

June 22, 1954

W. O. BURKE

2,681,819

LATCH CONSTRUCTION

Filed June 28, 1950

2 Sheets-Sheet 1

Fig. 1

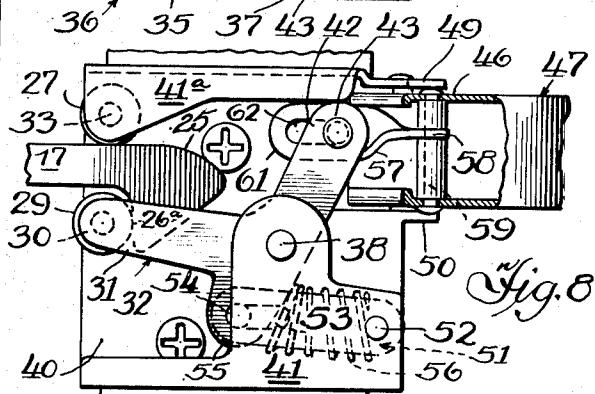
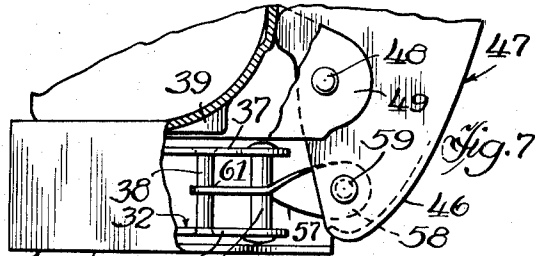
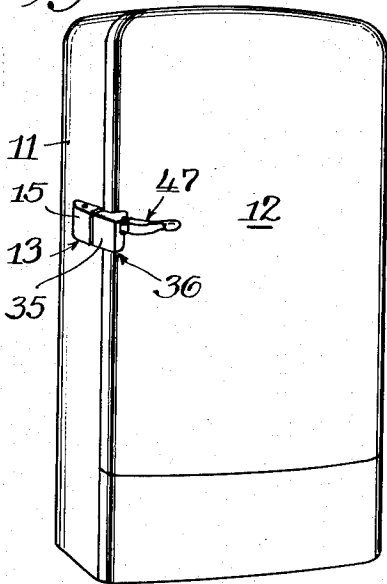


Fig. 2

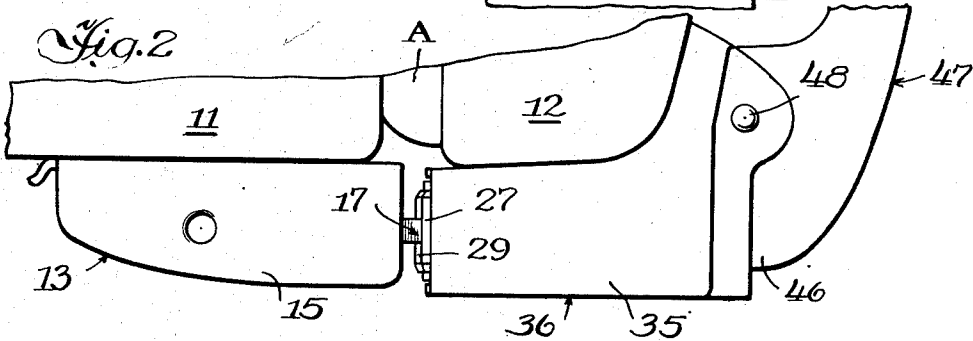
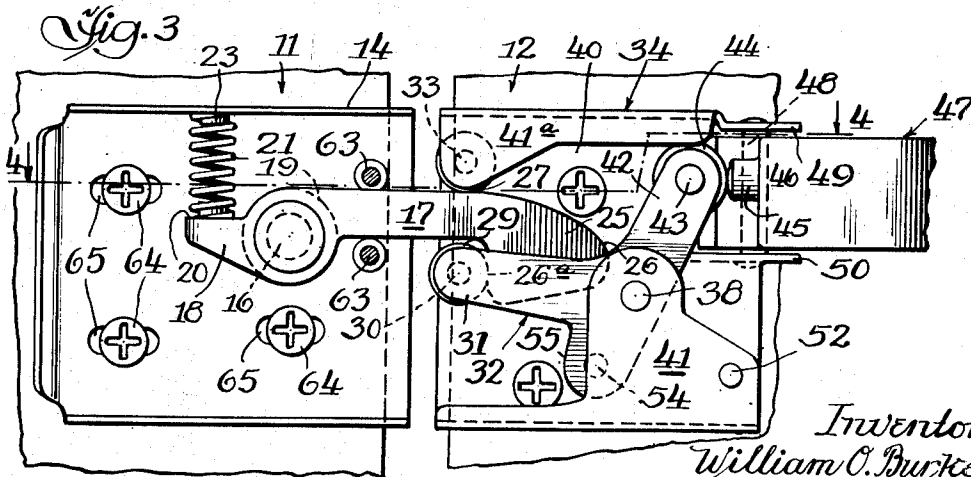


