May 18, 1954 R. H. RICHMOND, SR 2,678,758

BAIL OPERATED CLOSURE FOR GASOLINE CANS AND THE LIKE

Filed June 23, 1951 3 Sheets-Sheet 1

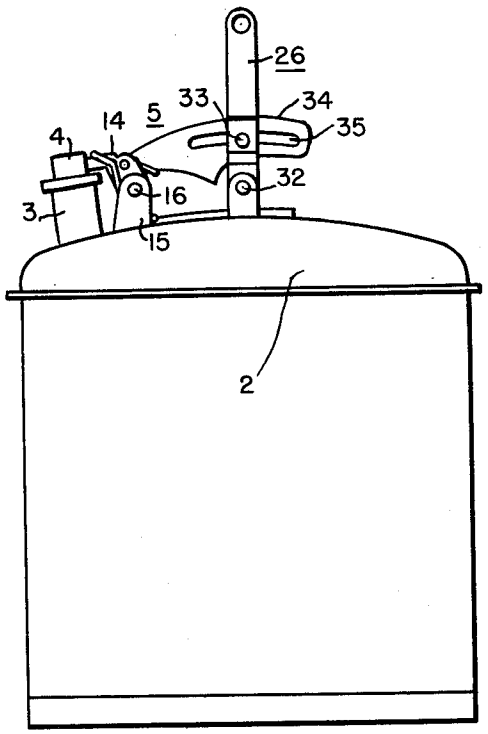


Fig.1.

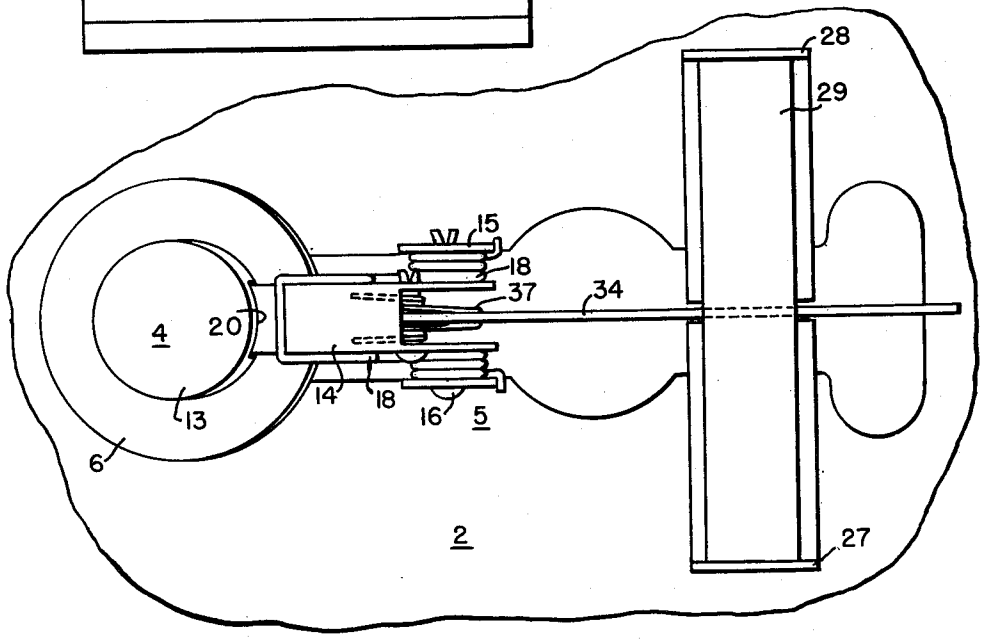


Fig.2.

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Fig.3.

