

July 29, 1941.

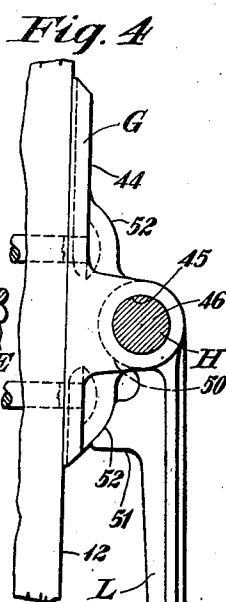
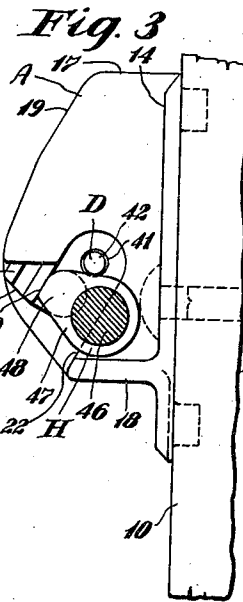
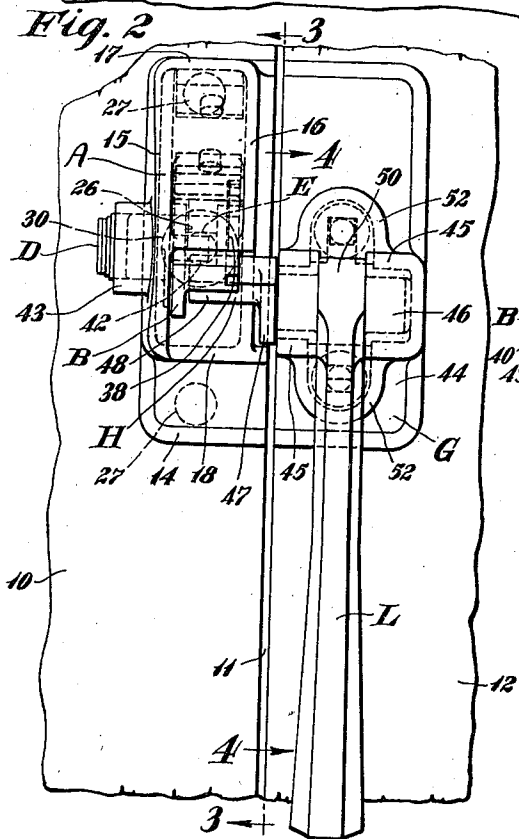
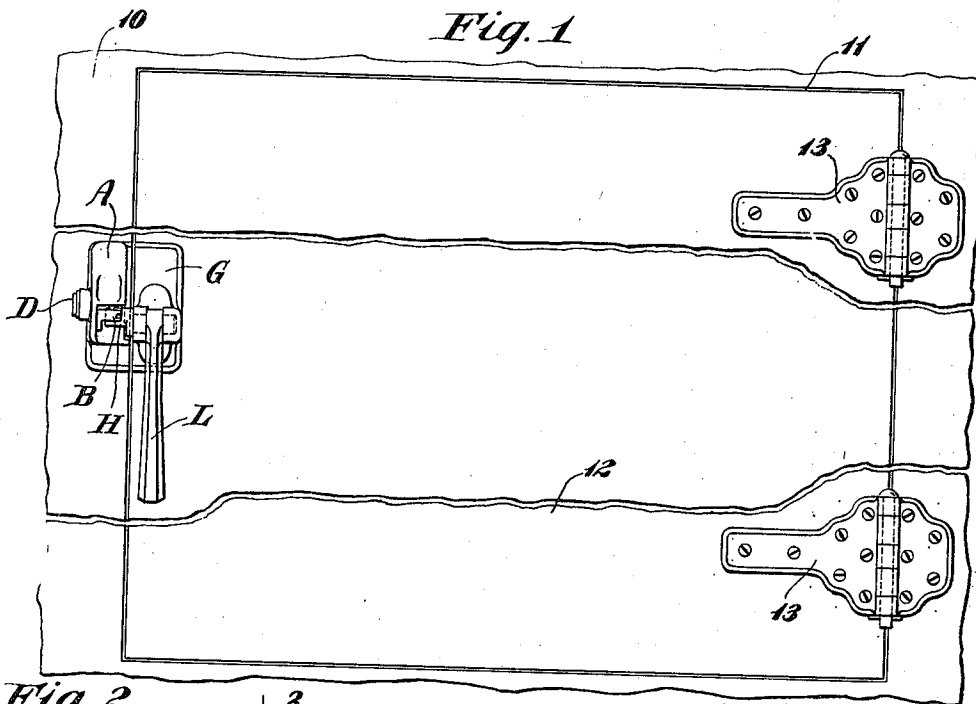
W. M. DWYER

