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FASTENING MECHANISM

Filed Jan. 30, 1928

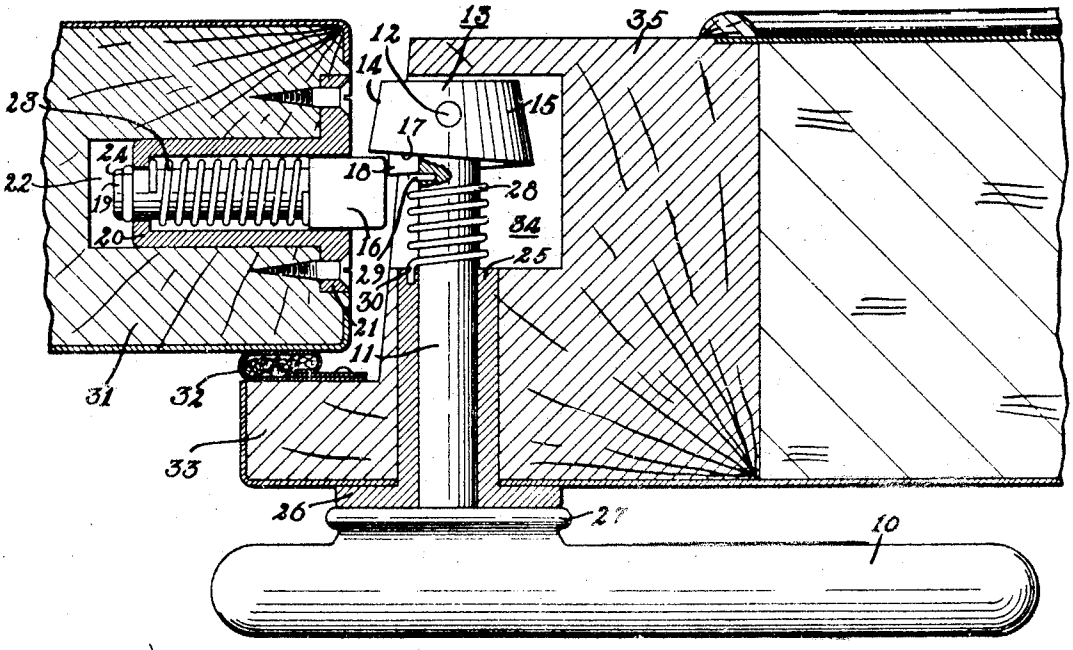


Fig. 1.

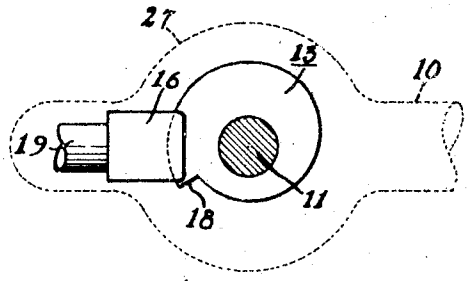


Fig. 3.

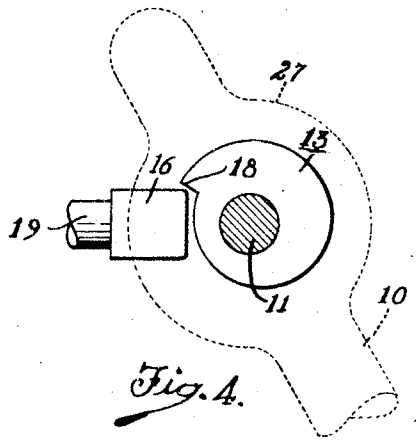


Fig. 4.

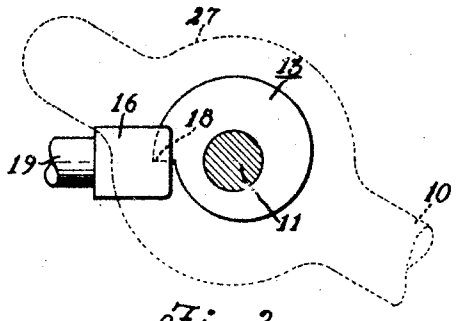


Fig. 2.

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UNITED STATES PATENT OFFICE

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FASTENING MECHANISM

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This invention relates to improvements in latches of the type intended particularly for refrigerator cabinets.

It is one of the objects of the invention to provide a rotatable latch which when applied to a refrigerator door will upon manipulation draw the door increasingly closer into contact with its frame and by compressing any heat insulation located between the door and its frame serve to insure a tight sealing of said door.

It is another object of the invention to provide a rotatable latch which will normally remain in a predetermined position of rest in which condition it may be pushed over the nose of a yielding keeper when the door is closed so as to latch the door whereupon the keeper-engaging member of the rotatable portion may, upon turning out of its predetermined position, be caused to force a wedge surface thereon in increasing engagement with said keeper so as to draw the door closer in contact with its frame.

