June 20, 1939. A. SCHAUER 2,162,753

TAMPERPROOF CLOSURE FOR CONTAINERS

Filed March 30, 1935

FIG. 1

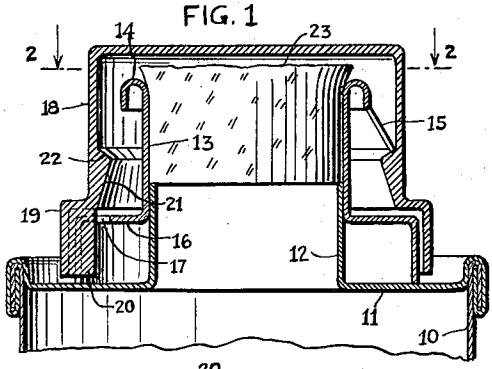


FIG. 3

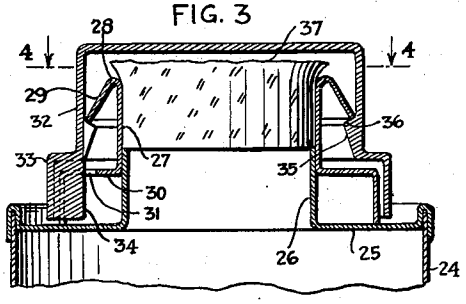


FIG. 2

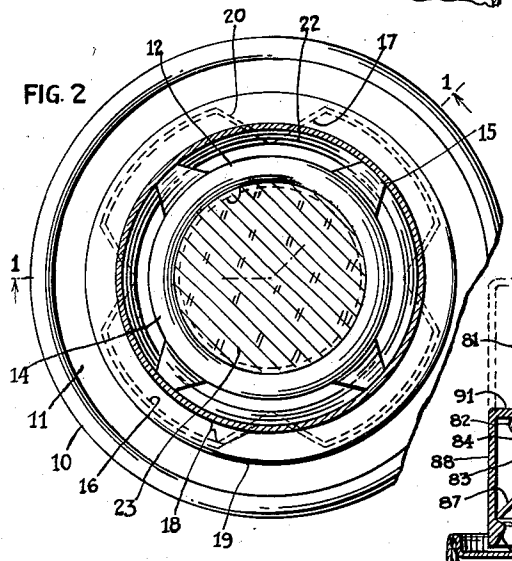
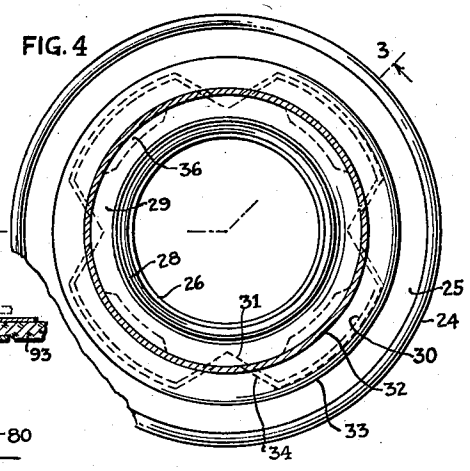


