March 11, 1941. S. W. PARSONS 2,234,541

REFRIGERATOR LATCH

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Fig-1

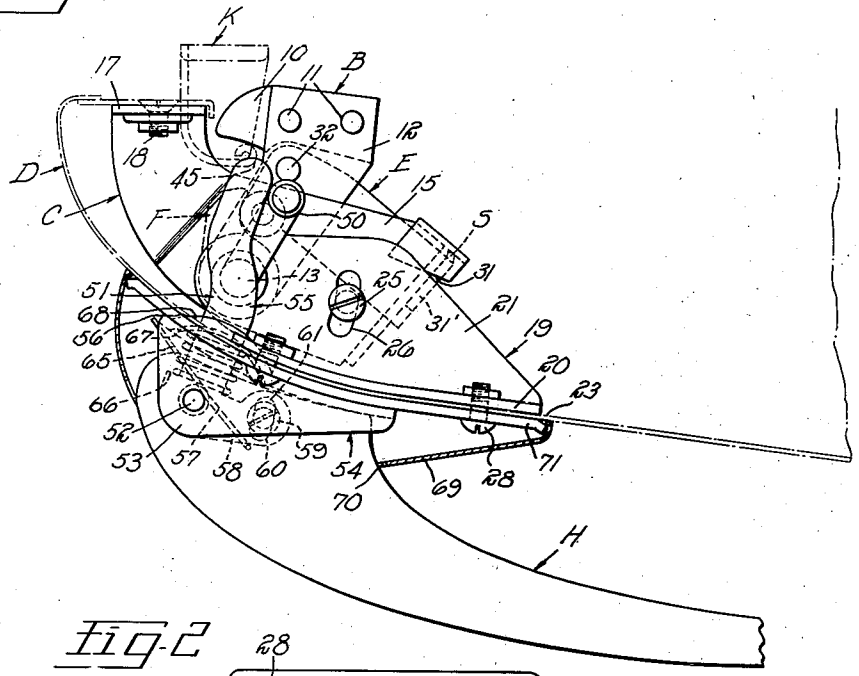
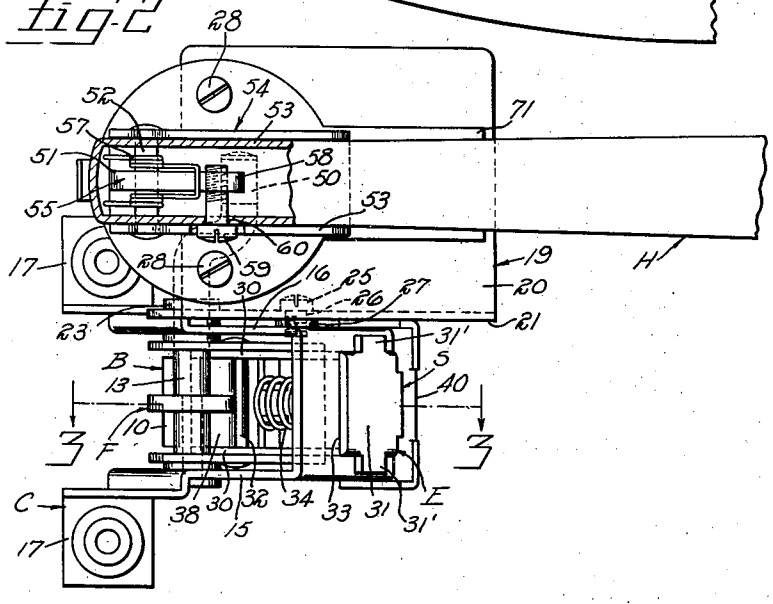


