June 20, 1939. J. HAMBERGER 2,162,711

TAMPERPROOF CLOSURE

Filed March 31, 1936

Fig. 1

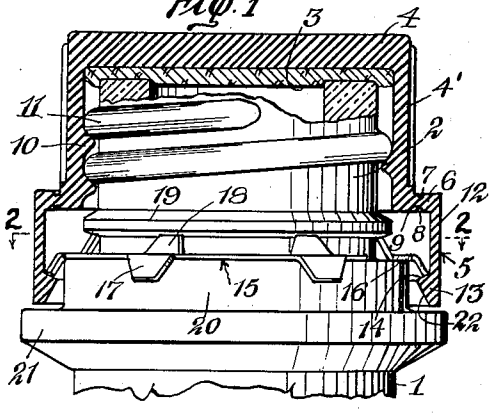


Fig. 7

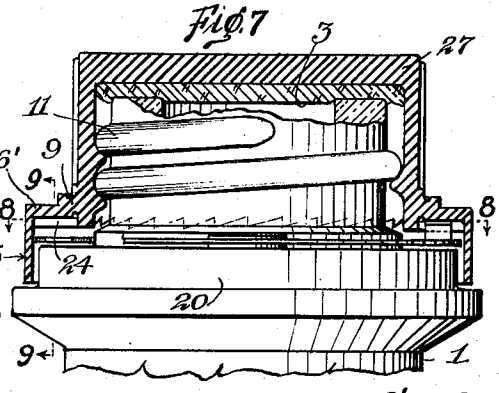


Fig. 9

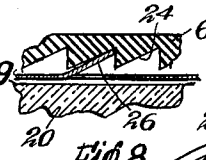


Fig. 10

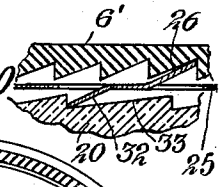


Fig. 2

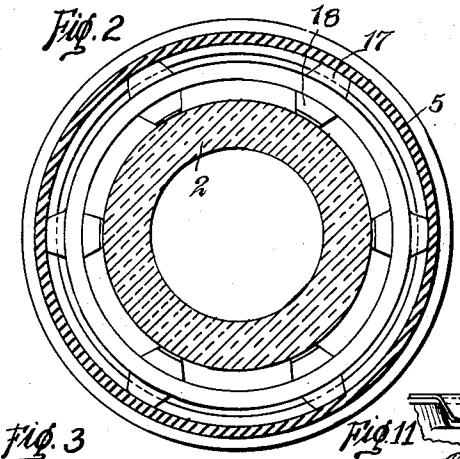


Fig. 8

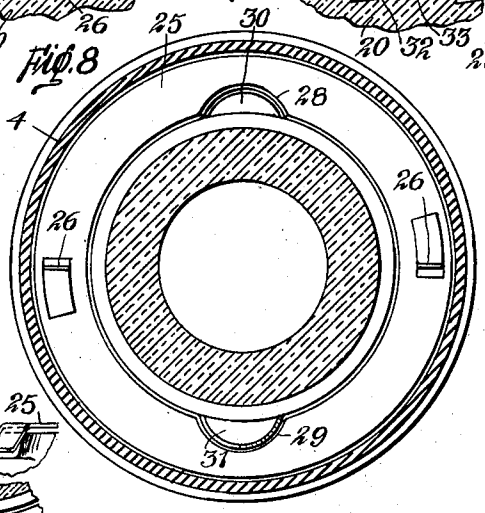


Fig. 11

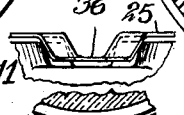


Fig. 12



Fig. 3

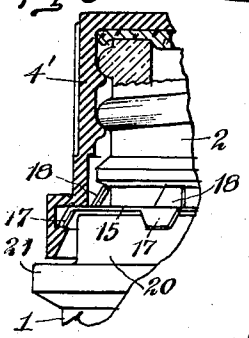


Fig. 4

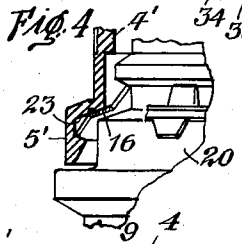


Fig. 5

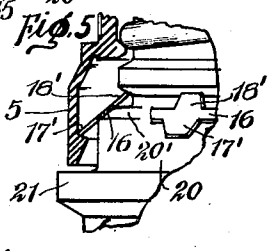


Fig. 6

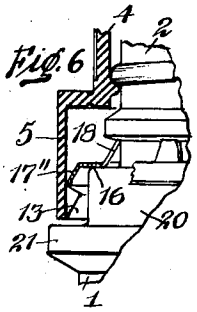


Fig. 13

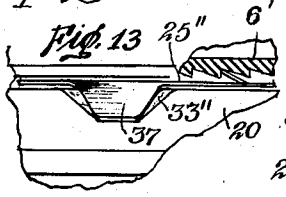
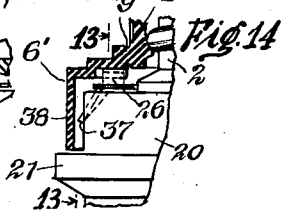


Fig. 14



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UNITED STATES PATENT OFFICE

2,162,711

TAMPERPROOF CLOSURE

John Hamberger, New York, N. Y.

