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MECHANISM FOR OPERATING A REFRIGERATOR DOOR FASTENER

Filed April 13, 1954

3 Sheets-Sheet 1

Fig. 1.

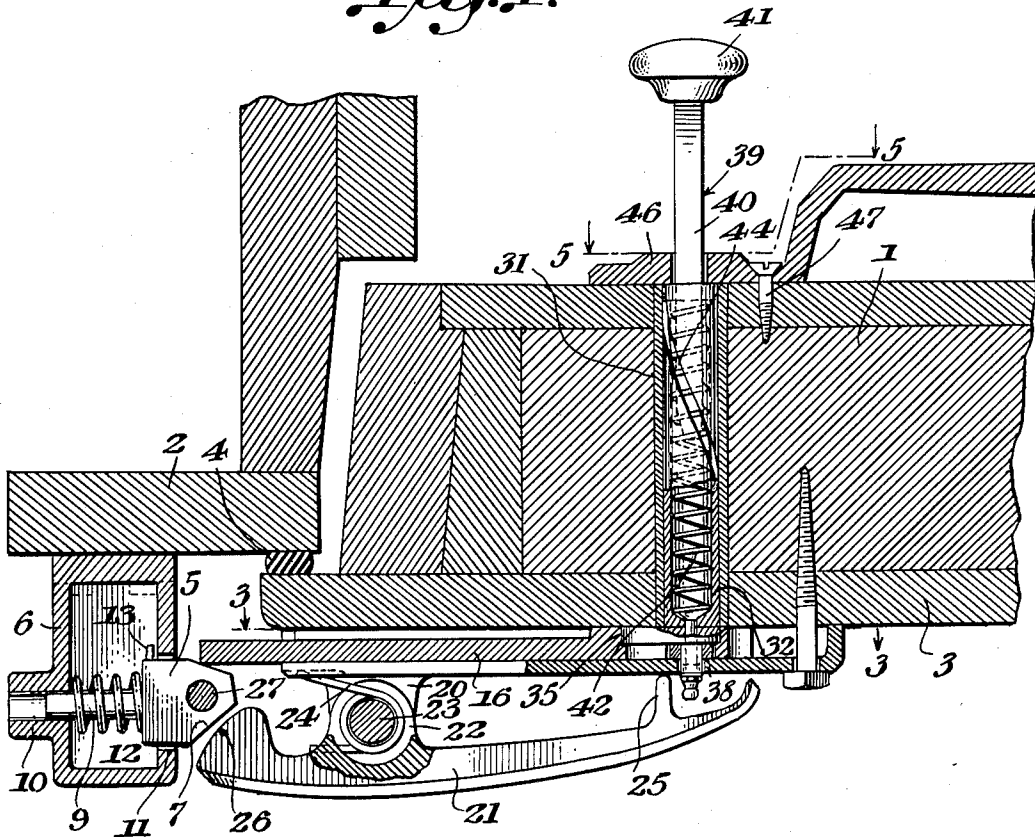
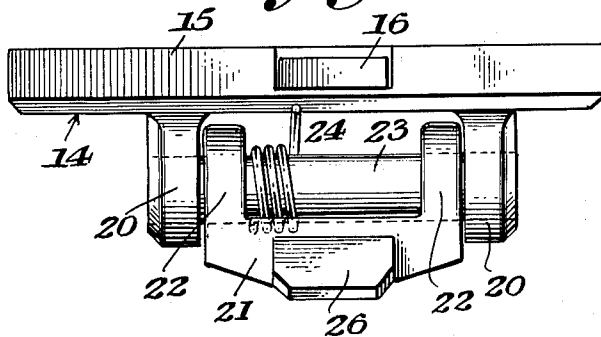


Fig. 3.^a



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Fig. 2.

