

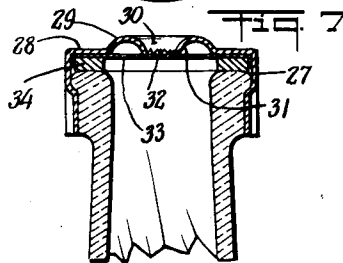
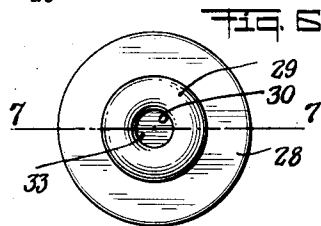
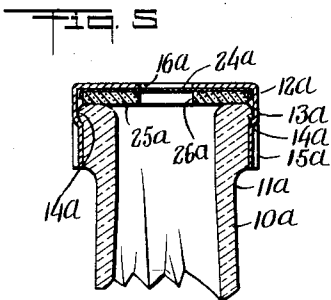
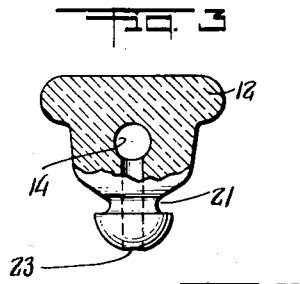
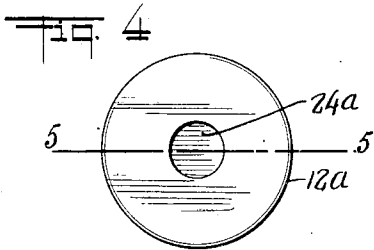
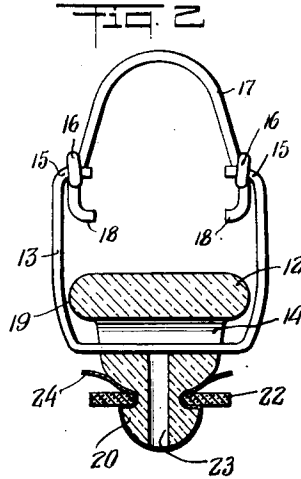
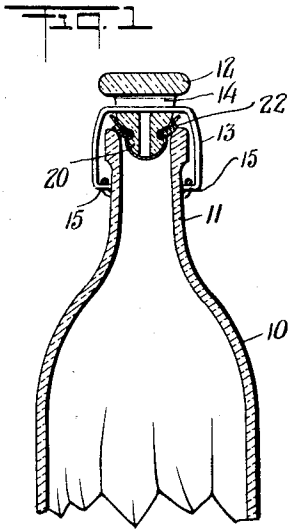
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A. LOWY

1,725,092

BOTTLE CLOSURE

Filed Sept. 21, 1927



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# UNITED STATES PATENT OFFICE.

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## BOTTLE CLOSURE.

Application filed September 21, 1927. Serial No. 221,126.

This invention relates to a bottle closure, particularly for containers of liquids charged with effervescent gases or capable of generating a gaseous ingredient resulting from fermentation. The invention contemplates the provision of a closure member capable of withstanding the gas pressures in highly charged beverages or particularly those which generate a high gaseous content, resulting from fermentation. In the production of malted beverages, such as beer, high internal pressure may be accumulated due to the continued fermentation of the components. This pressure sets up a tremendous force which, with the ordinary type of closure, will cause the shattering of the glass container or bottle, sometimes accompanied with such explosive force as to be hazardous and likely to cause injury to anyone in the immediate vicinity thereof. Glass bottles used to store these effervescent beverages will, on some occasions, withstand the accumulated pressure of the internal gases but have been found, upon slight jarring, to burst and shatter the glass vessel, causing painful injury to the attendant.

My invention, therefore, has for an object thereof the provision of a closure for containers such as bottles made of glass so constructed and arranged as to include a safety device whereby effervescent or charged beverages or beverages which are in the process of fermentation and become heavily charged with gases may be relieved of the accumulated pressure when this is stored in excess of the factor of safety of the designed pressure of the vessel. My invention contemplates the provision of a closure for containers adapted to hold liquids under pressure or those generating gaseous ingredients to produce high internal pressures, the closure being capable of forming a seal for retaining the liquid and its contents under normal pressures but capable of releasing a quantity of the gas when the internal pressure is greater than the safety factor of the glass vessel; the provision of a closure for retaining liquids under pressure, the closure including a readily rupturable element which will serve to release the gases within the vessel when the pressure within the vessel has reached a point in excess of the safety factor of the readily shatterable vessel.

