

July 18, 1933.

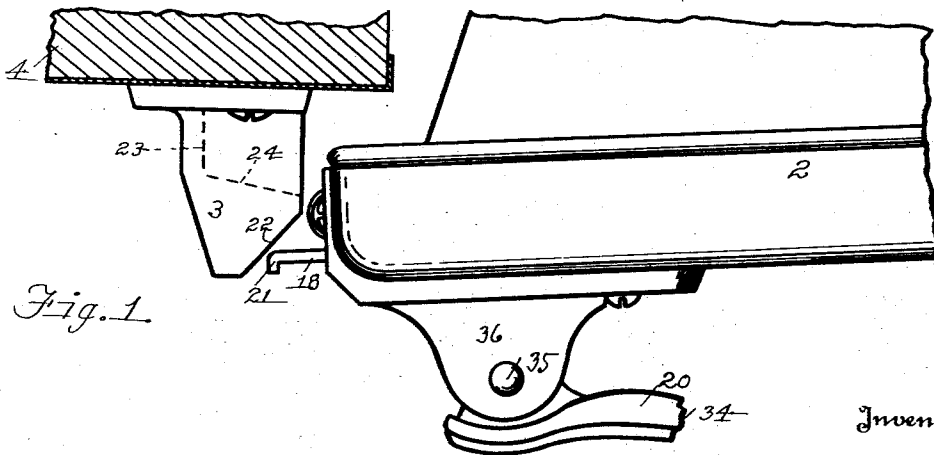
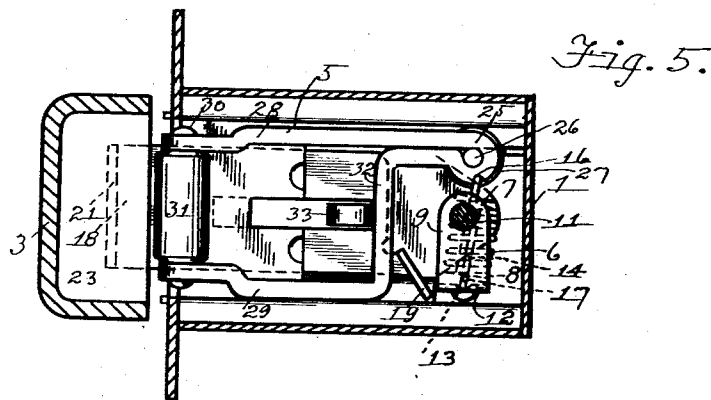
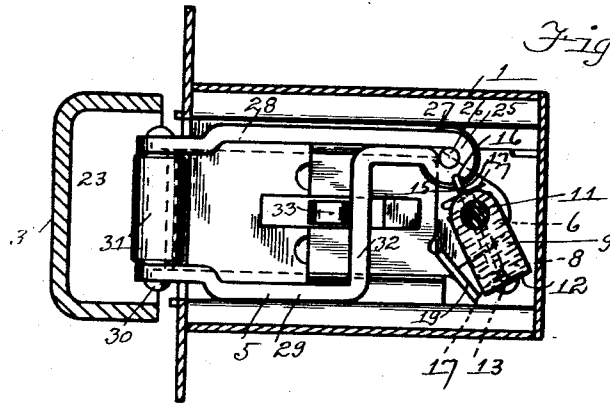
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LATCH

