Dec. 6, 1949 I. BARCLAY 2,490,194

OPERATING MECHANISM FOR SAFETY CAN CLOSURES

Filed May 17, 1946 2 Sheets-Sheet 1

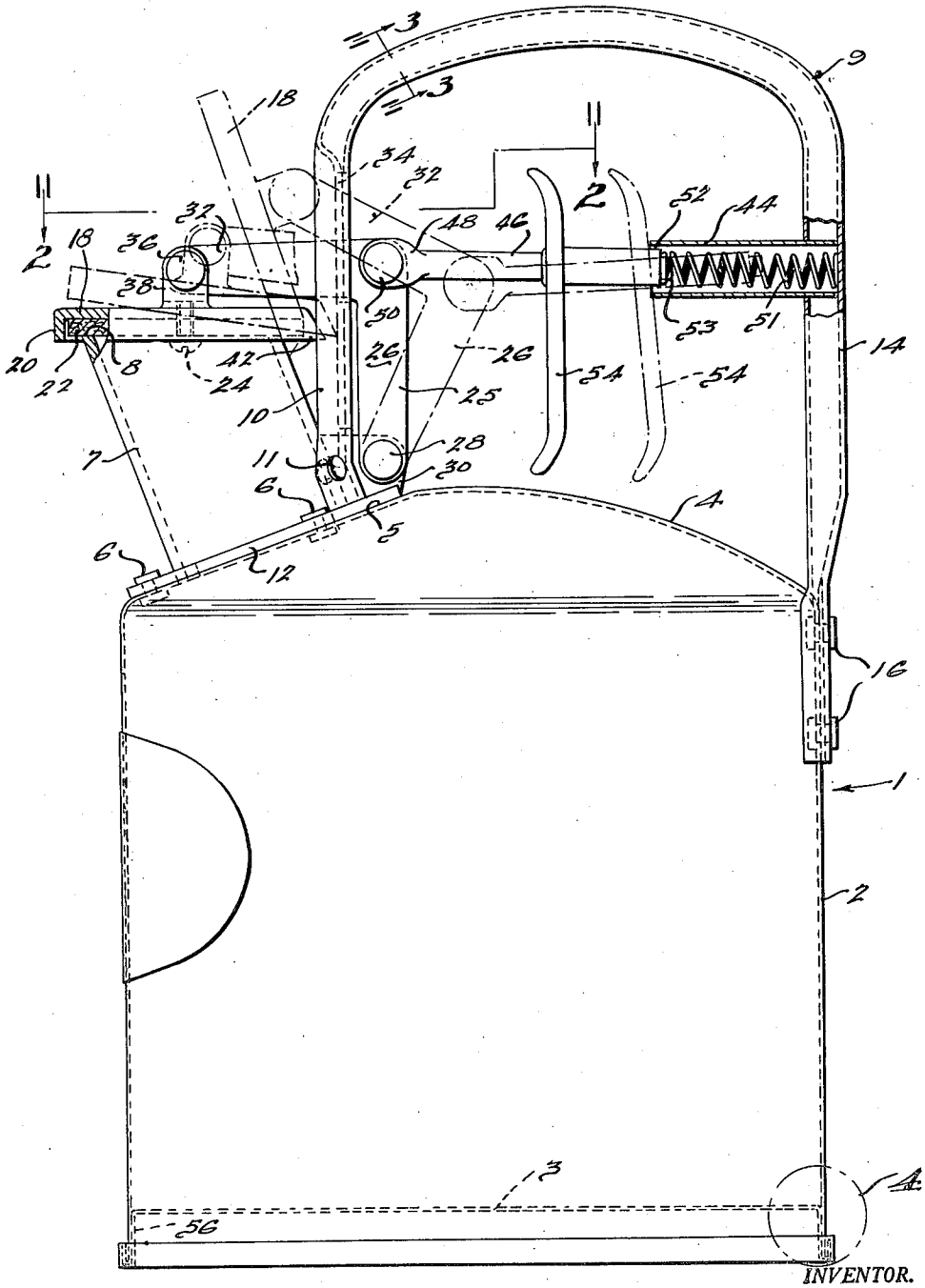


Fig. 1.

