June 25, 1957 D. J. KETTLEBOROUGH 2,797,022

LATCH TYPE CLOSURE FOR CONTAINERS

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Fig. 3.

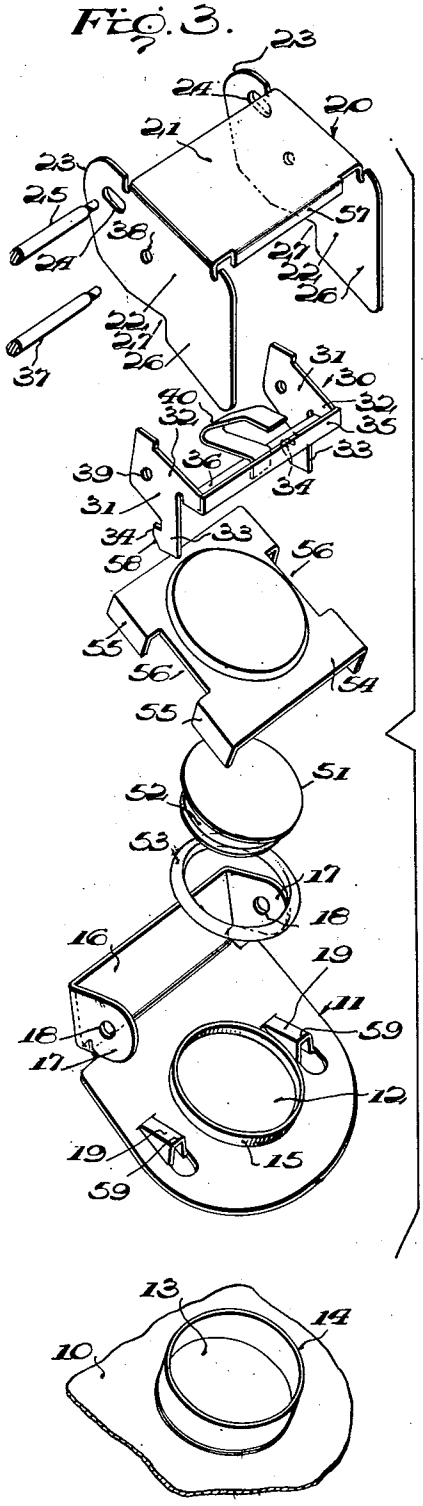


Fig. 1.

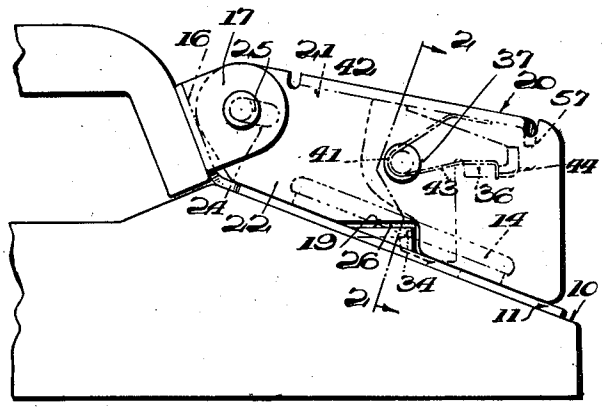
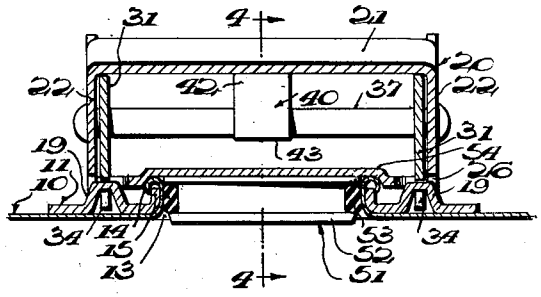


Fig. 2.



INVENTOR.
Donald J. Kettleborough
BY
W. J. Eudeston
ATTORNEY

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FIG. 4.