Filed Dec. 11, 1931

2 Sheets-Sheet 1



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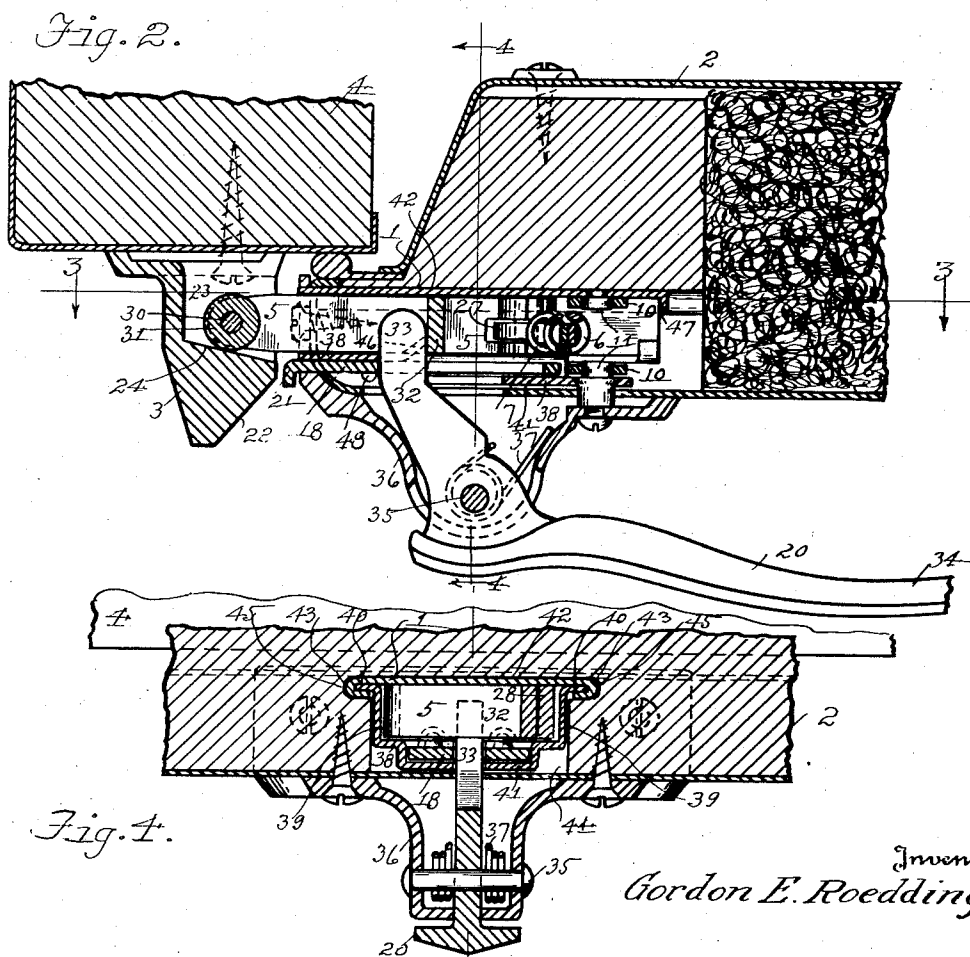
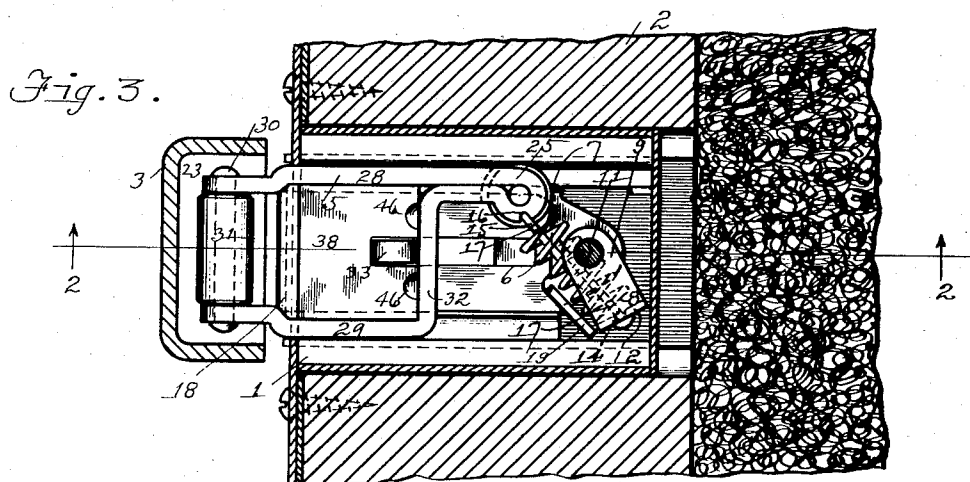


Fig. 4.

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LATCH

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The present invention relates to latches for refrigerator doors and the like; and its object is, generally, to provide a device of that character having improved means for urging the latching bolt to its operative position and for yieldingly holding the same in retracted position, and improved means for actuating the aforesaid means; and further, to provide improved means for applying such a latch to a door member; and further, to provide an improved construction of the latch bolt.