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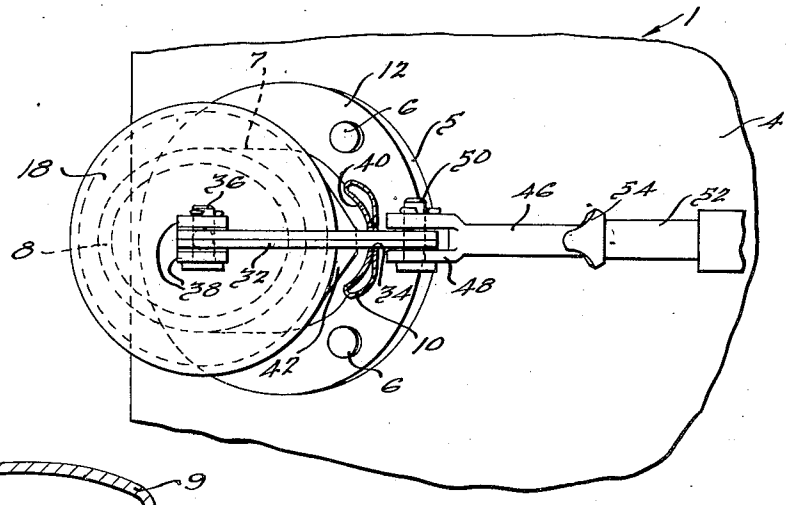


FIG. 2.

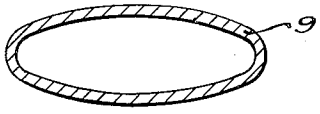


FIG. 3.

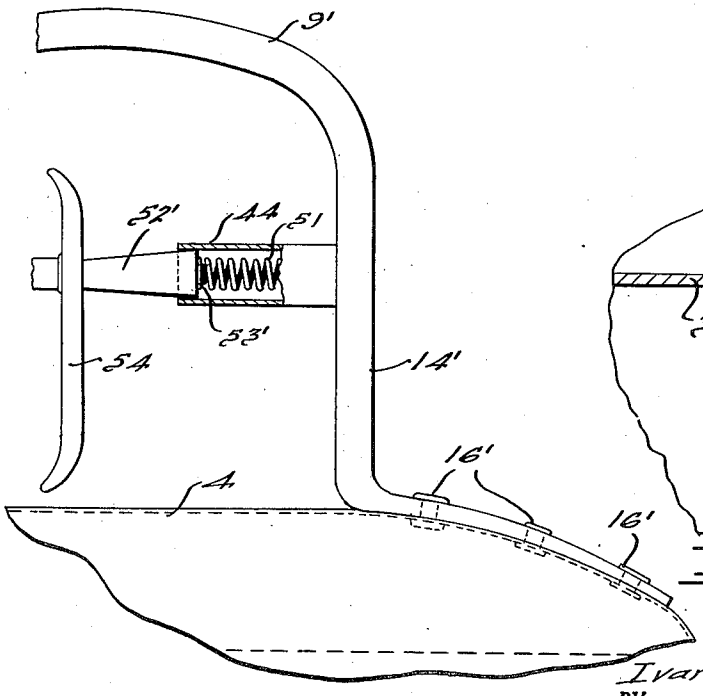


FIG. 5.

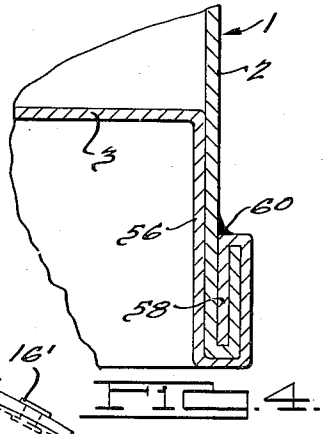


FIG. 4.

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OPERATING MECHANISM FOR SAFETY CAN CLOSURES

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Application May 17, 1946, Serial No. 670,377

6 Claims. (Cl. 222—556)

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This invention relates generally to containers of the class referred to in the art as "safety cans" and particularly adapted, among other uses, for containing volatile fluids.