FIG. 4



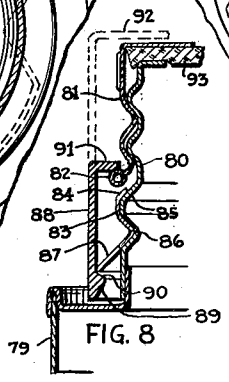


FIG. 8

FIG. 9

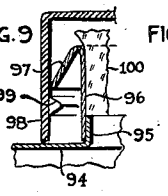


FIG. 10

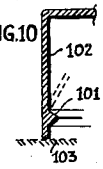


FIG. 11

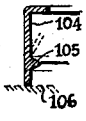


FIG. 5

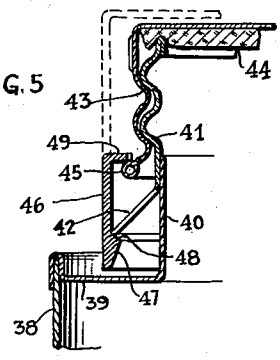


FIG. 6

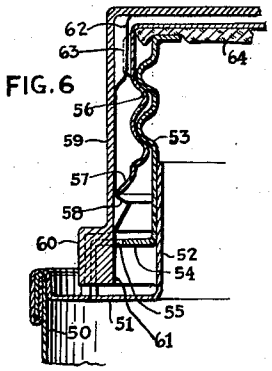
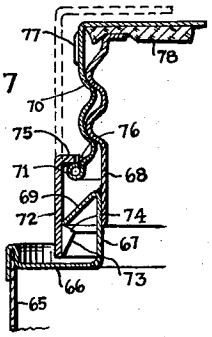


FIG. 7



INVENTOR.
Adolf Schauer
BY
Glenn C. Hemmings
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,162,753

TAMPERPROOF CLOSURE FOR CONTAINERS

Adolf Schauer, Brooklyn, N. Y., assignor to John Hamberger, Richmond Hill, N. Y.

Application March 30, 1935, Serial No. 13,869

12 Claims. (Cl. 220—39)

My invention relates to improvements in closures for containers as they are for instance described in my co-pending application Serial No. 748,997, filed October 19, 1934 of which this application is a continuation in part, and it is the principal object of my invention to provide a tamperproof closure for containers, which will at a glance indicate whether a removal or attempted removal of it has been made either for the purpose of refilling the container with inferior grade of goods or pilfering or adulterating the contents.

Another object of my invention is to provide a tamperproof closure by which the act of removal or attempted removal will produce and cause a visible difference in appearance and shape than the original package.

A further object is to provide a tamperproof closure, whereby the buyer (consumer) as well as the seller or originator (manufacturer) of the package and its contents shall be protected against falsification, pilfering or unauthorized refilling of the container in as much as a removal of the closure will produce visible changes in appearance and shape different from the known, advertised or described original package before removal of the closure.

A further object is to provide a tamperproof closure which is made of brittle fragile material preferably molded plastic material such as Bakelite or easily breakable or tearable material such as thin soft metal etc., so that a removal will cause the closure to burst, split or tear in as many places as possible to prevent a pasting or cementing of the pieces together to assume their original shape.

The tamperproof closure will also indicate any attempt to destroy the brittle or fragile material by manual force or by means of a tool.

A further object is to provide a tamperproof closure which may be used either independent from any type or style of closure including cork etc., that seals the container opening liquid- and air-tight, or it may be used in connection with it. And it may also be used on containers where a tamperproof closure serves also as a cover for the container opening without having to use a separate liquid or airtight closure and such a tamperproof closure may be used where the contents of the container is other than liquid.

Another object of my invention is to provide a tamperproof closure which either completely or partially hides the regular seal cap of the container opening and may be so designed that it is locked either with or without an intermediate locking member.

Another object of my invention is to provide a tamperproof closure without affecting the standard construction of the actual seal cap for the container opening so that it may remain as it is when used without a tamperproof closure.

A further object is to provide a tamperproof closure in form of a cover cap or cylindrical band having at its lower portion annular inwardly directed projections, either continuous or interrupted with a cross sectional profile similar to a ratchet wheel tooth with its working face turned upward. Said projections in cover cap come to grip with reversed but similar shaped projections either continuous or interrupted and said projections being either a portion of the container body or of the seal cap itself.

The projections of the cover cap are hooked or snapped on by having either the projection of the container or seal cap deflected or contracted for the moment of passage of the cover cap projection and said projecting of container or seal cap having sufficient elasticity, will spring back and spread against wall of cover cap thereby preventing an uplift of cover cap or also that cover cap wall has to spread or expand with sufficient elasticity to let its projection pass over rigid or stiff projection of container or seal cap.

