

Feb. 1, 1944.

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2,340,470

DOOR FASTENER

Filed Dec. 5, 1940

2 Sheets-Sheet 1

Fig. 1

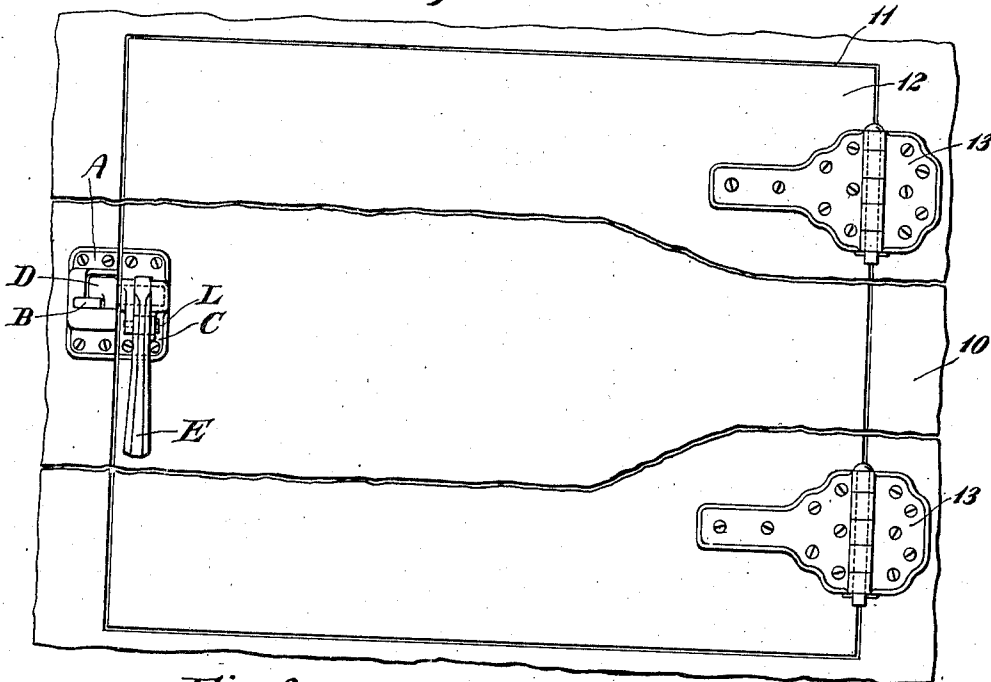
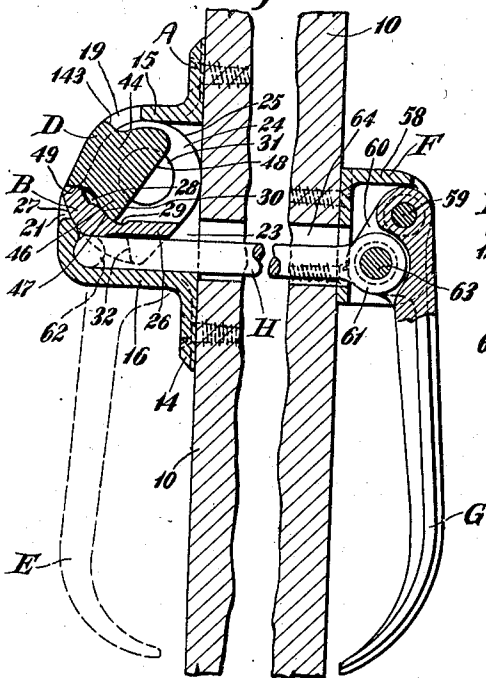
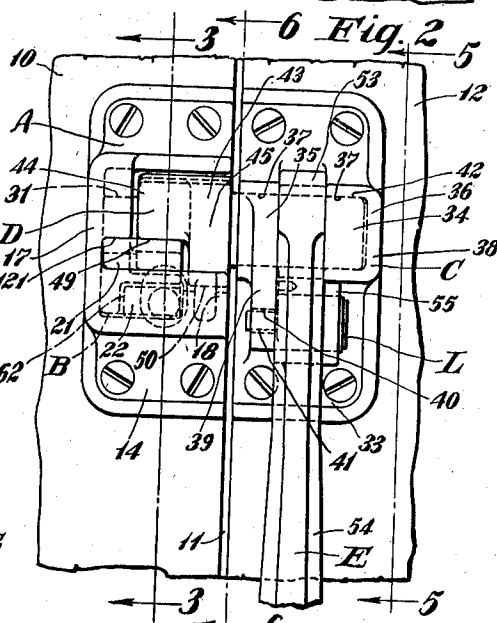


