Jan. 21, 1936. W. BAKER 2,028,489

CLOSURE

Filed Sept. 21, 1933 2 Sheets-Sheet 1

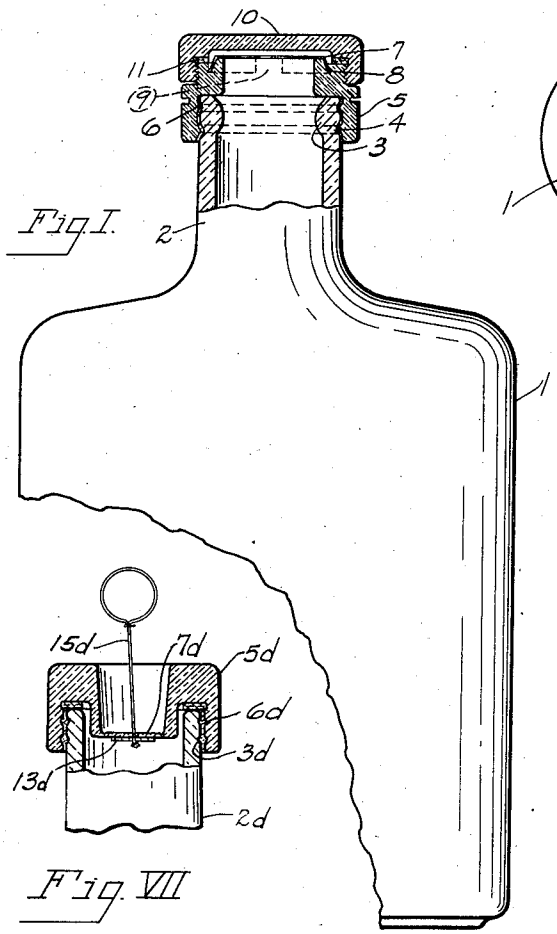

Fig. I.