Fig-2



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Fig. 3

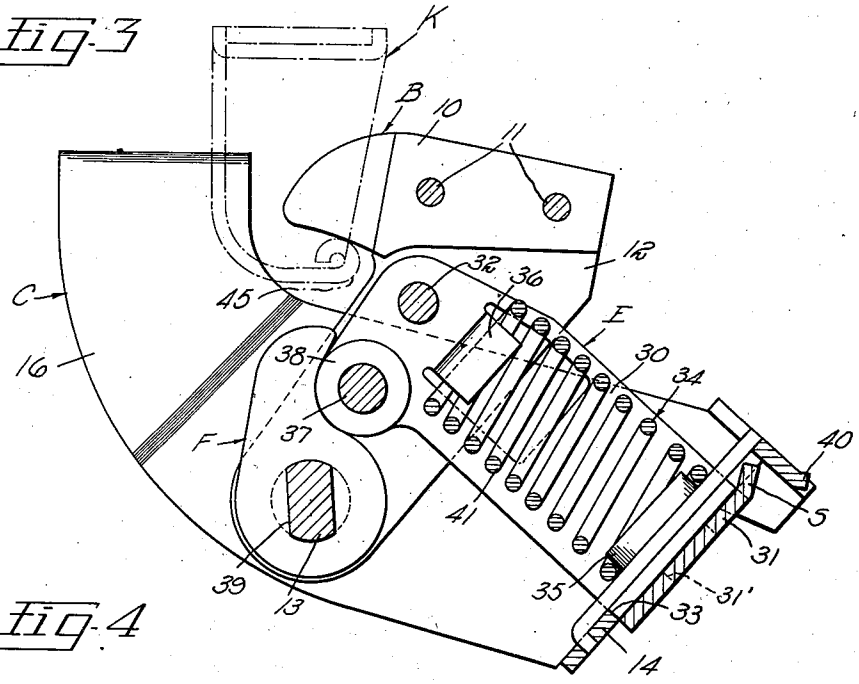
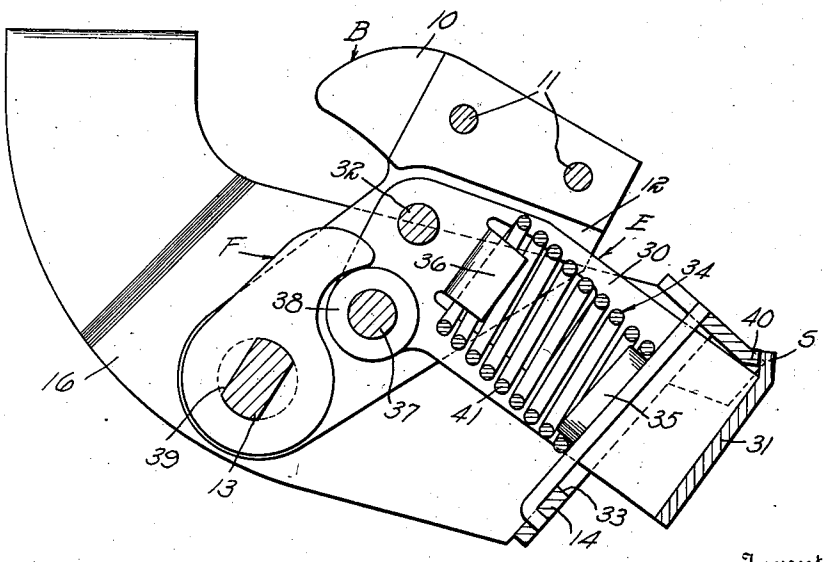