Fig. 3



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Fig. 4

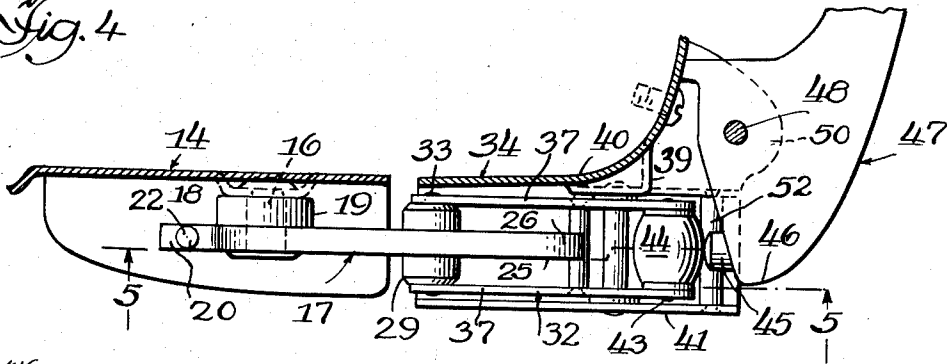


Fig. 5

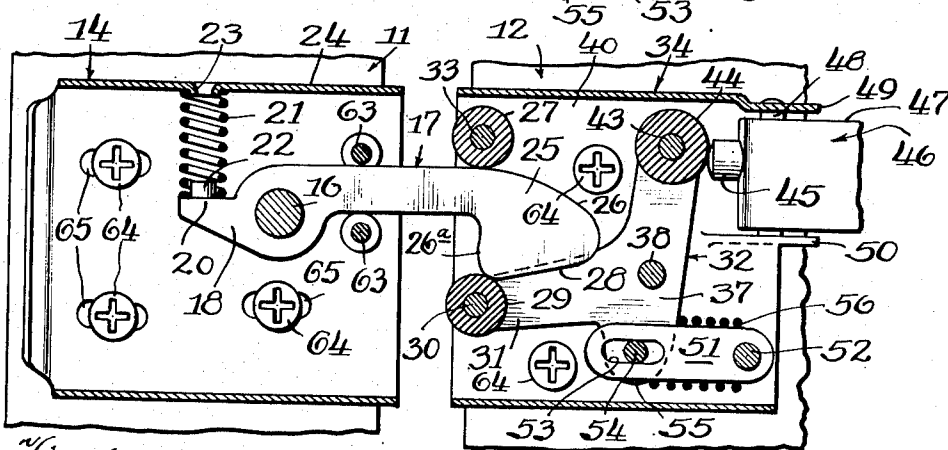
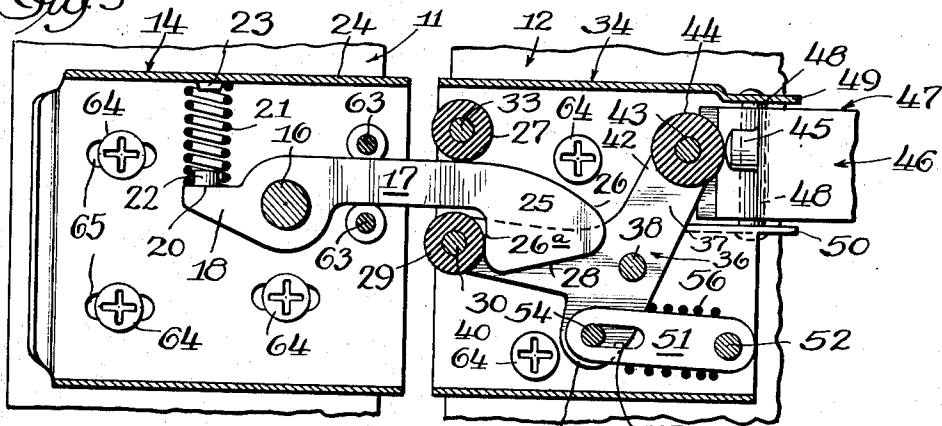


