Aug. 18, 1942. S. W. PARSONS 2,293,402

REFRIGERATOR LATCH

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Fig-1

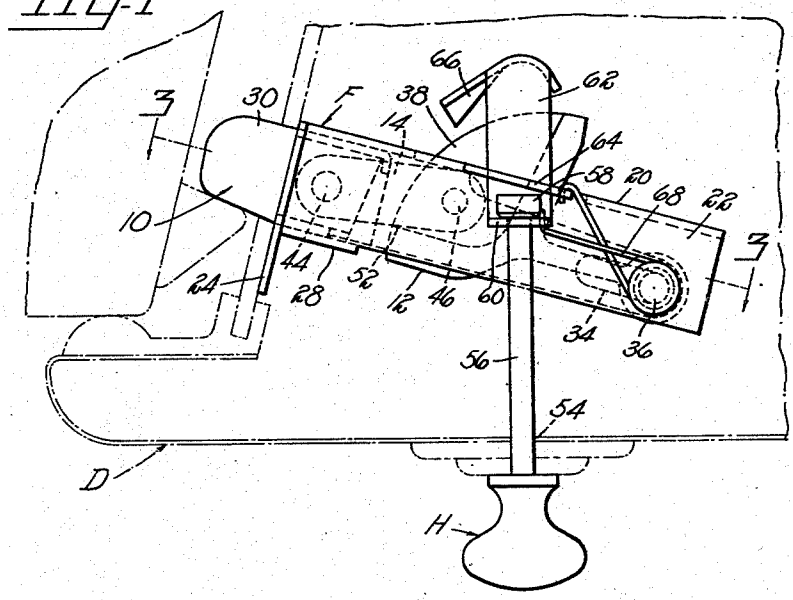


Fig-2

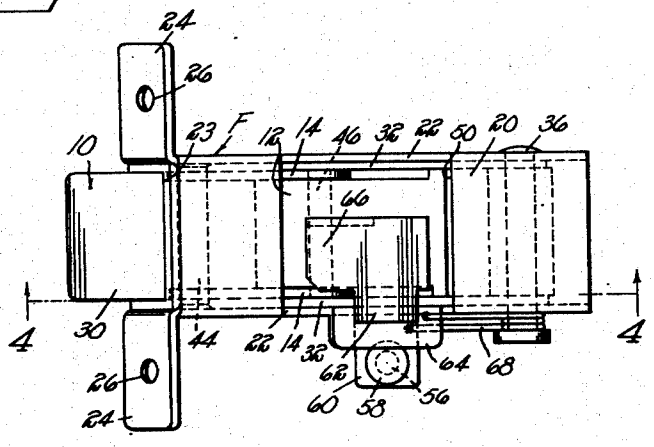
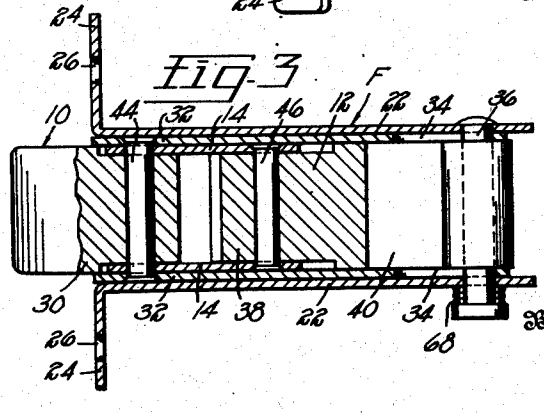