The main objects of this invention are to provide a new and improved closure member for volatile fluid containers; to provide in such a closure member means to wipe foreign matter from the seating surface to permit complete closure; to provide such a member which will contact the rearward portion of the spout first and then gently but firmly close the spout without a hammering action which might form rings in the surface of the gasket with consequent leakage; to provide such a member in which the majority of the operating parts are positioned within an extremely rigid handle whereby they are protected against distortion and contact with other objects; to provide in such a mechanism an operating spring which is protected from contact with foreign matter which would cause distortion or disintegration; to provide such a closure member which will fully open the spout to provide an unobstructed access thereto for filling the can; to provide such a closure member which will not climb over the edge of the spout and lock itself in open position; and to provide a handle by which the can may be picked up and the spout cap opened with one hand. Further objects will be apparent from a reading of the specification and appended claims.

The invention consists in the improved construction and combination of parts to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

In the accompanying drawings, to be taken as a part of this specification, there is clearly and fully illustrated a preferred embodiment of this invention, in which drawings:

Fig. 1 is a view in elevation of a container embodying the invention;

Fig. 2 is a view taken substantially along the line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged vertical sectional view of the bottom edge construction of the container; and

Fig. 5 is a fragmentary elevational view, partly in section, of a modified form of the invention.

Referring to the drawings by characters of reference, the numeral 1 designates generally a cylindrical container having a side wall 2, a

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bottom wall 3, and a dome-shaped top wall 4. The top wall 4 adjacent the wall 2 has a flattened portion 5 against which is secured, as by rivets 6, the peripheral bottom flange 12 integrally formed on the lower end of a tubular outlet spout 7 which extends upwardly and outwardly from the container at substantially an angle of 30° from the longitudinal axis of the container 1. The top edge or rim 8 of the spout 7 is disposed at such an angle with respect to the spout axis as to be horizontal when the container 1 is upright.

An inverted U-shaped handle member 9 has the lower end of its front vertical leg 10 bifurcated and secured by rivets 11 to the spout 7 adjacent its flange 12. The rear vertical leg 14 of the handle has its lower end collapsed surface to surface and curved to conform to the outer curved surface of the side wall 2 and is secured by rivets 16 to the side wall 2 diametrically opposite the spout 7. The handle member 9 is formed of hollow tubing, elliptical in cross section, as shown in Fig. 3, and provides an exceptionally rigid handle construction for carrying the container and enclosing certain of the working parts. It is furthermore so positioned with respect to the center of gravity of the container that the handle member 9 can be gripped substantially vertically above the center of gravity of the container 1 so that it may be carried substantially perpendicularly in a convenient manner.

Means are provided for closing and sealing the top end of the spout 7 and comprise a cover or cap 18 having a circumferential downwardly extending flange 20 providing a pocket for receiving a disk-shaped sealing gasket 22 held therein by a central screw 24. In closed position of the cap 18, the lower surface of the gasket 22 seats against and seals the rim 8 to prevent the escape of fumes from the container.

An angular lever 26 has a generally upright arm 25 fulcrumed at 28 to an upwardly extending tab or lug 30 integral with the flange 12 and which projects through the bifurcated portion of the front leg 10 of the handle into the space between the parallel handle portions 10 and 14. An upper arm portion 32 of the lever 26 extends forwardly through a longitudinal slot 34 in handle portion 10 and is pivotally secured intermediate a pair of upwardly extending, centrally located, integral tabs 38 of the cap 18 by a pin 36 extending through aligned apertures in the arm 32 and tabs 38. The diameter of the aperture through the arm 32 is somewhat larger than the diameter of

the pin 36, and the spacing of tabs 38 exceeds the thickness of arm 32, thereby providing a loose fit between the cap 18 and arm 32, so that the cap may rock laterally and thereby bear with equal pressure against all points of spout rim 8. The walls of the handle portion 10 adjacent the slot 34 are collapsed to provide an arc-shaped recess 40 which receives a triple-beveled projection 42 of the cap member 18.

The inwardly facing wall of portion 14 is apertured to receive a tubular member 44 fitted therein, seated against the inner surface of the opposite wall of the portion 14 and extending horizontally forwardly within the area bounded by the handle and in coplanar relation to such handle.

A pull rod member 46 is slidably fitted in and projects forwardy from tube 44 and is bifurcated at its forward end 48 to receive the lever 26, which is pivotally secured thereto by pin 50 substantially at the intersection of the arms 25 and 32. The diameter of this rod member 46 is somewhat less than the internal diameter of the tubular member 44 into which the end 52 opposite to the end 48 extends to provide the necessary clearance because of the arc-shaped path of travel of the bifurcated end 48. A helical compression spring 51 is housed within the tubular member 44 and bears between the handle portion 14 and the end portion 52 of member 46. The rear end of member 52 is reduced in diameter to form a pilot 53 which is surrounded by the adjacent end of the spring 51. A grippable member 54 is secured to the rod member 46 intermediate its ends and has portions extending upwardly and downwardly therefrom for convenient gripping by the operator's hand.