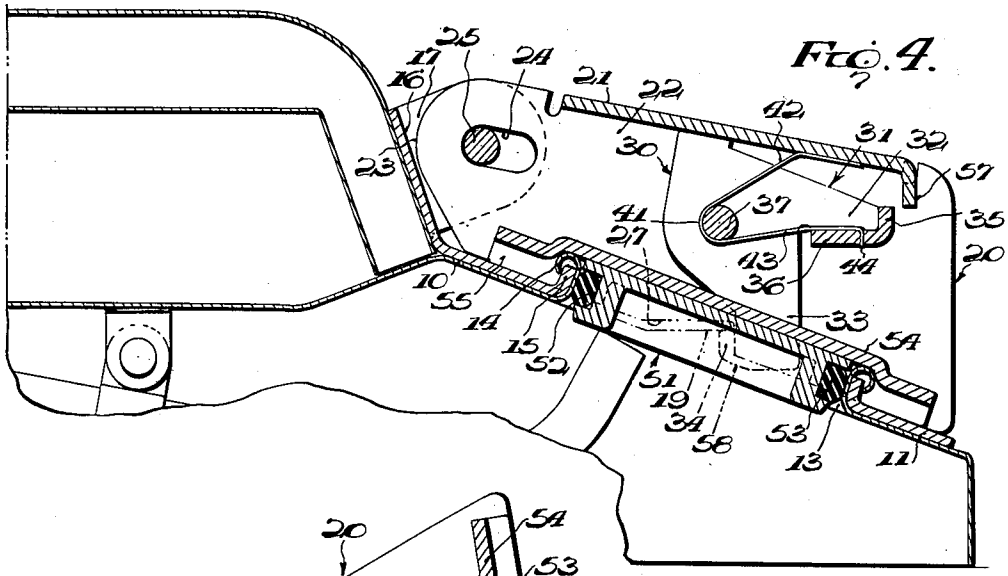
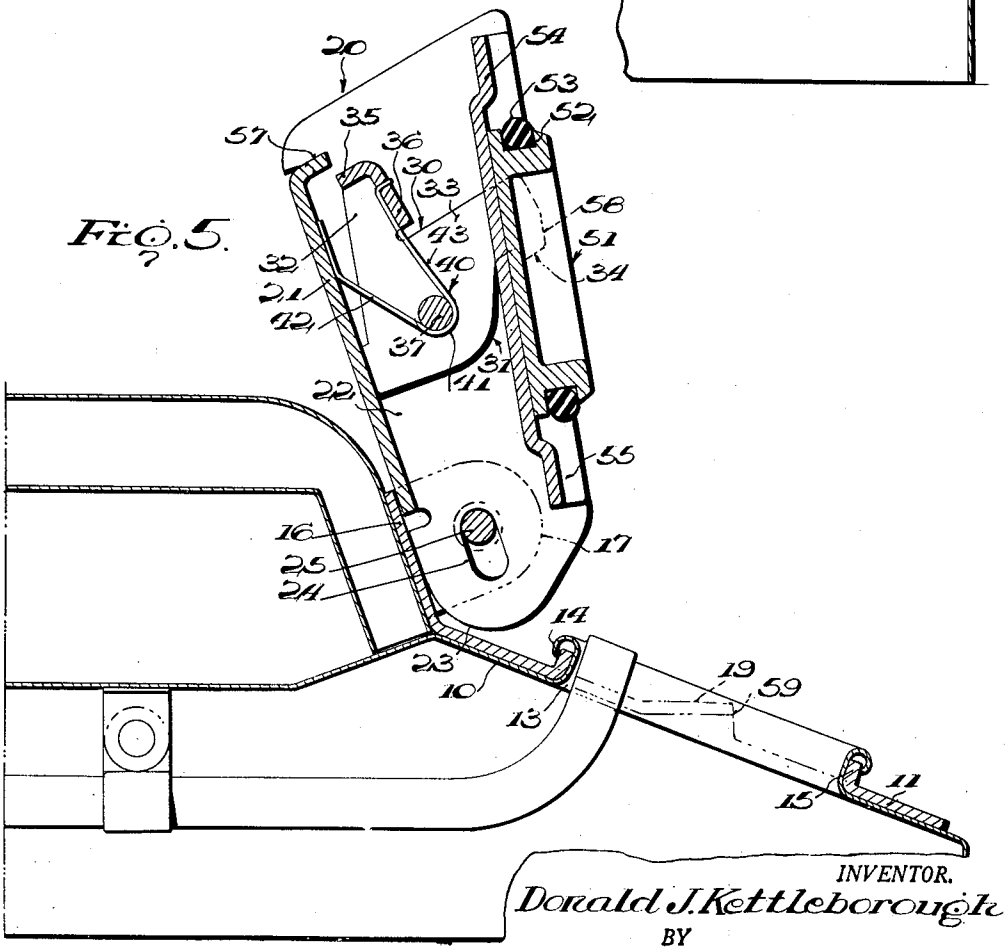


FIG. 5.