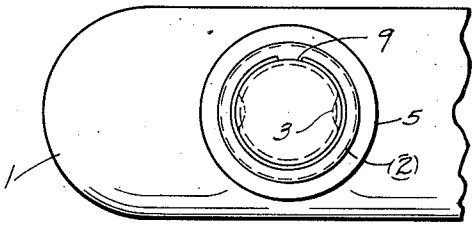

Fig. II

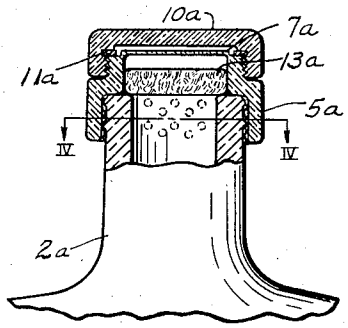

Fig. III

Fig. VII

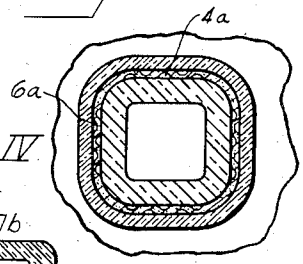

Fig. IV

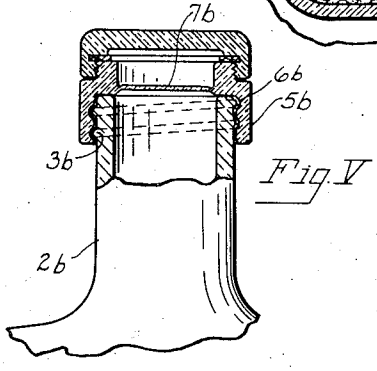

Fig. V

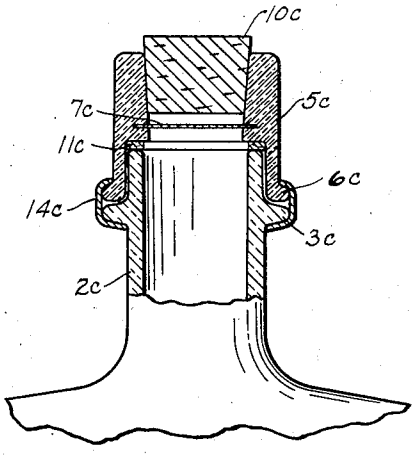

Fig. VI

William Baker
INVENTOR

BY C. O. Marshall
ATTORNEY

Jan. 21, 1936. W. BAKER 2,028,489

CLOSURE

Filed Sept. 21, 1933 2 Sheets-Sheet 2

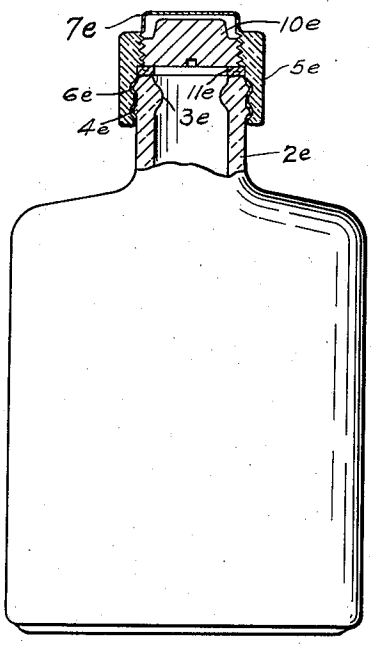

Fig. VIII

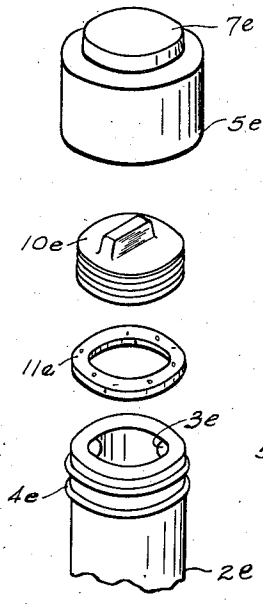

Fig. IX

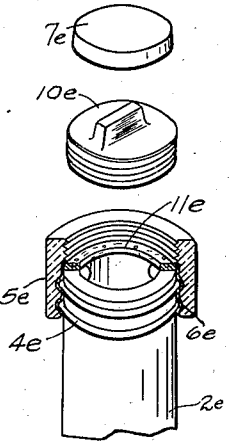

Fig. X

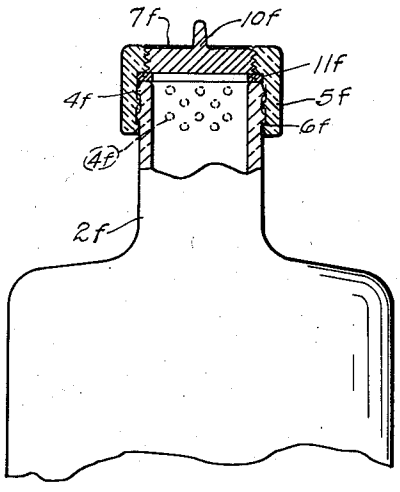

Fig. XI

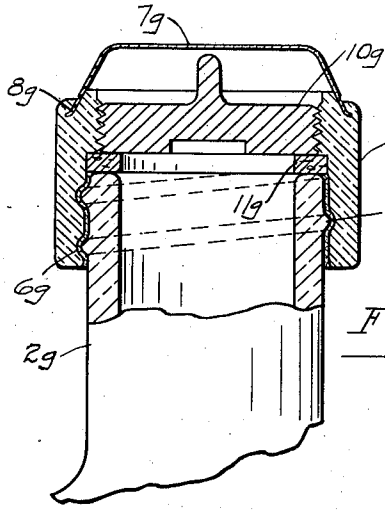

Fig. XII

William Baker
INVENTOR

BY C. O. Marshall
ATTORNEY

Patented Jan. 21, 1936 2,028,489

UNITED STATES PATENT OFFICE

2,028,489

CLOSURE

William Baker, Toledo, Ohio

Application September 21, 1933, Serial No. 690,365

7 Claims. (Cl. 215—7)

This invention relates to closures for containers and particularly to closures for bottles provided with means for indicating whether or not such closures have been opened for removal of the contents.

One of the principal objects of the invention is the provision of a fitting having a nonreplaceable diaphragm which may be broken, perforated or removed to obtain access to the contents of a container.

Another object is the provision of a fitting having an inner seal covered by a cap or stopper and adapted to be readily broken, perforated or removed after removal of said cap or stopper.