Having thus locked the temperproof cover cap against uplift and in order to lock it also in circular direction its wall is extended out and downward all around, for having preferably two or four tooth- or wedge-shaped inward projections (male) which correspond with similar spaces (female) on the container.

The downward movement of the tamperproof cover cap or band is limited by the top cover or bead of the container extending outward and all around beyond the cover cap, said top cover serving also as support of the cover cap which now is locked in all directions. When removal of the cover cap is desired it is turned with sufficient force in clockwise or counterclockwise direction so that its tooth- or wedge-shaped projections will ride and wedge laterally over the similar projections of the container thereby expanding the lower portion of the cover cap simultaneously on two or four places so that it bursts or tears in pieces.

It is also an object of my invention to have the lips or tongues which engage the ratchet tooth-like projection spread with sufficient force against the wall of the cover cap or band, once they are snapped into engagement with said

ratchet tooth-like projection, so that they cause sufficient friction with said wall to prevent eventual play or slight rattling of the cover cap or band.

Another provision of my invention is to use a tamperproof band or cylindrical ring with an inwardly directed flange at its upper portion for the purpose of gripping with an outward projection of the seal cap at the lower portion of its skirt.

Still another object of my invention is a tamperproof cover cap with provision of inward projecting knurls at its upper portion of depending skirt corresponding and gripping with similar projecting knurls or corrugations of the seal cap. The rest of the construction and function of such a tamperproof closure is similar to the others already described.

Another object is to have a tamperproof closure whereby the linear locking members of a cover cap are optionally formed to a helix for the purpose, to not only lock said cover cap in linear direction, but also to accomplish at the same time a seal with the outlet of the container, by having said cover cap partially screwed on, hereby lowering the inner top of said cover cap to compress an interposed sealing disc against sealing surface of the container outlet for getting an air- and liquid-tight seal. If such a tamperproof seal cap is also provided with circular locking means, then the tooth-like projections of the container which interlock with the similar projections of the cover cap must be spaced so as to allow for the partial turn of the cover cap.

It is also an object of my invention to have the tamperproof closure provided either with a linear locking means alone or with a linear and circular locking means together.

The sectional profile of the linear locking projection or ledge may also have the shape of a teat, cone, tooth, etc., instead that of a ratchet tooth.

One of the more specific objects of my invention is the provision of a tamperproof closure for containers in which the intermediary linear locking member in form of a cylindrical band having at its lower portion of skirt outwardly and angularly downwardly spread lips, is rolled into an annular groove or recess of the container neck.

Another object of my invention is the provision of a metal container having the upper portion of its nozzle skirt formed into an outwardly and angularly downwardly turned continuous or interrupted lip or lips to engage the brittle cover closure with a snap.

A further object of my invention is the provision of a tamperproof closure for metal containers, the lower portion of the skirt of the nozzle of which is spread outwardly and angularly downwardly to form lips for the engagement by the tamperproof cover closure or band.

A still further object of my invention is the provision of a tamperproof closure for metal containers in which the linear locking member is so constructed so as to form lips with the neck end of the container by having its upward extended skirt spread outwardly and angularly downwardly, to form interrupted or continuous lips to engage the ledge or ledges of the band or cover closure provided for the linear engagement.

Another provision of my invention is to have a tamperproof closure either turned in clockwise or counter-clockwise direction to break or destroy the frangible element.

A further provision is also to have an eventual intermediate linear locking member assembled with the tamperproof closure or band before applying same to the container.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a fragmentary elevation of a container neck equipped with a closure constructed according to my invention, partly in section on line 1—1 of Figure 2.

Fig. 2 is a section on line 2—2 of Figure 1.

Fig. 3 is a fragmentary elevation of a container neck equipped with a modified form of closure, partly in section on line 3—3 of Figure 4.

Fig. 4 is a section on line 4—4 of Figure 3.

Fig. 5 is a fragmentary sectional view of a further modification of my container closure.