Fig. 3



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Fig. 4

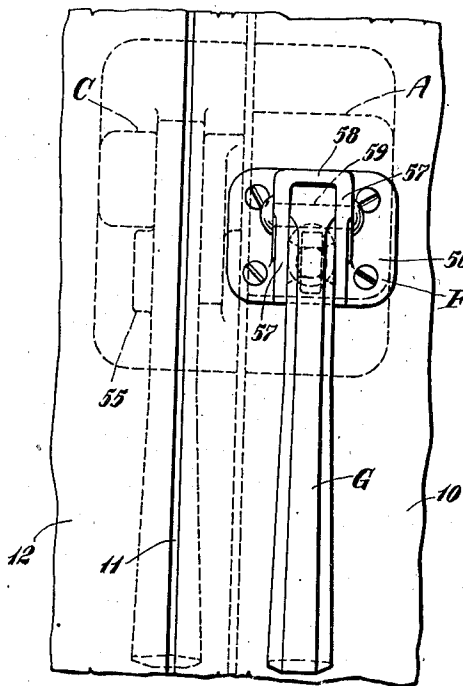


Fig. 5

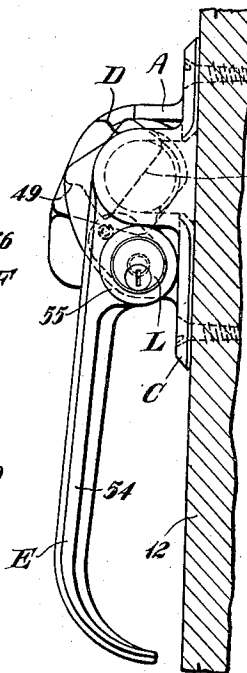


Fig. 6

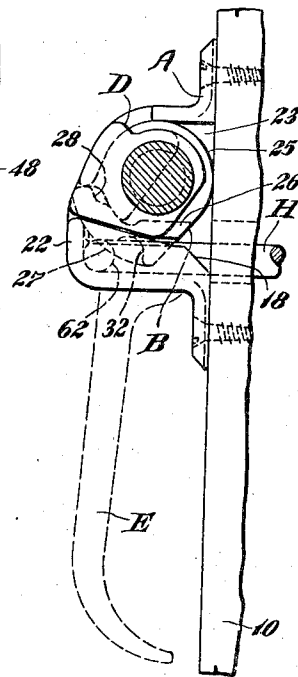


Fig. 7

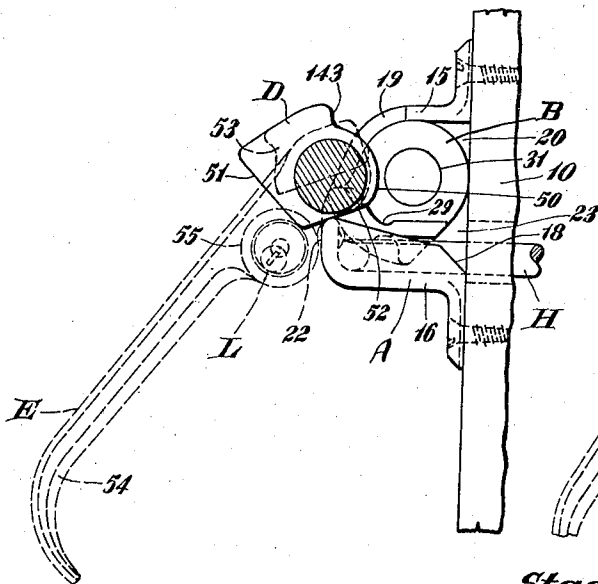
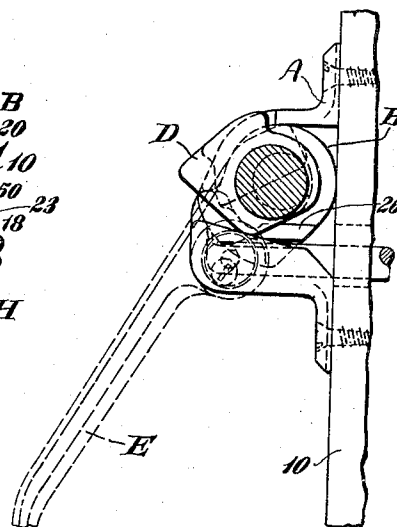


Fig. 8



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UNITED STATES PATENT OFFICE

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DOOR FASTENER

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Application December 5, 1940, Serial No. 368,609

5 Claims. (Cl. 292-241)

This invention relates to improvements in door fasteners for hinged doors of refrigerator automobile trucks, and more particularly to fasteners which operate to hold the doors closed when the same are slammed shut.

One object of the invention is to provide a fastener for hinged doors, comprising manually operated means engageable with keeper means for positively camming the door either open or closed, wherein said means is also effective to interengage with the keeper when the door is slammed shut to automatically fasten the door in closed position.

Another object of the invention is to provide a fastener for hinged doors for automobile refrigerator trucks which is effective to securely fasten the door in closed position when the same is slammed shut and which may be released from locked condition from the interior of the body of the truck, so that the door may be readily opened by the attendant in the event of his being confined in the truck by accidental sliding shut of the door.