Fig. 4



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Fig-5

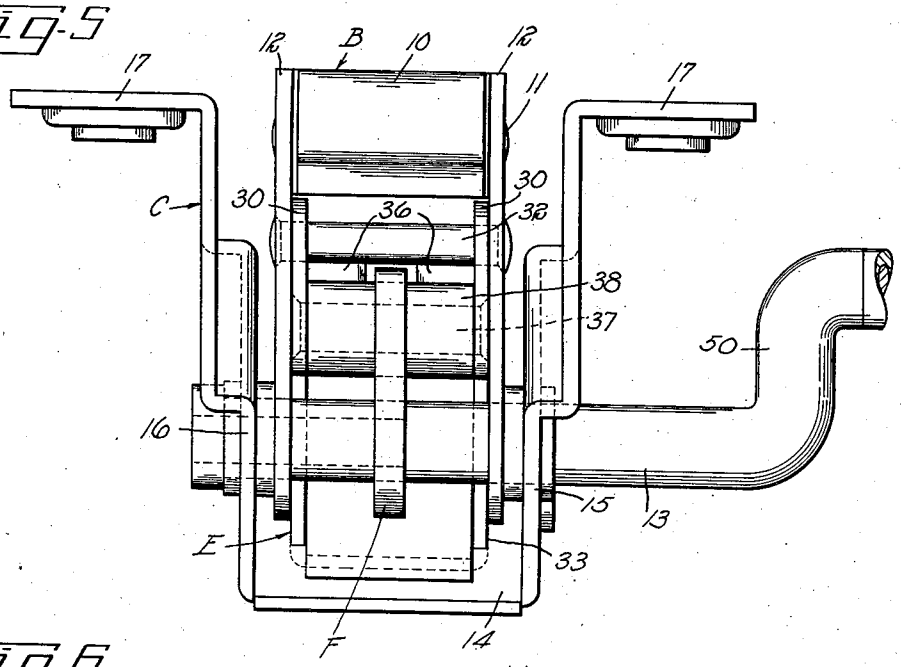
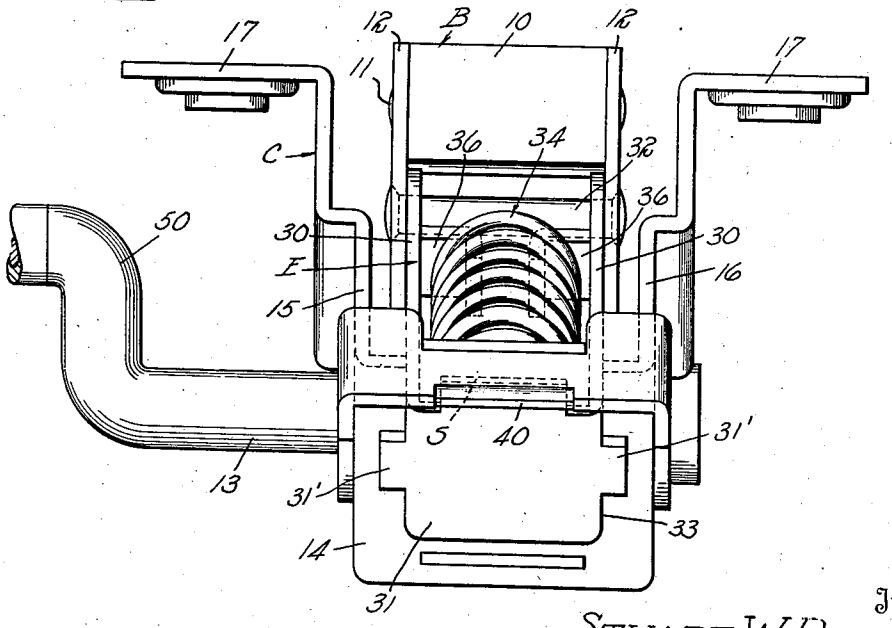


Fig-6



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Patented Mar. 11, 1941 2,234,541

UNITED STATES PATENT OFFICE

2,234,541

REFRIGERATOR LATCH

Stuart W. Parsons, New Britain, Conn., assignor to The Stanley Works, New Britain, Conn., a corporation of Connecticut

Application June 27, 1940, Serial No. 342,758

5 Claims. (Cl. 292—332)

The present invention relates to latches and is concerned primarily with a latch adapted for installation in refrigerator doors.

The object of the present invention is to provide an improved refrigerator latch wherein, when the door is opened the latch bolt is forced to and releasably retained in unlatched position and, when the door is closed the bolt, upon engaging a strike member mounted on the door jamb, is released and resiliently urged into latching position. Heretofore, because of the high pressure springs used in latches of this type for resiliently urging the bolt into latching position, the sear and cooperating stop for retaining the bolt in unlatched position have been subjected to considerable wear which resulted in faulty operation of the latch.

It is therefore a further object of this invention to provide a latch having sear and cooperating stop members sufficiently sensitive and so designed that the least pressure placed on the bolt by the strike will release the bolt to latching position without producing detrimental wear between the sear and stop.

