No. 674,053. Patented May 14, 1901.

E. J. BROWN.

DETECTOR DEVICE FOR BOTTLES, &c

(Application filed July 20, 1900.)

(No Model.)

Fig. 1.

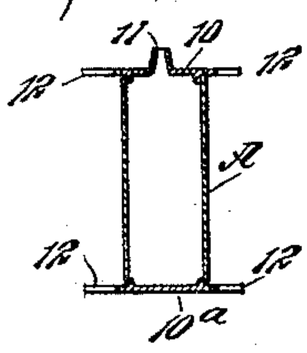

Fig. 2.

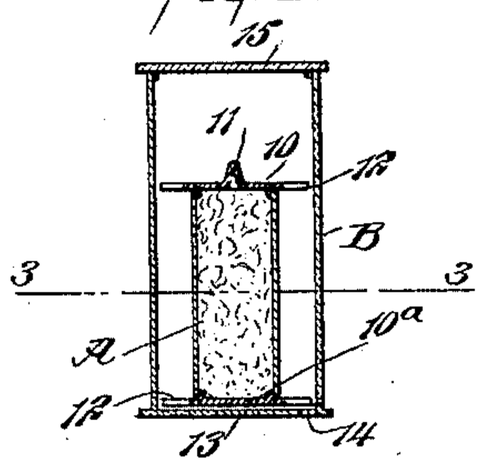

Fig. 3.

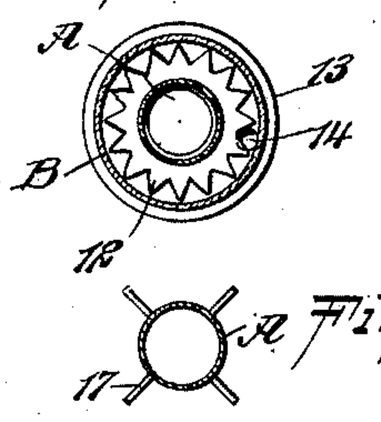

Fig. 7.

Fig. 6.

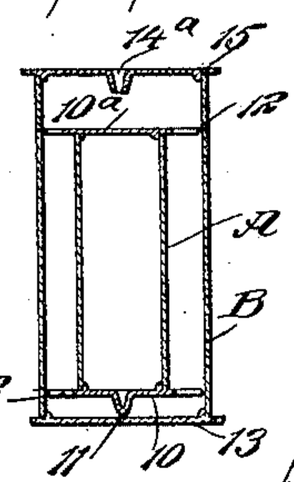

Fig. 4.