Application March 31, 1936, Serial No. 71,847

4 Claims. (Cl. 215—7)

This invention relates to a tamperproof closure for containers, and particularly to an improvement in tamperproof closures having as its principal object to present an effective and very simple construction and which is easily applied.

Another object of the invention is to provide an improved tamperproof closure for containers in which is reduced the number of parts necessary for such a device and to make it as inexpensive in construction as possible together with a form which may be easily and rapidly assembled.

A further object of the invention is to provide an improved tamperproof closure for containers which includes an opening closure structure structurally combined with an externally visible readily breakable or tearable indicator positioned to prevent the removal of the closure without the breakage of the breakable portion of the indicator so as to leave an externally visible fractured surface on the closure after breakage and removal of the indicator portion from the closure when the latter is removed from the container.

An additional object of the invention is to provide a closure and indicator which is preformed before its assembly with the container and may be of any desired structure which may be molded into the correct shape.

An additional and more specific object of the invention is to provide a closure for containers formed with an extended breakable portion coacting with means carried by the container and removably associated therewith, whereby when the closure is removed or partly removed the breakable portion or indicator will be acted on by the means carried by the container so that it will be swung outwardly and therefore fractured sufficiently to be readily observable by a person inspecting the closure.

In the accompanying drawing:

Fig. 1 is a view of the upper part of a container and tamperproof closure embodying the invention, the closure and certain parts of the container being shown in section;

Fig. 2 is a sectional view through Fig. 1 approximately on the line 2—2;

Fig. 3 is a fragmentary view similar to Fig. 1 but showing a modified form of the invention;

Fig. 4 is a view similar to Fig. 3 but showing another form of the invention;

Fig. 5 is a view similar to Fig. 4 but showing a further modified form of the invention;

Fig. 6 is a view similar to Fig. 5 but showing an additional modified form of the invention;

Fig. 7 is a view similar to Fig. 1 but showing a modified form of the invention to that illustrated in Fig. 1;

Fig. 8 is a horizontal sectional view through Fig. 7 approximately on the line 8—8;

Fig. 9 is a developed fragmentary sectional view through Fig. 7 approximately on the line 9—9;

Fig. 10 is a view similar to Fig. 9 but showing a modified construction thereof;

Fig. 11 is a fragmentary elevation of a modified form of locking means to that shown in Fig. 8, the view illustrating how the spring is depressed into the locking notch of the container;

Fig. 12 is a top plan view partly in section of the structure shown in Fig. 11;

Fig. 13 is a view similar to Fig. 11 but showing a slightly modified construction, the sectional part being taken on the line 13—13 of Fig. 14;

Fig. 14 is a sectional view through the structure shown in Fig. 13.

Referring to the drawing by numerals, 1 indicates a container of any desired size and shape and also of any desired material, as for instance glass, metal, porcelain, or the like. Extending from the container 1 is what may be termed a neck 2 which is open at the top and which is adapted to be sealed by a suitable washer or gasket 3 of cork or other material. This cork or other member is compressed by the closure 4 which may be made from any desired material, as for instance a molded material, or it could be formed with metal provided the depending apron 5 was formed to be readily broken under circumstances hereinafter fully described.

In order to make the invention clear, the specific structure shown in the drawing will be described, but it will be understood that any equivalents or any forms which come within the appended claims are within the invention.

As shown in Fig. 1 of the drawing, the closure 4 and the apron or indicating member or element 5 are made integral or structurally connected or associated by a section 6 having grooves 7 and 8 whereby a weakened neck 9 is presented. Preferably the closure 4 with its indicator 5 is made from some moldable composition including synthetic resins whereby the neck 9 which is naturally annular will be readily breakable, and when broken will present a rough surface always visible when the indicator 5 has been removed. It is also contemplated that by providing pressure against some part of the indicator 5, the same may not only break at neck 9 but may break at other points. By providing this breakable indicating element anyone looking at the container

will readily see that it has been tampered with. By providing the annular horizontal shoulder 6, the broken edge at neck 9 will be prominently displayed or presented to view so that the eye can not miss this broken surface which might be true if the surface was at the bottom of the annular wall 4'. In forming the closure 4 the same may be of any shape desired and held in place by any desired means, but for the purpose of illustration threads 10 are formed on the inner surface of wall 4' which coact with the threads 11 on neck 2, whereby the closure may be screwed downwardly into position and also unscrewed when desired.