Figs. 6, 7 and 8 illustrate in fragmentary detail views further modifications of my container closure.

Fig. 9 is a fragmentary detail view illustrating a modified form of the linear locking illustrated in Figure 3, omitting the circular locking means.

Fig. 10 is a view similar to Fig. 9, showing a further modification of the linear locking member to be used with any of the other forms.

Fig. 11 is a modified form of a band equipped with a modified teat or ledge for the linear locking means.

As shown in Figures 1 and 2, a metal container 10 having a top cover 11 with a neck 12, has attached to said neck part a nozzle 13, formed at its upper part of skirt with an outwardly and angularly downwardly turned edge 14, which carries a plurality of outwardly and angularly downwardly spread interrupted lips 15.

The lower widened portion of the skirt of the nozzle is extended outwardly and downwardly, as at 16, and contacts normallly with the top cover 11 of the container, and is notched on two or more places, as indicated at 17.

An outer, cap-like closure 18 of brittle material has a lower widened portion of wall 19 which is formed with inwardly directed tooth-like projections 20, to fit into the notches 17 of the nozzle to prevent circular movement of the closure with respect to the container.

An inwardly directed continuous projection 21 above the tooth-like projections of said widened portion, has a sectional profile similar to a ratchet tooth, its bevelled upper working face 22 is engaged by the lips 15 to prevent linear movement of the cap-like closure. The nozzle outlet may be corked as at 23, to present a liquid and air-tight closure.

As shown in Figures 3 and 4, the metal container body 24 is connected with a top cover 25, which has a neck 26 combined with a nozzle 27, the upper end 28 of which is outwardly and angularly downwardly bent to form a continuous lip 29. The lower portion 30 of the skirt of the nozzle 27 is extended outwardly and downwardly all around, and has a plurality of vertical cutaway spread V-shaped notches 31.

The cap-like cover closure 32 of brittle material has a lower widened part 33 with inwardly directed tooth-like projections 34 which fit into the correspondingly formed vertical notches 31 of the nozzle to prevent circular movement with respect to the container. Inwardly directed projecting ledges 35 above the tooth-like projections 34 have inclined upper surfaces 36 for engagement by the lip 29 to prevent linear movement. The nozzle opening may be sealed by a cork 37 or the like.

In Figure 5, I have shown a form of my invention in which the container 38 has connected

therewith a top-cover 39 having a neck 40 with which is connected or combined a threaded nozzle 41. The lower portion of the nozzle skirt has outwardly and angularly downwardly spread lips 42. A threaded seal cap 43 seals with a liner 44 the opening of the nozzle liquid and air-tight. The bottom edge of skirt of the seal cap has a bead 45. A band 46 of brittle material has at its lower end an annular inwardly directed ledge 47 with an inclined upper surface 48 to be engaged by the lips 42 of the nozzle to prevent linear movement.

The upper end of the band 46 has an inwardly directed flange 49 for the engagement by the bead 45 of the seal cap to prevent helical movement of said seal-cap.

As shown in Figure 6, the metal container 50 has connected therewith a top-cover 51 having a neck 52, with the upper end of which is combined a threaded nozzle 53. The lower portion 54 of the skirt of the nozzle is widened and has a plurality of vertical spread V-shaped notches 55, and the nozzle normally rests on the top cover of the container.

A threaded seal cap 56 has its lower portion of skirt spread outwardly and angularly downwardly to form an elastic lip-shaped portion 57 engaging the inclined upper surface of a ledge 58 integral with the inner wall of the cap-like closure 59. The lower portion of said cap-like closure is widened, as at 60, and formed with a plurality of tooth-like projections 61 for the engagement of the V-shaped notches 55 of the nozzle to prevent circular movement with respect to the nozzle. The interrupted ledge 58 preventing linear movement of the cap-like closure with respect to the seal cap.

