised and grasped and having scored or weakened portions in conjunction therewith to guide the tearing of the capsule are known in the prior art, it is an object of our invention to materially improve both the capsule and the combined capsule and friction stopper. This object is accomplished by reinforcing the capsule so that the fragility induced by the necessary weakening is eliminated with the consequent elimination of crushing or collapse during packing and subsequent application to the receptacle. This reinforcement provided by our invention also serves a dual function in combination with the friction stopper in that it aids in supporting the top portion of the capsule of the combined closure and prevents the alteration of the bottle contents by insertion of an instrument through the friction stopper, since the latter is provided with a metallic encasement even though the tear-off tab be lifted.

Furthermore, our invention has as an object the provision in a capsule having a long skirt of means that positively insure tearing from the top tab through the length of the skirt.

A full understanding of the various objects and details of our invention will be had upon reference to the attached drawing, in which:

Fig. 1 is an elevational view of a preferred form

of the invention with parts broken away in section;

Fig. 2 is a sectional view of a second embodiment of our invention taken on a vertical plane; and

Fig. 3 is a plan view to an enlarged scale of the top of the capsule.

A bottle of which fragments are shown in Figs. 1 and 2 has a neck portion 1 with an annular groove 2 and a cylindrical portion 3 that extends to the mouth of the bottle. The bottle mouth is closed by a friction stopper 4 which may be made of cork or other resilient material. The stopper is preferably shaped to conform to the inner neck contour of the bottle when fully inserted. It is provided with a flange 5 having a diameter substantially the same as the outside diameter of the bottle mouth and being of sufficient thickness to permit easy removal.

The external closure of capsule 6 may be made of any material capable of permanent deformation and tearing readily, thin metal, and preferably aluminum, being satisfactory and recommended. In Figs. 1 and 2 the capsule is cylindrical in shape and in close contact with the cylindrical finish of the bottle neck. The invention, however, is applicable to receptacle finishes of varied shapes and contours, but it is desirable that close contact be maintained between the skirt of the capsule and the finish. From the top surface of the capsule is cut a tear-off tab 7, leaving a marginal flange 8. As is shown to particular advantage in Fig. 3, the circular line of severance of the tab is discontinued throughout a considerable arc, and from the points of discontinuance 9 and 10 of the circular line the line of severance is extended through the marginal flange along projections of parallel chords 11 and 12 to the line of junction of top and skirt. The tab is provided with a marginal bead 13 that extends adjacent to the line of severance throughout its length in order to reinforce the tab and protect the fingers from the scored or cut edge thereof when digitally grasped for removing the capsule. The skirt of the capsule is provided with a weakened portion by the provision of parallel cuts or scored lines 14 that fall well within the area between the projected chords 11 and 12, which relationship creates a hinge along the line of junction of the top and skirt. The lines 14 as seen in Fig. 1 extend substantially the entire depth of the skirt in order to effectuate certain removal of the capsule by directed tearing.

With a relatively deep skirted capsule it be-

comes necessary to provide long skirt scores or cuts as have been described. These weakened portions along with the cut top surface produce a fragile capsule when made from metal of the customary thinness. It is not commercially feasible to use metal of thicker gauge for reasons of cost, bulk in packing and difficulty in application to the container. The present invention overcomes this fragility and weakness by the addition of a metal disc 15 as shown in Fig. 1, which is positively and permanently retained within the capsule and against the marginal flange 8 by means of an annular, inwardly-projecting bead or projection 16 that is formed in the skirt in any suitable manner after the insertion of the disc. When this form of capsule is used it is apparent that the contents of the receptacle cannot be reached without either removal of the capsule entirely or visible puncturing of the metal disc, since with relation to the latter only the surface of the disc is exposed by raising the tear-off tab 7.

In Fig. 2 the disc 15 is shown as being frictionally retained by contact with the skirt. This embodiment of the invention is a less expensive form, but when the disc is so assembled with the stopper and capsule it offers the same tamper-proof protection as the first-described form and gives the combination the necessary rigidity.

