The present invention relates to latches of the type used on refrigerator doors, though not limited thereto, and is concerned with a novel retracting mechanism for withdrawing the latch bolt.

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An object of the present invention is to provide an improved latching mechanism of simple, compact and inexpensive construction having a bolt normally held in position by a heavy spring and a novel retracting mechanism including a manually operable handle located remotely from the latching mechanism and cooperatively connected thereto for retracting the bolt.

A further object of the present invention is to provide a latching mechanism of this type having the further advantage of requiring the application of but slight effort to the manually operable handle for retracting the latch bolt to an unlatched position.

A still further object of the invention is to provide a retracting mechanism having a handle so constructed and so journalled that it can be moved in a variety of directions to accomplish the desired retraction of the latch bolt.

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 hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing:

Figure 1 shows a front elevation of a portion of a door having mounted thereon latchung and operating mechanism made in accordance with the present invention.

Fig. 2 shows the operating mechanism of Fig. 1 before mounting on the door with the handle and escutcheon removed therefrom:

Fig. 3 is a cross-sectional view of the operating mechanism taken through lines 3-3 of Fig. 1; and

Fig. 4 is a cross-sectional view taken along line 4-4 of Fig. 3 showing an end elevation of the latch operating mechanism.

In order to illustrate one application of the present invention there is shown generally a refrigerator door D to which there is secured a frame F for supporting a latching mechanism L including a latch bolt B, and a manually operable retracting mechanism B including a handle H. As indicated in Figs. 1 and 2 the frame F includes a channel shaped section 10 having welded to its upper end a retracting mechanism support 12 and having similarly welded to its lower end a U shaped mounting 14 for the latch mechanism.

In the present instance the support 12 is provided with a vertical bearing plate 16 having a vertical end wall 18 and upper and lower horizontal side walls 20 at right angles thereto and to the bearing plate 18. In order to properly secure the frame F to the door D the outer ends of the walls 18 and 20 are respectively provided with ears 22 and 24 securable to a mounting plate 26 on the refrigerator door D by means of suitable screws 28 and 30. The lower end of the frame, comprising the U-shaped mounting 14 is similarly provided with flanges 32 securable to another mounting plate on the door by means of screws 38 as illustrated in Fig. 1.

Referring more specifically to the retracting mechanism B it includes a crosshead C slidable mounted on the support 12. To accomplish this, the crosshead comprises a rear stem portion 36 slidable secured in a slot 40 in the end wall 18; and a flat bearing surface 42, forwardly thereof, slidable secured to the bearing plate 18 by a headed stud 44, fixed to the plate 18, and extending through an elongated slot 46 in the crosshead.

A spring 50 surrounds the stem 36 and is compressed between the end wall 18 and a pair of shoulders 52 on the stem whereby the crosshead C is normally urged to the left as indicated in Figs. 2 and 3. According to the invention, the crosshead C must be moved rearwardly against the action of the spring 50 to retract the latch bolt B. In order to so move the crosshead, it is provided with a crossarm 54 having shoulders 56 and 57 operatively engaged by a yoke 58 secured to the handle H.

More specifically the yoke 58 includes a pair of spaced camming offsets or flanges 50 and 51 disposed forwardly of the crossarm shoulders 56 and 57 and in engagement therewith, for camming the shoulders rearwardly against the action of the spring 50. The yoke further includes an arched journaling flange 55 engaging the periphery of the bearing plate stud 44 for journaling the yoke thereon. The yoke 58 is secured on one end of a stud 60, the other end of which is secured by a screw 66 in a bored recess 68 in the journalled end of the handle H. The handle further comprises the usual lever arm 70 having a grip member 72 on the outer end thereof.

According to the present invention the handle H is movable in a variety of directions to actu-
ate the crosshead C to retract the latch bolt B. For this reason the journaled end of the handle H comprises a half-round or hemispherical bearing end 74 movably secured in a mating socket 76 provided in a mounting fixture or escutcheon 78 having a slot 80 therein through which the stud 64 extends. The escutcheon is secured to the surface of the door wall 26 by the screws 28 and 30 which also mount the support 12 thereon, as heretofore indicated.

The retracting mechanism thus far described operates in the following manner: Referring to Fig. 1, when the handle H is rotated in either a clockwise or a counterclockwise direction, the stud 64 rotates therewith and one or the other of the yoke flanges 60 or 61 cams the cooperating shoulder of the crossarm 54 rearwardly against the action of the spring 50. It will be noted that the arcuated journaling flange 62 fulcrums the yoke on the bearing plate stud 44 so that the yoke stud 64 does not frictionally bind in the escutcheon slot 80. The movement of the crosshead, thus effected, is sufficient to retract the latch to unlatching position, as will be hereinafter described. The same movement of the crosshead is obtained by drawing the handle H away from the door in a plane vertical thereto instead of moving it in a plane parallel with the door. When the handle is drawn away from the door, the yoke stud 64 is moved transversely in the escutcheon slot 80 and both of the flanges 60 and 61 engage the cooperating shoulders 56 and 57 to cam the crosshead rearwardly.

In order to transfer the movement of the crosshead to the latching mechanism L to retract the latch bolt, there is provided a transfer linkage comprising a pair of connected bell cranks 82 and 84 respectively, pivotally mounted at the upper and lower ends of the channel section 10. As shown in Fig. 1, one arm 86 of the upper bell crank lever 82 is provided with a flange 87 operatively engaging the free end of the crosshead stem 38. The other lever arm 88 is provided with an eyelet in which one end of a rod 89 is secured, and the corresponding arm 90 of the lower bell crank 84 is provided with a similar eyelet in which the lower end of the rod 89 is secured. The remaining arm 92 of the crank 84 is provided with a flange 93, similar to flange 87, for operatively engaging the latch mechanism L.

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 drawing 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 latch operating means comprising a supporting structure, a crosshead supported for rectilinear sliding movement on said structure and having a pair of shoulders, a spring associated with said crosshead for normally urging the same to one position, said supporting structure having a parti-spherical socket and a slot at the bottom of the socket extending generally in the direction of the line of movement of said crosshead, a handle having a parti-spherical end fitting in said socket and a stud projecting from said end of said handle and through said slot to permit of pivotal and rotational movements of said handle in planes at right angles to each other, and a yoke secured to the inner end of said stud and having flanges respectively engaging behind said shoulders whereby said crosshead is operated on either a rotary or pivotal movement of said handle.

2. A latch operating means comprising a supporting structure, a crosshead mounted thereon for rectilinear sliding movement and having a pair of shoulders and an elongated slot, a stud secured to said structure projecting through said slot and having a cylindrical head on its forward end, a spring normally urging said crosshead to one position, said supporting structure having a parti-spherical socket forwardly of said stud and an elongated slot in the bottom of said socket, a handle having a parti-spherical end journaled in said socket for pivotal and rotatable movements in planes at right angles to each other, a stud secured to said end of said handle and extending through the slot in the bottom of said socket, and a yoke secured to the inner end of said last-mentioned stud and having a pair of flanges respectively engaging said shoulders of said crosshead, said yoke also having a flange engaging the periphery of said cylindrical head for fulcruming the yoke thereon.

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