It is another object of the invention to arrange the improved latch so that upon rotating the keeper-engaging member in another direction the keeper will be suddenly released from its engagement with the member, thus permitting ready opening of the door.

It is a further object of the invention to provide means for maintaining the rotatable portion of the latch in such a position when the door is open and the latch not in use, that it will always be ready to engage the keeper without requiring preliminary positioning of the rotatable member by hand.

A still further object is to provide a latch of attractive appearance in which the engaging elements are concealed within the door or its frame, leaving merely the operating handle visible and in which the keeper and the rotatable member may readily be attached to existing doors with a minimum of expense.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a horizontal section through the latch showing the operative elements and the method of mounting the same in a door and jamb;

Fig. 2 shows the keeper engaging the rotatable portion of the latch after the door has been slammed shut;

Fig. 3 illustrates the position of the operating members after the rotatable portion of the latch has been turned so as to draw the wedge-shaped portion of the rotatable portion over the keeper, and

Fig. 4 shows the latch in released position in which the rotatable member is out of engagement with the keeper.

Referring in detail to the drawings, the improved latch comprises an operating handle 10 attached to a shaft 11 to which shaft there is attached as by a pin 12 a member 13. This member as shown in Fig. 1 comprises a cam of relatively heavy proportions. The vertical sides of this cam are angularly tapered as shown in Fig. 1 at 14, 15 so as to present a sliding engagement with the front side 16*a* of keeper 16 when the operating elements of the latch are caused to coact and thus permit the door to be "slammed" shut. The front surface 17 of the cam is built like a ramp or inclined plane. This causes the cam to act as a wedge when the cam is turned against a stationary member such as the keeper as hereinafter described. The cam 13 has an off-set portion which constitutes a drop-off or release point for the keeper 16. The cam is preferably constructed after the fashion of a spiral with the release point 18 sharply defined so that a quick release of the keeper may be effected.

The keeper comprises a plunger 19 slidably mounted in a frame or casing 20 provided with a flange 21 by means of which it may be recessed in the door or jamb as desired. The casing 20 is preferably cylindrical in shape so that in mounting the keeper it is merely necessary to drill a suitable hole in the jamb or door, and countersink the same to accommodate the flange 21. The plunger

19 carries the head portion or keeper 16, the side of which contacting with the sloping or tapering cam sides may be suitably tapered if desired as shown at 16*a* so as to permit the cam to slide readily over the keeper. The keeper is urged forward by a coiled spring 23, a suitable locking ring or stop 24 being provided at the opposite end of the plunger. In mounting the keeper, care must of course be taken to leave sufficient space as at 22 for the recession of the plunger when the keeper contacts with the cam.

Referring again to the latch the shaft 11 is preferably journalled in a suitable bushing 25 provided with a flange 26 which may form a bearing plate for a similar flange 27 on the operating handle 10. If desired, the flange 26 may be countersunk into the wood frame. The cam 13 is located in a recess 34 cut in the door or the jamb as the case may be.

A coiled spring 28 is provided to urge the cam inwardly and to provide a certain amount of resiliency to the latch when the door is abruptly slammed.

The main purpose of the spring 28, however, is to maintain the cam and the handle in a central or normal position (the position normally being central with respect to the extreme positions shown in Figs. 3 and 4) of rest in which condition it is adapted to engage the keeper, and from which position it must be moved manually when it is desired to tighten the door against its jamb. To this end the spring 28 is attached as by being hooked to the bushing 25 at the point 30 and to the shaft 11 at the point 29. By this means the shaft 11 and hence the handle 10 will normally be maintained in one position hereinafter assumed to be the "normal" or central position.

In the operation of the device assuming the cam and operating handle to be mounted on the door of a refrigerator 35 and the keeper 16 with its related mechanism in the jamb or frame 31 it follows that when the parts are in the position shown in Fig. 1, and the door is slammed shut, the sloping surfaces 14, 15 will slide past the yielding keeper 16 so that the keeper will slip upon the front inclined or ramp surface 17 of the cam. This position is indicated in Fig. 1 where it is assumed that the door has just been slammed shut. Fig. 2 indicates the normal or central position occupied by the handle and cam at this instant.

After the door is slammed shut and the back edge of the keeper has engaged the sloping ramp or inclined-plane surface of the cam 13 as indicated by Figs. 1 and 2, the handle 10 may be moved from the normal position shown in Fig. 2 to that indicated in Fig. 3. This operation causes the ramp surface 17 to wedge itself progressively against the contacting edge of the keeper, thus drawing the door tighter against the jamb, with a screw-like action. By thus forcing the door tighter against the jamb the insulating material 32 placed at suitable points such as beneath the flange 33 may be compressed sufficiently to produce a tight seal and thus prevent warm air entering the refrigerator.