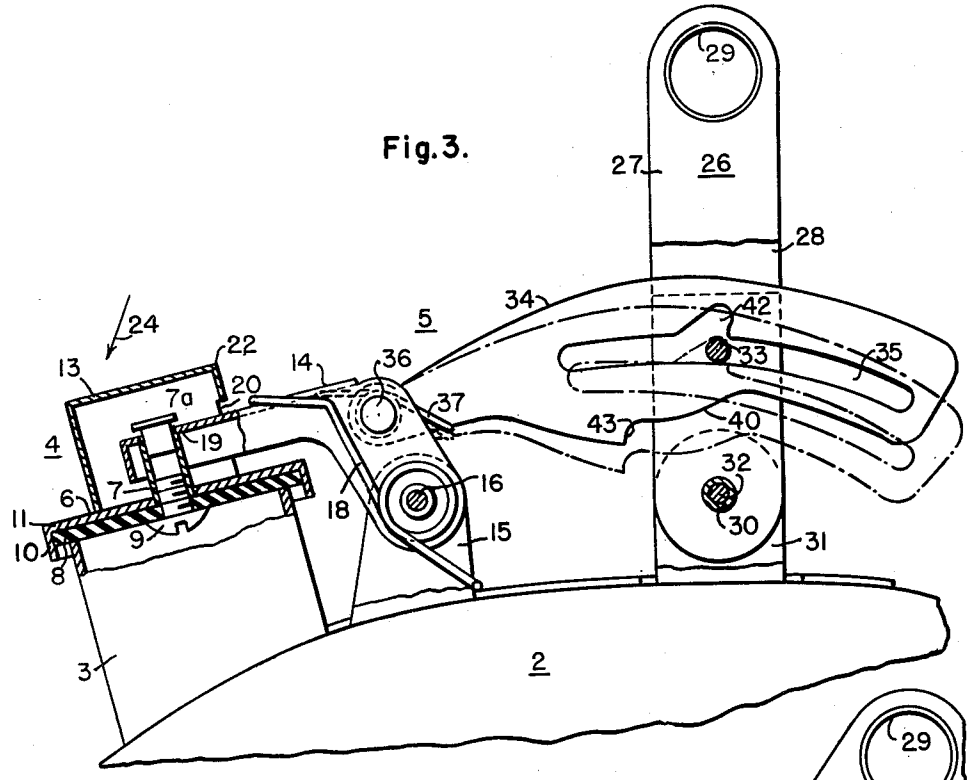
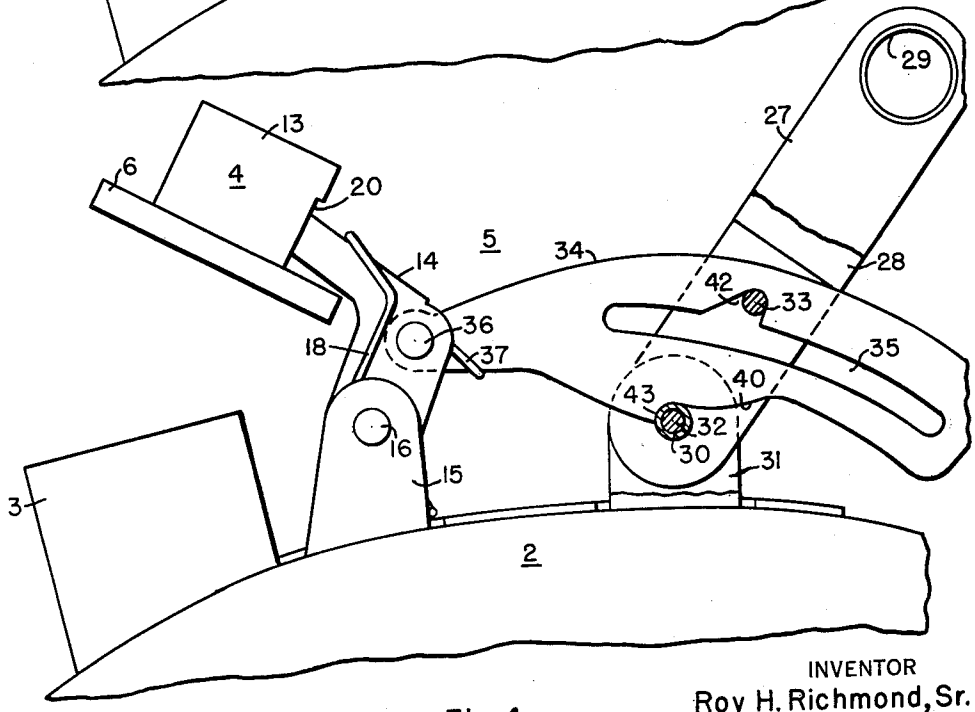


Fig.4.