When a bottle is sealed in accordance with our invention the stopper 4 is placed in the bottle mouth so that the lower surface of the flange 5 rests upon the mouth surface. The capsule is then slipped over the protruding stopper until the disc 15 bears upon the top of the stopper flange, whereupon the lower edge of the skirt of the capsule is rolled, spun or otherwise turned into the annular groove 2 in order to retain the capsule. It will be seen by reference to Figs. 1 and 2 that the capsule, when so affixed, has the skirt portion amply reinforced by contact with the cylindrical bottle finish and by proximity to the side wall of the stopper flange 5. The flange 5, when the combination is assembled, also adds additional reinforcement and support to the top surface of the capsule because of the relationship of the diameter thereof to the inner diameter of the capsule.

In order to open the bottle it is necessary only to lift the tab and pull it downwardly over the bottle neck. The uncut metal in the junction line of top and skirt between the skirt cuts 14 and top line of severance will tear towards the skirt cuts, and when they have been reached the portion of the skirt between the cuts will pull away and the metal of the skirt below the cuts therein will tear to the bottom edge of the skirt without difficulty and permit the remaining portion of the capsule to be spread and removed. The friction stopper with its substantial flange is then revealed and the opening is completed by its removal. It is apparent that the stopper forms the reuseable portion of the closure combination, since the capsule must be completely destroyed in removal to give our combined closure a complete tamper-proof nature.

While our invention has been described with relation to two forms, it will be obvious that changes and modifications may be made therein

that fall within the scope of our invention as set forth in the following claims, and it is our intention that such changes and modifications be covered thereby.

We claim:

1. In combination with a receptacle having a neck portion with an annular groove therein, a friction stopper in the receptacle mouth having a relatively thick flange portion covering substantially the entire mouth surface, a metal capsule having a depending skirt enclosing the stopper flange and extending downwardly along the neck portion and into said annular neck groove, and a metal reinforcing element retained against the top portion of the capsule by deformation of the skirt, said capsule having partially severed from the top surface a liftable tab that cooperates with a portion of the skirt weakened along a vertical dimension thereof to facilitate removal of the capsule, said reinforcing element being positioned between said weakened top portion and said stopper flange to complete the metal encasement of the stopper when the tab is lifted, said flange serving to support at least the marginal portions of both reinforcing element and capsule.

2. In combination with a receptacle having a neck portion with an annular groove therein, a friction stopper in the receptacle mouth having a relatively thick flange portion covering substantially the entire mouth surface, a metal capsule having a depending skirt enclosing the stopper flange in proximity thereto and extending downwardly in close contact with the neck portion and into said annular neck groove, and a metal reinforcing disc retained against the top portion of the capsule by deformation of the skirt, said capsule having partially severed from the top surface a liftable tab that cooperates with a skirt portion weakened along a vertical dimension thereof to form a rupturable hinge between the lines of weakening of tab and skirt, said disc being positioned between said weakened top portion and said stopper flange, said flange serving to support the marginal portions of said disc and the said top portion of the closure.

3. In combination with a receptacle having a neck portion with an annular groove therein, a friction stopper in the receptacle mouth having a relatively thick flange portion covering substantially the entire mouth surface, a metal capsule having a depending skirt enclosing the stopper flange and extending downwardly along the neck portion and into said annular neck groove, and a metal reinforcing disc retained adjacent the top portion of the capsule by a continuous deformation of the skirt, said capsule having partially severed from the top surface a liftable tab that cooperates with a portion of the skirt weakened along a vertical dimension thereof to facilitate removal of the capsule, said reinforcing disc being positioned between said weakened top portion and said stopper flange to complete the metal encasement of the stopper when the tab is lifted, said flange serving to support at least the marginal portions of both reinforcing disc and capsule.

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