These general objects and any other and more specific objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the structure and mechanism particularly described in the body of this specification and illustrated by the accompanying drawings forming a part hereof, in which:

Figure 1 is a top plan view of the free edge portion of a partially opened swinging door closure to which closure a latch is applied, and a horizontal sectional view of the jamb or casing of the door to which jamb the keeper for the latch's bolt is applied;

Figure 2 is a sectional view of said parts taken on a horizontal plane corresponding to line 2—2 of Figure 3, the closure being shown shut and the latch's bolt in operative or latching engagement with the keeper;

Figure 3 is a vertical sectional view of parts seen in Figure 2 taken on line 3—3 of Figure 2;

Figure 4 is a vertical sectional view thereof taken on line 4—4 of Figure 2;

Figure 5 is a view of the latch and keeper similar to Figure 3, but showing the latch's bolt in retracted position; and

Figure 6 is a view of said parts, similar to Figures 3 and 5 but showing the latch's bolt in an intermediate position.

In these drawings are shown a latch designated generally 1 applied to the free edge portion of one member (the swingable closure 2) of a door and a keeper 3 applied to the other door member (the door's casing or jamb 4). The latch comprises a bolt 5 movable into operative or latching engagement at its outer end with the keeper as shown in

Figures 2 and 3 and to retracted position as seen in Figure 5, this bolt being thus movably slidable in the illustrated preferable embodiment of the invention.

A spring 6 pressing at its upper end 7 (through intermediate parts as hereinafter described) on the bolt and having its lower end 8 movable in the general direction of the bolt's movement so as to change the direction of the spring's action by thus moving said lower end thereof, serves to urge the bolt outwardly into operative latching engagement with the keeper when the spring is in the position seen in Figure 3 (i. e. when the spring's lower end 8 is moved away from the keeper), or serves to yieldingly hold the bolt in retracted position when the spring is in the position seen in Figure 5 (i. e. when the spring's lower end is moved toward the keeper). This spring is mounted for such movement preferably as shown in the drawings, viz: an arm 9 having spaced parallel sides 10 pivotally mounted at 11 on the latch casing has a middle portion 12 in whose notch 13 rocks the lower end of a bar 14 extending inside the coiled spring 6, a second bar 15 also extending inside the spring and having its upper end rocking in a notch 16 in the bolt, these bars having abutments 17 on which the ends of the spring press. The latch has means for moving the arm 9 to the position seen in Figure 3 comprising a movable trigger, desirably the slidable trigger 18 of the shown construction, whose inner end portion 19, when the trigger is slid inwardly (as hereinafter explained), engages the free lower end of said arm 9 and swings the same past the "dead center" position shown in Figure 6 and toward the position seen in Figure 3, thus shifting the axial direction of the spring and its direction of action, the spring's expansion now urging the bolt to its operative latching engagement with the keeper seen in Figure 3.

When the bolt 5 is retracted by the lever handle 20 to open the closure member 2, it swings the arm 9 reversely and slightly beyond the dead center position seen in Figure 6 to the position shown in Figure 5. In this movement the free end of the arm 9 engages

the inner end portion 19 (desirably inclined as shown) of the trigger 18 and moves it outwardly to the position indicated in dotted lines in Figure 5.

As the pivotal mounting 11 of the arm 9 is intermediate the outer ends of the bars 14, 15, the arm and spring have a lever action about said pivot 11 as a fulcrum, so that when the bolt 5 is retracted the trigger 18 is projected and vice versa.

When the closure member 2 is nearing its shut position as seen in Figure 1, the projecting outer end 21 of the trigger 18 engages the other door member 4, i. e. the outwardly bevelled face 22 of the keeper 3, and is thereby slid inwardly, so that when the closure is shut the trigger has moved inwardly far enough to engage the free end of arm 9 and swing it past said dead center position, whereupon the spring suddenly urges the bolt 5 forwardly and its outer end into latching engagement in the recess 23 of the keeper, which recess having an inwardly-inclined surface 24 wedgingly moves the closure into its tightly shut position as shown in Figure 2. There is thus a timed relation between the movements of bolt 5 and trigger 18, and the spring 6 intermediate their inner ends serves to cushion their relative movements.

In the illustrated construction, this latch bolt 5 is formed of a metal bar bent to form a bight portion 25 embracing a pintle 26 on which a roller 27 turns, and parallel portions 28, 29 whose extremities are connected by a pintle 30 on which rotates a roll 31 forming the bolt's outer end which engages the keeper and rides up on the inclined face 22 thereof if the closure be shut when the bolt is not retracted.