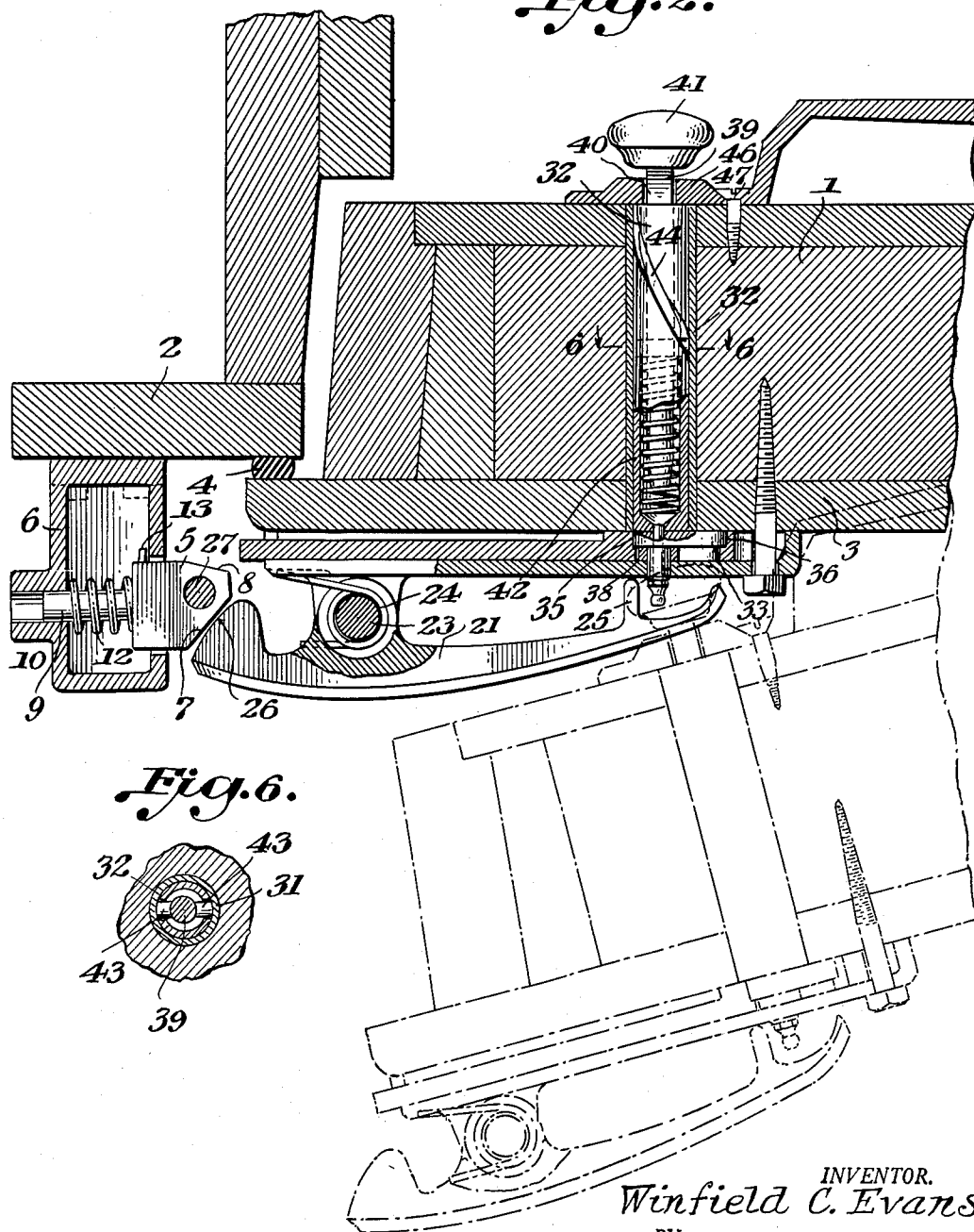
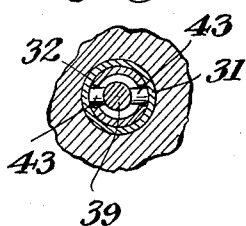


Fig. 6.