2,250,447

DOOR FASTENER

Filed May 31, 1940

2 Sheets-Sheet 1



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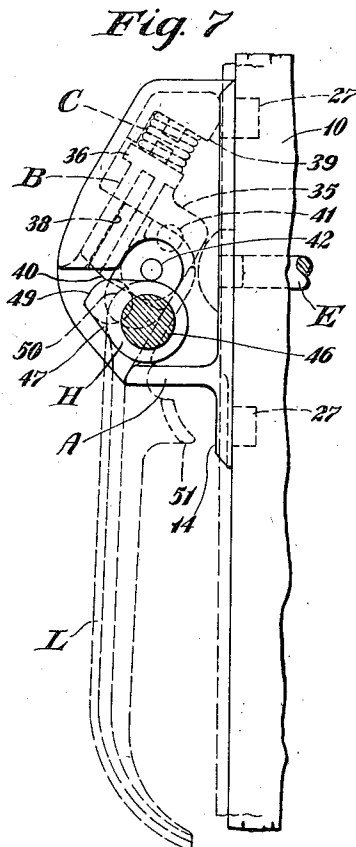
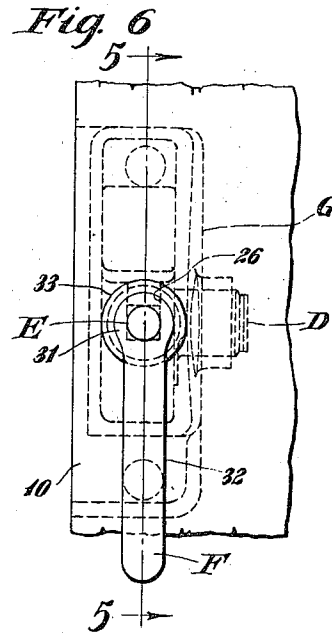
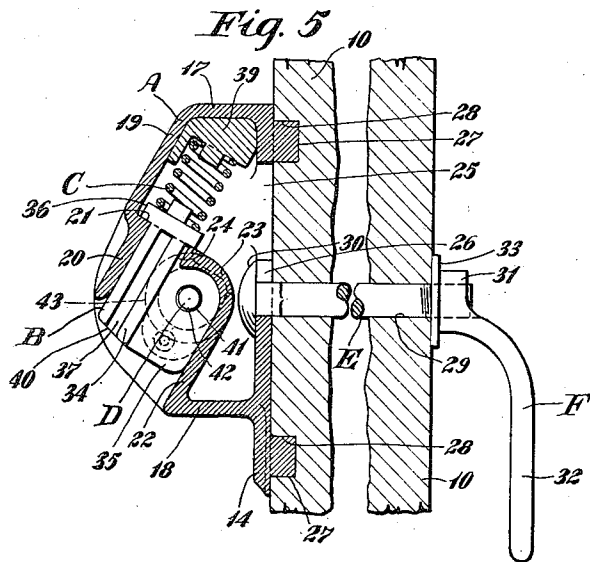
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DOOR FASTENER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,250,447

DOOR FASTENER

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Application May 31, 1940, Serial No. 338,140

6 Claims. (Cl. 70—145)

This invention relates to door fasteners and more particularly to such fasteners for refrigerator automobile trucks having hinged doors.

One object of the invention is to provide a door fastener including a keeper, and a rotary operating member having eccentric keeper engaging cam means thereon adapted to cooperate with the keeper to force the door tightly closed and pry the same partly open, wherein the keeper engaging means and keeper are further designed to interlock when the door is slammed shut.