A further and more specific object of the invention is to provide a door fastener for hinged doors comprising a lever actuated rotary keeper engaging member arranged to be locked against unauthorized operation and a cooperating keeper, wherein the keeper includes a moveable part, normally locked in fixed position, with which the keeper engaging member interlocks to hold the door closed, and wherein means is also provided on the inner side of the door to unlatch said moveable part and actuate the same to unlock it from the keeper engaging member so that the door may be opened from the inside although the rotary keeper engaging member remains locked against operation.

A still further object of the invention is to provide a fastener for hinged doors comprising a keeper and keeper engaging member, wherein the keeper engaging member is provided with a cam projection adapted to engage with and seat on the keeper when the door is slammed shut but fails to reach the tightly closed position, and is engageable with a second seat on the keeper by operation of said keeper engaging means to cam the door to tightly closed position.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a broken side elevational view of a portion of the wall of the body of a refrigerator automobile truck, the wall being pro-

vided with an opening which is closed by a single hinged door, said view illustrating my improved fastener in connection therewith. Figure 2 is a view similar to Figure 1, on an enlarged scale, of a fragment of the door and side wall of the truck body, illustrating my improved fastener more in detail. Figure 3 is a vertical sectional view corresponding substantially to the line 3-3 of Figure 2, the wall of the truck body being shown broken. Figure 4 is an interior elevational view looking from right to left in Figure 3. Figure 5 is an elevational view on the line 5-5 of Figure 2, looking in the direction of the arrows. Figure 6 is a vertical sectional view, corresponding to the line 6-6 of Figure 2. Figures 7 and 8 are views similar to Figure 6 but showing the fastener means in different operative positions.