Fig-3



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Fig. 4

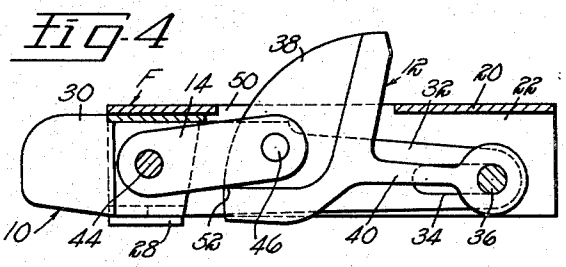


Fig. 5

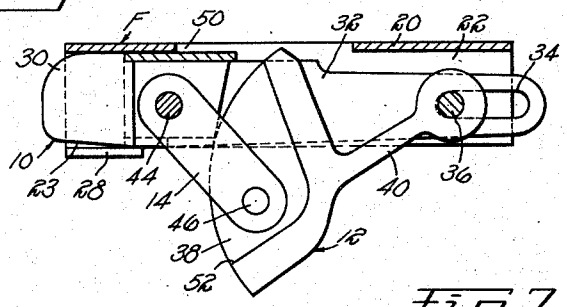


Fig. 6

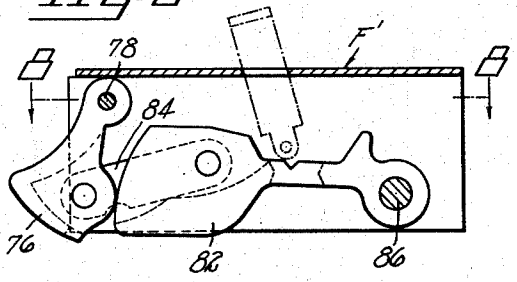


Fig. 7

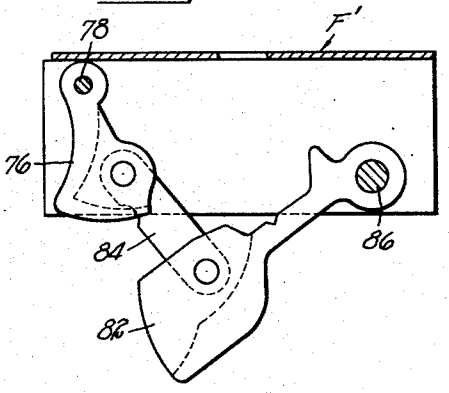
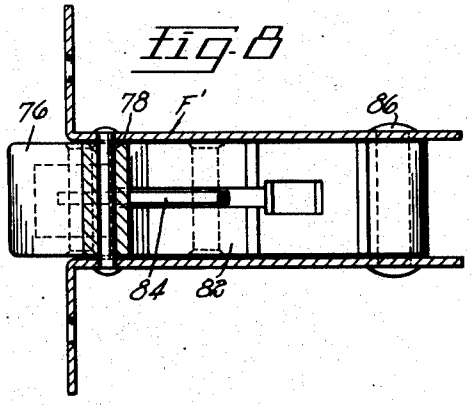


Fig. 8



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REFRIGERATOR LATCH

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Application July 30, 1940, Serial No. 348,463

9 Claims. (Cl. 292—138)

The present invention relates to latches and more particularly to a refrigerator latch which utilizes the inertia of one or more of its component parts as the source of energy for forcing the latch bolt to latching position. A latch made in accordance with the invention is especially advantageous for latchably securing refrigerator doors and particularly for securing the large closure members of oversized commercial refrigerators such as are found in butcher shops and dairies.

Heretofore various difficulties have been found in providing an automatic latch suitable for use in structures of this type primarily because of the heavy type of spring formerly used to force the latch bolt to latching position.

It is therefore the object of this invention to provide an improved latch for refrigerators which overcomes these difficulties, is inexpensive to manufacture, and may be easily installed and operated.

A further object is to provide such a latch which utilizes the inertia of one or more of its parts to force the bolt to latching position and thereby eliminates the use of heavy springs.

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 phantom cross-sectional view of a portion of a refrigerator door and an abutting jamb, showing mounted therein a latch made in accordance with the present invention;

Fig. 2 is a side elevation of the latch shown in Fig. 1;

Fig. 3 is a cross-sectional view taken through line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view taken through the line 4—4 of Fig. 2 with the latch bolt retracting mechanism removed, and illustrates the component parts of the latch in latching position;

Fig. 5 is a view similar to Fig. 4 illustrating the parts in unlatched position;

Fig. 6 is a view similar to Fig. 4 illustrating a second embodiment of the present invention provided with a pivoted rather than a reciprocating latch bolt;

Fig. 7 illustrates the parts of the latch shown in Fig. 6 in their unlatched positions; and

Fig. 8 is a cross-sectional view taken through line 8—8 of Fig. 6.