Fig. 6

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UNITED STATES PATENT OFFICE

2,681,819

LATCH CONSTRUCTION

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4 Claims. (Cl. 292—226)

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The present invention relates to a latch mechanism and especially to a novel latch construction adapted to be applied to the exterior of a refrigerator or other cabinet structure and its door or closure. In cabinets of this type, it is essential to provide a positive lock or latch which will effectively maintain the door or closure in tight sealing engagement with the cabinet.

It is, therefore, an important object of the present invention to provide a novel latch construction consisting of a two-part assembly, one part or unit thereof mounted upon the cabinet and carrying the strike or keeper and the other part thereof carrying the latch member for receiving the hook or latching end of the strike or keeper and shown as mounted upon the door or closure, both units being preferably mounted on the exterior of the cabinet and its door or closure and adjacent the parting line therebetween.

The present invention further comprehends the provision of a novel latch mechanism for a refrigerator of the type in which the door or closure is provided with a sealing gasket for sealing the space between the cabinet and door, said latch assembly being of rugged construction and positive in its locking engagement whereby to assure effective sealing contact between the door and cabinet, yet so designed and constructed as to effect quick release and assure ready opening of the door or closure whenever the occasion requires.

Another object of the present invention is the provision of a novel latch mechanism comprising a housing mounted upon an exterior edge of the cabinet and containing a strike or keeper pivotally mounted therein and having its hook or locking end projecting beyond the parting line or edge of the cabinet, and a housing mounted upon an adjacent exterior edge of the door or closure and containing a pivotally mounted bell crank carrying a latching roller moved and spring-biased into latching engagement with the hook or locking end of the strike or keeper.

Further objects are to provide a construction of maximum simplicity, efficiency, economy, ease of assembly and operation, and in the provision of the novel construction, combination and arrangement of parts illustrated in the accompanying drawings, and while there is shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions without departing from the spirit of the invention.

In the drawings:

Figure 1 is a view in perspective of cabinet and door or closure of the type employed with refrigerators and equipped with my novel latch mechanism.

Fig. 2 is an enlarged fragmentary, top plan view of the novel latch construction and assembly applied to the cabinet and door or closure and with the latter in closed position.

Fig. 3 is a view in side elevation of the latch construction of Fig. 2 but with the cover of the housings or enclosures removed for more complete disclosure.

Fig. 4 is a view in horizontal cross-section taken in a plane represented by the line 4—4 of Fig. 3.

Fig. 5 is a view in vertical cross section taken in a plane represented by the line 5—5 of Fig. 4.

Fig. 6 is a view similar to Fig. 5 but showing the component parts of the latch unit or assembly in position for release of the strike or keeper and with the door or closure partially opened.