The bottom wall 3 of container 1 has a circumferentially downwardly extending flange 56 which telescopes within the side wall 2 and extends beyond the end thereof as at 58. This extending portion 58 is folded around the wall 2, and then the portion of wall 2 lapped by portion 58 is again folded along the wall 2. The top edge of the folded portion may then be suitably sealed at 60 to the outer surface of wall 2 as by soldering. This construction provides for an inwardly inset bottom wall 3 which is sufficiently spaced from the lower end of wall 2 so that the container may be set upon uneven surfaces. It also provides an extremely rigid seating surface and reinforcement against deformation of the container 1.

The construction shown in Fig. 5 is similar to that of the other figures, with the exception that handle portion 14' is formed at its lower end portion to conform to the contour of the top wall 4 and is riveted thereto by rivets 16' rather than being riveted to the side wall 2. In certain sized containers this construction is preferable in order to keep the width of the U-shaped handle member 9 narrow and in correct relationship to the center of gravity of the container, so that when carried, the container will remain substantially perpendicular. It will also be noted that the rod 52' is tapered, and the large end portion received in tubular member 44 has a snug rather than a loose fit therein. The taper provides the necessary clearance because of the arcing path of travel of the bifurcated end of member 52'. This construction acts to form a partial seal to keep foreign matter away from the spring 51.

When carried, the handle is gripped slightly forward of the mid point of the connecting portions of the U-shaped handle and substantially

vertically above the center of gravity of the container. When it is desired to pour fluid from the container 1, the member 54 is gripped by the operator's fingers with the palm of the hand resting against the handle portion 14. The member 54 is then pulled toward portion 14 which rocks the bell crank lever 26 about the pivot 28 as a fulcrum, and the arm 32 is swung upwardly in the slot 34. Initial rotation of lever 26 raises the cap member 18 upward until the triple beveled projection 42 engages the wall of recess 40 substantially as shown in dash, dash, dot lines. At this time the cap member 18 is slightly tilted from a lateral position with respect to the longitudinal axis of the container 1 due to the extra weight of this projection 42 and the arcuate path of the pin 36. Further rotation of lever 26 causes the projection 42 to cam against the wall of recess 40 and positively rock the cap member 18 about the lever arm 32 to provide quick opening of the spout 7. Rotation of the lever 26 is limited by engagement of the member 54 with the end wall of member 44, and which engagement is so proportioned relative to the lever rotation that, with the projection 42 in engagement with the wall of spout 7, the adjacent surface of the cap member 18 is in alignment with the engaged wall. This open position permits the insertion of a funnel or conduit into the spout 7 for filling the container with fluid. In this position the projection 42 prevents the lower edge of the cap 18 from climbing over the back portion of the spout whereby the cap 18 would be locked in open position.

As the force exerted by the operator on member 54 is decreased, spring 51 pushes the rod member 46 to the left (Fig. 1), rotating the lever 26 counterclockwise and moving the extending end of arm 32 outwardly and downwardly. The projection 42 is either already in engagement with the spout 7 or shortly engages the same, and the cap member 18 pivots toward a closed position with a sliding and wiping action on the end surface of spout 7. This action removes any accumulated foreign matter which may have deposited thereon during the pouring operation and allows the gasket to gently but firmly seat against the spout 7 without hammering, which would cause the formation of a series of indented rings and in time a leaky closure.