The upper inner portion of the wall of the cover cap is formed optionally with vertical corrugations 62; similar corrugations or knurls 63 in the upper portion of skirt of the seal cap engage the corrugations 62 of the outer closure to prevent circular movement with respect to the seal cap. A liner 64 is compressed by the seal cap against the sealing top of the nozzle which provides a liquid and air-tight seal.

As shown in Figure 7, the container 65 has a top cover 66 with a neck 67, and a threaded nozzle 68 is connected to said neck. The end of the neck is extended outwardly and angularly downwardly, as at 69 to form a lip-shaped portion. A threaded seal cap 70 screwed upon the threaded nozzle has formed at its bottom edge a bead 71. A band 72 of brittle material has at its lower portion a plurality of inwardly directed ratchet-tooth-like or ledge-like projections 73 with inclined upper surfaces 74, which are engaged by the lip-shaped portion 69 of the neck of the container, to prevent linear movement. The upper portion of the band 72 has an inwardly directed annular flange 75 engaged with the bead 71 of the seal-cap to prevent helical movement of said seal cap 70. Vertical corrugations 76 at the inner edge of said flange corresponding to similar but optional corrugations or knurls 77 in the upper portion of skirt of said seal cap serve to enlarge the gripping area of the band flange 75 with the bead 71.

A liner or sealing disc 78 is compressed by the seal cap 70 against the sealing surface top of the nozzle to provide a liquid and air-tight seal at the nozzle opening.

As shown in Figure 8, a container 79 of suitable material has a threaded neck 80 adapted to be engaged by the thread of a seal cap 81. Said seal cap has at its bottom edge a bead 82. A cylindrical skirt-like locking member 83 has an inwardly directed upper flange 84 resting against a shoulder 85 of the container neck to limit the downward movement of the locking member 83 when applying same. An annular groove or recess 86 formed by shoulders on the container neck is adapted to receive an annular bend in the locking member which is forced into the same to prevent especially a linear movement of the locking member with respect to the container neck. The lower portion of skirt of the locking member 83 is spread out and angularly and downwardly bent to form lips 87.

A band 88 of brittle material has at its lower portion an inwardly directed annular ledge 89, the upper face of which is inclined, as at 90, and is engaged by the lips 87 of the locking member to prevent linear movement of said band. The upper end of the band 88 is inwardly directed to form a flange 91 engaging the bead 82 of the seal cap to prevent helical or linear movement of the seal cap with respect to the container neck.

As indicated by the broken lines 92, the wall of the brittle band may be extended upwardly to connect and be integrally formed with a top cover to conceal the seal cap completely without its flange 91. Such a tamperproof closure could be broken manually or with the help of a tool or instrument. A liner 93 may be compressed by the seal cap 81 against the sealing surface of the container to provide a liquid and air-tight seal.

As shown in Fig. 9 the top cover 94 of a container has a neck 95 and combined therewith a nozzle 96. The upper portion of skirt of said nozzle is outwardly and angularly downwardly turned to form a lip shaped part 97. A frangible cap-like closure 98 has at its lower portion of inner wall an interrupted teat-like ledge 99 engaging the edges of the lip shaped portion 97 of the nozzle to prevent linear movement of said closure with respect to the nozzle. The opening of said nozzle may be sealed by a cork 100. The bottom edge of said closure 98 normally rests on top of cover 94 of the container.

The breaking or removal of such a tamperproof cover closure without the circular locking means may be done either manually by compressing its skirt until it breaks or with the help of a tool or instrument by smashing its brittle fragile wall.

As shown in Fig. 10, the linear locking member 101 of the brittle cap-like closure 102 may have a sectional profile similar to a teat or rounded tooth instead that of a ratchet tooth. The cap-like closure may be with or without a circular locking means. Its lower edge may rest on top of a shoulder or cover top 103 of a container.

As shown in Fig. 11, the brittle band 104 may also have integral with it a linear locking member with a sectional profile similar to a tooth or teat 105. The bottom edge of the band may rest on top of a shoulder or top cover 106 of the container.