In such case the bolt is slid inwardly by engaging said inclined face, and if thus moved sufficiently to cause the arm 9 to project the trigger into engagement with said inclined face and be thereby moved reversely, the arm 9 will be moved by the trigger to the position releasing the retracted bolt and moving it by the spring 6 to operative latching position. The latch bolt has a transverse portion 32 with which the short arm 33 of the operating lever 20 engages to retract the bolt by drawing the lever's handle 34 outwardly. This operating lever is fulcrumed at 35 in the escutcheon plate 36 and is swung outwardly against the pressure of a spring 37.

The latch casing, as best shown in Figure 4, is made of two metal sheets, the forward sheet 38 having horizontal sides 39, bent rearwardly, with flanges 40 turned from each other. The middle portion of this sheet has a part 41 struck forwardly to provide a slide bearing thereunder for the trigger 18. The casing's rear sheet 42 has its upper and lower edges bent over the flanges 40 to hold the sheets tightly together and form therewith

three-ply ribs 43. The door's closure member 2 has a recess or mortise 44 extending from its free edge, with grooves 45 in each of its sides. The latch is applied to the closure member by thrusting the casing into this recess, with the ribs 43 tightly fitting slidably in the grooves 45.

The parallel portions 28, 29 of the bolt 5 bear slidably on the opposite sides 39 of the casing's sheet 38, the roller 27 serving to lessen the friction of said movement particularly where the spring 6 would tend to increase it. Screws are shown for securing the latch and the keeper in place and stops for limiting the movement of various parts are also shown, as the inwardly bent stops 46 limiting the outward movement of the bolt, the stop 47 for the rearward movement of the arm 9, and the stop 48 limiting the outward movement of the trigger.

It will be seen that the arm 9 together with the spring 6 and its bars 14, 15 constitute a lever member fulcrumed at 11 in its middle, the spring's ends (or their bars) on the opposite sides of said fulcrum pressing between the bolt and the free end 12 of the arm respectively, this lever member in one swung position (Fig. 3) urging the bolt to operative engagement with the keeper and in its oppositely swung position (Fig. 5) yieldingly holding the bolt retracted and ready to be engaged by the trigger's end 19 to swing the arm (and thus the lever member as a whole) past the dead-center position (Fig. 6) so that the spring's action may then urge the bolt to operative position (Fig. 3).

It will also be seen that the upper end of this lever member (i. e. the upper end of the bar 15 thereof) is spring-pressed to rocking connection with the bolt, while the lower end of the lever member (i. e. the free end 12 of the arm) is adapted to strike or engage the trigger to move it outwardly or to be engaged by the trigger to swing the arm to the position seen in Figure 3.

It is evident that other specific forms of the various parts of this latch may be adopted, accomplishing the same purpose and having substantially the same mode of operation; wherefore the invention is not to be limited to or by the particular embodiment of the invention illustrated by the drawings or hereinbefore described.

I claim:

1. In a device of the class described: a keeper applied to a door member, a latch applied to a relatively movable door member comprising a bolt movable to operative engagement with the keeper and to retracted position, a swingable arm, a spring pressing directly between the arm and the bolt urging the bolt to operative position in one swung position of the arm and yieldingly holding the bolt in retracted position in another swung position of the arm, a trigger

movable by its engagement with the first-mentioned door member in the closing movement of the other door member to swing the arm to its first-mentioned position, and means for moving the bolt to retracted position.

2. In a device of the class described: a latch applied to a swingable door closure having a keeper applied to the door casing, comprising a bolt slidably movable to operative engagement with the keeper and to retracted position, a swingable arm, a spring pressing directly between the arm and the bolt urging the bolt to operative position in one swung position of the arm and yieldingly holding the bolt in retracted position in another swung position of the arm, a trigger slidably movable by engagement with the door casing in the closing movement of the door closure and engaging the arm to swing the arm to its first-mentioned position, and a handle for moving the bolt to retracted position.