INVENTOR.
Donald J. Kettleborough
BY
W. J. Eccleston.
ATTORNEY

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2,797,022

LATCH TYPE CLOSURE FOR CONTAINERS

Donald J. Kettleborough, Mendota, Ill., assignor to the United States of America as represented by the Secretary of the Army

Application June 9, 1955, Serial No. 514,400

9 Claims. (Cl. 220—57)

(Granted under Title 35, U. S. Code (1952), sec. 266)

My invention relates to closures for containers and more particularly to closures of the type which are hingedly connected to the container and which are secured in a closed position by a spring latch. In closures of this general type, it is desirable to form the parts of sheet metal because of the cheapness of this material and the relative ease with which blanks can be formed and bent to the required shape. However, such sheet metal structures are inherently weak and subject to damage incident to normal use of the container.

Another weakness of a closure of this type is that the latch or the operating lever therefor is usually more or less exposed whereby it may be accidentally damaged and/or actuated so as to allow the closure to fly open. This is extremely undesirable, particularly when flammable liquids are in the container.

With the foregoing in view, it is an object of this invention to provide a latch type closure the main components of which are formed of sheet material but wherein the parts are so arranged as to enclose and protect those parts most susceptible to damage.

A further object is to provide such a closure wherein the latch and the latch keeper means are substantially entirely enclosed by the device when the same is in the closed position.

A further object is to provide such a device which is readily and cheaply constructed of sheet material by simple operations and without the necessity for expensive tools and dies.

Other objects and advantages reside in the particular structure of the invention, the structure of the several elements thereof, combinations and subcombinations of such elements, all of which will be readily apparent to those skilled in the art upon reference to the attached drawing in connection with the following specification wherein the invention is shown, described and claimed.

In the drawing:

Fig. 1 is a fragmentary elevational view of a container showing the closure according to the invention attached thereto and in the closed position;

Fig. 2 is a transverse vertically sectional view taken substantially on the planes of line 2—2 of Fig. 1;

Fig. 3 is an exploded perspective view of the closure according to the invention;

Fig. 4 is a longitutinal vertical sectional view on an enlarged scale and taken substantially on the plane of the line 4—4 of Fig. 2; and

Fig. 5 is a sectional view like Fig. 4 but showing the parts in the open position.

Referring specifically to the drawings, wherein like reference characters designate like parts in all views, **10** designates generally a wall of any suitable container such as the well-known military 5-gallon can disclosed in the patent to Johnson, Patent No. 2,387,270. A base plate **11** is fixed to the wall **10** and rigidly secured thereto by any suitable means, not shown. The base plate is formed with upstanding neck **15** which defines a central opening **12** therethrough which is concentrically disposed about

a like opening **13** in the wall **10**. An upstanding neck **14** of the can wall **10** defines the opening **13** and has its free upper edge outwardly embossed to provide a sealing joint with the neck **15** of the base plate **11**. A free rear portion **16** of the base plate **11** is outwardly inclined away from the wall **10**. Also, side edges of the rear portion **16** are forwardly directed to provide hinge ears **17** each formed with a central hinge pin aperture **18**. A pair of forwardly opening hollow bosses **19** are formed integral with the base plate **11** preferably on opposite sides of the neck **15**. Such bosses are preferably formed from upstruck portions of the stock of the base plate.

A closure carrier, now to be described, is hingedly secured to the hinge ears **17** of the rear portion **16**. The carrier is generally designated at **20** and is of inverted channel shape, comprising a top web **21** and depending side flanges **22**. The flanges **22** have rear portions which extend rearwardly of the web **21** and which terminate in arcuate free edges **23**. Such rear portions are formed with any suitable means such as the slots **24** for receiving the hinge pins **25** to hingedly connect the carrier to the ears **17**. The purpose of the slots **24** is to provide means for releasably securing the carrier **20** and the closure carried thereby in an open position. Thus, the hinge pin **25** is normally at the rear ends of the slots **24** whereby the arcuate edges **23** of the rearward extensions of flanges **22** just clear the forward surface of the base plate rear portion **16** and allow the carrier to be swung to the open position of Figure 5. As seen in Figure 5, the carrier **20** is now slid downwardly so that the hinge pin **25** seats in the front ends of the slots **24**. This positions the straight upper edges of the rearward flange extensions against the base plate rear portion **16** and prevents swinging of the carrier **20** toward the closed position even when the container is tilted to dispense from the opening **13**. Of course, the carrier **20** is readily released for closing movement merely by raising the same to reseat the hinge pin **25** against the rear ends of the slots **24**. The flanges **22** also include forward portions **26** which preferably extend forwardly of the web **21** for a purpose to be apparent hereinafter. The lower edges of the flanges **22** are formed with notches **27** which are complementary to the profile of the bosses **19** whereby to receive the same therein when the parts are in the closed position. If desired, and instead of the notches **27**, the flanges **22** may be shaped outwardly to enclose the bosses **19** entirely.