In order to illustrate one embodiment of the present invention there is shown generally a refrigerator door D having secured therein a latch frame F, wherein a latch bolt 10 is reciprocably supported and an inertia member 12 is operably mounted. A pair of spaced links 14 are pivotally connected to the latch bolt and to the inertia member and form with the inertia member a toggle for securing the bolt in latched position. Manually operable retracting means including a handle H are provided for withdrawing the toggle members 12 and 14 and the latch bolt 10 from the latched to the unlatched position.

More specifically the latch frame comprises a rectangular bolt guide having a back wall 20 and side walls 22. The outer ends of the walls 22 are provided with ears 24 having bolt or rivet openings 26 therein for securing the frame F to the door D. A pair of lugs 28 extend inwardly from the walls 22 and together with the back and side walls 20 and 22 define a rectangular guideway 23 for reciprocably mounting the forward end or nose 30 of the latch bolt. Extending rearwardly from each side of the nose are a pair of bolt supporting flanges 32. To slidably support the bolt flanges 32, a stud 36 is secured at each end in the walls 22 of the casing and extends through a pair of oppositely disposed elongated slots 34 cut in the flanges. Inasmuch as the extent of bolt travel from latched to unlatched position is controlled by the movement of the flanges 32 on the stud 36, the length of the slots 34 is determined by the length of bolt travel desired.

As heretofore indicated the latch is provided with an inertia member 12 for forcing the latch bolt to latching position. The inertia member comprises a hammer shaped link having the bulk of its mass concentrated in a head portion 38 from which there extends an arm 40, the outer end of which is pivotally supported on the stud 36. The links 14 for operably connecting the latch bolt 10 and inertia member 12 are pivotally secured at either side of the bolt head 10 on a pin 44, and carry between their free ends a pin 46 pivotally secured in the inertia member 12.

As heretofore indicated the links 14, together with inertia member 12 constitute a toggle connection between the bolt 10 and the stud 36. As illustrated in Fig. 4 there is cut in the back wall 20 of the casing an opening 50 through which a portion of the head 38 extends when the latch bolt is located in its outward or latching position.

In this position the connecting pin 46 is located above the line formed by the outer pivot points 36 and 44 of the toggle, and, inasmuch as further counterclockwise movement of links 14 is prevented by the engagement of the links with the edge 52 of the inertia member, the toggle prevents rearward movement of the bolt.

As heretofore indicated the latch is provided with retracting means including a handle H for manually retracting the latch bolt from latched to unlatched position. For this purpose there is reciprocably journalled in the door, as at 54 a rod 56 carrying on its outer end the handle H. The inner end of the rod 56 is provided with a head 58 for operably securing the rod in a pierced lug 60 of a retracting slide 62. The slide is reciprocably mounted in a slotted offset flange 64 of the casing and is provided with a shoe 66 which overlies and is engageable with the inertia member. As indicated in Fig. 1, a coiled spring 68 is located on the stud 36 and is compressed between the pierced lug 60 and the offset flange 64 whereby the retracting slide 62 is normally urged to its inner or inoperative position.

In order to retract the latch bolt, the pull handle H is drawn outwardly from the door, whereupon the shoe 66 engages the inertia member and rotates it in a counterclockwise direction to the position illustrated in Fig. 5. Thereafter, latching of the door is accomplished by merely swinging the door to closed position. When the door is swung closed, the door D and the inertia member 12 rotate about the door axis without any relative movement therebetween until the door reaches closed position. Upon engagement of the door with the jamb member the velocity of the door will abruptly decelerate to zero whereas the inertia of the member 12 will cause the inertia member to rotate in a clockwise direction relative to the door and the movement thereof will force the bolt to latching position. The engagement of the links 14 with the edge 52 will prevent further clockwise rotation of the inertia member beyond the latched position and the toggle formed by the links and the inertia member will retain the bolt in latching position.

In the event that the bolt is inadvertently jarred to latching position before the door is swung shut the inertia of the member 12 upon initial movement of the door toward closed position will rotate the member 12 in a counterclockwise direction relative to the door and will retract the bolt to unlatched position.