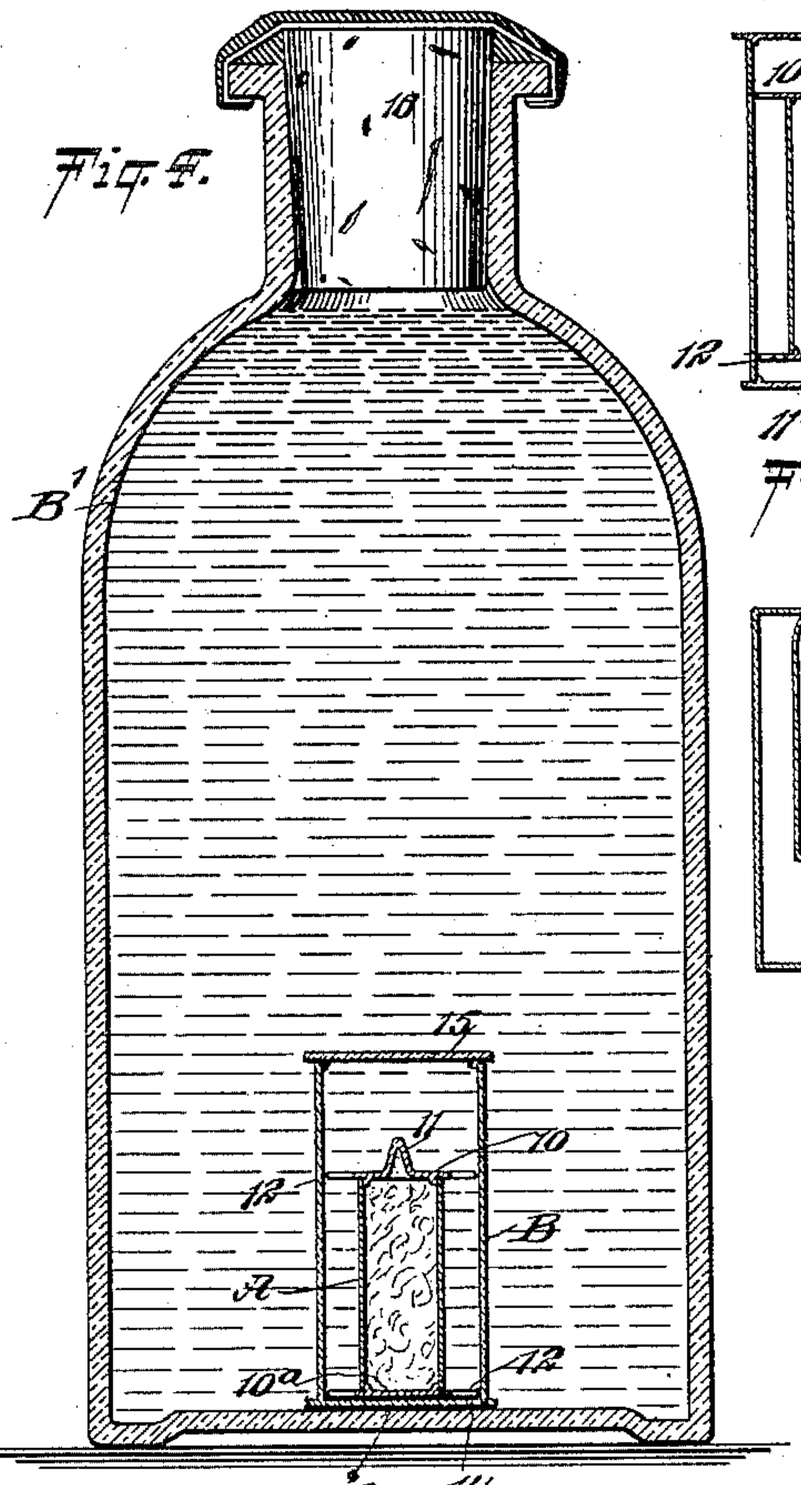

Fig. 5.

