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DOORLATCH MECHANISM

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Fig. 1

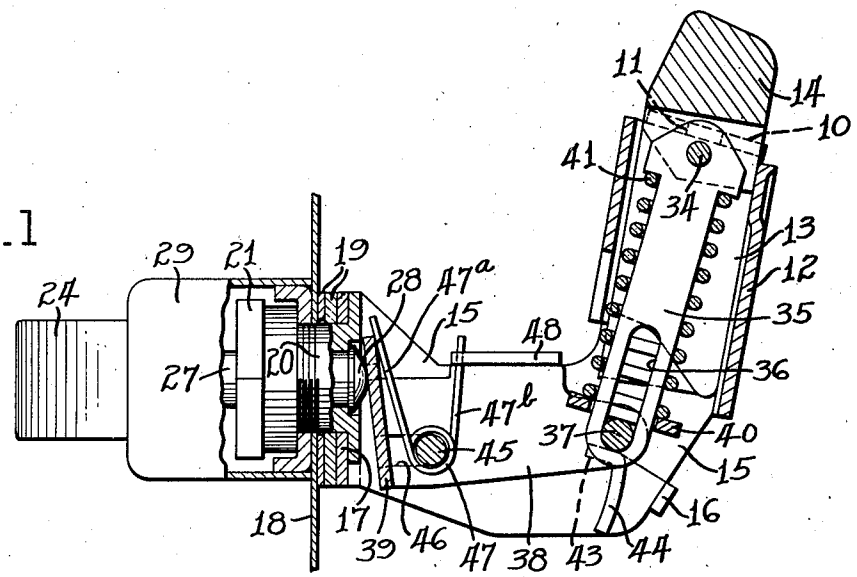
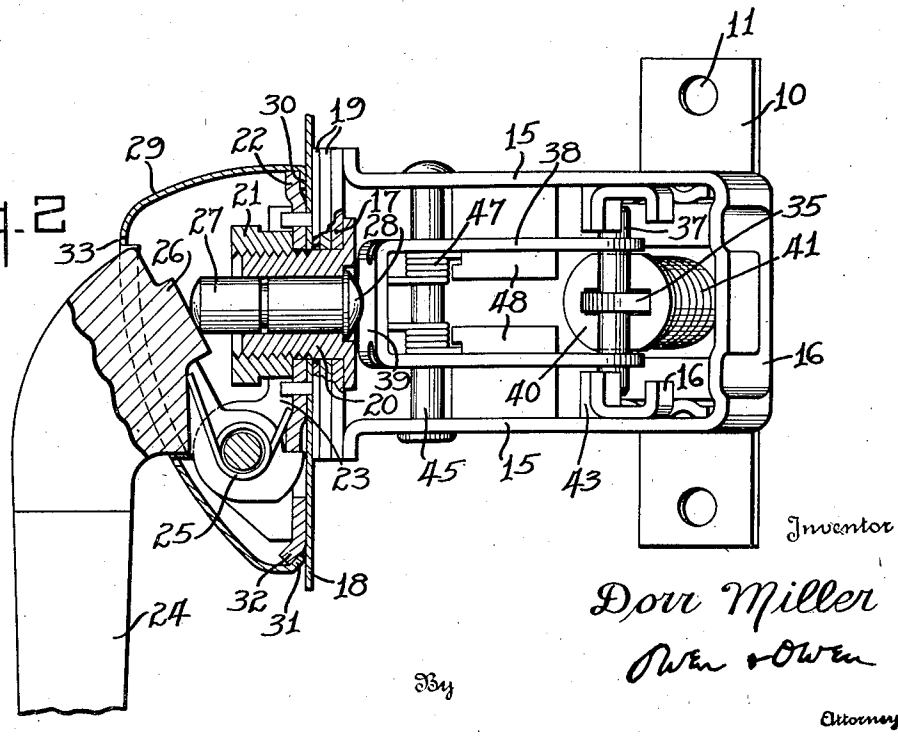


Fig. 2



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DOORLATCH MECHANISM

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7 Claims. (Cl. 292—167)

This invention relates to door latches, particularly for refrigerator doors, and is concerned with the provision of a latch mechanism which is simple to operate, holds the door closed with an appreciable force, is simple and reliable in construction, can be manufactured on a production basis at a reasonable cost and has the new and improved features of construction, arrangement and operation hereinafter described.

For purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing, in which:

Figure 1 is a horizontal sectional view of the latch mechanism viewed from above; and

Figure 2 is a side elevation partly in section of the latch mechanism shown in Figure 1.

The illustrated embodiment of the invention comprises a refrigerator door latch having a casing provided with a face plate 10 provided with openings 11 through which screws, or other securing devices, extend into the face or edge portion of the door, and secured thereto is a rearwardly extending bolt guide 12 in which a furcated extension 13 of a latching head or nose 14 is slidable, the nose 14 projecting outside of the guide for engagement with a suitable keeper (not shown). Rigid with the rear end portion of the latch bolt guide 12 are substantially V-shaped yoke arms 15, which are connected by a cross bar 16 substantially adjacent the apex of the V-shaped arms.

The opposite ends of the arms 15 are fixed as by welding to a plate 17, and interposed between the plate 17 and refrigerator door structure 18 are spacers 19, these parts together with the plate 17 being apertured to receive a flanged guide member 20 which has a screw threaded end portion to receive a nut 21, which clamps a plate portion 22 of the handle assembly against the opposite side of the refrigerator door structure 18 for securing these parts in assembled relation.