Another object is the provision of a fitting having means for securing it to a container, the relative strengths of the fitting and the securing means being such that the fitting cannot be removed from the container without destruction.

Another object is the provision of means for inhibiting the application of a cap or stopper to a container from which my fitting has been removed.

Another object is the provision of a molded fitting for a bottle neck having a nonreplaceable diaphragm molded thereto.

Another object is the provision of a fitting having a diaphragm molded thereto and a stopper adapted to be removed after said diaphragm has been broken away.

Other objects and advantages will be apparent from the following description, in which reference is had to the accompanying drawings illustrating preferred embodiments of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawings:—

Figure I is a front elevational view, with parts broken away and parts in section, of a bottle equipped with one form of the closure of my invention.

Figure II is a top view, with parts broken away, of a bottle equipped with a closure of the form shown in Figure I.

Figure III is a fragmentary elevational view showing a bottle neck equipped with another form of the closure of my invention, the upper part of the bottle neck and the closure being shown in section.

Figure IV is a sectional view taken substantially on the line IV—IV of Figure III.

Figure V is a fragmentary elevational view showing the neck of a bottle equipped with a further modified form of the closure of my invention, the upper part of the bottle neck and the closure being shown in section.

Figure VI is a fragmentary elevational view showing the neck of a bottle equipped with still another form of the closure of my invention, the upper part of the neck and the closure being shown in section.

Figure VII is a front elevational view of the upper part of the neck of a bottle equipped with still another form of the fitting of my invention, a stopper having been removed therefrom, the top of the bottle neck and the fitting being shown in section.

Figure VIII is a front elevational view of a bottle equipped with still another form of the closure of my invention, parts being in section.

Figure IX is a perspective view of the parts which are in section in Figure VIII, the parts being shown in disassembled relation prior to assembly.

Figure X is a perspective view, with parts in section, of the same elements which are shown in Figure IX, indicating the relationship of the parts in condition to permit passage of the contents of the bottle.

Figure XI is a front elevational view, with parts broken away and parts in section, of a bottle equipped with still another form of the closure of my invention; and

Figure XII is a front elevational view of the neck of a bottle equipped with still another form of the closure of my invention.

Referring to the drawings in detail, I have shown my closure applied to a bottle or flask 1, which may be of any desired shape and material. In the form shown in Figures I and II, the neck 2 of the bottle is provided with inwardly projecting protuberances 3 to prevent the mouth from being tightly fitted with a stopper or cork in case an attempt is made to use the bottle without my fitting. The exterior of the neck is provided with circumferential grooves 4.

Fitted over the mouth of the bottle is an annular member 5 provided with inwardly extending beads 6 engaging the grooves 4. The annular member 5 may be made of metal, porcelain, or glass, but it is preferably made of urea-formaldehyde resin or other molded material. Before the annular member is pushed into place on the upper end of the neck 2, a coating of cement is applied to one or both of the surfaces of the neck and annular member to be engaged, the character of the cement preferably being such that when it has set or hardened the annular member 5 cannot be removed from the neck without destroying

either the annular member or breaking the bottle neck. The member 5 may, if desired, be made more frail by one or more outer grooves or furrows such as is shown in Figure I.

At the upper end of the annular member 5 and closing the opening therethrough is a seal 7, preferably of foil, or thin sheet metal capable of being easily cut or torn, or of parchment or the like. The seal 7 is provided with a downwardly extending flange 8 which is molded into the material of the annular member 5. If desired, an opening 9 may be left in the flange 8 to facilitate insertion of a pointed instrument or finger nail under the seal. The seal also may be scored adjacent its periphery so that it can be easily torn away.

Surmounting the annular member 5 is a cap 10 provided with internal screw threads engaging complementary external threads on the upper end of the annular member 5. Lying within the cap 10 is a liner or gasket 11, which, when the cap is screwed down upon the annular member 5, is tightly compressed between the cap and annular member and thus prevents leakage even though the seal 7 may have been perforated or removed.