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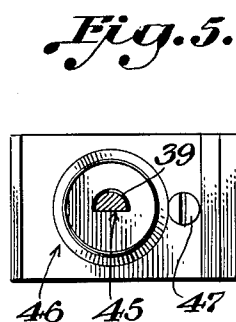
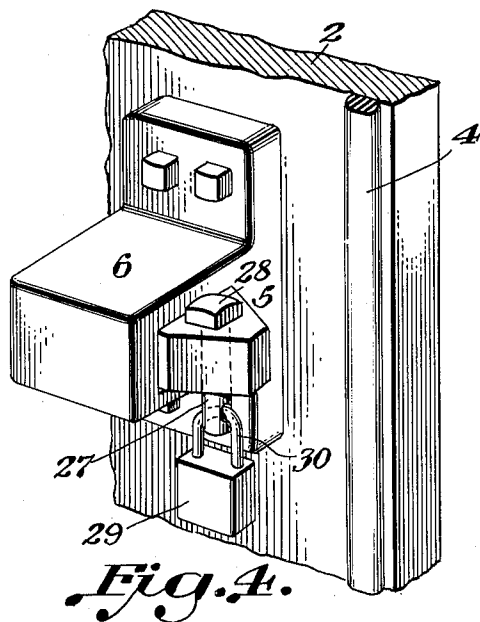
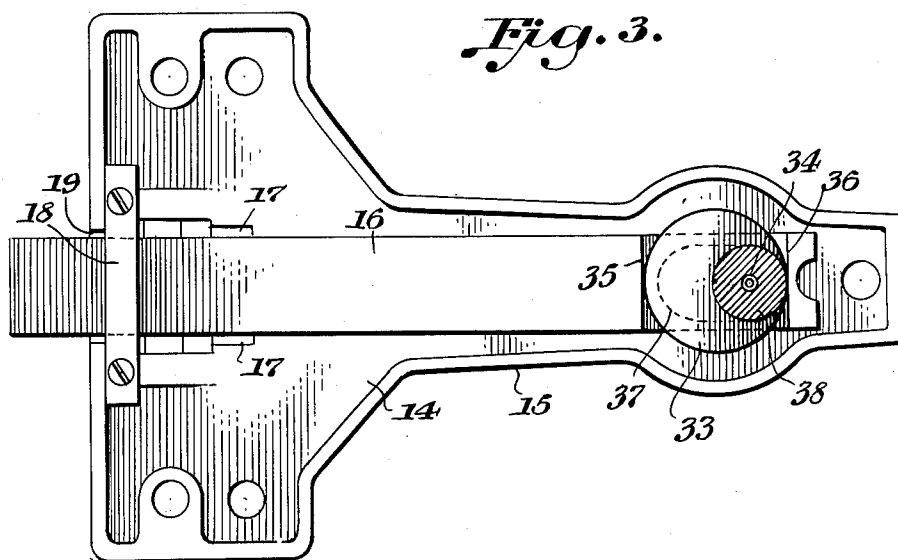
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MECHANISM FOR OPERATING A REFRIGERATOR DOOR FASTENER

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1 Claim. (Cl. 292—92)

The invention relates to new and useful improvements in a fastener for the door of a walk-in type of refrigerator, which fastener is so constructed that the door may be locked in closed position to prevent unauthorized entrance to the refrigerator.

An object of the invention is to provide a fastener of the above type with a push rod mounted for endwise movement toward and from the inside of the door and devices controlled by said endwise movement of the push rod for withdrawing the latch bar for releasing the locked door.

A further object of the invention is to provide a fastener of the above type wherein the push rod when moved endwise inwardly of the door rotates a sleeve carrying a cam for retracting the latch bar for releasing the locked door.

A still further object of the invention is to provide a fastener of the above type with means for automatically returning the rod and the latch bar to their initial positions when the push rod is released.

In the drawings: which show by way of illustration one embodiment of the invention:

Figure 1 is a horizontal sectional view through a portion of a refrigerator door and the frame thereof showing the improved latching mechanism as applied to the door and the door frame with the fastener in locked position.

Figure 2 is a view similar to Figure 1 but showing the latch withdrawn so as to release the locked door, said figure also showing in broken lines the door moved toward open position.