In said drawings 10 indicates a wall of a chamber, such as the body of a refrigerator automobile truck. The wall 10 has the usual door opening 11 closed by a door 12. The door 12 is of the swinging type and is supported by hinges 13-13 secured to the wall 10 at one side of the door opening. As is usual in refrigerator trucks, the cooperating engaging edges of the door and walls of the door opening are provided with insulation which is tightly compressed when the door is forced to completely closed position.

My improved fastener comprises broadly a keeper housing A; a swinging keeper element B; a supporting bracket C on the outer side of the door; a rotary keeper engaging member D journaled in the bracket C; an operating lever E for the keeper engaging member; a lever supporting housing or bracket F on the inner side wall of the refrigerator body; a lever G pivoted in the bracket F; a combined locking and actuating rod or latch H connected to the lever G; and a key controlled lock L mounted in the operating lever E.

The housing A includes a base plate 14 by which the same is secured to the outer side of the wall 10 of the truck body, the base plate being preferably fastened by screws extending into said wall. Outstanding from the base plate are vertically spaced, horizontally disposed, top and bottom walls 15 and 16, and laterally spaced, vertical side walls 17 and 18, forming the top, bottom and side walls of the housing. The top and bottom walls 15 and 16 are connected to a current front wall 19. The side wall 18 only partly closes the corresponding side of the housing at the bottom thereof and is of the height and shape shown most clearly in Figures 6, 7, and 8, being of

greater height at the front than at the rear of the housing and having its top edge downwardly and rearwardly inclined between the front and rear ends thereof. The opening above said side wall 18, which is indicated by 20, is relatively large, as shown. The front wall 19 is cut out to provide a relatively large opening 21, as indicated in Figures 2 and 3, thus leaving a relatively narrow flangelike wall portion along the side wall 17 and a relatively low flangelike portion 22 along the bottom of the housing connecting the side walls 17 and 18, said wall portion 22 being of substantially the same height as the outer extremity of the side wall 18. The wall 22 is spaced from the lower end of the flangelike wall which extends along the wall 17 to provide a horizontal opening or slot 121. The housing is open at the back, as indicated at 23, the wall 10 of the automobile body closing the back of the housing when the latter is in position secured to said wall. As shown in Figures 1 and 2, the housing A is mounted directly at the edge of the door opening 11.

The keeper element B comprises a winglike plate section 24 having its upper edge rounded, as indicated at 25, and having a lateral flange 26 near its bottom end with the main portion thereof extending in a plane at an angle to the longitudinal axis of said plate and substantially horizontal as shown in Figure 3. At the outer end of the flange 26 is curved upwardly, as indicated at 27, the end of the flange at said curved portion extending beyond the front edge of said plate section 24. At the left hand end, as viewed in Figure 2, the upwardly curved portion of the flange 26 is adapted to register with the slot 121 of the housing A. The flange 26, at the junction of said curved portion and the horizontal section thereof, is thickened, as shown, and is provided on its upper face with outer and inner concave seats or depressions 28 and 29 at the front and rear ends of said thickened portion, said depressions extending entirely across the flange. The thickened portion presents a cam face 30 which merges with the seat 29. The keeper element B is swingingly supported on a cylindrical lug or pivot member 31 projecting from the inner side of the wall 17 of the housing and into a suitable bearing opening in the plate section 24. The plate section 24 extends below the flange 26 and has its lower edge rounded, as shown, said rounded edge merging with the outer face of the upwardly curved portion 27 of the flange 26. At the rear portion of the bottom end of the plate section 24, a depending, laterally extending rib 32 is provided on the flange 26, the rib being cut away at its outer end to clear the actuating rod H. The rib 32 forms a projection or shoulder for a purpose hereinafter pointed out.