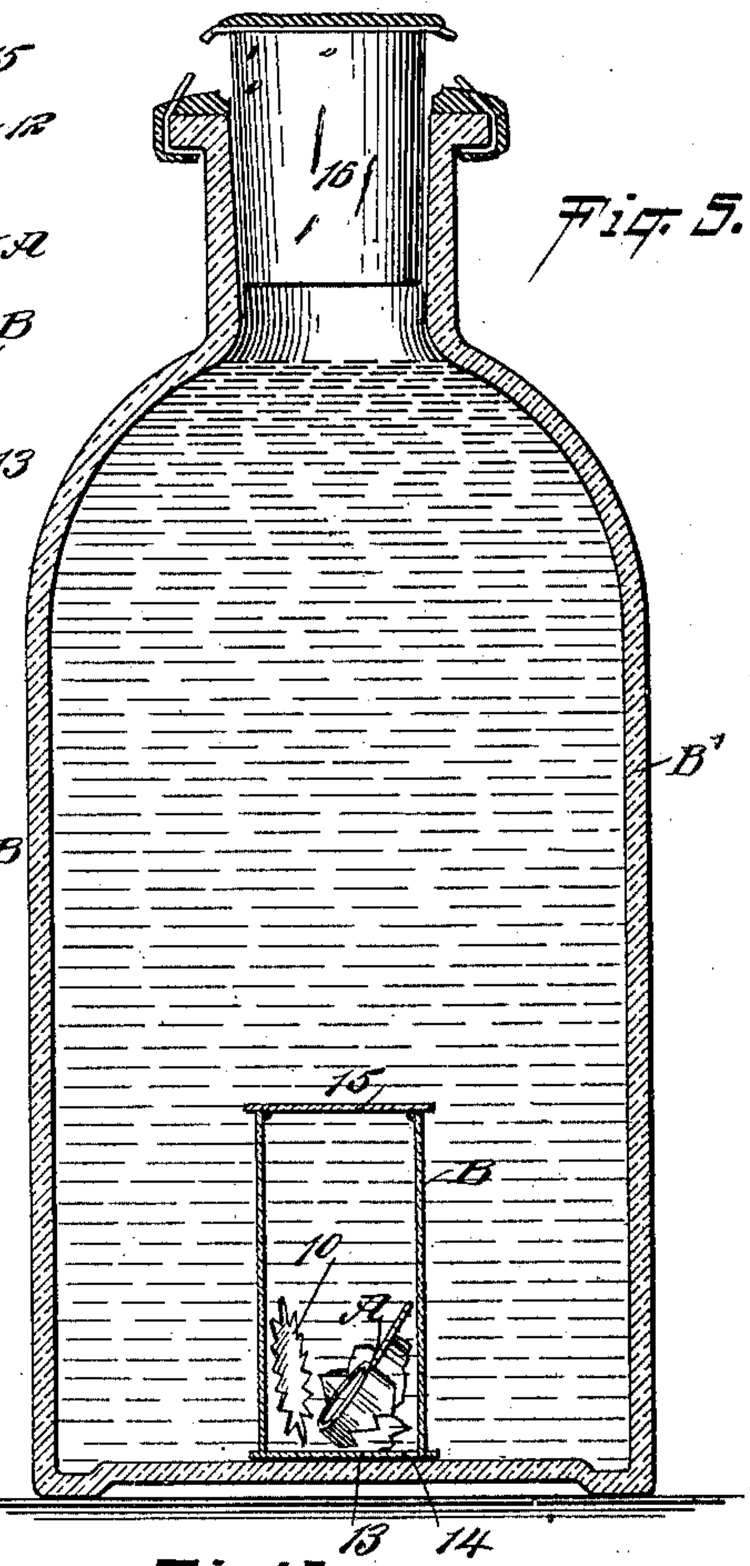

Fig. 8.

Fig. 9.

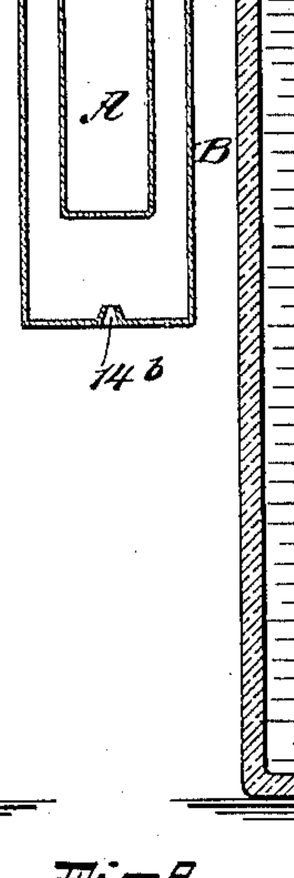

Fig. 10.

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EDWIN J. BROWN, OF ONEIDA, NEW YORK.

DETECTOR DEVICE FOR BOTTLES, &c.

SPECIFICATION forming part of Letters Patent No. 674,053, dated May 14, 1901.

Application filed July 20, 1900. Serial No. 24,300. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. BROWN, a citizen of the United States, and a resident of Oneida, in the county of Madison and State of New York, have invented a new and Improved Detector Device for Bottles or Jars or Metallic Cans with Transparent Tops, of which the following is a full, clear, and exact description.