Another object of the invention is to provide a door fastener comprising a keeper and keeper engaging means adapted to secure the door in closed position, together with key controlled means for locking the keeper engaging means and keeper in position to prevent unauthorized opening of the door, wherein the keeper may be bodily detached from its supporting means from the interior of the body of the truck, so that the door may be opened by the attendant in the event of his being confined in the truck by accidental or unauthorized closing and locking of the door, the keeper swinging with the door in its locked condition bodily with the keeper engaging means.

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 provided with an opening which is closed by a single hinged door, said view illustrating my improved fastener in connection therewith. Figure 2 is a front elevational view, on an enlarged scale, of the improved fastener illustrated in Figure 1, parts of the door and wall of the truck body being shown broken away. Figures 3 and 4 are vertical sectional views corresponding respectively to the lines 3—3 and 4—4 of Figure 2. Figure 5 is a vertical sectional view through the keeper and associated parts of the fastener shown in Figure 2, the section corresponding to the line 5—5 of Figure 6, the wall of the truck body being illustrated in broken section. Figure 6 is an elevational view, looking from right to left in Figure 5. Figure 7 is a vertical sectional view, similar to Figure 3, showing the operating handle lever in dotted lines and the parts of the fastener in different position.

In said drawings, 10 indicates one of the walls of a chamber such as the body of a refrigerator automobile truck. The wall 10 has the usual door opening 11 closed by a single door 12. The door

12 is of the swinging type and is supported along one vertical edge by a pair of hinges 13—13 secured to the wall 10 at one side of the door opening.

My improved door fastener comprises broadly a keeper housing A; a sliding latch B; a spring C yieldingly opposing sliding movement of the latch; a key controlled lock D; a bolt E extending through the wall 10; a lever nut F threaded on the bolt; a supporting bracket G on the outer side of the door; a keeper engaging crank member H journaled in the bracket G; and an actuating lever L fixed to the crank member.

The housing A includes a base plate 14 which forms the back wall of the housing. Upstanding from the base plate 14 are spaced, parallel, vertical walls 15 and 16 forming the side walls of the housing, and spaced, horizontally disposed walls 17 and 18 forming the top and bottom walls of said housing. The housing A has an inclined front wall 19 which extends downwardly and outwardly from the front edge of the top wall 17 and terminates some distance above the bottom of the housing. The lower end portion of the wall 19 is inwardly offset, as indicated at 20, thereby providing an internal shoulder 21. The housing A is further provided with an upstanding transverse wall 22 which extends upwardly from the bottom wall 18, is spaced inwardly from the wall section 20 of the wall 19, and is parallel thereto. The wall 22 extends above the lower end of the wall 19 and has its upper end portion rounded or curved, as indicated at 23, said curved portion extending toward the wall 19 but being spaced therefrom to provide an opening 24 therebetween. The base portion 14 extends beyond the outer wall of the housing, as clearly shown in Figures 1, 2, 3, 5, and 7 to provide a base flange. The portion of the base plate 14 which forms the back wall of the housing is provided with an opening 25 at the upper end portion of the housing, and below said opening the plate 14 is vertically slotted as indicated at 26. The slot 26 is open at the top to communicate with the opening 25. Projecting from the rear side of the base plate 14 are top and bottom, spaced, cylindrical lugs 27—27 which are seated in recesses or pockets 28—28 in the outer face of the wall 10 and anchor the casing against displacement in a plane parallel to said wall.

The keeper A is secured to the wall 10 by bolt E which extends through the slot 26 of the base plate 14 and an opening 29 through said wall and has the head thereof, which is indicated by 30, shouldered against said base plate. The inner

end of the bolt projects beyond the inside surface of the wall 10 and is threaded to receive a nut member. The bolt is drawn tight by the combined lever and nut member F which comprises a nut portion 31 having an integral wrench handle or lever 32. A washer 33 is preferably interposed between the nut portion 31 of the member F and the wall 10 of the truck body. As will be evident, the bolt E and the combined nut and lever F serve to tightly secure the keeper housing A to the wall of the truck, the lugs 27—27 serving to prevent rotary displacement of the housing about the axis of the bolt. By unscrewing the nut portion 31 of the member F from the bolt E, the keeper housing A becomes quickly detachable from the wall 10, it being necessary merely to pull the housing away from the wall and thus withdraw the bolt E bodily therewith.