3. In a device of the class described: a keeper applied to a door member, a latch applied to a relatively movable door member comprising a bolt movable to operative position engaging the keeper and to retracted position, a spring pressing between the bolt at one end of the spring and the second-mentioned door member at the other end of the spring said other end being movable by engagement of the hereinafter-mentioned trigger therewith to change the direction of the spring's action so that the spring urges the bolt to operative position in one position of said other end and yieldingly holds the bolt in retracted position in another position of said other end of the spring, trigger means movable by the first-mentioned door member in the closing movement of the other door member for moving said other end of the spring to its position wherein the spring urges the bolt to operative position, and means for retracting the bolt.

4. In a device of the class described: a keeper applied to a door member and having an inclined outer face, a latch applied to a relatively movable door member comprising a bolt movable to operative position engaging the keeper and to retracted position, a spring pressing between the bolt at one end of the spring and the second-mentioned door member at the other end of the spring said other end being movable by engagement of the hereinafter-mentioned trigger therewith to change the direction of the spring's action so that the spring urges the bolt to operative position in one position of said other end and yieldingly holds the bolt in retracted position in another position of said other end of the spring, trigger means movable by its engagement with said inclined face in the closing movement of the second-mentioned door member for moving said

other end of the spring to its position wherein the spring urges the bolt to operative position, and means for retracting the bolt.

5. In a device of the class described: a keeper applied to a door member and having a recess and an inclined outer face, a latch applied to a relatively movable door member comprising a bolt movable to operative position engaging in said recess and to retracted position, a spring pressing between the bolt at one end of the spring and the second-mentioned door member at the other end of the spring said other end being movable by engagement of the hereinafter-mentioned trigger therewith to change the direction of the spring's action so that the spring urges the bolt to operative position in one position of said other end and yieldingly holds the bolt in retracted position in another position of said other end of the spring the bolt being movable to retracted position by its engagement with said inclined face in the closing movement of the second-mentioned door member, trigger means movable by its later engagement with said inclined face in said closing movement for moving said other end of the spring to its position wherein the spring urges the bolt to operative position, and handle means for retracting the bolt.

6. In a device of the class described: a keeper applied to a door member, a latch applied to a relatively movable door member comprising a bolt movable to operative engagement with the keeper and to retracted position, a lever member fulcrumed in its middle adapted to engage at one end with the bolt and at its other end with the hereinafter-mentioned trigger said lever member in one swung position moving the bolt to operative position and in an oppositely swung position moving said trigger reversely to the bolt's movement, a trigger movable by its engagement with the first-mentioned door member in the closing movement of the other door member to swing the lever member to its first-mentioned position, and handle means for moving the bolt to retracted position.

7. In a device of the class described: a keeper applied to a door member, a latch applied to a relatively movable door member comprising a bolt movable to operative engagement with the keeper and to retracted position, a lever member fulcrumed in its middle comprising a spring pressing between the lever member at one side of its fulcrum and the bolt at the opposite side of said fulcrum to urge the bolt to operative position in one swung position of the lever member and to yieldingly hold the bolt in retracted position in another swung position of the lever member, a trigger movable by its engagement with the first-mentioned door member in the closing movement of the other door member to swing the lever member to

its first-mentioned position, and means for moving the bolt to retracted position.

8. In a device of the class described: a keeper applied to a door member, a latch
5 applied to a relatively movable door member comprising a bolt movable to operative engagement with the keeper and to retracted
position, a lever member comprising a spring and an arm swingably mounted intermediate
10 the ends of the spring said spring pressing between the arm at one side of its pivotal mounting and the bolt at the opposite side of said mounting to urge the bolt to operative
position in one swung position of the arm and to yieldingly hold the bolt in retracted
15 position in another swung position of the arm, a trigger movable by its engagement with the first-mentioned door member in the closing movement of the other door member
20 to swing the arm to its first-mentioned position, and handle means for moving the bolt to retracted position.

9. In a device of the class described: a keeper applied to a door member, a latch applied to a relatively movable door member comprising a bolt movable to operative engagement with the keeper and to retracted
5 position, a lever member comprising a spring and an arm swingably mounted intermediate the ends of the spring, the spring having at one end a rocking connection with the bolt and at its other end pressing on the arm to
10 urge the bolt to operative position in one swung position of the arm and to yieldingly hold the bolt in retracted position in an oppositely swung position of the arm, a trigger movable to a position abutting the free
15 end of the arm to swing the same to its first-mentioned position, and handle means for moving the bolt to retracted position.

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