It will be apparent that I have provided a new and improved container wherein the majority of the moving parts are located within a protecting handle structure which is extremely rigid and resistant to distortion, an operating spring protected from contact with foreign matter which might cause distortion or disintegration, a spout cap which is quickly opened to a position for providing an unobstructed access to the spout for filling of the container and upon closure a fast but gentle sealing of the spout which will wipe foreign matter from the seating surface and prevent the formation of rings in the surface of the sealing gasket due to hammering.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a device of the character described, a container having a top, a handle of inverted U-shape extending upwardly from the top, a spout for said container extending upwardly adjacent said handle and having a seating surface, a closure member for said surface, a lever having one end portion pivoted adjacent said spout and having another portion pivoted to said closure

member, a hollow member secured at one end to said handle remotely from said spout, extending generally horizontally and opening toward said spout, a resilient member positioned within said hollow member, a thrust member pivoted at one end to said lever and having its other end received within said hollow member and in engagement with said resilient member, a grippable member located within the area bounded by the handle and movable toward the hollow member to move said thrust member against the force exerted by said resilient member to rock said lever to remove said closure member from said seating surface, said hollow member being engageable by said grippable member for limiting such movement of the latter.

2. In a device of the character described, a container having a handle, a spout for said container adjacent said handle and having a seating surface, a closure member for said surface, a lever pivoted adjacent one end portion of said spout and having an arm pivotally connected to said closure member, a hollow member opening toward said spout and secured at one end to said handle remotely from said spout, a resilient member positioned within said hollow member, a thrust member pivoted at one end to said lever and having its other end received within said hollow member and in engagement with said resilient member, means whereby said thrust member may be moved against the force exerted by said resilient member to pivot said lever, a cam surface on said handle adjacent said closure member and abutting means on said closure member operable to engage said cam surface upon rotation of said lever against the force of said resilient member to rotate said closure member relative to said lever.

3. In a device of the character described, a hollow container, a U-shaped handle having parallel extending legs secured to the top portion of said container and having a gripping portion substantially vertically of the center of gravity of said container, a spout for said container adjacent one leg of said handle, said one leg having an aperture therethrough, a lug rigid with said container and located between said legs, a lever having one of its arms pivotally carried by said lug and having the other of its arms extending through said leg aperture and operable to overlie said spout, a closure member for said spout, means securing said closure member to said other arm, a tubular member secured to the other of said handle legs and extending toward said lever, a thrust member having one end portion pivotally secured to said lever and its other end received within said tubular member, and resilient means positioned within said tubular member for opposing movement of said thrust member in one direction.

4. In a device of the character described, a hollow container, a U-shaped hollow handle having parallel extending legs secured rigidly with the top portion of said container and having a laterally extending gripping portion substantially vertically of the center of gravity of said container, a spout for said container, means securing one end of said spout to said container adjacent one leg of said handle, said one leg having apertures therethrough, a lug integral with said spout and projecting through one of said leg apertures and between said legs, a lever having one of its arms pivotally carried by said lug and having the other of its arms extending through the other of said leg apertures and operable to overlie said spout, a closure member for said spout, means securing said closure member to said other arm, a tubular member having one end portion extending into the hollow interior of the other of said handle legs and having its other end portion extending toward said lever, a thrust member having one end portion pivotally secured to said lever and its other end received within said tubular member, and resilient means positioned within said tubular member for opposing movement of said thrust member in one direction.

5. In a device of the character described, a hollow container, a U-shaped handle of substantially elliptical cross section having parallel extending legs secured to the top portion of said container and having a gripping portion substantially vertically of the center of gravity of said container, a spout for said container adjacent one leg of said handle, said one leg having a deformed wall portion facing said spout, said deformed portion having an aperture therethrough, a lug rigid with said container and located between said legs, a lever having one of its arms pivotally carried by said lug and having the other of its arms extending through said leg aperture and operable to overlie said spout, a closure member for said spout, means pivotally securing said closure member to said other arm, means for rotating said lever, and engaging means on said closure member and engageable with said deformed portion upon rotation of said lever whereby said closure member is pivoted relative to said other arm.

6. In a device of the character described, a hollow container, a U-shaped handle of substantially elliptical cross section having parallel extending legs secured to the top portion of said container and having a gripping portion substantially vertically of the center of gravity of said container, a spout for said container adjacent one leg of said handle, said one leg having a portion of its wall adjacent said spout folded inwardly to form a concave guide surface having an aperture therethrough, a lug rigid with said container and located between said legs, a lever having one of its arms pivotally carried by said lug and having the other of its arms extending through said leg aperture and operable to overlie said spout, a closure member for said spout, means pivotally securing said closure member to said other arm, means for rotating said lever, and a beveled extending edge on said closure member engageable with said concave surface upon rotation of said lever whereby said closure member is pivoted relative to said other arm.

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