The keeper engaging member D is rotatably supported in the bracket C, which is mounted on the outer side of the door 12 adjacent the free edge thereof, in such a manner that it will be in transverse alignment with the keeper housing A when the door is closed. The bracket C comprises a base plate 33 having an outstanding bearing portion 34. The plate 33 is secured to the door by any suitable means, such as screws, extending through openings in the base plate and into the body of the door. The bearing portion 34 comprises two laterally spaced sections 35 and 36 having aligned, horizontally disposed, cylindrical bearing openings 37—37. The bearing opening of the section 36 is closed at its outer end by a wall 38. The section 35 of the bearing portion 34 has an outstanding, depending flange

39, the lower end portion of which is formed on the plate 33. The inner face of this flange is in vertical alignment with the inner end face of the section 35 and continuous therewith. The depending lower end portion of the flange 39 is provided with an opening therethrough forming a seat 40 for the locking pin 41 of the key controlled lock L, hereinafter described.

The keeper engaging member D includes a relatively short, cylindrical shaft 42 journaled in the bearing openings 37—37 of the bearing portion 34 of the bracket C. At the outer end of the shaft 42 a head 43 is provided. The head 43 comprises a keeper engaging portion proper 44 and a guide portion 45. The keeper engaging portion 44 of the head is outermost and is of the shape shown most clearly in Figure 3. The head 43 is provided with a transverse shoulder 143 at the upper side thereof adapted to engage with the end edge of the top wall 15 of the housing to force the door 12 open, as hereinafter described. The keeper engaging portion 44, as shown in vertical section in Figure 3, is of irregular outline having a projecting cam portion 46 at the bottom thereof. The cam portion 46 has a curved face 47 which forms the active cam element of said cam portion. The rear side of the portion 44 of the head 43 is cut away to clear the keeper element B as the door swings to open or closed position. As shown in Figure 3, the portion 44 is cut away in such a manner as to present a substantially straight back face 48, said back face 48 forming a relatively sharp corner with the end of the cam face 47 to present, in effect, a tooth portion at said cam projection 46. Outwardly beyond the cam face 47 the lower side face of the keeper engaging portion 44 presents a stop shoulder 49 adapted to seat on the end of the upwardly curved portion 27 of the flange 26 of the keeper element B to limit rotation of the keeper engaging member D. The guide portion 45 which forms the part of the head 43 inwardly of the keeper engaging portion 44 extends rearwardly beyond the face 48 and downwardly beyond the cam projection 46 of said portion 44, but otherwise corresponds in outline to the same. These projecting portions of the guide portion 45 form, in effect, a relatively thick flange or wing 50 on the head 43 having substantially straight edge faces 51 and 52 meeting at an obtuse angle. As shown most clearly in Figure 2, the flange 26 of the keeper element B is of such a width as to underlie the portion 44 and to leave a space at the right hand side of the keeper housing A to accommodate the flange or wing 50 of the guide portion 45 of the head of the keeper engaging member, the edge of the flange 26 being spaced slightly from the wing 50 to assure a certain amount of clearance between these parts.

The lever E is fixed to the shaft 42 of the keeper engaging member D in any suitable well-known manner and comprises a head 53 and a relatively narrower hand grip portion 54 extending from said head. The head portion 53 is accommodated for swinging movement in the opening between the sections 35 and 36 of the bearing portion 34 of the bracket C and has a hollow boss 55 below the pivotal axis of the lever forming a socket within which the key controlled lock is mounted.

The key controlled lock L is of well-known design, being in the form of a bolt having the projecting locking portion 41 adapted to engage in the seat 40 on the bracket C to lock the lever against movement. As is well known in key operated locking means of this type, the lock is spring pressed and when unlocked projects outwardly

beyond the boss 55. To operate the same to lock the lever E, it is pressed inwardly to engage the pin 41 in the seat 40, the plunger and the pin being held in the locking position by the usual well-known means comprising a spring pressed detent engaging in a locking socket or recess in the lock housing. When unlocked by the usual key inserted in the key receiving opening of the lock, the spring action of the lock retracts the pin 41 as the lock proper is being projected to its outer position, thus unlocking the lever E.