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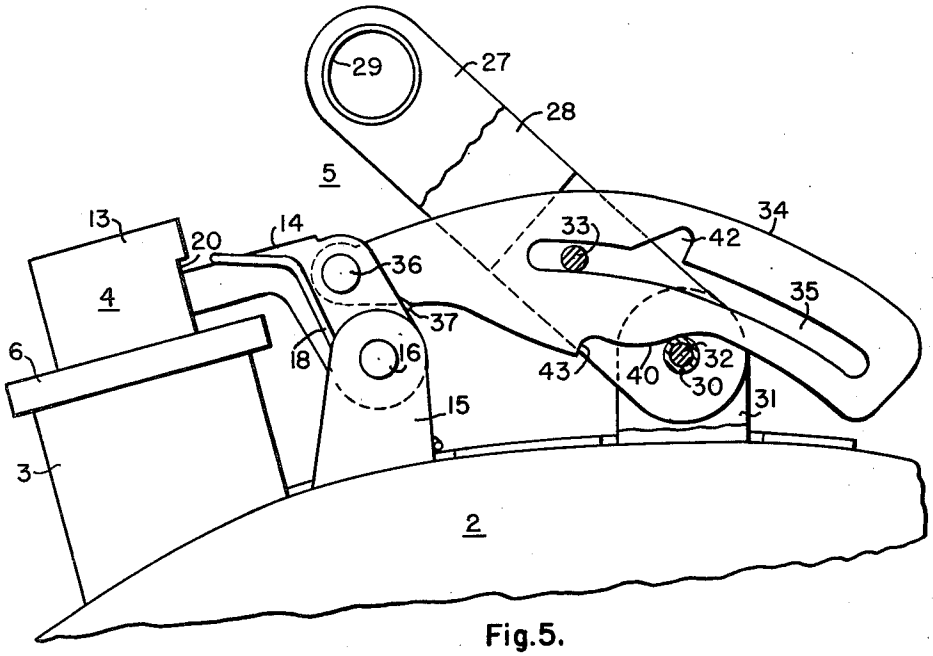


Fig.5.

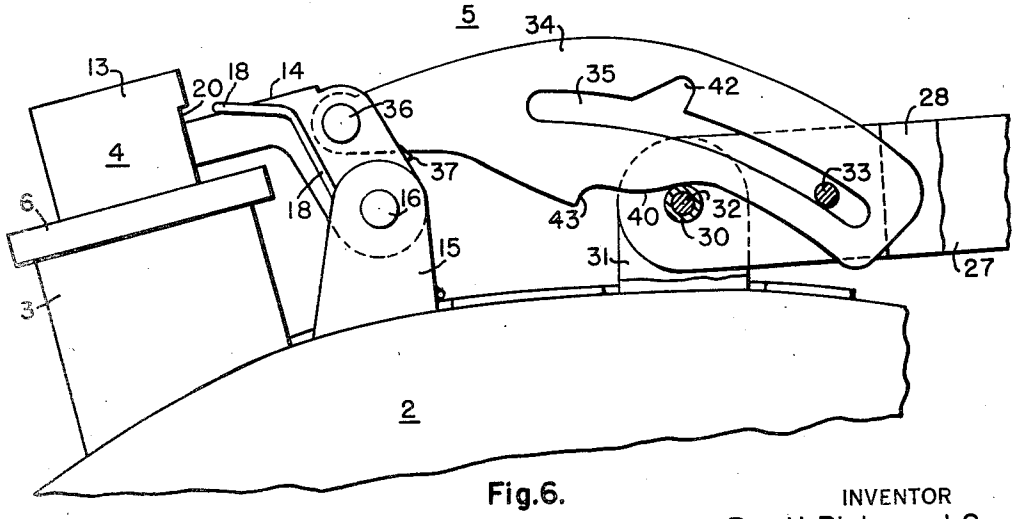


Fig.6.