The sliding keeper latch B is in the form of a bar comprising a shank 34 of rectangular cross section having a lateral, platelike flange or wing section 35 at the left hand side thereof, as seen in Figure 2. At the inner end, the shank 34 of the latch B is provided with a transverse head 36 which limits the sliding movement of the latch. The shank of the latch B bears against the inner side of the portion 20 of the outer wall 19 of the keeper housing and is slidably guided for movement in a straight path by a longitudinal guide groove 37 on one side of the shank thereof engaged with a rib 33 on the inner side of the side wall 16 of the housing. The wall portion 23 of the wall 22 is suitably slotted at one side to provide clearance for sliding movement of the wing 35. As shown most clearly in Figures 2, 3, and 5, the outer end of the shank 34 of the latch B normally projects beyond the lower extremity of the outer wall 19 of the housing. This position of the latch is determined by the head 36 thereof shouldering against the shoulder 21 of the wall 19 and the rear portion of the wall 23, and is the extreme outer position of the latch.

The spring C, which is in the form of a coil, bears on the inner end of the latch B and yieldingly resists inward movement thereof. A block 39 fitted in the pocket formed by the top, back and side walls of the housing at the top portion of the latter forms a seat for the rear end of the spring C, the block having a centering boss which extends into the coil. The front end of the spring C, which bears on the head 36 of the latch B, is also centered by a boss projecting from said head.

The spring C normally holds the latch B projected with the outer end of the latter protruding beyond the lower extremity of the wall 19 of the housing. The projecting extremity of the latch is preferably beveled off, as indicated at 40, to provide a cam face which cooperates with the keeper engaging member when the door is slammed shut, as hereinafter pointed out. The platelike section or wing 35 is perforated, as indicated at 41, to receive the locking projection of the key operated lock D, as hereinafter described. The perforation is located between the opposed walls 19 and 22 of the housing.

The inner side of the sliding latch B and the opposed wall 22 of the housing, together define an opening or cam slot with which the keeper engaging member cooperates in the usual well-known manner in the door being forced tightly closed or being pried partly open.

The key controlled lock D is mounted in a

socket provided by a cylindrical tubular projection 43 on the wall 15 of the housing A. This key controlled locking member is of well-known design, being in the form of a bolt having a projecting locking pin portion 42 adapted to engage through the perforation 41 of the latch B to lock the latter against sliding 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 sleeve 43. To operate the same to lock the latch B, it is pressed inwardly to engage the pin 42 in the opening or perforation 41 of the latch, the plunger and pin being held in locking position by the usual well-known means comprising a spring pressed detent engaging in a locking socket or recess in the sleeve 43 of the housing A. When unlocked by the usual key inserted in the member D, the spring action of the lock retracts the pin 42 while the lock is being projected to its outer position, thus unlocking the sliding latch bar B.

The supporting bracket G comprises a plate-like base member 44 having spaced, outstanding journal bearing elements 45—45 thereon, said bearing elements having aligned cylindrical bearing openings. The bearing opening of the right hand element 45, as seen in Figure 2, is preferably closed at its outer end. This bracket is fixed to the door adjacent the free edge thereof in alignment with the keeper housing A by any suitable means, such as bolts, extending through the base plate 44 and the door member.

The keeper engaging crank member H comprises a short shaftlike section 46 having a radially extending crank arm 47 at the outer end thereof provided with a keeper engaging lug 48. This lug is preferably of the cross sectional outline shown in Figures 3 and 7, the same being in the form of a cylindrical pin having one side flattened, as shown, to provide a straight face 49 thereon. The shaft 46 is journaled in the bearings 45—45 and has the handle lever L secured thereto between said bearing members. The lever L has an enlarged head portion 50 at its inner end which is fixed to the shaft 46 in any suitable manner so that the shaft will be rotated when the lever is swung toward or away from the door. Adjacent to the head 50 the lever L is provided with a projecting stop lug 51 which shoulders against the base of the bracket G to limit downward swinging movement of the handle lever L, as shown in Figure 4. The stop lug 51 of the lever has the engaging face thereof formed concave, as shown in Figures 4 and 7, to accurately seat on the base of the bracket G, which base is formed with closed pockets 52—52 which accommodate the heads of the retaining bolts and conceal the latter, the raised walls of the pockets 52—52 being arched or rounded, as shown.