My invention relates to improvements in devices for preventing refilling of glass bottles or jars or metallic cans with glass or transparent tops with inferior or adulterated goods after they have been once emptied of their original contents and for preventing the opening of glass bottles or jars or metallic cans with glass or transparent tops after they have been hermetically corked, covered, or sealed without immediate detection of the fact that the bottle, jar, or can has been opened. Ordinarily such devices are a part of the bottle, jar, or can or require some change in its shape, or when used render the bottle, jar, or can unfit for use again. My invention does not affect the bottle, jar, or can and requires no change in its shape. It is entirely independent of it. After a receptacle has been used once it can be used again for the same or for other purposes. The detector device, however, can be used but once, as it is destroyed immediately by the mere uncovering of the receptacle. The manufacturer of the original contents of the bottle, jar, or can when using the improved device can fill the receptacles again with original or accredited goods and the purchaser will be perfectly protected, as at first. If desired, the receptacle can thus be returned to the manufacturer and the bottle, jar, or can may be used over and over, it being remembered that each time a new detector device must be placed in the receptacle, since said device is destroyed when the bottle, can, or jar is opened; but as no one not entitled thereto can obtain the device from its manufacturer no one can use the detector device except the persons who have acquired such right. Should the bottle, jar, or can not contain the device intact, or should it be discovered to be broken before the bottle, can, or jar is opened, the contents of the receptacle will be known to be spurious.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section through the inner tube of the device. Fig. 2 is a vertical section through the complete device. Fig. 3 is a horizontal section on the line 3 3 of Fig. 2. Fig. 4 is a vertical section through a bottle and the complete detector device therein, the bottle being sealed. Fig. 5 is a view similar to that shown in Fig. 4, showing the bottle partially unsealed and the inner tube of the detector device fractured. Fig. 6 is a vertical section of a detector device constructed in a slightly-different manner. Fig. 7 is a horizontal section through the inner tube of the detector device, showing a slight variation in the guards therefor; and Figs. 8, 9, 10, and 11 illustrate different ways in which the detector device may be constructed.

The device consists of an inner tube A and an outer tube B of greater diameter than the inner tube. The inner tube A, which is shown in detail in Fig. 1, is represented as round; but it may be made three-sided, square, or octagonal, or of any desired shape and of any size that does not prevent it being completely contained within the larger tube B, as shown in Fig. 2. The inner tube A can be made of transparent glass of any color or may be opaque and of any color to adapt it to or contrast it with the color of the bottle or jar or the glass top of a metallic can in which it is to be used or with the contents of the same, so that by the transparency of the tube or the contrast between its color and the color of the bottle, jar, or top of the metallic can or the contents of the said receptacles it will be easy to discover whether the said inner tube is whole or broken when examination is made by looking through the bottle or jar or the glass top of a metallic can before the same is opened.

In the construction of the inner tube A an opening 11 is formed in a teat-like projection from the upper end 10, and this opening is adapted to be closed with glass either by drawing the edges together when properly heated or by heating the edges and filling the opening with melted glass, which by uniting at the edges of the said opening will hermetically close the same. A second end cover is provided for the inner tube, both end covers 10 and 10^a being wholly of glass, as well as the inner tube *a*. The end covers 10 and 10^a are made strong, and the glass composing the body of the said inner tube A where it joins with the end covers 10 and 10^a is somewhat thickened, so that the said body may be supported, and when the body explodes these end portions will not be broken, but only the intermediate portions of said body. The end covers 10 and 10^a extend a short distance beyond the body, and the extensions 12 of the end covers are preferably serrated, as shown in Fig. 3. These extensions are provided in order that the body of the inner tube A will be prevented from coming in contact with the inside of the outer tube B when one tube is contained in the other. The protruding portions 12 of the end covers 10 and 10^a are serrated, so that air may pass freely between such edges and the inner surface of the outer tube B when the device is completed. The body of the inner tube is made strong enough to support the end covers 10 and 10^a, but so thin that the said body will explode when the difference between the pressure of air on the outside and the inside of the inner tube A reaches a predetermined number of ounces or pounds per square inch—that is, if the pressure is greater on the inside by a predetermined number of ounces or pounds than it is on the outside of the inner tube A the body of said tube will explode, and if the pressure is greater on the outside than it is on the inside of the body portion of the inner tube A by a predetermined number of ounces or pounds the said body will be crushed in.

The name of the firm, person, or corporation using the device or the trade-mark name of the contents of the bottle, jar, or can or the word "Patented" and the date of the patent or the date of bottling or any other name or design that the user may desire and that will not interfere with the usefulness of the device may be blown or molded in the end covers 10 and 10^a of the inner tube, if desired.