Figs. 6, 7, and 8 illustrate a second embodiment of the invention wherein a latch bolt 76 is pivotally mounted on a pin 78 in a casing F', rather than slidably mounted as in the first embodiment. As in the first embodiment, the bolt 76 is pivotally connected to a stud 86 secured in the casing walls by a toggle comprising an inertia member 82 and a connecting link 84. The operation of the second embodiment of the latch is the same as that heretofore described for the first embodiment. It will be noted in both embodiments that there is no resistance to closing inasmuch as the latch bolt is always in withdrawn position until the door contacts the jamb member, thus eliminating wear of the bolt and keeper and adding substantially to the life thereof.

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 carried by a door including a latch bolt, means for manually retracting the latch bolt to unlatched position and inertia means for automatically retracting the latch bolt upon initial closing movement of the door and for automatically urging the latch bolt to latching position when the door reaches closed position.

2. A refrigerator latch carried by a door including a latch bolt, means for manually retracting the latch bolt to unlatched position, inertia means for automatically retracting the latch bolt upon initial closing movement of the door and for automatically urging the latch bolt to latching position when the door reaches closed position, and toggle means for securing the bolt in latching position.

3. A refrigerator latch comprising a frame member mountable in a door, a latch bolt operably mounted in the frame member, an inertia member pivotally mounted in the frame, a link pivotally connected to the bolt and to the inertia member and forming with the inertia member a toggle, said inertia member being rotatable in one direction relative to the frame when the door is swung to closed position for forcing the latch bolt in latching position whereat said toggle normally retains the latch bolt, and means for manually rotating the inertia member in the opposite direction to retract the bolt to unlatched position.

4. A refrigerator latch comprising a frame member mountable in a door, a latch bolt operably mounted in the frame member, toggle means including an inertia member for retaining the latch bolt in latching position, said inertia member automatically forcing the latch bolt to latching position when the door is swung to closed position and manually operable means for retracting the inertia member and latch bolt to unlatched position.

5. A refrigerator latch comprising a frame member mountable in a door, a latch bolt reciprocably supported in the frame, a toggle including an inertia member pivotally connected to the bolt and to the frame member for retaining the latch bolt in latching position, said inertia member having sufficient mass to force the latch bolt to latching position when the door is swung to latching position, and manually operable means for retracting the inertia member and the latch bolt to unlatched position.

6. A refrigerator latch comprising a frame member mountable in a door, a latch bolt pivotally supported in the frame, a toggle including an inertia member pivotally connected to the bolt and to the casing for retaining the latch bolt in latching position, said inertia member having sufficient mass to force the latch bolt to latching position when the door is swung to latching position, and manually operable means for retracting the inertia member and the latch bolt to unlatched position.

7. In combination with a door mounted for

swinging movement from open to closed position together with means against which said door abuts when the door reaches closed position, a latch carried by the door and including a latch bolt, means for retracting the latch bolt to unlatched position, and inertia means operable when said door contacts said abutting means when moved to closed position for automatically urging said bolt to latched position.

8. In combination with a door mounted for swinging movement from open to closed position together with means against which said door abuts when the door reaches closed position, a latch bolt mounted in said door, an inertia member mounted in said door for movement at right angles to the plane thereof, an operative connection between said latch bolt and said inertia member, said inertia member having one position of stability when the door is closed where it maintains said bolt in latched position, means for manually opening said door and simultaneously retracting said bolt and moving said inertia member to a second position of stability where it maintains said latch bolt in unlatched position, said inertia member automatically moving to its first position of stability when the door contacts said abutting means when moved to closed position for automatically urging said latch bolt to latched position.

9. In combination with a door mounted for swinging movement from open to closed position together with means against which said door abuts when the door reaches closed position, a latch bolt mounted in said door, an inertia member operatively connected to said bolt, said inertia member having one position of stability when the door is closed where it maintains said bolt in latched position, means for manually opening said door and simultaneously retracting said bolt and moving said inertia member to a second position of stability where it maintains said latch bolt in unlatched position, said inertia member automatically moving to its first position of stability when the door contacts said abutting means when moved to closed position for automatically urging said latch bolt to latched position.

STUART W. PARSONS.