Fig. 7 is a plan view of the latch assembly or unit on the door or closure with a portion of the housing and supporting bracket broken away to show an alternate form of connection between the operating handle and the toggle.

Fig. 8 is a view in side elevation of the latch assembly or unit of Fig. 7 applied to the door or closure, but with the cover removed and the adjacent end of the actuating handle broken away.

Referring more particularly to the disclosure in the drawings and to the novel illustrative embodiment therein shown, the novel latch construction is disclosed as comprising a two-part latch assembly, one mounted upon a cabinet or body 11 and the other mounted or carried on a hinged or pivoted door 12 of a refrigerator or the like. The latch assembly or unit 13 mounted on the cabinet includes a housing comprising a supporting bracket or base 14 and a removable cover 15 therefor. Upon this supporting base or bracket is mounted a pivot pin or rivet 16 projecting outwardly and adapted to receive and pivotally mount a strike or keeper 17 adjacent its inner end 18. A washer 19 maintains the strike or keeper centered on the pin or rivet 16 and between it and the outer clinched end of the rivet.

This strike or keeper 17 is provided at this inner or rear end with a ledge or shoulder 20 adapted to receive one end of an expansible or coil spring 21, and having an upstanding lug or projection 22 adapted to locate and keep cen-

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tered the lower end of the spring. A projection or embossment 23 depending from the upper flange 24 of the supporting bracket or base 14 is provided for locating and retaining the upper end of the spring 21.

The hook or engaging end 25 of the strike or keeper 17 projects a substantial distance beyond the parting line between the cabinet and the door or closure and beyond the forward projecting edge of the supporting base or bracket 14. This hook or locking end has an upper cam face 26 adapted to abut and ride against and under a roller or bearing surface 27, a lower cam face or engaging surface 26^a and an inclined connecting surface 28 adapted to engage and ride over a roller 29 mounted upon a cross pin 30 at the outer end 31 of a bell crank 32, the cam face or engaging surface 26^a being slightly rearwardly and downwardly inclined to interlock or interengage with the roller 29 when the door is in closed position.

The roller 27 is rotatably mounted on a pin or stub shaft 33 secured in a supporting bracket or base 34 which with a removable cover 35 provides a housing or enclosure for the latch assembly or unit 36 mounted on the door or closure 12. The bell crank 32 comprises spaced arms or link members 37 carrying the transverse cross pin 30 therebetween upon which the roller 29 is rotatably mounted, a pivot or cross shaft 38 which may be in the form of a rivet projecting through these members and secured at one end in an embossment 39 in the rear wall 40 of the supporting bracket 34 (Fig. 4), and the other end mounted in the front wall 41 of this bracket (Fig. 3). The roller 27 is also mounted or journaled in the rear wall 40 and in a depending flange 41^a forming a part of the front wall of the support or bracket 34 (Fig. 3).

Upon the outer end 42 of the spaced arms or link members 37 is a cross pin or rivet 43 spanning these members and carrying a roller 44 adapted to engage an abutment or lug 45 on the actuating end 46 of a latch-operating handle 47 shown as mounted at the front of the door or closure 12. This end of the handle is pivotally mounted on a vertically disposed pin or rivet 48 mounted in spaced and offset flanges 49 and 50 preferably formed integral with and as extensions of the supporting bracket 34. Thus by pulling outwardly on the free end of the handle 47, the lug or projection 45 engages and moves the roller 44 inwardly in a counter-clockwise direction to depress the roller 30 and release the latching end 25 of the keeper 17.