The supporting bracket F comprises a plate-like base portion 56, laterally spaced vertical flanges 57—57 projecting from the central portion of said plate-like base, and a horizontal top wall or flange 58 closing the space between the upper ends of the flanges 57—57. The bracket F is secured to the inner side of the wall 10 of the truck body adjacent the door opening 11 opposite to the housing A on the outer side of the wall 10. Any suitable means, such as screws, extending through the base plate 56 of the bracket F and into the wall 10, serve to secure the bracket in position.

The operating lever G is swingingly mounted at its upper end on a pivot bolt 59 fixed in the flanges 57—57 of the bracket F and extending through a pivot opening in said lever. Immediately below the pivot, on the side of the lever G which is adjacent the wall 10, the same is provided with inwardly projecting, laterally spaced ears 60—60 provided with transversely aligned pin receiving openings.

The combined locking and actuating rod H is in the form of a cylindrical bar having an eye 61 at its inner end and bent angularly at its outer end to provide a hook 62. This rod H is pivotally connected to the lever G by a pin 63 extending through the ears 60—60 and the eye 61 of the rod, the eye portion 61 being accommodated between said ears. The rod H extends through the wall 10 and into the keeper housing A, the outer end of the rod underlying the swingable keeper element B. The wall 10 of the truck body and the plate portion of the bracket F are provided with aligned openings 64 which accommodate the rod H, these openings being vertically elongated to permit the required upward and downward displacement of the rod during swinging movement of the lever G. The angularly bent hooked end of the rod projects to the left of the main body portion or shank of said rod, as seen in Figure 2, to overhang the rib 32 of the keeper element B so that when the rod is pulled inwardly the hooked end thereof will engage the rib 32 and thus swing or rock the keeper element on its pivot to clear the keeper engaging portion of the member D and thus unlock the door. As will be evident when in the position shown in Figure 3, the rod H blocks swinging movement of the keeper element B.

The locked position of the door 12 is clearly illustrated in Figures 1 to 6 inclusive and, as shown most clearly in Figures 3, 5, and 6, the door is held in that position by the cam projection of the keeper engaging member being seated in the depression 29 of the keeper element B. With the operating lever E locked by the key controlled lock L, it is thus impossible to unlock the door from the outside without first unlocking the lever. However, the attendant can operate the door from the inside even when locked by the key controlled lock L by utilizing the safety feature provided by the lever G. This is of great importance if someone becomes imprisoned in the refrigerator truck. In the event it becomes necessary to open

the door from the inside of the truck body, due to the attendant being trapped by the door accidentally swinging shut or by same being fastened from the outside by the keeper engaging lever being locked by the key controlled lock L, the door may be readily opened by actuating the lever G. As the lever G is swung upwardly and away from the wall of the truck body, the rod H is pulled inwardly to unlock and provide clearance for swinging movement of the keeper element B, and then engage the hook of said rod with the rib 32 of the keeper element to swing the latter on its pivot to completely clear the cam projection of the keeper engaging member D, thereby unlocking the keeper engaging member from the keeper and permitting the door to be pushed open from the inside.

In opening the door from the outside the operation of my improved door fastener is as follows: The key controlled lock L is first unlocked in the usual manner, thus withdrawing the pin 41 from locking engagement with the bracket C, thereby freeing the lever E for swinging movement. The lever E is then swung outwardly away from the wall 10 by the attendant, thereby rotating the keeper engaging member D and clearing the same from the keeper element B, the cam projection of the member D being moved out of engagement with the seat 29 and the cam face 30 thereof. The door may then be pulled open manually by swinging the same outwardly. In the event that the door is jammed in the door opening due to sticking of the same, it may be pried open by swinging the lever E upwardly away from the door to a greater extent, thus bringing the shoulder 143 of the keeper engaging member D forcibly against the outer edge of the top wall 15 of the housing A and moving the door outwardly by the prying action of the lever against said wall. The door may then be manually swung open in the usual manner.