In the form of device shown in Figures III and IV the neck 2a of the bottle is substantially square so that it cannot be tightly closed by a stopper. The exterior of the neck, in the form shown in Figures III and IV, is provided with teardrop-like projections 4a. Fitted over the mouth of the bottle is a member 5a having a depending skirt conforming to the shape of the bottle neck 2a, with inwardly extending teardrop-like projections 6a, which, when the member 5a is in place on the neck, are interdisposed among the projections 4a on the bottle neck. Between the inner surface of the member 5a and the adjacent outer surface of the neck 2a is a layer of cement, the strength of which relative to the strength of the member 5a preferably is such that if an attempt be made to force the member 5a off of the neck 2a, the member 5a will be destroyed more easily than the cement bond can be broken.

The upper portion of the member 5a is in the form of a threaded annulus, across the opening of which extends an integral diaphragm or seal 7a molded of the same material and at the same time with the member 5a, the juncture between the seal or diaphragm 7a and the member 5a being preferably made very thin so that the seal or diaphragm can be easily cut or broken away from the member 5a by inserting the pointed end of a tool, such as a knife blade, corkscrew or ice pick, through the thin juncture at the edge of the seal or diaphragm.

Screwed upon the threaded upper portion of the member 5a is an internally threaded cap 10a provided with a liner or gasket 11a to prevent leakage between the member 5a and the cap 10a. As a precaution to prevent parts of the diaphragm 7a from falling into the contents of the bottle, the space beneath the diaphragm 7a may be loosely filled with an easily removable wad, such as 13a, which may be inserted in the closure or laid over the bottle mouth before the closure is placed upon the bottle neck.

In the form of device shown in Figure V the neck 2b of the bottle is round and is provided with a helical bead 3b; an annular member 5b, provided with a complementary helical groove 6b, being screwed into place on the bottle neck; a layer of cement lying between the adjacent surfaces of the neck and the annular member and binding them together, the strength of the cement preferably being such that the annular member cannot be unscrewed from or otherwise forced off the neck without destruction. As an additional deterrent to removal, the direction of the helical bead 3b and groove 6b may be such as to form a left-hand thread.

Molded across the opening in the annular member 5b and lying somewhat below its upper end is an integral diaphragm or seal 7b. A circular groove is molded into the seal or diaphragm adjacent its edge to provide an easily breakable juncture so that the diaphragm may be punched out with the finger or any instrument, such as a pencil or key, which is small enough to be pushed into the opening.

In the form of device shown in Figure VI the neck 2c is provided with a circumferential bead 3c. An annular member 5c is provided with a bead 6c, which, when the annular member 5c is mounted on the neck 2c, lies adjacent the bead 3c on the neck. Molded across the opening of the annular member 5c is a diaphragm 7c, preferably of foil, or thin metal capable of being easily torn or perforated, or of parchment or the like. If desired, the diaphragm 7c may be partially cut through or scored along a line at which it is desired that the diaphragm shall tear most easily.

The annular member 5c extends upwardly sufficiently to form an adequate receptacle for a cork 19c or similar stopper. When the cork is removed an opening may be punched or torn in the diaphragm 7c by pushing a finger or an instrument such as a corkscrew or pencil through it. A gasket 11c is interposed between the top of the bottle neck and an internal shoulder on the annular member 5c to prevent leakage between the bottle neck and the member. A metal band 14c is spun over the beads 3c and 6c to hold the member 5c in place upon the bottle neck, and the space between the member 5c and bottle neck may, if desired, be filled with cement.

In Figure VII is shown a further modification of my invention, the neck 2d being provided with circumferential grooves 3d, an annular member 5d, having grooves 6d around its interior surface, being mounted thereon and held in place by means of cement lying between the adjacent surfaces of the neck 2d and the member 5d and filling the grooves 3d and 6d. In this form of the device the annular member 5d has an integral diaphragm 7d molded across its opening adjacent its lower end, the diaphragm having a circular groove molded therein adjacent its edge to provide an easily breakable juncture. The upper portion of the member 5d is shaped to receive a cork or other stopper (not shown).