In the closed and locked position of the door, as shown in Figures 1, 2, 3, and 4, the keeper engaging lug 48 of the crank member H is engaged in the slot of the keeper A defined by the sliding latch B and the wall 22 of the housing, the sliding latch being locked against movement by the key controlled lock D, the pin 42 of which is engaged through the opening 41 of the latch. The pin 42 projects some distance through the opening into the path of rotary movement of the lug 48 of the keeper engaging crank member, thus securely locking the latter against movement. As will be evident, the door is thus securely locked against unauthorized opening, it being

impossible to rotate the keeper engaging crank member or push in the latch B so long as the lock D is in the locking position.

The operation of my improved door fastener in opening the door, assuming the door to be in the locked position shown in Figures 1 to 4 inclusive, is as follows: The key controlled lock D is first unlocked in the usual manner, thus withdrawing the pin 42 from locking engagement with the latch B. The withdrawal of the pin 42 also frees the keeper engaging cam lug 48 of the crank member H so that the latter may be rotated to pry the door partly open. After the cam lug 48 has been cleared for operation by withdrawal of the pin 42, the attendant swings the handle lever L away from the door and upwardly, thereby rotating the keeper engaging crank member H. The keeper engaging cam lug is thus swung against the inclined rear wall 22 of the cam slot of the keeper A, thereby camming the door partly open. The door may then be swung fully open in the usual manner.

The door may be closed by either moving the same to partly closed position and then forcing it tightly closed by operation of the keeper engaging crank member, or by slamming the same shut, thereby automatically locking the door by the latching action of the keeper latch slide B.

In closing the door by actuation of the crank member, the operation is as follows: The attendant first swings the door to partly closed position to bring the keeper engaging crank member into cooperative relation with the keeper A. While the door is being swung to this position, the operating handle lever L may be in the pendant position shown in Figures 1, 2, 3, and 4. However, it is preferable that the same be raised to a position at right angles to the plane of the door so that the keeper engaging lug 48 of the crank member H is rotated to a position of alignment with respect to the entrance of the slot of the keeper so that it will enter this slot as the door is pushed to partly closed position. In the event that the lever has been left in pendant position while the door is being swung to partly closed position, the lever must then be raised to horizontal position to align the keeper engaging lug 48 of the crank member H with the slot of the keeper so that the cam lug may properly cooperate with said slot. The actuating lever L is then swung downwardly toward the door, thus rotating the crank member H in reverse direction to that hereinbefore described, causing the cam lug 48 to enter the cam slot of the keeper A and swing against the inclined outer wall of the slot, which wall is formed by the latch B, to cam the door inwardly to tightly closed position. In thus camming the door shut, the flat portion 49 of the cam lug 48 will be brought into flat face contact with the inner side face of the sliding latch B, thereby locking the crank member against accidental rotation. After the door has been thus tightly closed, the key actuated lock D is pressed inwardly by the attendant, thus engaging the locking pin 42 of said lock with the keeper latch slide B to lock the latter against sliding movement, and further projecting said pin into the path of swinging movement of the lug 48, thereby positively locking the crank member H against rotation.

In closing the door by slamming the same shut, the operation is as follows: As the door is forcibly swung shut by the attendant, the cam lug 48 strikes against the keeper latch slide B, engaging the inclined cam face 40 thereof, thus, through the camming action between said lug

and cam face sliding the latch B inwardly against the resistance of the spring C, as the lug rides along said cam face, as shown in Figure 7, until it clears the latch B, whereupon the latch B is projected back to the original position through the action of the spring C in front of the lug 48 to lock the door closed. The parts having reached this latched position, the attendant depresses the key controlled lock D to project the pin 42 thereof through the latch slide B and into the path of movement of the lug 48 of the crank member H to positively lock the latch against sliding movement and the keeper engaging crank member against rotation.