In its more particular form, my invention contemplates the provision of a closure for

bottles adapted to retain liquids under pressure, the closure including a safety release orifice normally held closed by readily rupturable material, such as tin foil or the like, the tin foil being so chosen as to its property to resist rupture so that a pressure per unit area thereof will be less than the factor of safety of a glass vessel whereby the pressure within the vessel will be reduced and a portion of the contents of the vessel will be emitted through the ruptured material before any tendency on the part of the glass vessel to burst and shatter the glass or cause loss of the fluid contents thereof.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawing forming a part hereof, in which

Figure 1 is a side elevation in section of a fragment of a bottle disclosed in my invention;

Figure 2 is a detail of a closure in one embodiment thereof, showing a section thereof;

Figure 3 is an end elevation partly in section, of the closure plug shown in Figure 2;

Figure 4 is a plan view of the top of a cap showing a modification of my invention;

Figure 5 is a section on a line 5—5 of Figure 4;

Figure 6 is a plan view of a still further modification;

Figure 7 is a section taken on a line 7—7 of Figure 6.

Making reference to the drawing, I illustrate the same in connection with a bottle 10 whose neck 11 is provided with a closure plug 12, held in position by a wire strap 13, passing through a transverse orifice 14 whose terminals 15 are pivotally mounted within the ears 16 of the inverted U-shaped lever member 17. The terminals 18 of the member 17 are arranged to pivotally engage a permanent collar of conventional form, providing the fulcrum for the U-shaped lever arm 17. This mechanism for retaining the closure 12 in position is of conventional form. The plug 12 which is customarily made of porcelain or glass has an enlarged head 19 and a restricted nose portion 20 below the transverse orifice 14. Intermediate the end of the nose portion there is provided a restricted flange 21, adapted to hold a resilient washer 22, made of rubber or the like.

From the nose portion and connecting with the orifice 14, there is provided a longitudinal orifice 23. In its position over the neck of the bottle 11, the longitudinal orifice 23 connecting with the transverse orifice 14 will provide ready access to the atmosphere from within the bottle. For purposes of storage of highly charged or effervescent beverages or beverages which may become charged with gas due to fermentation and to retain the normal, desired pressure of this beverage within the vessel, prior to the positioning over the flange 21 of the resilient washer 22, the nose 20 has placed thereover a readily rupturable sheeted material, such as tin foil, celluloid or the like, shown at 24 and is held in position beneath the washer 22, previously described. With the orifice 23 closed by the sheet of tin foil as shown in Figure 2, the plug 12 is positioned over the neck of the bottle in the normal way after the container has had deposited therein its fluid contents of charged beverage or a liquid which is likely to ferment and becomes charged with a gaseous material. The sheeted material 24 and the size of the orifice which the sheeted material closes are so chosen as to withstand rupture by certain predetermined pressures. This pressure is chosen so as to be greater than that desired to be retained within the fluid but less than the factor of safety of the glass vessel, which, however, it will be understood, may be made of any other material.

It will be observed that by my construction, undue increase in pressure within the vessel due to exposure to heat of a bottle of the liquid or material charged with gas or where a fermentable liquid is stored due to an overproduction of gaseous material, the sheeted material 24 will yield and be ruptured by the excess pressure within the bottle, allowing the escape of some of the gases through the longitudinal orifice 23 and outwardly through the transverse orifice 14. It will be observed that the orifice 23 is of such dimensions as to prevent any undue loss of the liquid contents of the container but such release of pressure will serve to prevent the breakage of the vessel and the harmful shattering of broken pieces of glass.

In the embodiment shown in Figures 4 and 5, the bottle 10<sup>a</sup> has its neck 11<sup>a</sup> provided with a closure 12<sup>a</sup> of the crown seal type wherein the dependent flange 13<sup>a</sup> is crimped over the bead 14<sup>a</sup> of the bottle by a plurality of depressions shown at 15<sup>a</sup>. The bead of the seal, however, differs in this respect that an orifice 16<sup>a</sup> is provided. Within the crown seal in superposed position there is provided first a sheet of readily rupturable material 24<sup>a</sup>, held in position by an adhesive and yieldable gasket material such as composition cork or the like, 25<sup>a</sup>. This gasket 25<sup>a</sup> is also provided with an orifice 26<sup>a</sup> under-

lying the orifice 16<sup>a</sup>. In the position as shown, the layer of readily rupturable material 24<sup>a</sup> serves to close the neck of the bottle in the manner as described in connection with the construction shown in Figures 1, 2 and 3. Similarly, the orifice provided by 16<sup>a</sup> and 26<sup>a</sup> is so chosen in respect to the size of the opening of the bottle and the character of the readily rupturable material 24<sup>a</sup> as to retain pressures within the vessel in accordance with the previously described modification but capable of being ruptured when conditions within the bottle will tend to burst the bottle if a solid head or closure were provided.