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BAIL OPERATED CLOSURE FOR GASOLINE CANS AND THE LIKE

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Application June 23, 1951, Serial No. 233,185

7 Claims. (Cl. 222—469)

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This invention relates, as indicated, to an improved arrangement of bail operated closures for gasoline cans and the like.

Fluid containers for gasoline and other volatile liquids are advantageously provided with closures which are bail or otherwise operated to open position only when the container is manually supported. The provision of such closures is desirable in that the closure is automatically returned to its closed position when the container is placed on the ground. However, such closures are frequently objectionable for the reason that they may be accidentally operated to open position, for example, when the container is upset and strikes other objects in rolling or moving over the ground or other supporting surface. Accidental operation in this manner may result in spillage of the contents of the container. In its broader aspect, this invention is concerned with the elimination of accidental operation of closure operating mechanism of this nature.

More specifically, this invention is concerned with an improved form of bail operated closure mechanism of the type illustrated in Patent No. 1,954,983, issued April 17, 1934 to LeRoy O. Brown. In this patent, there is disclosed a container having a pour and fill spout and a cap for opening and closing the outer end of the spout. The cap is mounted on one arm of a bell-crank lever, the other arm of which is pivotally connected to an operating link which has a pin and slot connection with the carrying bail for the container. When the container is tilted while held by the carrying bail, the operating link and bell crank lever are actuated to move the closure cap to its open position. Thereafter, the closure cap will automatically move to its closed position when the container is placed on the ground or restored to an untilted position. However, the form of bail operated closure mechanism shown in this patent has the objectionable feature of moving the closure cap to open position when its operating mechanism is accidentally operated by accidental movement of the carrying bail relative to the container. In a more specific aspect, this invention is concerned with an improved form of bail operated closure mechanism of the type shown in this patent which will be effective to maintain the cap closure in a closed position at all times even though the container be upset and be rolling about on the ground or other supporting surface.

One of the principal objects of this invention is to provide a manually operable closure mechanism for gasoline cans and the like which will

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automatically return the closure to its closed position whenever the container is placed on the ground and which will effectively eliminate the possibility of accidental movement of the closure to its open position.

A further object of the invention is to provide a bail operated closure mechanism for gas cans and the like in which an operable connection between the bail and the closure operating mechanism is automatically broken upon manual release of the bail.

A still further object of the invention is to provide in a bail operated closure mechanism of the character referred to a releasable connection between the bail and the closure operated mechanism which is normally inoperative to transmit movment of the bail to the closure operating mechanism but which may be manually operated to provide an operative connection therebetween.

Another object of the invention is to provide in a bail operated closure mechanism, of the character referred to, an improved arrangement of apparatus which will be effective only to increase the closing force applied to the closure member in response to accidental operation of the closure mechanism by the bail.

Other objects and advantages of the invention will be apparent from the following description.

In the drawings, there is shown a preferred embodiment of the invention. In this showing:

Fig. 1 is an elevational view of a fluid container having a closure member operating mechanism embodying the principles of this invention;

Fig. 2 is a fragmentary enlarged plan view of the container of Fig. 1;

Fig. 3 is a fragmentary enlarged elevational view, partly in section, showing the closure operating mechanism of Fig. 1 with the cap in closed position;

Fig. 4 is a fragmentary enlarged elevational view showing the closure operating mechanism of Fig. 1 with the cap in open position; and

Figs. 5 and 6 respectively show the relative positions which the operating mechanism may assume with the closure cap in its closed position.

The container illustrated in Fig. 1 is one of conventional cylindrical shape having a top cover portion 2. The cover portion 2 is sheet metal stamping having a pour and fill spout 3 adjacent an edge thereof. The spout is sealed by a cap generally designated 4 which is operated by a mechanism generally designated 5.