The outer tube B, which is also of glass, is made larger than the inner tube and of a proper shape to correspond with the shape of the inner tube, being adapted to contain the said inner tube. The dimensions of the outer tube are such that it will readily pass through the neck of the bottle, jar, or can B′ in which it is to be used. This outer tube B must be made of uncolored transparent glass, so that it will present as slight an obstacle as possible when the inner tube is to be examined before the bottle, can, or jar is opened. The lower end 13 of the outer tube is provided with a very small opening 14 for the purpose of allowing the air contained in both tubes to escape after the inner hermetically-sealed tube is fractured. The upper end of the outer tube is normally left open, and the body of this tube is made thicker than the body of the inner tube A and so strong that it will sustain a pressure of more ounces and pounds to the square inch than the body of the inner tube A. When the device is completed, an upper end 15 is hermetically secured upon the body, and the ends 13 and 15 are made strong and thick, and any design, lettering, or the like may be produced in or upon the ends of the outer tube in such manner as not to interfere with the usefulness of the device.

In Fig. 4 I have shown one tube within the other and both tubes inclosed in a bottle B′, which is filled with liquid. The mouth of the bottle is closed by a cork 16, which cork is wired and sealed in any suitable or approved manner or is otherwise secured in the neck in an air and gas tight manner.

In Fig. 5 I have shown the cork 16 as partially drawn from the neck of the bottle and the inner tube as broken or exploded within the outer tube B, which latter remains intact in the bottle, thus preventing any fragments of the inner tube mingling with the contents of the bottle. In making use of this form of my device an especial air-chamber is prepared, made strong and tight enough to contain compressed air up to a certain pressure, which may be one, two, or more atmospheres. The room or chamber is provided with an escape-valve, which can be regulated to maintain the pressure at any determined number of ounces or pounds to the square inch or to constantly vary the pressure between predetermined degrees. The air is forced into the chamber or room by means of an air-pump worked by steam or other power, so that there is a constant supply of air in said chamber kept at the required pressure or at a constantly-varying pressure by means of the air-pump and the escape-valve. By watching the air-pressure gage, which must be in the air-chamber, and closing the escape-valve after the air-pump has commenced working the air-pressure will constantly increase until the gage shows the highest degree which is desired. Then by shutting off the pump and opening the escape-valve the pressure can be slowly lessened until it reaches the lowest point desired. Operating in that manner the pressure can be very easily kept constantly varying. Under such circumstances some of the tubes will be filled with air at one pressure and others at another pressure, and no two tubes will be likely to be filled with air at the same pressure. The air-chamber is made large enough to contain a sufficient number of workmen

and apparatus, and, in fact, everything necessary for treating the device and sealing the bottles or cans, and when the air-pump is not working the packed material may be carried from the room to any place for shipment.