In the embodiment shown in Figures 6 and 7, the crown seal or cap 17 has its top portion 28 provided with a concentric bead 19, offset upwardly from the flattened head 28 so as to provide an orifice 30 at the inwardly directed flange 31, the edges of which are provided with piercing points 32. These piercing points 32 are in alignment with the flattened portion of the head 28. Within the cap I position in superposed relation a disk of readily rupturable material such as tin foil 33, and adhesively hold the same in position with a ring 34, made of composition cork, rubber or the like. The disk of readily rupturable material, such as tin foil 33, as it will be observed, is supported at its rim within the cap by the flattened portion 28 and is unsupported immediately below the cap, underneath the hollow portion formed at the head 29 and just in contact with the mouth of the inwardly directed flange 31 so as to be barely supported by the piercing points 32 thereon provided. A cap of this character may be used to seal the neck of a bottle in the manner as described in connection with the modification shown in Figures 4 and 5 wherein the side walls of the crown seal are crimped in position in a manner well known, the gasket 34 resting upon the neck of the bottle to give a gas tight seal. In this modification, the layer of tin foil immediately beneath the flattened portion 28 will be substantially unsupported. Any undue increase in pressure beyond that calculated to be retained within the vessel with safety will cause the tin foil to be bulged to such an extent whereby the piercing points 32 will serve to facilitate rupturing of the tin foil or similar material, where this is provided.

In this form of construction, particularly, I may substitute for the tin foil or thin sheets of celluloid, materials having greater tensile strength but capable of being easily pierced and it will be observed that the pronged neck 31 functions in a manner similar to the mouth of the nose 20 about the orifice 23 in the embodiment shown in Figures 1, 2 and 3, wherein the reduced portion

of the nose 20 assists materially in rending and puncturing the covering material of tin foil or the like.

It will thus be observed that I have provided a closure for vessels adapted to retain materials under pressure and include a safety factor to avoid hazardous handling in storage of such material.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is

1. A sealing device for bottles containing liquids under pressure comprising a closure head having a portion thereof adapted to communicate with the atmosphere disposed with an entrance to the interior of said bottle, a readily rupturable material for closing said portion at the interior portion mentioned, said portion and said material being so formed as to withstand pressures less than the pressures which may be accumulated within the bottle whereby pressures in excess of the safety factor of said bottle will be avoided.

2. A sealing device for bottles containing liquids under pressure comprising a closure head including a gas release orifice disposed with an entrance to the interior of said bottle adapted to relieve the pressure within the container without substantial loss of the fluid contents thereof, a readily rupturable material disposed to close said orifice at the interior portion mentioned, said material being capable of withstanding normal pressures within the bottle but rendible at pressure which will burst the bottle.

3. A sealing device for bottles containing liquids under pressure comprising a closure head, an orifice formed therethrough adapted to connect with the atmosphere when said closure member is disposed upon the neck of said bottle with an entrance portion disposed towards the interior of said bottle, means to close said orifice at the interior portion thereof comprising a readily rupturable material, a gasket disposed

on said head to hold said material in position and serving to form a gas tight seal with the neck of said bottle.

4. A sealing device for bottles comprising a closure plug, means on said plug to engage a bottle neck and hold the same against displacement thereupon including a strap member and a pressure lever mounted on said plug, a by-pass orifice through said plug for connecting the bottle to the atmosphere connected with said strap member holding portion and having an entrance interior of said bottle, said plug being formed as to hold a resilient gasket thereover and position a readily rupturable material for sealing said orifice and interior entrance portion.

5. A sealing device for bottles comprising a closure plug, means on said plug to engage the bottle neck and hold the same against displacement thereupon, including an embracing portion for the bottle neck and resilient means for holding the same thereon, an orifice through said plug for connecting the bottle to the atmosphere having an entrance interior of said bottle, said plug being so formed as to hold a resilient gasket and position a readily rupturable material for sealing said orifice and entrance of said orifice within said bottle.

6. A sealing device for bottles comprising a closure, means on said closure to engage the bottle neck and hold the same against displacement thereupon, an orifice through said closure for connecting the bottle to the atmosphere and having an entrance portion interior of said bottle, said closure being so formed as to hold a resilient gasket and position a readily rupturable material for sealing said orifice at the entrance portion, the orifice being of a size which when used with the rupturable material will support a bottle pressure less than that which will break and shatter the bottle.

In witness whereof I have hereunto signed my name this 17th day of September, 1927.

ALEXANDER LOWY.