The latch for the closure is generally designated by **30** and comprises a pair of laterally spaced bell cranks **31** each having a horizontal arm **32** and a vertical arm **33**. The lower ends of the vertical arms **33** have rearward extensions **34** providing latch dogs. The bell cranks **31** are rigidly connected together by an angle member comprising a vertical flange **35** and a horizontal flange **36** providing a finger grip. The angle member extends between and is integral with the front ends of the horizontal lever arms **32** whereby the latch may be made from a single blank. The latch **30** is pivotally connected to the carrier **20** by means of a latch pin **37** which extends through aligned holes **38** and **36** in the carrier flanges **22** and the bell cranks **32**, respectively. Any suitable spring such as the V-shaped leaf spring **40** loads the latch in a latch keeper engaging direction. Thus, the spring has a bight **41** in which the latch pin **37** is seated and upper and lower spring arms **42** and **43**, respectively. The upper and lower arms **42** and **43** are normally compressed between the undersurface of the web **21** and the upper surface of the horizontal flange **36** of the angle member connecting the bell cranks **31**. Preferably, the spring **40** is releasably secured in place by any suitable means. This may be conveniently accomplished by seating one or both of the free ends of the spring arms **42** and **43** in recesses in the web **21** and horizontal flange **36**. In the embodiment illustrated, only the lower spring arm **43** is so

utilized, the free front end of which being downwardly directed at 44 to seat in a suitable recess in the horizontal flange 36.

Any suitable closure is carried by the carrier to seal the openings 13 and in the embodiment illustrated, the closure comprises a plug 51 having a peripheral groove 52 in which is seated an O-ring 53 which is adapted to seal the opening 13 in a well-known manner. The plug 51 is secured in any suitable manner, not shown, to a floor plate 54 which spans the flanges 22 of the carrier 20 adjacent the free lower edges thereof. Thus, the floor plate 54 may have vertically directed depending flanges 55 which flatly engage the flanges 22 and are secured thereto in any suitable manner as by welding, not shown. A pair of notches 56 are formed in the side edges of the floor plate 54 to receive the bosses 19 freely therein and provide openings through which the latch dogs 34 project.

As best seen in Figs. 2 and 4, it is apparent that the floor plate 54, web 21 and flanges 22 entirely enclose the latch 30 at the top, bottom and sides. Likewise, the outwardly inclined rear portion 16 of the base plate at least partially closes the carrier at the rear. Moreover, if desired, the front of the carrier may be partially closed by a depending flange such as the eave 57 which is integral with the web 21. In this connection, the eave 57 may be extended downwardly considerably further than the relative short distance shown in the drawing. It is only necessary to provide sufficient space between the lower edges of the flange or eave to permit one or more fingers to be inserted therebelow for engagement with the finger piece 36 of the latch 30. Likewise, it will be observed from Fig. 2 that when the bosses 19 are seated in the notches 27 of the flanges 22, they are protected against accidental damage incident to rough handling of the container. Obviously, the latch 30 is protected against accidental blows and/or the elements by the housing of the carrier. Also it is protected against accidental opening because it is extremely unlikely that force in an upward direction can be applied to the finger piece 36 accidentally.

In operation, it is clear that as the carrier moves from the open position of Fig. 5 to the closed position of Fig. 1 or 4, the inclined strike portion 58 of the latch dogs 34 will engage the front edges 59 of the bosses 19 whereby the latch 30 is rocked sufficiently in a counterclockwise direction to permit the latch dogs to enter latch keepers 19 in a well-known manner under the load of the spring 40. To release the latch, one or more fingers apply upward pressure on the finger piece 36 so as to rock the latch counterclockwise until the latch dogs 34 are withdrawn from the keepers 19. The carrier 20 may now be swung counterclockwise to the open position.