As best shown in Fig. 3, the cap 4 comprises an inverted cup-shaped cap member 6 having a centrally positioned short tubular section 7 pro-

jecting upwardly from the top surface thereof. A sealing washer 8 which may be rubber or other suitable gasket material is fitted into the cup-shaped cap member 6 and is secured therein by means of a screw 9 which has a threaded engagement in the lower end of tubular section 7, the head of the screw having holding engagement with the washer 8. The gasket or washer 8 seats on the end of spout 4 to seal the spout.

The washer and cap, being of larger diameter than the spout, have a radially overhanging portion 10 thereabout. By reason of this overhang, a blow on the edge of the cap, for example at point 11, may cant it to a position in which the spout is partially open thereby enabling leakage through the spout. To eliminate partial opening in this manner, the cap is provided with a tubular extension 13 which has a diameter only slightly less than the cap. The extension 13 projects upwardly from the cap and has its lower end secured as by welding or other suitable means to the cap 6, in a position forming a housing for the tubular section 7. In a manner to be described, the extension 13 is effective to prevent canting of the cap to open position.

The cap is mounted on the outer end of one arm of a bell-crank lever 14 which has the outer end of its other arm pivotally connected to a bracket 15 by a pin 16. The bracket 15 may be a U-shaped stamping of sheet metal having the bight thereof secured by spot welding to the top 4 of the container. A torsion spring 18 which is coiled about pin 16 is anchored at one end to the bracket 15 and at the other end to the lever 14 and applies a counterclockwise bias to the lever, as viewed in Fig. 3, forcing the free end of the lever 14 down upon cap 4 to assure positive seating of the cap on the spout. The mounting of the cap on the free end of the bell-crank lever 14 is deliberately made loose to provide relative movement between the cap and lever to assure seating of the cap on the spout. This mounting of the cap is effected by part 7a which extends loosely through an opening 19 in the end of lever 14, and has its lower end secured to the upper end of the tubular section 7. Part 7a may be press-fitted or threaded in the upper end of tubular section 7. The material of the lever about its opening 19 abuts against the upper end of the tube 7 and is effective to apply the bias of the spring 18 to seat the cap on the spout 4. The lost motion of the part 7a provides a support for the cap about which it may wobble and automatically seat on the spout.

Thereafter the tubular extension 13, which has a slot 20 in the side through which the lever 14 extends, is secured to the cap portion 6. The lateral and vertical dimensions of the tubular extension 13 are proportioned essentially as shown to afford impact of the surface over which the container may be tumbling, in most instances, with the upper edges of the tubular extension 13, for example at points such as 22, thereby preventing impact of such surface with the cap portion 6 along edge 11, when the relative movement between the container 6 and the surface over which tumbling occurs is in a direction generally represented by arrow 24 and other corresponding directions. Blows against the cap closure such as are encountered when the container is upset and strikes objects in rolling about are applied to the extension 13 and are distributed thereby around the periphery of the spout 3. Canting of the cap on the spout 3 is thereby minimized if not entirely eliminated.

The operating mechanism for the closure member or cap 4 includes the carrying bail 26 which is formed of a pair of strap metal side portions 27 and 28 connected at their upper ends by a tube 29 forming a hand grip. The strap side portions are connected at their lower ends by a tubular member 30 extending between the side portions and parallel to the hand grip 29. A U-shaped bracket 31 has the bight thereof secured to the top 2 of the container substantially centrally thereof and mounts a pivot pin 32 which extends through the tubular member 30 to provide a pivotal connection of the carrying bail to the container. An operating pin 33 is secured across the spaced side portions 27 and 28 of the carrying bail at a point radially displaced from the pivot pin 32.

A link 34 stamped from sheet metal, or otherwise suitably formed, is provided with an arcuate slot 35 disposed longitudinally of the link and terminating adjacent one end thereof. The other end of link 34 is pivotally connected to the bell-crank lever 14 at the junction of its arms by a pin 36. The slotted end of link 34 passes between the side portions 27 and 28 of the carrying and operating pin 33 which extends through the slot 35 therein.