There are two ways in which the pressure at which the inner tube A will explode can be varied for different tubes. If all the tubes are made of the same strength, the pressure of air in the air-chamber can be constantly varied by means of the escape-valve and pump, as hereinbefore set forth, so that no two tubes A in any one gross will explode or be crushed when the difference in pressure between the inside and outside of a tube A is the same. If the tubes A are made of varying strength, the air-pressure can be kept constant and the same result will be obtained. If desired, the two methods can be used, one at one time and the other at another. If the tubes be made of different strength, the number of ounces or pounds pressure at which an inner tube A will explode or be crushed will be marked on each box of tubes at the time they are packed by the manufacturer. When the workmen are ready in the air-chamber, the doors are closed, the air-pump is started, and the escape-valve is set to maintain a constant pressure, or by changing the pump and valve the pressure will constantly vary. The air inside the inner and outer tubes A and B and in the necks of the bottles, cans, or jars is compressed to the same degree as the air in the chamber and the liquor or contents of the bottles, jars, or cans is subjected to the same pressure. The inside of the inner and outer tubes A and B having been washed and dried before being brought into the air-chamber, the workmen close the openings 11 in the inner tubes A by using a flame and blowpipe or some other adequate means which will draw the edges together, or the workmen heat the edges and seal the openings 11 with melted glass, which unites the edges and hermetically closes said openings. When the inner tubes A thus treated are washed and dried, they are placed inside of the outer tubes B. The serrated edges 12 of the ends of the inner tubes A fit rather closely to the inside of the outer tubes B, so that the inner tubes cannot be broken by striking against the inside or ends of the outer tubes, but the air can pass without obstruction. The workmen now seal the ends 15 upon the outer tubes in any approved manner, and then the outer tubes, containing the inner tubes, are placed inside of the bottles, jars, or cans. When the contents of the bottles, jars, or cans are liquid, the air in the outer tubes will not be apt to escape through the openings 14 in their bottom portions; but should the air escape through said openings into the neck of the bottle and some of the liquid take its place in an outer tube B the pressure upon the liquid will be the same as the pressure of the air, and therefore the pressure upon the outside of the inner tube A will remain the same and the inner tube will not explode until the bottle, jar, or can is opened. After the tubes have been placed in the bottles, jars, or cans said bottles, jars, or cans are corked and tightly sealed. The dealer who receives the packages prepared as above has no means of knowing at what degree of pressure the inner tubes will explode or be crushed in. The tubes thus prepared and placed in the bottle, jar, or can with a glass top are a perfect guarantee of the integrity of the contents as originally packed. It is absolutely impossible to open a bottle, jar, or can prepared as above without causing the inner tube to explode unless the bottle, jar, or can is opened in an air-chamber with an air-pressure the same as when the inner tube A was filled, or, if the air-pressure was constant, by knowing at what pressure the inner tube was made to explode or to be crushed in and varying the air-pressure accordingly to prevent the explosion or crushing, since if the bottle, jar, or can is opened and the air-pressure in the chamber is less than the amount required the tube A will explode, if it is more it will be crushed in, and it is evident it would be too expensive an experiment to fit up an air-chamber for the purpose of opening bottles, jars, or cans and extracting the tubes whole to be used for the purpose of selling spurious goods when the result would be so disastrous.

The reason of the explosion of the inner tube is this: The moment the cork or air-tight covering is removed or a hole is bored in it or the bottle, can, or jar is opened, or anything happens which allows the air or any part of the contents to escape, from that moment the pressure is relieved from the air and contents in the receptacle, and that relieves the pressure upon the fluid or air in the outer tube B, which escapes through the opening 14 in the said outer tube into the liquid in the receptacle and through the liquid into the neck of the bottle, and so into the outer air. The compressed air in the inner tube A pressing against the inner wall of the body of said inner tube bursts or explodes the said body the moment the amount of pressure on the outside of the tube A is reduced to a predetermined number of ounces or pounds by the escape of the compressed air from the outer tube B. The compressed air that was contained in the inner tube A escapes into the outer tube B and thence through the opening 14 into the liquid, and so into the outer air. The purchaser has only to look and see if the bottle, can, or jar contains the tubes uninjured to be assured that the receptacle contains the original contents.

In Fig. 6 I have shown a difference in the construction of the detector device, the difference consisting in that the inner tube A is reversed in position in the outer tube B, the sealed opening 11 of the inner tube being at the bottom thereof, and instead of the out-

let-opening 14 being placed at the bottom of the outer tube an opening 14^a is located at the upper end of the outer tube, the wall of the said opening extending inward.

In Fig. 7 I have illustrated a cross-section through the inner tube A, in which side fins 17 are attached to the exterior of the said inner tube A to take the place of the extensions 12 from the ends of the said tube. In Fig. 8 the outer tube B has its upper end closed in the manner heretofore described, but the lower end of the outer tube is open and provided with an exterior thread 18. The open end of this outer tube B is closed by a cap 19, having a threaded flange 20, adapted to be screwed upon the threaded portion of the outer tube. The cap is so secured to the body of the outer tube that the air may escape between the outer tube and the flange of the cap, so that an air-vent 14 or 14^a is not necessary. The form of the inner tube A shown in Fig. 8 is the same as that shown in Fig. 2.