When it is desired to open the door the handle 10 is moved to the position shown in Fig. 4. The drop-off portion 18 of the cam 13 is disengaged from the keeper and the door may then be opened. When the hand of the operator is removed from the handle, the latter by virtue of the force exerted on the shaft 11 by the coiled spring 28 causes it to resume the normal or central position above referred to. The normal position selected may be any position but in order to improve the appearance of the exterior of the cabinet it is preferable so to time the return movement of the handle that it will come to rest in the position shown in Fig. 2 so that subsequent tightening of the handle and consequent tightening of the door will leave the handle horizontally placed.

While the form of embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a latch for a refrigerator including a door and a frame therefor, a yieldable keeper, a cam member adapted to slide past said yieldable keeper and to be engaged thereby and a surface on said cam movable independently of the door and coacting with said keeper for increasingly engaging said keeper and adapted to force said door tighter into engagement with said frame.

2. In a latch for a refrigerator including a door and a frame therefor, a cam adapted to slide past a yieldable keeper and to be engaged thereby to latch said door, a surface on said cam coacting with said keeper, said surface being wedge-shaped and adapted when rotated in contact with said keeper to ride over said keeper and arranged to draw said door into tighter engagement with said frame.

3. In a latch for a refrigerator including a door and a frame therefor, a rotatable cam member, a yieldable keeper, said cam being adapted when in one position to slide past said keeper and to engage said keeper in door latching relation and movable to a second position to force said door into tighter contact with said frame while preserving said latching relation and being movable to another position and having means at this last mentioned position to suddenly disengage said keeper to unlatch said door.

4. In a refrigerator cabinet, a door system including a movable portion and a stationary portion, a yielding keeper carried by one of said portions, a latching cam carried

by the other portion and rotatably journaled therein and adapted to slide over and engage said keeper, said cam having a surface rotatable against a face of said keeper and adapted to force the movable portion of said door system into increasingly tighter engagement with said stationary portion, and said cam being rotatable to another position and having means at this last mentioned position to suddenly release said cam from said keeper.

5. In a refrigerator cabinet including a door and a frame therefor, a yieldable keeper recessed in said frame, a latching cam recessed in said door and arranged normally to engage said keeper upon the shutting of said door, said cam being operable from the exterior of said door and having a ram surface adapted when said cam is rotated to increasingly engage said keeper and to tighten the door in its frame, and being rotatable to another position and having means at this last mentioned position to suddenly release said cam from said keeper to unlatch said door.

6. In a latch for a refrigerator door, a bushing in said door, a shaft journaled in said bushing operable from the exterior of said door, a cam member mounted upon said shaft, angularly beveled sides upon said cam, a ramp surface on the rear of said cam, a spring adapted to normally retain said cam in a predetermined position, a keeper comprising a beveled latch member yieldingly mounted in the frame of said door and adapted to permit said cam in its normal position to slip over said latch to engage the rear surface of said cam to latch said door, said cam being rotatable out of its normal position to cause the ramp surface of said cam to ride over said latch at its point of engagement to bring said door into tighter contact with its frame, and said cam being rotatable to another position and having means at this last mentioned position to suddenly release said cam from said latch to unlatch said door.

7. In a latch for a refrigerator cabinet door system, a rotatable cam member and a yieldable keeper therefor, said cam member having side surfaces angularly beveled to permit said cam to slide over said keeper, and a rear edge to engage said cam in door latching relation, the rear surface of said cam being ramped and adapted to be rotated in increasing contact with said keeper to tighten said door, said cam having a portion thereof that upon rotation thereto permits said cam to be suddenly disengaged from said keeper.

8. In a latch for a refrigerator door, a rotatable cam member and a yieldable keeper therefor, said cam member having a beveled side surface to permit said cam to slide over said keeper and an eccentric ramp surface on said cam adapted upon rotation to release the cam member from engagement with said keeper, and upon rotation in an opposite direction to bring said cam member and said keeper into tighter latching relationship.

9. In a latch for a refrigerator, a cam member having an exterior beveled side surface and an eccentric ramp end surface and a keeper in operative relation with said surfaces.

10. In a latch for a refrigerator, a cam member having an exterior beveled side surface and an eccentric ramp end surface and a keeper in operative relation with said surfaces, and a spring tending to keep said cam member in a predetermined position.

11. In a latch for a refrigerator door system, a yieldable keeper therefor, a rotatable cam member, said cam member having beveled sides adapted to engage and slide over said yieldable keeper, said cam member also having a ramp end surface to engage said keeper in operative latching position, said ramp end surface being eccentric in order to provide a releasing position and a position of maximum closure in said door system, and a spring tending to keep said cam member in a position intermediate said releasing position and said position of maximum closure.

In testimony whereof I hereto affix my signature.

JAMES C. ARNOLD.