It will be understood that I have described and shown the preferred forms of my invention only as an example of some of the many ways to practically construct the same, and that I may make such changes in the general arrangement of cap or band or in the construction of their minor details as come within the scope of the appended claims without departure from the spirit of my invention and the principles involved.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A device including means consisting of sheet metal and comprising a top wall adapted for flanged reenforcing engagement with the tubular side wall of a drum or can container, said top wall having a neck means projecting outward of the container and providing an opening for the latter, said neck means having its cross sectional configuration upset to provide an external thread at the upper portion thereof, a closure engaged with said external thread to close the neck means, an indicator member, and a relatively resilient portion connected to said means adjacent to the lower portion of the neck means, said indicator member having means to permit free downward axial movement of the indicator member to receive the closure and to automatically engage the said resilient portion to prevent removal of the indicator member and hence of the closure, said indicator member having a preformed externally visible breakable portion adapted to be broken by said resilient portion upon upwardly forcing the indicator member to thus permit removal thereof, said resilient portion projecting externally downwardly and outwardly relative to the neck means and being radially braced by the latter, the resilient portion and the neck means cooperating with each other and with the threaded portion and closure to provide a relatively light structure that is well adapted to withstand any unusual stresses exerted thereon in attempting to remove the indicator member.

2. In combination with a cap type closure and a metal container having a neck providing an opening, a one piece tubular member externally sleeved on and connected to said neck and providing a continuation of said opening, said tubular member having its upper portion screw threaded for engagement by the closure, said screw portion being above the neck, an indicator member for the tubular member receiving a portion of the latter and having a breakable portion, said indicator member coacting with the closure and being secured to prevent removal of the closure except on breaking the breakable portion, and means for interengaging the indicator member and the tubular member upon axial movement of the former in one direction and causing breaking of the breakable portion upon movement of the indicator member in a different direction, said means including an element integrally formed with the lower portion of the tubular member and concealed by the indicator member.

3. In combination with a container having a neck and an internally threaded cap closure therefor, of a tubular member having a lower portion sleeved on the upper portion of said neck and spaced above the lower portion of said neck, said tubular portion being nonremovably connected to said neck, the upper portion of said tubular member being threaded for engagement by said closure, a frangible indicator member for said tubular member adapted to internally receive a lower portion of the latter, said indicator member being engaged with the closure to prevent removal thereof without breaking the indicator member, and means for locking the indicator member to the tubular member, said means including an integral downward and outward extending prong element connected to the tubular member at the lower portion thereof and being located adjacent to the neck, said indicator element receiving and concealing said means and having an inward extending portion adapted for camming interengaging action with the prong element to secure the indicator member against removal without breakage.

4. In combination with a container having a top wall having a relatively short upstanding neck providing an opening, a sheet metal tubular member partially sleeved on and secured to the container neck in spaced relation above said wall, said tubular member having a resilient integral locking portion at the lower edge thereof and extending downward and outward above said wall in spaced relation to said container neck, and means receiving the tubular member and adapted to cause closing of the same, said means having camming locking engagement with the free lower edge of said locking portion upon movement of said means to closing position to thus restrict movement of said means relative to said locking portion.

5. In combination with a container having a top wall having a neck providing an opening, and a screw threaded cap closure therefor, a tubular member having its lower portion sleeved on and secured to the upper portion of the container neck and forming a continuation thereof, said tubular member having a locking portion integrally connected to the tubular member at the lower edge thereof, said portion being disposed in spaced relation to said top wall, and frangible indicator means receiving the tubular member and having camming locking engagement with said portion upon movement of said means into closing position, said means coacting with said closure to prevent removal thereof without breaking the said means, and the upper portion of the tubular member being threaded for screw engagement with the closure.