To close the door the same is slammed shut, thereby bringing the keeper engaging member D forcibly against the keeper. As the door is thus swung to closed position, the face 52 of the guide portion 45 of the head 43 of the keeper engaging member engages with the upper edge of the flange 22 of the housing A, as shown in Figure 7, thereby camming the lever E upwardly until the face 52 passes beyond said flange 22, thereby permitting the lever to swing downwardly and the keeper engaging member to rotate to a position to engage the cam projection thereof within the seat 29 of the keeper element, as shown in Figures 3 and 6, and permit the cam face 47 of the cam portion 46 of the member D to engage in back of the cam face 30 of the keeper element B, thus latching the door closed. The key controlled lock L is then depressed to lock the lever E to the bracket C, thereby effectively locking the keeper engaging member D against rotation.

In the event that the door is not slammed shut with a force sufficient to compress the insulation thereof to the required extent to bring the door to completely closed position with the cam projection 46 of the keeper engaging member in locked engagement with the seat 29 of the keeper element B, or the resistance of the insulation to compression is too great to permit the door being slammed to completely closed position, the cam projection 46 will seat in the outer seat 28 of the keeper element, as disclosed in Figure 8. To then bring the door to tightly closed position, the operating lever E is forced toward the door, thereby rotating the keeper engaging member D from the

position shown in Figure 8 to that shown in Figures 3, 5, and 6, thereby camming the door shut by movement of the cam projection 46 from the seat 28 to the seat 29 along the cam face 30 of the keeper element B. The parts are then locked as hereinbefore described by locking the lever E in fixed position by means of the key controlled lock L.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a fastener for a hinged door of a container, the combination with means on the outside of the container for locking the door in closed position, including a keeper element adapted to be engaged by a keeper engaging member, said keeper element being movable to disengage the same from the keeper engaging member; of a reciprocable latch bar normally locking said element against movement; a projection on said bar having shouldered engagement with said element to move the latter to disengage the same from said keeper engaging member; and means operable from inside the container for reciprocating said latch bar to unlock said element and move the same to disengaged position.

2. In a fastener for a hinged door of a container, the combination with a movable keeper element adapted to be engaged by a rotary keeper engaging member mounted on the outer side of the door; of a slide normally blocking movement of said element to hold the latter in locked engagement with the keeper engaging member; a projection on said slide engageable with a shoulder on said element; and lever means on the inside of said container for sliding said slide to free said element for movement and engage the projection on said slide with the shoulder on said element to move the latter out of shouldered engagement with the keeper engaging member to unlock said door to be pushed open from the inside of said container.

3. In a fastener for a hinged door of a container, the combination with a keeper element with which a keeper engaging means is adapted to interlock when the door is closed; means supporting said element for rocking movement; a slidable bar normally in the path of rocking movement of said element blocking movement of the same; a hook on said bar engageable with said element when said bar is slid lengthwise to rock said element to unlock it from the keeper engaging member; and lever means on the interior of the container connected to said bar to slide the same to free said element for rocking movement and rock the same to unlock the door.

4. In a keeper means for a door fastener including a keeper engaging member mounted on the outer side of a hinged door, the combination with a rocking keeper element normally latched against rocking movement, with which the keeper engaging member is adapted to interlock to hold the door closed; of a slide for latching said element against rocking movement; means operable from inside the container for moving said slide to unlatch said element; and cooperating shouldered means on said slide and element for rocking the latter during movement of said slide to unlock said element from said keeper engaging member and thereby free the door to be pushed open from inside said container.

5. In keeper means for a door fastener for containers comprising a keeper engaging member located on the outside of the container, the combination with a movable keeper element normally locked against movement, with which said keeper engaging member has shouldered engagement to lock the door; of sliding locking means for locking said element against movement; means operable from the inside of the container for actuating said sliding means to unlock said keeper element; and cooperating shouldered means on said sliding means and element for moving said element out of shouldered engagement with said keeper engaging member during actuation of said sliding means to unlock the door.

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