The bell crank 32 is freely pivoted but spring-biased to rotate in a clockwise direction in which the roller 29 is raised or elevated to cocking position and interlocking engagement with the hook end 25 of the strike or keeper. This spring-biasing (Figs. 5 and 6) is accomplished by an arm or link 51 pivoted at one end upon a cross pin or rivet 52 bridging or spanning the front wall 41 and rear wall 40 of the supporting bracket. This arm or link 51 is longitudinally slotted at 53 adjacent its other end and this slot is adapted to receive a pin 54 having its opposite ends mounted in a depending projection or offset 55 on the spaced arms or link members 37 of the bell crank 32. A compression spring 56 engages or abuts at one end against the pin or rivet 52 and at its other end against the projection or offset 55 on the arms or links 37 and tends to force the bell crank to rotate in a clockwise direction.

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Figs. 7 and 8 disclose an alternate form of connection between the latch operating handle on the bell crank 32 for releasing the bell crank and its roller 29 from the hook end 25 of the strike or keeper 17. In place of providing the handle with a lug or projection 45 engaging a roller 44 as in Figs. 1 to 6, inclusive, an arm or link 57 is connected at its outer end 58 to the latch actuating end 46 of the handle by means of a vertically projecting pin or rivet 59, and at its inner end 61 this arm or link 57 is connected to the outer or upper end 42 of the arms or links 37 forming the bell crank 32. This latter connection is made by extending the pin or rivet 43 through an elongated, longitudinally extending slot 62 in the twisted inner end 61 of the arm or link 57.

Thus, when the free end of the latch operating handle 47 is withdrawn or pulled outwardly, the actuating end 46 of this handle forces the link or arm 57 to move inwardly or rearwardly and when the pin 43 is seated in the forward end of the slot 62, further forward movement of the arm or link 57 will rock the bell crank 32 in a counterclockwise direction whereby to compress the spring 56 and disengage the roller 29 from the hook or engaging end 25 of the strike or keeper 17 and the door may be readily opened. As the spring 56 spring-biases this bell crank in clockwise direction upon release of the handle, it will be readily apparent that the bell crank will elevate the roller 30 to cocking position ready to receive the strike or keeper.

The latch strike or keeper 17 is maintained in its proper operative position and alignment for ready engagement by the rollers 27 and 29 as the open door or closure 12 is moved toward closed position. This is accomplished by means of the coil spring 21, and to limit the arc of movement of the strike or keeper about its pivot 16 the supporting bracket 24 may be provided with spaced projections or guide pins 63 (see Figs. 3, 5 and 6).

The supporting brackets or bases 14 and 35 are securely affixed to the cabinet 11 and door 12, respectively, by screws, bolts or other securing means 64. To permit adjustment thereof with respect to the edge of the cabinet, the supporting bracket 34 is shown as provided with elongated slots 65 for the reception of the securing means.

As shown in Figs. 3, 5 and 6, the spring 21 spring-biases the floating strike or keeper 17 in a counterclockwise position with the limit of its upper movement determined by the upper pin 63. Each of these views also shows that the keeper upon engaging the roller 27, is spaced from and positioned below this upper pin 63 whereby to allow for variation in the position in which the supporting bracket or base is mounted on the cabinet. As the strike or keeper 17 enters the space between the roller 27 on the fixed pin 33 and the roller 29 carried by the pin 30 on the movable end or arm 31 of the bell crank 32, the upper cam face 26 of this strike or keeper 17 contacts the upper roller 27 and is guided thereby into proper position for latching. Thus by spring-mounting the floating strike or keeper 17 in the manner disclosed, this strike or keeper is assured of contact with the roller 27 in the closing operation and is guided and directed thereby.

Although it is intended that the keeper or strike 17 and the latching unit be mounted in 75 alignment, as frequently happens such align-

ment is affected by a mere movement of the refrigerator or by failure to mount the refrigerator level. If the keeper or strike is mounted in fixed position or is not permitted to float in a manner such as contemplated by applicant, such misalignment prevents the proper functioning of the latch assembly or closing of the door.

By mounting the strike or keeper in a manner whereby it floats and is spring-biased, and whereby the cam surface 26 engages the upper roller 27 upon closing of the door, this keeper or strike is positively guided by the roller 27 into proper position for latching engagement.