Figure 3 is a view along the line 3, 3 of Figure 1 and showing the inner parts of the housing for the latch bar, the latch bar and the cam for operating the same.

Figure 3a is an end view of the housing for the latch bar and showing the mounting of the lever for retracting the keeper when not locked in projected position.

Figure 4 is a view of the keeper, the housing therefor, the locking bolt for locking the keeper in projected position for locking the refrigerator door in closed position.

Figure 5 is a sectional view on the line 5, 5 of Figure 1.

Figure 6 is a sectional view on the line 6, 6 of Figure 2.

In the illustrated embodiment of the invention there is shown a door 1 of the usual construction for a walk-in type of refrigerator. A portion of the door frame is illustrated at 2. The door has a front plate 3 which engages a gasket 4 when the door is closed for sealing the opening. The fastener for the door includes a keeper 5. Said keeper is mounted in a housing 6 of any suitable construction which is attached to the door frame 2. The keeper 5 has a head provided with a tapered face 7 at the front thereof and a tapered face 8 at the rear thereof. The head of the keeper is mounted on a shank or rod 9. This rod is mounted in a bearing 10 for free endwise sliding movement. The keeper head extends through a slot 11 in the front wall of the housing. A spring 12 surrounds the rod 9 and bears at one end against the head of the keeper and at its other end against the rear wall

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of the housing. The head 5 carries a stop 13 which limits the projected position of the keeper.

The fastener includes a housing 14 which has a rib 15 extending all the way around the same (see Fig. 3). This housing is attached to the door plate 3 at the front of the door. Mounted for endwise movement in this housing is a latch bar 16. Said latch bar is guided by lugs 17, 17 and is held between the lugs by a plate 18. The latch bar moves through a slot 19 in the housing and may be projected from the housing as shown in Figures 1 and 3 or retracted as shown in Figure 2. When in projected position it engages behind the keeper 5 and when retracted it is so positioned that it will escape the keeper and permit the door to be opened.

In the normal operation of the fastener this latch bar remains in projected position as shown in Figure 1. Mounted on the front of the housing are two spaced lugs 20, 20. A hand operated lever 21 is provided with two spaced lugs 22, 22. These lugs are mounted on the pin 23 for free oscillation. There is a spring 24 surrounding the pin 23 and one end of the spring bears against the housing while the other end bears against the lever and normally holds it in the position shown in Figure 1. In this position a lug 25 formed as a part of the lever bears against the housing and prevents any further movement of the lever in a counter-clockwise direction. This lever is provided with a cam shaped face 26 at the outer end thereof.

Let us assume that the keeper is not locked but is free to move into and out of the housing under control of the spring 12 and it is also assumed that the latch bar 16 is in projected position and behind the keeper. When the door is to be opened the operator turns the lever so as to bring the cam face 26 into contact with the inclined face 7 of the keeper and this will force the keeper into the housing to a position so that the latch bar is released from engagement with the keeper and the door can be freely opened. When it is desired to close the door a push on the door will cause the latch bar to engage the inclined face 7 and force the keeper into the housing so that the latch bar will pass from engagement with the inclined face 7 to an engagement with the inclined face 8 of the keeper. The keeper will be forced by the spring 12 to its extreme outer position and the face 8 will force the door into very tight sealing contact with the gasket 4.

When it is desired to lock the door in closed position to prevent unauthorized entrance into the refrigerator a locking pin 27 is inserted through the opening in the keeper head. This pin has a head 28 thereon which not only prevents the pin from dropping through the opening but the head also engages the housing and holds the keeper in a projected position. The ordinary padlock 29 is attached to the pin by passing the hasp 30 through an opening in the pin. This locks the pin in place in the keeper and the pin in turn locks the keeper in its projected position. Assuming that the parts are in the position shown in Figure 1, the lever 21, pressed against the keeper, will be ineffective to force the keeper into its housing so as to release the latch bar because of this locking pin.