A still further object is to provide a latch of this type which may be inexpensively manufactured, easily installed and thereafter simply operated.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view of a latch illustrating the present invention wherein the latch is shown in latching engagement with a strike and keeper member, and the door and strike illustrated in phantom;

Fig. 2 is a profile view of the latch mechanism illustrated in Fig. 1 with a portion of the handle broken away;

Fig. 3 is an enlarged cross sectional view taken through line 3—3 of Fig. 2 showing the latch in latching engagement with the keeper;

Fig. 4 is a view similar to Fig. 3 showing the latch retained in its retracted or unlatched position;

Fig. 5 is a front end view of the portion of the latch illustrated in Fig. 3; and

Fig. 6 is a rear end view of the portion of the latch illustrated in Fig. 3.

A latch made in accordance with the present invention comprises generally a frame C adjustably secured within a door D and pivotally supporting a spring actuated latch bolt B. Pivotally secured to the latch bolt is a plunger E including a catch or sear S engageable with the frame C for retaining the bolt in a releasably retracted position when drawn thereto by a retracting lever F actuated by a manually operable handle H.

More specifically, the bolt B includes a bolt head 10 secured by means of rivets 11 between a pair of depending flanges 12. The flanges are pivotally supported on a shaft 13 journalled in the spaced side walls 15 and 16 of the frame C. The frame comprises a U shaped member having a back wall 14 connecting the spaced side walls 15 and 16, and the upper extremities of the latter are provided with outwardly extending ears 17 for fastening the frame by means of screws 18 to the door D.

In order to more rigidly support the frame C and the shaft 13 there is provided a frame support 19 comprising a reinforcing plate 20 designed to closely engage and reinforce the underlying surface of the door D, and a flange 21 is located adjacent and parallel with the wall 15 of the frame, and is provided with a bearing bushing 23 in which the shaft 13 is additionally journalled. A headed bolt 25 extends through an arcuated slot 26 in the flange 20 and is threaded into the wall 15 with a spacing washer 27 therebetween. In mounting the latch in the door, the plate 20 is adjustably rotated about shaft 13 so as to abut the surface 23 of the door, and is secured thereto by the screws 28. Thereafter, the bolt 25 is tightened in order to prevent relative movement between the frame C and the support 19.

Referring to Figs. 3 and 4, the plunger E comprises a pair of spaced arms 30 joined at their rear ends by a connecting wall 31 having a pair of ears 31' extending outwardly from the side edges thereof. Adjacent their forward ends, the arms 30 are pivotally secured by a stud 32 to the bolt secured in the flanges 12 thereof, adjacent the bolt head 10. The plunger E extends rearwardly through a guiding aperture 33 in the back wall 14 of the frame C, thereby limiting the pivotal movement of the plunger relative to the bolt. A heavy coil spring 34 is positioned and axially compressed between a cylindrical stud 35 on the back wall 14 of the frame and a pair of positioning lugs 36 integral with the plunger, whereby the ears 31' of the plunger are normally urged into

engagement with the wall 14 thereby defining the latching position of the bolt.

To retract the plunger against the force of the spring 34 there is secured between the arms 30 of the plunger E, a stud 37 carrying a cylindrical follower 38 operatively engageable with the lever F non-rotatably secured to the bolt shaft 13 as by the tongue and slot connection 39. As seen in Fig. 4, in order to retain the plunger, and thereby the bolt, in a retracted or unlatched position, there is provided on the upper edge of the rear wall 31 of the plunger a sear or shoulder S engageable with a stop or abutment 40 provided on the latch frame rearwardly of the back wall 14. Upon rotation of the shaft in a clockwise direction, inasmuch as the plunger is pivoted on stud 32, the lever F will force the follower 38 rearwardly and upwardly to retentively engage the cooperating sear S and cooperating abutment 40. In this position, the coils 41 of the spring 34 are forced out of alignment and a torque is superimposed on the axial compression of the spring.

As illustrated in Fig. 3, a keeper K, which may be mounted on the door jamb (not shown) secures the door when the bolt is in latching position. Upon swinging the door closed, the strike portion 45 of the keeper engages and cams the bolt head 10 rearwardly to disengage the sear and abutment. The disengagement of the sear removes the torque imposed on the spring and permits the spring coils 41 to move to aligned position whereby the plunger is rotated clockwise and the sear clears the casing abutment 40 when the bolt is forced into the keeper K by the spring 34.