It is apparent from the foregoing that the carrier 20 together with the closure parts carried thereby, provides a tubular housing for the latch 30. Such housing is closed at the rear by the rear portion 16 of the base plate and partially closed at the front by the eave 57. Thus the latch is at least partially protected on all sides whether it is in the closed or open position. In this connection, Fig. 5 clearly shows that the plug 51 extends slightly beyond the free end of the vertical latch arm 33. Indeed, such free ends just barely project beyond the floor plate 54. Obviously, such free ends need not project at all if the bosses 19 are raised slightly. Thus, these arm ends and the latch dogs 34 formed thereon are protected from most damaging blows even when the closure is open. In like manner, the preferred location for the latch keepers 19 is on opposite sides of the opening 13 where they are protected from most damaging blows by the neck 15 when the parts are in the open positions. Of course, the keepers 19 are protected by the carrier 20 when the device is moved to the closed position.

It follows then, that although the parts are formed of sheet metal, they are arranged for mutual support and protection whereby they present relatively great resistance to damage incident to normal use.

Moreover, while I have shown and described what is now thought to be the preferred embodiment of the invention, it should be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the exact structure shown and described herein except as hereinafter claimed.

I claim:

1. A closure for a container having a wall formed with an opening therethrough; an aperture base plate fixed to said wall in surrounding relation to said opening, said base plate including a free rear portion extending outwardly of said wall, said rear portion having side edges formed to provide forwardly extending hinge ears, said base being formed with a pair of forwardly opening hollow bosses providing latch keepers, there being a latch keeper on each side of said opening, a closure carrier, said carrier being of inverted channel-shaped configuration and having a web and laterally spaced depending flanges, said flanges having rear parts overlapping said hinge ears and being pivotally connected thereto whereby to hingedly connect said carrier to said base plate for movement to and from open and closed positions, closure means carried by said carrier and sealing said opening when said carrier is in said closed position, latch means carried by said carrier, and said latch means including rearwardly directed twin latch dogs engageable with said latch keepers when said carrier is in said closed position.

2. A closure according to claim 1, wherein said flanges of said carrier include lower edges formed with notches complementally to said latch keeper providing bosses and seating the same therein when said carrier is in said closed position.

3. In a container closure, the combination with a container wall; of a base plate fixed to said wall, said base plate and wall being formed with aligned holes providing a closure seat, a closure carrier and a closure carried thereby, hinge means hingedly connecting said base plate and closure carrier together for swinging movement of the latter into and out of a closed position seating said closure on said seat, said base plate being formed with a pair of laterally spaced and aligned latch keepers, there being a latch keeper on either side of said seat, a latch on said carrier, said latch having a laterally spaced pair of latch dogs engageable with said latch keepers to secure said carrier in said closed position, cooperating means on said base plate and carrier providing a housing for said latch, said housing having top, bottom, side and rear walls.

4. A container closure according to claim 3, wherein said latch keepers are hollow bosses comprising integral upward extensions of said base plate, and said bosses being formed with openings for the entry therein of said latch dogs.

5. A container closure according to claim 4, wherein said latch dogs are rearwardly directed and wherein said openings in said bosses are forwardly directed.

6. In a closure for a container having a wall formed with an opening therethrough, a closure seat associated with said opening, a closure for said opening, and a closure carrier mounting said closure; the improvement comprising a base plate fixed to said wall and surrounding said opening, hinge means rearwardly of said opening hingedly connecting said base plate and carrier together for swinging movement of the latter into and out of a closed position seating said closure on said seat, a latch providing means on said carrier, latch keeper providing means on said base plate, and said carrier being formed as a tubular housing having top, bottom and side walls enclosing said latch providing means.

7. A closure according to claim 6, wherein said base includes a rear portion projecting outwardly of said container wall to provide a rear wall for said housing, when said carrier is in said closed position.

8. In a closure for a container having a wall formed

with an opening therethrough, a closure seat associated with said opening, a closure for said opening, and a closure carrier mounting said closure; the improvement comprising a base plate fixed to said wall and surrounding said opening, hinge means rearwardly of said opening hingedly connecting said base plate and carrier together for swinging movement of the latter into and out of a closed position seating said closure on said seat, a latch providing means on said carrier, latch keeper providing means on said base plate, cooperating means on said base plate and carrier providing a tubular housing for said latch-providing means, and said housing having top, bottom, rear and side walls.

9. A closure according to claim 8, wherein said bottom wall of said housing is formed with at least one opening therethrough in which said latch keeper-providing means is received when said carrier is in said closed position.

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