The fastener and the keeper as described above are all of the usual construction except for minor details. The present invention has to do with devices for releasing the latch bar from the inside of the door so that the door may be opened without disturbing the locked position of the keeper. Mounted in the door and extending from front to rear thereof is a tubular casing 31. Mounted for rotation in this tubular casing is a sleeve 32. This sleeve 32 has a cam 33 secured to the end thereof by welding or otherwise so that when the sleeve is turned the cam will turn with it. The cam as shown in Figure 3 is a concentric member set eccentrically on the sleeve the center of which is indicated at 34 in Figure 3. The latch bar 16

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has a shoulder 35 which engages one side of the cam 33 and a shoulder 36 which engages the other side of the cam 33. There is a slot 37 in the latch bar 16 and the sleeve carries a disc 38 which is located in this slot. The slot has parallel sides and the latch bar will be guided in its endwise movements by this disc 38. When the sleeve 32 is turned in the housing 31 in one direction the latch bar 16 will be retracted to the position shown in Figure 2 and when the sleeve is turned through 180 degrees the latch bar will be projected as shown in Figure 1. Mounted for endwise movement in the sleeve 32 is a push rod 39. This push rod has a flat side 40. On the end of the rod is a knob 41. A spring 42 is disposed in the sleeve 32 and bears at its lower end against the closed end of the sleeve 32. The rod 39 carries a pin 43. The pin projects from opposite sides of the rod and is adapted to engage in a spiral groove 44 formed in the sleeve 32. The flat side 40 of the rod engages the flat side 45 of an opening in a plate 46 through which the rod extends. The plate 46 is secured to the inner face of the door by screws one of which is indicated at 47. This flat side on the rod prevents it from turning when it is pushed inwardly from the position shown in Figure 1 to the position shown in Figure 2. The ends of the pin will move along the spiral grooves in the sleeve 32 and cause the sleeve to rotate. This in turn causes the cam 33 to retract or project the latch bar. The spring 42 bears at its upper end against this pin carried by the push bar and when the push bar is released the spring will force it outwardly from the casing. The outward movement of the push rod 39 is limited by the pin contacting with the inner face of the plate 46. This push rod can only be operated from the inside of the refrigerator door. If an attendant enters the refrigerator chamber and the door is closed and locked unintentionally the attendant can, by pushing on the rod 39 cause the latch bar 16 to be retracted and thus release the door so it can be opened. This is accomplished notwithstanding the fact that the keeper 5 is locked in its projected position. It will be noted that the improved fastener can be opened from the outside by retracting the keeper. It can also be opened from the inside by the push rod 39 retracting the latch bar. This retraction of the latch bar may be accom-

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plished from the inside when the keeper is locked without in any way disturbing the locked position of the keeper by the retraction of the latch bar. When the door has been opened by retracting the latch bar and the push rod is released the spring will automatically move the push rod to its extreme outer position and as the pins move along the spiral slots they will turn the sleeve and force the latch bar to its initial position projecting from the housing therefor as shown in Figure 1. If, therefore, the operator opens the door from the inside and then releases the push rod the parts will be restored to their initial position with the latch bar extended and ready for normal operation. It is noted that the opening of the door from the inside through the push rod is accomplished by pressure on the push rod in a direction for opening the door so that as soon as the latch bar is retracted the continued pressure will swing the door to open position.

It is obvious that many changes in the details of construction of the fastener may be made without departing from the spirit of the invention as set forth in the appended claim.

I claim:

In a door fastener having a latch bar on the outer face of the door with which a spring projected keeper co-operates and a cam for extending and retracting said latch bar, mechanism for operating said cam comprising a sleeve rigidly connected to said cam, said sleeve having a spiral slot therein, a push rod disposed in said sleeve, means for preventing rotation of the push rod, a pin fixed to said rod and engaging said spiral slot in said sleeve for rotating the sleeve when the push rod is moved endwise therein for retracting said latch bar, a spring in said sleeve for moving the rod to an initial extended position and for projecting the latch bar into engaging position with the keeper when the push rod is released by the operator.

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