In order to manually retract the bolt, the bolt shaft 13 is provided at one end with an offset crank 50 operatively connected by a bell crank lever 51 to the handle H, whereby manual movement of the handle will rotate the shaft in a clockwise direction to retract the bolt B, as heretofore described. The handle H is pivotally mounted on a stud 52 secured between side flanges 53 of a mounting 54 secured to the door by one of the screws 28. Likewise pivotally mounted on the stud 52 within the handle H is the bell crank lever 51, one arm 55 of which extends through an opening 56 in the door and operatively engages adjacent its outer end the crank 50. A spring 57 located on the stud 52 is compressed between the mounting 54 and the other arm 58 of the bell crank lever for normally urging the bell crank 51 in a counterclockwise direction to its inoperative position. In order to operatively engage the handle with the bell crank lever, the arm 58 carries a threaded screw 59 which extends outwardly through an arcuated slot 60 in the handle to form a lost motion connection therebetween.

Referring to Fig. 1, it will be seen that upon manual rotation of the handle the portion 61 terminating the upper end of the slot 60 will engage the screw 59 and rotate the bell crank lever in a clockwise direction, whereupon the outer end of the lever arm 55 will engage and rotate the crank 50 clockwise and thereby force the plunger E and bolt B to retracted position. When the bolt is released to latching position by engagement with the strike in the manner described, the crank 50, because of the force placed thereon by the heavy spring 34, will strike the bell crank arm 55 with considerable force. However, because of the lost motion connection between the bell crank and handle provided by the screw 59 and slot 60, this blow cannot be transmitted to the handle.

In order to absorb the blow a cushioning spring 65 surrounds the arm 55 and is compressed between the handle mounting 54 and a shoulder 66 formed on the arm. In order that the end of the spring will not engage the mounting 54 and hinder rotation of the arm 55 in the slot 56, a spherically curved washer 67, formed of brass or other suitable bearing metal, is interposed between the spring and a like spherical depression 68 in the mounting 54. An escutcheon plate 69, having an opening 70 therein through which the handle extends, is sprung into fixed engagement with a second reinforcing plate 71 secured to the door by the screws 28, thus giving the latch a more finished appearance.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. A refrigerator latch including a frame having an abutment thereon, a bolt pivotally secured to said frame, a plunger pivotally secured to said bolt, a sear on the plunger engageable with the abutment for retaining the bolt in unlatched position, spring means for moving the sear away from the abutment and for urging the bolt to latching position, and retracting means for retracting said sear into retentive engagement with the abutment.

2. A refrigerator latch including a frame having an abutment thereon, a bolt operably mounted on said frame, a plunger pivotally secured to the bolt having a sear on the plunger engageable with the abutment, means for retracting the bolt and rotating said plunger to retentively engage the sear with the abutment, spring means for urging said bolt into latching position and for rotating said sear away from said abutment.

3. A refrigerator latch having a frame, a shaft rotatably journalled in said frame, a bolt pivotally mounted on said shaft, a plunger pivotally secured to said bolt, an abutment, a sear on said plunger engageable with said abutment for retaining the bolt in an unlatched position, a lever fixed to said shaft for retracting said bolt and rotating said plunger to engage said sear and abutment, and spring means for rotating said bolt into a latching position and for rotating said plunger away from said abutment.

4. A refrigerator latch including a frame having an abutment thereon, a bolt operably mounted on said frame, a plunger pivotally secured to said bolt and having a sear thereon engageable with said abutment to retain said bolt in a retracted position, a coil spring surrounding said plunger and compressed between the plunger and the casing for urging the bolt into latching position, and means for retracting said bolt and rotating said plunger to engage said sear and said abutment and to bend said spring out of axial alignment whereby said spring

will rotate said plunger away from said abutment when the sear and abutment are disengaged.

5. A refrigerator latch including a frame having an abutment thereon, a bolt operably mounted on the frame, a plunger pivotally secured to the bolt and having a sear thereon engageable with the abutment for retaining the bolt in unlatched position, a spring for urging the bolt to latching position with considerable force, a bell crank lever for retracting the plunger to unlatched position, a handle connected to the bell crank lever by a lost motion connection for operating the bell crank lever to retract the bolt, and a cushioning spring on the bell crank lever for absorbing the force of the bolt when it moves to latching position.

STUART W. PARSONS.