6. A device including a container having an outlet neck, a tubular member of sheet metal adapted to be permanently secured to the container, said member neck at the upper edge thereof extending above the neck and having an upper threaded portion, a closure having screw connection with said threaded portion, an indicator member having a breakable portion and receiving the closure to prevent removal of the latter without breaking the breakable portion, the tubular member having at its lower edge integral resilient means restricting movement of the indicator member and whereby the breakable portion can be broken to permit free movement and removal of the indicator member.

7. A device including means consisting of sheet metal and comprising a top wall adapted for flanged engagement with the tubular side wall of a drum or can container, said top wall having an integral neck projecting upward of said top wall and providing an opening for the latter, a one piece tubular member having a threaded upper end portion and having its lower end portion formed with an outward and downward extending resilient element, said tubular member having an intermediate cylindrical portion externally sleeved on and secured to the upper end portion of the neck, a closure screwed on the screw portion of said neck, and an indicator member having a frangible portion and coacting with the closure to prevent removal thereof without breaking the indicator member, the latter having means for automatically engaging and locking with said element upon moving the indicator downward into assembly relation in the device.

8. A device including means consisting of sheet metal and comprising a top wall adapted for flanged securement to the side wall of a container, said top wall having an integral neck pro-

jecting upward therefrom and affording an outlet, a one piece tubular sheet metal member having its upper portion formed to provide a thread and its lower portion outwardly formed, the intermediate portion of the tubular member being cylindrical and being externally sleeved on and secured to the upper end portion of the neck, a closure screwed on the threaded portion of the tubular member, and a frangible indicator member secured against removal and receiving the neck and coacting with the closure to prevent removal thereof without breaking the indicator member, the latter having engagement with the outward extending bottom portion of the tubular member to break the indicator member upon attempting relative movement between the indicator member and the tubular member to thus release the closure, and the neck serving to reenforce the tubular member at the outward extending lower portion of the latter.

9. A device including a container having an outlet neck, a closure cap therefor having its side wall removably screwed on the neck externally thereof, said side wall having an integral downward and outward extending resilient portion adjacent to the bottom of said wall, an indicator having a frangible portion and coacting with the closure cap to prevent removal thereof except on breaking the frangible portion, said indicator having an internal inward extending element causing the resilient portion to move inward on axially applying the indicator to the container, said resilient portion engaging over said element to prevent upward removal of the indicator relative to the closure cap, and means interengaging the indicator and container to prevent unscrewing of the closure cap without breakage of the indicator.

10. A three piece tamperproof device, including a container, a cap therefor threadedly connected thereto, a frangible indicator engaged with the container and coacting with the cap to prevent removal of both cap and indicator without breakage of the latter, and means supplying said coaction between the indicator and cap including an internal shoulder on the former and a downward and outward projecting resilient element integral with the cap and formed of the same material as the latter, said element being connected at its upper part of the lower edge portion of the cap and being yieldably movable toward and away from the axis of the cap on downward movement of said shoulder past said element in applying the indicator over the cap, said element being engaged over said shoulder to prevent upward removal of the indicator relative to the cap.

11. A device according to claim 10, wherein the engagement between the indicator and container is furnished by means including toothed portions on the container and indicator interengaged on applying the latter over the cap and serving to prevent rotary movement of the indicator.

12. In combination with a cap type closure member and a container having a neck providing an opening, a one piece tubular member externally sleeved on and connected to said neck and providing a continuation of said opening, said tubular member having its upper portion screw threaded for engagement by the closure, said screw portion being above the neck, an indicator element for the tubular member receiving a portion of the latter and having a breakable portion, said indicator element coacting with the closure member and being secured to prevent removal of the closure member except on breaking the breakable portion, and means for interengaging the indicator element and one of said members upon movement of the former in one direction and causing breaking of the breakable portion upon movement of the indicator element in a different direction, said means including an element integrally formed with the lower portion of one of the said members and concealed by the indicator element.

ADOLF SCHAUER.