From the above description and the disclosure in the drawings it will be apparent that the present invention comprehends a novel latch mechanism for refrigerators and the like that is structurally rugged and positive in its operation, and when the door is in closed position the interior of the cabinet is effectively sealed by the resilient sealing gasket A.

Having thus disclosed the invention, I claim:

1. In a latch construction for releasably latching a door to a cabinet having a spring-biased keeper pivotally mounted on the cabinet and provided with a hook at its locking end projecting toward the door, a latch assembly carried by the door and including a supporting bracket secured to the door, a roller in said bracket and adapted to be engaged by the keeper as the door is closed, a pin projecting through said roller and fixedly mounted in the bracket, a bell crank pivotally mounted on the bracket and carrying a roller at one end movable toward and away from the first mentioned roller providing a latch member for engaging the locking end of the keeper and retaining the keeper between said rollers, a second roller carried by the other end of the bell crank, means adapted to engage the last mentioned roller for swinging the bell crank about its pivot and urging the locking roller out of locking engagement with the end of the keeper, a projection on said bell crank, and spring-biasing means engaging said projection and urging the first mentioned roller on the bell crank into interlocking engagement with the keeper.

2. In a latch construction for releasably latching a door to a refrigerator cabinet having a spring-biased hook-type keeper pivotally mounted on the cabinet and having its hook end depending and projecting beyond the line of division between the door and cabinet, a latch unit mounted upon the door and including a fixed supporting bracket, a pin fixedly mounted in the bracket, a roller mounted upon the pin in the bracket with the pin projecting through the roller and the roller adapted to be engaged by the upper edge of the hook end of the keeper as the door is closed and limit its upward movement, and a bell crank pivotally mounted upon the bracket and provided with an arm carrying a roller at one end for interlocking engagement with the hook end and underside of the keeper, a projection on said bell crank, spring-biasing means for urging said projection and bell crank to rotate in a direction to elevate said arm and

its roller into interlocking engagement with the hook end, and means for engaging the other end of the bell crank and moving the bell crank and withdrawing its roller out of interlocking engagement with the hook end of the keeper when the door is to be opened.

3. In a latch mechanism of the character described employing a spring-biased floating hook-type keeper mounted upon one part of a two-part closure and having its latching end projecting toward the other part, a latch assembly mounted upon the other part and including a supporting member fixedly mounted on said other part, spaced rollers for receiving therebetween the latching end of the keeper, a pin fixedly mounted in the supporting member and projecting through one of said rollers whereby said last mentioned roller is mounted on a stationary pivot in said member, a bell crank pivotally mounted in said member and provided with an arm carrying the other roller, spring-biasing means including a link pivotally mounted at one end to the fixed supporting member and at its other end pivotally and slidably mounted upon the bell crank for rotating the bell crank to move its roller toward the first mentioned roller and into latching engagement with the latching end of the keeper, and means engaging the other arm of the bell crank for rotating the latter to release its roller from latching engagement with the keeper.

4. In a latch construction for releasably latching a closure to a cabinet having a floating hook-type keeper pivotally mounted on the cabinet and spring-biased to elevated position with its hook end depending and projecting beyond the adjacent edge of the cabinet and toward the closure, a latch assembly on the closure for receiving the projecting end of the keeper and including a stationary support, a pair of rollers in the support adapted to receive the projecting end of the keeper therebetween, a pin projecting through one of said rollers and fixedly mounted in the stationary support for mounting said roller in said support, a bell crank pivotally mounted in the support and having one arm carrying the other of said rollers, an offset on said bell crank, spring-actuated means engaging said offset for rotating said bell crank to elevate its roller into latching engagement with the hook end of the keeper, and means engaging the other arm of said bell crank for rotating the bell crank in the direction opposite to that of the spring-actuated means to release its roller from engagement with the hook end and permit opening of the closure.

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