In this form of the device, means is provided to break the diaphragm around the thin line formed by the circular groove and remove it through the stopper opening. This diaphragm breaking and removing means consists of a disk 13d and a line 15d which may be of cord or wire and which extends through small perforations in the diaphragm 7d and the disk 13d. The disk 13d and the line 15d are preferably assembled with the annular member 5d, after it is molded, but before it is placed upon the bottle neck 2d. The line 15d is dropped or folded upon the upper face of the diaphragm 7d and lies beneath such cork or stopper as is placed in the opening above it. After the cork or stopper has been removed, the line may be spilled from the opening by turning the bottle upside down so that it may be

grasped, and after the bottle has again been righted the diaphragm may be pulled out by means of the line.

Figures VIII, IX and X show a flask or bottle the neck 2e of which is provided with inwardly projecting protuberances 3e to prevent the mouth from being tightly fitted with a stopper or cork in case an attempt is made to use the bottle without my fitting. The exterior of the neck is provided with circumferential beads 4e.

Fitted over the mouth of the bottle is an annular member 5e provided with grooves 6e to receive the beads 4e on the bottle neck. Before the annular member is pushed into place on the upper end of the neck 2e a coating of cement is applied to one or both of the surfaces of the neck and annular member to be engaged, the character of the cement preferably being such that when it has set or hardened the annular member 5e cannot be removed from the neck without destroying either the annular member or breaking the bottle neck.

At the upper end of the annular member 5e and closing the opening therethrough is an integral diaphragm or seal 7e molded of the same material and at the same time with the member 5e, the juncture between the seal or diaphragm 7e and the member 5e being preferably made very thin so that the seal or diaphragm can be easily cut or broken away from the member 5e by inserting the pointed end of a tool, such as a knife blade, corkscrew or ice pick, through the thin juncture at the edge of the seal or diaphragm.

The upper portion of the annular member 5e is interiorly threaded, and screwed into such interiorly threaded upper portion of the member 5e is an externally threaded stopper 10e, which may be made of synthetic resin, metal or other material; the dimensions of the lower portion or skirt of the member 5e which surrounds the bottle neck being such that the threaded stopper 10e can be screwed into place through the lower end of the annular member 5e before the fitting is placed upon the bottle neck. The stopper 10e is provided in its lower side with a screwdriver slot to facilitate screwing it into place.

In assembling the device the stopper 10e is screwed into the fitting from the bottom, cement is applied to the exterior surface of the bottle neck and the interior surface of the fitting which are to be cemented together, a liner or gasket 11e is laid on the top of the bottle neck and the fitting is pushed down into place on the neck. When it is desired to remove the contents of the bottle, the diaphragm 7e is broken away from the top of the fitting 5e. The stopper 10e may then be removed through the top of the fitting as indicated in Figure X.

In the form of device shown in Figure XI the neck 2f of the bottle is preferably of non-circular form so that it cannot be tightly closed by a stopper. The exterior of the neck of the bottle is provided with teardrop-like projections 4f. Fitted over the mouth of the bottle is a member 5f having a depending skirt conforming to the shape of the bottle, with inwardly extending teardrop-like projections 6f, which, when the member 5f is in place on the neck, are interdisposed among the projections 4f on the neck. Between the inner surface of the member 5f and the adjacent outer surface of the neck 2f is a layer of cement, the strength of which relative to the strength of the member 5f preferably is such that if an attempt be made to force the member 5f off of the neck 2f, the member 5f will be destroyed more readily than the cement bond can be broken.

The upper portion of the member 5f is in the form of an internally threaded annulus, across the opening of which extends an integral seal 7f molded of the same material and at the same time with the member 5f, the juncture between the seal 7f and the member 5f being preferably made very thin so that the seal can be easily broken away from the member 5f.

Fitted within the threaded upper portion of the member 5f is an externally threaded stopper 10f which has a finger-piece projecting upwardly through the seal 7f. The stopper 10f, which is preferably made of metal but which can be made of other material, is molded in place in the fitting 5f when the fitting is made, the stopper being placed in the mold with the moldable resin or other moldable material of which the fitting 5f is formed. When it is desired to remove the stopper 10f the seal 7f may be broken away either with a pointed instrument such as a knife or ice pick or by forcibly turning the stopper 10f. A gasket or liner 11f between the stopper 10f and the top of the bottle neck serves to prevent leakage around the stopper 10f when it is replaced after having once been removed.