A counterclockwise bias is applied to link 34, as viewed in the drawings, by a torsion spring 37 which is coiled about connecting pin 36, one end being connected to lever 14 and the other end being connected to link 34. This counterclockwise bias forces the lower uniform edge of slot 35 upwardly against operating pin 33. Hence, upon pivotal movement of the carrying bail between its extreme left- and right-hand positions, as viewed in Figs. 5 and 6, respectively, the operating pin 33 rides over the uniform lower edge of slot 35 without interference therefrom. Throughout this movement the link 34 moves between its uppermost position when the carrying bail is vertical, as seen in Fig. 3, to its lowermost position (indicated by the broken lines in Fig. 3), and in so moving pivots about connecting pin 36. Figs. 5 and 6 illustrate the relative positions of the parts with the bail in a collapsed position and the pin 33 adjacent the ends of the slot 35.

Movement of the slotted end of link 34 downwardly, as viewed in the drawings, against the bias of torsion spring 37 is limited by engagement of the lower edge of the link 34 with tubular bridging member 30 of the carrying bail. This lower edge 40 is cam shaped, the surface thereof being inclined downwardly from right to left toward lever 14, so that upon application of downward pressure on the link 34, the cam surface 40 bearing on tubular member 30 thrusts the link 34 toward lever 14 applying a counterclockwise torque thereto and more securely seating the cap 4 on spout 3. With this arrangement, the application of any force to the link 34, whether through the carrying bail or to the link directly, which forces the link against the tubular bridging member 30 results in an increase in the seating force of the cap 4 on spout 3 due to the camming action of the lower link edge 40. This action prevents the cap from opening when the can may have upset and be rolling about the floor.

An operating pin receiving notch 42 is provided in the upper edge of slot 35 at a point substantially corresponding to a position directly above operating pin 33 when the carrying bail is vertical or just slightly to the left of vertical, as best seen in Fig. 3. This notch opens into the slot 35 and slopes towards the spout or lever

14 to a slight extent. By depressing link 34 when the notch is aligned with the operating pin 33, the pin engages the notch and due to the inclination of the notch the arrangement becomes self-locking when the hand grip is pulled from left to right, tensioning the link 34. The application of sufficient force, from left to right, to the hand grip of the carrying bail, tensions link 34 against the bias of both torsion springs 18 and 37 and rotates the bell-crank lever 14 clockwise lifting cap 4 from its position sealing spout 3.

Clockwise movement of the carrying bail in moving the cap 4 to open position is limited by providing a depending projection 43 on the lower edge of link 34 which after predetermined movement of link 34 from left to right, corresponding to the full open position of cap 4, engages tubular bridging member 30, and arrests movement of the link, as shown in Fig. 4.

In a pouring operation the container may be carried between the hand grip of the carrying bail and the lower right-hand edge of the container in which position, if the container is full, the contents are usually sufficiently heavy to cause movement of the mechanism to the full open position shown in Fig. 4 when the container is tilted. If the weight is insufficient, the application of a small compressive force between the mentioned supporting points is sufficient to move the cap to open position.

It will be appreciated that inadvertent movement of the cap to open position is substantially obviated by the construction shown. The carrying bail is effective at all times to actuate the cap to open position until such time as the notch 42 and the operating pin 33 are deliberately engaged by a manual operation and clockwise torque applied to the carrying bail at the same time, to maintain such engagement. Thus the carrying bail may be employed to transport the container and though free to move, in the event the container is dropped or upset and caused to roll or tumble, is ineffective to unseat cap 4.

Attention is directed particularly to the fact that the provision of the arcuate slot 35 together with the bias of the spring 37 enables free movement of the carrying bail 26 at all times when the actuating pin 33 is out of the notch 42, the bias of the spring 37 being effective to maintain the link 34 in a position with the actuating pin out of engagement with the notch 42. Due to the fact that the radius of curvature of the slot 35 is greater than the distance between the pins 32 and 33, the pin 33 in sliding over the lower surface of the slot 35 is effective to cam the link 34 downwardly against the bias of the spring 37 when the bail 26 is moved in either direction from a vertical position. The camming action of the pin 33 on the lower surface of the slot 35 causes the link 34 to pivot about its pivot pin 36 without imparting movement to the bell-crank lever 14. At the extreme limits of movement of the bail 26 as shown in Figs. 5 and 6, the cam movement imparted to the link 34 by the pin 33 is effective to engage the camming surface 40 with the surface of the tube 30. Further downward movement of the link 34, as explained above, is effective to apply force to the pin 36 in a direction adding to the closing force of the biasing spring 18, thereby increasing the force tending to hold the closure cap in its closed position.