The indicator 5 is, as above mentioned, an integral extension or apron of the closure 4, and is provided with a comparatively thin annular section 12 which at the lower edge merges into a thickened part 13 having a beveled or cam surface 14 and may be annular, continuous or interrupted. The enlargement 13 coacts with a ring 15 which may be termed the combined locking and breaking ring. Ring 15 may be made from metal or other desired material and is formed with an annular central section 16, from which project spaced breaking prongs or extending members 17 which coact with the anchoring or retaining extensions or members 18.

The container or the neck of the container is formed with an annular bead 19, an annular enlargement 20 and a second annular bead 21 which has its upper surface preferably arranged flat or slightly tapered. The upper surface of the enlargement 20 is preferably flat or slightly tapered and in a plane parallel to the upper surface of the bead 21, while the upper and lower surfaces of bead 19 taper or press a bevel so that when the ring 15 is moved downwardly over the neck 2 into the position shown in Fig. 1, the various anchoring protuberances 18 may readily snap into the position shown in Fig. 1. It will be understood that the protuberances 18 are resilient and also the protuberances or members 17 are resilient and also bendable. Comparatively small members 17 have been shown, but it will be evident that it will be in the spirit of the invention if these were made much larger or even smaller or continuous.

The ring 15 and also the closure 4 with its indicator 5 are both formed into proper shape before they are applied to the container, and consequently it may be said that they are preformed. After the ring 15 has been snapped into position as shown in Fig. 1, the closure 4 is then applied and the indicating member 5 will naturally readily slip over the upper part of the container, and then the threads 10 and 11 will interlock. As the closure is rotated in order to be screwed down into closing position, the enlargement 13 will engage the various members 17 and the under-beveled surface or cam 22 will slide over the upper surface of member 17. These members being resilient will yield, and finally when the closure 4 has been screwed down tightly into position the various members 17 will snap into their normal locked position on top of the cam surface 14. When this occurs the closure with its breakable indicating element will be in correct normal position.

It will be noted that the bead or flange 21 almost touches the lower edge of the indicator 5, and consequently will present the insertion of any tool or implement. When an authorized person desires to secure the contents of the container, closure 4 is merely grasped and rotated so as to be unscrewed. This will produce a rotary and an axial movement of the parts. As the closure with its indicator 5 moves axially, the surface 14 will press against the outer ends of the respective members 17 and attempt to raise these members, but as the ring is anchored by member 18 the members 17 will merely bend or swing outwardly. This outward deforming of these members will radially slide the lower part of the member 5, and as this member is fragile it will break either at the lower part or at the neck 9. Usually the break is at the neck 9, although when this occurs several other parts will be substantially simultaneously broken. The container may then be shaken and these parts will fall off. The unscrewing of the closure will then be continued until it is removed. If this is done by an unauthorized person, anyone can readily see that the device has been tampered with by reason of the broken parts of the indicator 5 or by the broken surface left when neck 9 is broken.

In Figs. 3 to 6 inclusive slightly modified forms of the structure shown in Fig. 1 are disclosed, although the function of the device is the same and the results are the same, namely the breaking of the indicator portion of the closure. The construction of the indicator portion, as shown in Figs. 3 and 4, provides an alternative inasmuch as the spring member 15 can be assembled with the indicator portion of the closure prior to assembly with the container.

As shown in Figs. 3 and 4, the indicator 5' is smaller than in Fig. 1 and the section 16 bears against the inclined under-surface 23. Aside from these features, the action is the same as in the preferred form and therefore no additional description is thought to be necessary.

In Fig. 5 the ring 16 is arranged at an angle with the members 17' and 18' in the same plane. The enlargement 20 in this form of the invention is provided with an inclined top surface 20' for accommodating the section or body 16. Aside from these features, the action is the same as in the preferred form, namely in the form shown in Fig. 1.

In Fig. 6 the enlargement 13 is divided into a number of sections and the body 16 of the ring is formed with a depending inclined annular extension 17'' which functions the same as the members 17 of Fig. 1. Aside from these features, the construction and operation is the same as in the preferred form.

In Figs. 7, 8 and 9 an additional form of the invention is shown wherein the same principle is used as in the form shown in Fig. 1, but with the parts slightly changed in detail structure. In this form of the invention the indicator 6 is provided with a wider horizontal member 6' than in Fig. 1, and on the under-surface of member 6' there are provided teeth 24 formed therewith. The breaking neck 9 is still maintained in this form of the invention, although when the breaking action takes place it may break at this point or at some other point, but will always present an exposed surface which may be readily seen and thereby indicate to a purchaser that the closure has been tampered with.