In the form of device shown in Figure XII the neck 2g is round and is provided with a helical bead 3g, an annular member 5g, provided with a complementary helical groove 6g, being screwed into place on the bottle neck, a layer of cement lying between the adjacent surfaces of the neck and the annular member and binding them together, the strength of the cement preferably being such that the annular member cannot be unscrewed from or otherwise forced off the neck without destruction. As an additional deterrent to removal, the direction of the helical bead 3g and groove 6g may be such as to form a left-hand thread.

At the upper end of the annular member 5g and closing the opening therethrough is a seal 7g, preferably of foil, or thin sheet metal capable of being easily cut or torn, or of parchment or the like. The seal 7g is provided with a downwardly extending flange 8g which is molded into the material of the annular member 5g. The seal may be scored adjacent its periphery so that it can be easily torn away.

The upper portion of the member 5g is internally threaded and screwed into such internally threaded portion from the bottom is a threaded stopper 10g, which, when the seal 7g is removed, can be unscrewed through the top of the annular member 5g when it is desired to obtain access to the contents of the bottle and which can again be screwed into place when it is desired to again close the bottle. A gasket or liner 11g overlies the top of the bottle neck and is adapted to be compressed between the bottom of the stopper 10g and the top of the bottle neck to prevent leakage around the stopper.

It is to be understood that various features of my device, such as the circular or non-circular bottle mouth, the integral or metallic or parchment diaphragm, the cap or stopper, the wadding or removal disk and the various forms of protuberances and devices for preventing removal of the closure from the bottle neck, may be used interchangeably and in different combinations with each other.

The embodiments of my invention herein shown and described are to be regarded as illustrative only, and it is to be understood that the inven-

tion is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

Having described my invention, I claim:

1. In a device of the class described, in combination, a container, a fitting therefor, a nonreplaceable diaphragm forming a part of said fitting extending across an opening in said fitting to prevent passage of the contents of said container, said diaphragm being adapted to be broken away to permit such passage, and a stopper within said opening and removable therefrom after the breaking away of said diaphragm.

2. In a device of the class described, in combination, a fitting having one end adapted to be secured to the neck of a bottle, a nonreplaceable diaphragm forming a part of said fitting lying across its other end, a stopper adapted to be placed in said fitting from the end which is adapted to be secured to the neck of a bottle and to be withdrawn from its other end when said diaphragm has been broken away.

3. In a device of the class described, in combination, a fitting having one end adapted to be secured to the neck of a bottle and a diaphragm forming a part of said fitting lying across its other end, said fitting having an internally threaded portion adjacent its said other end, a threaded stopper, the construction of said fitting and stopper being such that said stopper may be screwed into said fitting from the end which is adapted to be secured to the neck of a bottle and unscrewed through said other end after said diaphragm has been broken away.

4. In a device of the class described, in combination, a fitting comprising a portion adapted to be secured to the neck of a bottle, a threaded portion, an integral seal overlying said threaded portion and adapted to be broken away, and a threaded stopper molded into said threaded portion and adapted to be unscrewed therefrom when said seal is broken away.

5. In a device of the class described, in combination, a container, a fitting therefor, a nonreplaceable diaphragm extending across an opening in said fitting to prevent passage of the contents of said container, said diaphragm and the remainder of said fitting being formed of the same material, said diaphragm being adapted to be broken away to permit passage of the contents of said container, and a stopper threaded into said fitting within said opening and removable therefrom after the breaking away of said diaphragm.

6. In a device of the class described, in combination, a fitting having one end adapted to be secured to the neck of a bottle, a nonreplaceable diaphragm of the same material as the remainder of the fitting lying across its other end, and a stopper adapted to be placed in said fitting from the end which is adapted to be secured to the neck of a bottle and to be withdrawn from its other end when said diaphragm has been broken away.

7. In a device of the class described, in combination, a fitting having one end adapted to be secured to the neck of a bottle with a diaphragm formed of the same material as the remainder of the fitting lying across its other end, said fitting having an internally threaded portion adjacent its said other end, and a threaded stopper, the construction of said fitting and stopper being such that said stopper may be screwed into said fitting from the end which is adapted to be secured to the neck of a bottle and unscrewed through said other end after said diaphragm has been broken away.

WILLIAM BAKER.