In the event that it becomes necessary to open the door from the inside of the truck body, due to the attendant becoming trapped by the door being closed and locked, the same may be readily opened by releasing the securing bolt E by unscrewing the combined nut and lever F from the bolt so that the bolt may be drawn out with the keeper A as the door is forcibly pushed open from the inside of the truck body. As will be evident, after the bolt E has been released by unscrewing the nut member therefrom through manipulation of the lever arm 32 by the attendant, the keeper A will be free to swing with the door to which it is locked by the engaging crank member H and the key controlled lock D, a direct outward pull being exerted on the bolt by the swinging action of the door to readily withdraw said bolt. The detachable arrangement of the keeper thus provides a safety device to assure escape of a person who has been trapped in the truck either accidentally or intentionally.

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 a keeper engaging crank member; of a slotted keeper mounted on the container adjacent the door, said crank member being engageable within the slot of the keeper to force the door partly open or tightly closed, the slot of said keeper being defined by a rigid rear wall and an inwardly slidable front wall spaced from said rear wall; and spring means yieldingly opposing inward sliding movement of said front wall to permit yielding of said wall when engaged by said crank member upon said door being slammed shut.

2. In a fastener for a hinged door of a container, the combination with a rotary crank member mounted on the door, said crank member having an eccentric cam lug thereon; of a keeper housing having a rigid cam wall; an inwardly slidable latch bar mounted in said keeper, said latch bar being spaced outwardly from said cam wall and extending in the same general direction as said wall, to define a cam slot between the latter and said bar; and means yieldingly resisting sliding movement of said bar, said cam lug having camming engagement with said slot to force the door closed when said crank member is rotated in one direction and to force the door open when said crank member is rotated in a reverse direction, said cam lug having camming engagement with said bar to force the same inwardly when the door is slammed shut.

3. In a fastener for a hinged door of a container, the combination with a rotary member having

an eccentric cam lug thereon; of means for latching said door closed comprising a sliding latch bar with which said cam lug has camming engagement when the door is slammed shut; spring means yieldingly projecting said latch bar to engage the same in front of said cam lug; and a fixed cam wall in back of said latch bar and spaced therefrom to define a cam slot, said cam lug being engageable within said cam slot and having camming engagement with the inner side of said latch bar when said crank member is rotated in one direction to force the door closed and camming engagement with said cam wall when said crank member is rotated in a reverse direction to pry the door open.

4. In a fastener for a hinged door of a container, the combination with a rotary member having an eccentric cam lug thereon; of a keeper housing mounted on the container adjacent the door; an inclined sliding latch bar mounted in said housing; a spring yieldingly holding said latch bar projected; and an inclined cam wall on said housing spaced rearwardly from said latch bar and projecting beyond the lower end of the latter, said cam lug being engageable with said latch bar to cam the same inwardly when the door is slammed shut and said bar being projected in front of said cam lug when the door is fully closed to lock the door, said cam lug being respectively engageable with the cam wall and the inner side of the latch bar when the crank member is rotated in reverse directions to either force the door open or tightly closed.

5. In a fastener for a hinged door of a container, the combination with a keeper engaging crank member mounted on the door; of a slotted keeper mounted on the container adjacent the door, said crank member being engageable within the slot

of the keeper to force the door partly open or tightly closed, the slot of said keeper being defined by a rigid rear wall and a lengthwise, inwardly slidable, front wall spaced from said rear wall; spring means yieldingly opposing inward sliding movement of said front wall to permit yielding of said front wall when engaged by said crank member upon said door being slammed shut; and a key controlled plunger lock engageable with said front wall to lock the same against inward sliding movement, and having a portion projected into the path of movement of said crank member in said slot to lock the latter against rotation.

15. 6. In a fastener for a hinged door of a container, the combination with a crank member rotatably mounted on the door, said crank member including an eccentric keeper engaging lug; of a keeper housing fixed to the container adjacent said door; a sliding latch bar mounted in said housing; spring means in the housing projecting said latch bar; a wall on said housing in back of said bar and spaced therefrom to define a slot within which said cam lug is engageable, said bar being supported in the path of movement of said keeper engaging lug when the door is slammed shut to be cammed inwardly by said lug and spring in front of said lug to lock the door when the latter is fully closed; and a key controlled lock on said housing having a locking pin portion engageable with the latch bar to lock the same against sliding movement, said pin when engaged with said bar projecting into the slot of the keeper to block rotary movement of said keeper engaging lug in door opening direction.

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