In this form of the invention there is provided a ring 25 made of metal or other desired material, and this ring is provided with two pressed-out teeth 26 as shown in Fig. 8. It will, however, be evident that a large number of teeth could be used without departing from the invention. These teeth are really cam members which are adapted

to engage the teeth or notches **24** as shown in Fig. 9, so that when the closure **27** is unscrewed or removed there will be a camming action between the teeth **24** and members **26**. This will cause the section **6'** to move upwardly faster than the closure **27** and consequently a break will result. It will be understood that there will be an angular strain as well as an axial strain and the result will be the breaking at one or more points of the indicator **5**.

Ring **25** is provided with a pair of notches **28** and **29** which interlock with lugs **30** and **31** formed as extensions of the member **20**. This arrangement is to prevent the ring **25** from rotating when the closure **27** is rotated. When the closure **27** is first applied it will be understood that the preformed ring **25** is already in position, and that when the closure **27** is screwed down tight as shown in Fig. 7 the teeth or notched formation **24** will snap over the respective cams or teeth **26**.

In Fig. 10 a slightly modified structure is shown to that illustrated in Fig. 9, wherein the ring **25'** is provided with not only cams **26** but cams or anchors **32** which engage notches **33** in member **20**.

In Figs. 11 and 12 a slightly modified structure is shown to that illustrated in Fig. 8. In these two figures there is provided a depression **33'** formed in member **20**, said depression having beveled sides **34** and **35** whereby the depending portion **36** of the ring **25** may readily snap therein. This structure takes the place of the notches **28** and **29** and the lugs **30** and **31** shown in Fig. 8.

In Figs. 13 and 14 a slightly modified structure to that shown in Figs. 11 and 12 is shown, wherein the ring **25''** is provided with a bent-down extension **37** fitting into the notch **33''**. The notch **33''** has the sides beveled so that the extension **37** may be swung outwardly against the wall **38** of member **6'** for breaking the same substantially at the same time that the cam **26** produces a breaking action at the neck **9**. In this form of the invention, as well as the other forms, means have been provided which will cause the indicator element to be broken at some point when the closure is tampered with or when it is removed by an unauthorized person. It will therefore be seen that after the closure has once been placed in position it can not be removed and replaced by anyone without indicating this fact in a very decided and prominent way. This will prevent unauthorized persons from substituting inferior goods for those in the original package, and at the same time will guarantee to a purchaser that he is receiving the original goods placed in the container in untampered form.

I claim:

1. In combination, a container provided with a neck having threads thereon and an annular groove spaced from said threads, a closure formed with internal threads coacting with the threads on said neck whereby said closure may be moved to a position for closing the opening in said neck, said closure having a frangible extending shoulder and an apron thereon formed with a thickened beveled lower edge provided with an annular upper shoulder, and a ring positioned within said annular groove having means extending in one direction anchoring the ring to the neck, and breaking members extending in the opposite direction to a point engaging said shoulder whereby when said closure is rotated so as to unscrew the same said shoulder will coact with the last-mentioned members and cause said apron to move radially whereby it will become broken.

2. A device including a container having an externally threaded neck affording an opening, a closure for said opening having an internal thread engaged with the external thread of the neck, said closure having a frangible downward and outward extending portion including an apron, said apron being formed with a lower edge portion that provides an internal upper shoulder, and means mounted on the container and having a downward and outward extending radially resilient portion arranged so as to be concealed and protected by said apron against external access, said resilient portion engaging and bearing downward on said shoulders so as to prevent removal of the closure without breaking the frangible portion.

3. A device including a container having an externally threaded neck affording an opening, a closure for said opening having an internal thread engaged with the external thread of the neck, said closure having a frangible downward and outward extending portion including an apron having an inwardly beveled lower edge, said apron being formed with a lower edge portion that provides an internal upper shoulder, and means mounted on the container and having a downward and outward extending radially resilient portion arranged so as to be concealed and protected by said apron against external access, said resilient portion engaging and bearing downward on said shoulder so as to prevent removal of the closure without breaking the frangible portion.

4. A device including a container having an externally threaded neck affording an opening, a closure for said opening having an internal thread engaged with the external thread of the neck, said closure having a frangible downward and outward extending portion including an apron, said apron being formed with a lower edge portion that provides an internal upper shoulder, and means mounted on the container and having a downward and outward extending radially resilient portion arranged so as to be concealed and protected by said apron against external access, said resilient portion engaging and bearing downward on said shoulder so as to prevent removal of the closure without breaking the frangible portion, said resilient portion being at a substantial angle so as to be upwardly and outwardly deflected on attempted removal of the closure to cause a downward and outward breaking stress on said apron.

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