While I have illustrated and described several specific embodiments of my invention, it will be understood that this is merely by way of illustration, and that various changes and modifications may be made therein within the contemplation of my invention and under the scope of the following claims.

I claim:

1. A bail operated closure apparatus for containers having a pour opening comprising a bail member mounted on the container for pivotal movement between two positions, a closure member mounted for movement to and from a position closing said pour opening, operating mechanism for actuating said closure member comprising a connecting link extending between said members, said link having an elongated slot therein, one side of said slot being smooth and the other side of said slot having a notch therein intermediate the ends thereof, a pin extending through said slot and connected to said bail member for movement therewith, a spring biasing said link to maintain said pin normally engaged with said smooth side for sliding movement thereover in response to pivotal movement of said bail member between said two positions without actuating said link or closure member, said link being movable against its bias to move said pin into said notch when said bail member is in a position intermediate said two positions to provide a connection between said link and bail member rendering said bail member operative to actuate said closure member.

2. A bail operated closure apparatus for containers having a pour opening and a closure member movable to and from a position closing said pour opening comprising a carrying bail, a pivot pin pivotally connecting said bail to the container, an operating pin on said bail radially displaced from said pivot pin, an actuating link extending between said bail and closure member and having a pivotal connection with said closure member, said link having an elongated slot therein through which said operating pin extends, said slot having a smooth surface on one side thereof, a spring biasing said link to maintain said smooth side engaged with said operating pin whereby said bail may pivot without imparting movement to said link, said slot having a pin receiving notch intermediate the ends of its other side into which said operating pin may be moved by movement of said link against the force of said biasing spring to provide a connection whereby pivotal movement of said bail will be effective to actuate said link and move said closure member to uncover said opening.

3. The invention claimed in claim 2 characterized by said link having a projection on its underside engageable with said pivot pin to limit pivotal movement of said bail, link, and closure member.

4. The invention claimed in claim 2 characterized by said slot being arcuate and having a radius of curvature greater than the radial spacing of said pivot and operating pins whereby pivotal movement of said bail with said operating pin disengaged from said notch is effective to pivot said link about its connection to said closure member.

5. The invention claimed in claim 4 characterized by the under side of said link having a camming surface engageable with said pivot pin in response to extreme pivotal movement of said link by pivotal movement of said bail to either of two extreme positions, engagement of said camming surface with said pin being effective

to apply a closing force through said link to said closure member.

6. A bail operated closure mechanism for containers having a closure cap movable between open and closed positions and a carrying bail respectively mounted for pivotal movement about spaced and parallel axes comprising a link having a pivotal connection to said cap and an elongated slot having upper and lower side walls, one of which is smooth throughout its length, a pin secured to said bail and extending through said slot, said link having a bias in one direction of pivotal movement thereof for maintaining its smooth side wall normally in sliding engagement with said pin, said slot having a length such that the bail may pivot freely on said container without said pin moving to either end of said slot, the other of said side walls having a pin-receiving recess therein, and a selectively engageable connection between said bail and cap for operating said cap to open position in response to pivotal movement of the bail consisting of said pin and recess and which is formed by manually pivoting said link against its bias with the bail in a predetermined position to effect a relative movement of said pin into said recess.

7. A closure mechanism as defined in claim 6 characterized by said smooth side wall having a shape such that sliding movement of said pin thereover in response to pivotal movement of said bail imparts a limited pivotal movement to said link, together with a camming surface on the underside of said link and a stationary camming member on said container movable into camming engagement with each other upon pivotal movement of said link in response to pivotal movement of said bail to either of its two extreme positions, said camming surface and member upon movement into camming engagement with each other being operative to move said link in a direction closing said cap.

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