Under the construction shown in Fig. 9 the outer tube B is made in the same manner as has been described with relation to Fig. 8; but the inner tube A is provided with a neck 21 at its upper end, in which a cork 22 is placed, and this cork is held in position by a seal 23 of any approved description. In Fig. 10 the outer tube B is closed at the bottom and open at the top, and at the open top a cork 24 is introduced, containing a small vent-tube 25, which establishes communication between the outside of the outer tube and the inside, and the inner tube A, which is constructed in the same manner as that shown in Fig. 9, with the exception that the guards 12 are omitted, is shown in Fig. 10 as reversed, the sealed portion of the inner tube being made to rest upon the bottom of the outer tube.

In the construction shown in Fig. 11 I have shown the outer tube B and the inner tube A as made in one casting or molding. The opening 11 at the top of the inner tube to be sealed is in this event carried out above the top of the outer tube B, and a vent 14^b for the outer tube, corresponding to the vents 14 and 14^a, is made in the bottom of the outer tube and is surrounded by an inwardly-extending sleeve.

When the contents of the receptacle B is opaque, the detector is placed at the neck of the bottle, where it can be seen.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A detector for receptacles, comprising a sealed vessel independent of the receptacle, adapted to be placed therein, and capable of being broken by fluid-pressure when the receptacle is opened to the atmosphere.

2. A detector for sealed receptacles of the character described, the said detector consisting of a fragile vessel capable of being broken by air or fluid pressure, and adapted to be placed in said receptacle, the said fragile vessel being fractured when the seal of the receptacle is broken, as described.

3. A detector for receptacles, such as glass bottles or jars, or metallic cans having a transparent cover, the said detector consisting of a fragile sealed vessel adapted to be broken by air or fluid pressure, and placed within the receptacle containing fluid or solids, the said vessel and receptacle being sealed under pressure differing from the normal atmosphere's pressure, the said fragile vessel being constructed to break when the receptacle is opened to the atmosphere, as set forth.

4. A detector for glass bottles or jars, or cans having a transparent cover, consisting of a fragile vessel capable of being broken by air or by fluid pressure, and an inclosing vessel for the fragile vessel, adapted to withstand the fluid or air pressure necessary to fracture the fragile vessel, both of the said vessels being adapted to be placed in the bottle, jar or can containing solids or fluids, the fragile vessel and the said bottle, jar or can being hermetically sealed.

5. A detector for glass bottles or jars, or cans having a transparent cover, consisting of a fragile vessel hermetically sealed and adapted to be broken by air or by fluid pressure, and an inclosing transparent vessel of greater resistance than that of the fragile vessel, both of the said vessels being charged with air at a greater or a less pressure than normal.

6. A detector for glass bottles or jars, or cans having a transparent cover, consisting of a fragile vessel capable of being broken by air or fluid pressure, which vessel is hermetically sealed, and an inclosing transparent vessel of greater power of resistance than the inclosed fragile vessel, the inclosing vessel being provided with a vent and both vessels being charged with air at a greater pressure than normal, as set forth.

7. The combination, with a receptacle the mouth of which is hermetically sealed, of a detector comprising a fragile vessel capable of being broken by air or by fluid pressure, which vessel is hermetically sealed, and an inclosing transparent vessel for the said fragile vessel, the inclosing vessel having greater power of resistance to atmospheric pressure than the fragile vessel, the inclosing vessel being provided with a vent and both of the said vessels and the receptacle being charged with air at the same pressure, which pressure is greater than the normal pressure, as set forth.

8. The combination with a receptacle sealed under pressure, of a detector comprising a sealed fragile vessel arranged in said receptacle and containing fluid under the same pressure as the pressure in the receptacle, the said vessel being capable of being crushed or broken by the difference in the pressure on the inside and outside of the said vessel caused by opening the receptacle, as set forth.

9. A detector for receptacles, comprising an outer transparent vessel provided with a

vent, and an inner vessel, the body of which is of less diameter than the outer vessel and spaced from the inner wall thereof, the said inner vessel in whole or part having less power of resistance to pressure, than the outer vessel, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN J. BROWN.

Witnesses:
R. H. WATTERSON,
FRED M. ROOT.