Pivotally mounted on a bracket 23 is a depending handle 24, which is yieldingly held in normal position by a coil spring 25. As shown, the upper end portion of the handle 24 is provided with a nose 26, which abuts against the outer end of a pin 27 yieldingly mounted in the member 20 and having a button head 28 on its outer end.

An escutcheon plate 29 has a downturned flange 30, which hooks over the upper end of the plate member 22, and the lower end portion of the escutcheon inclines upwardly and inwardly at 31 to snap over a downwardly and outwardly inclined end 32 of the plate member 22. The escutcheon is apertured at 33 to receive the upper end of the handle 24.

Pivotally mounted on the latch bolt head 14 on a pin 34, is an arm 35 which extends between the furcation 13 and has a longitudinally elongate slot 36 at its opposite end portion to receive a transverse pin 37, which is carried by a substantially U-shaped arm 38 which is disposed at an obtuse angle to the arm 35, and the transverse portion 39 of the arm 38 abuts against the button head 28 of the pin 27.

Loosely mounted on the arm 35 and abutting against the pin 37 is a washer 40 constituting an abutment for one end of a coil spring 41, which encircles the arm 35 and which bears at its opposite end against a shoulder formed on the inner end of the arm 35. The coil spring 41 normally holds pin 37 against flanges or stops 43 fixed to the arms 15 of the casing. As shown in Figure 1, the flanges 43 have a downwardly extending portion which is slightly curved and over which the pin 37 is adapted to ride, as will hereinafter appear. When the pin 37 is in abutting relation to the flange portion 43, it will be seen that the bolt head 14 may be retracted against the full force of the spring 41, the arm 35 riding over the pin 37 due to the slot 36. Preferably, the spring 41 is relatively strong to hold the latch nose 14 in latching position by relatively strong pressure to insure that the door of the refrigerator is held tightly latched.

Extending transversely of the arms 15 in the inner end portion thereof is a pin 45, and the legs of the U-shaped arms 38 are provided with slots 46 to enable the member 38 to slide or move rectilinearly, thereby to move the pin 37 clear of the stop 43 and on to the downwardly extending flange portion 44.

By lifting movement of the handle 24 it is apparent that the pin 27 is moved or slid inwardly, the head 28 bearing against the transverse portion 39 of the arm 38, thereby to effect sliding movement of the arm 38, but it will be noted that the head 28 engages the upper end portion of the transverse member 39, whereas the pin 45 and slots 46 are disposed in the lower portion of the arm 38. This enables the pin 27 to impart to the arm 38, after a predetermined sliding movement i. e. until the outer ends of the slots 46 have engaged the pin 45, to rock the arm 38, thereby to cause the pin 37 to travel downwardly along the flange 44 and retract the latch bolt 14. It should be noted that in the retraction of the latch bolt 14 in this manner, the spring 41 is not compressed since the abutment washer 40

retains substantially its relative position with respect to the shoulder on arm 35. It will thus be seen that although a relatively strong spring 41 holds the latch bolt 14 in latching position, the force of such spring does not have to be overcome in the retraction of the latch bolt when the same is retracted manually or by actuation of the door handle 24.

Encircling the pin 45 are coil springs 47, one end 47a of each spring abutting the transverse part 39 of the arm 38, and the other end 47b of each spring abutting plate portions 48 rigid with the casing arms 15. The springs 47 not only impart a retrograde movement to the U-shaped arm 38 to return the same to normal position, but also arrange to impart a lifting action to the inner end of the arm 38 to lift the same clear of the flanges 44. It is thus apparent that the springs 47 operate after the handle 24 is released to retract the actuating arm to normal position.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What I claim is:

1. A door latch comprising movable abutment means, a latching member movable to and from latching position independently of motion of said abutment means, means for holding said abutment means normally against movement during such independent movement, means for positively retracting said latching member upon movement of said abutment means from normal position, said retracting means including an element having successive sliding and pivotal movements, and a spring for said latching member movable with said abutment means and arranged to be compressed only upon said independent retracting movement of the latching member.

2. A door latch comprising movable abutment means, a latching member movable to and from latching position independently of motion of said abutment means, means for holding said abutment means normally against movement during such independent movement, means for positively retracting said latching member upon movement of said abutment means from normal position, said retracting means including a plate mounted for sliding movement for moving said abutment away from normal position and a pivotal mounting for said plate operative subsequent to the sliding movement for effecting retraction of the latching member, and a spring for said latching member movable with said abutment means and arranged to be compressed only upon said independent retracting movement of the latching member.

3. A door latch comprising movable abutment means, a latching member movable longitudinally to and from latching position independently of motion of said abutment means, means for normally holding said abutment means against movement during such independent movement, retracting means for said latching member including an element movable in a direction at approximately right angles to the longitudinal movement of said latching member and having successive sliding and pivotal movements, and a spring for said latching member movable with said abutment means and arranged to be compressed only upon said independent retracting movement of the latching member.

4. A door latch comprising a latch bolt, spaced apart means for guiding said bolt, a link pivoted to the outer end of the latch bolt, a link disposed at substantially right angles to said first link and connected thereto, spring means urging said latch bolt to latching position, means enabling retraction of said latch bolt against the full force of said spring means independently of movement of said second link, and means enabling retraction of said bolt by said second link without compressing said spring means.

5. A door latch comprising movable abutment means, a latching member movable longitudinally to and from latching position independently of motion of said abutment means, means for normally holding said abutment means against movement during such independent movement, retracting means for said latching member movable in a direction at an angle to the longitudinal movement of said latching member, said retracting means being operable to shift said abutment means angularly with respect to the movement of the latching member, and a spring for said latching member and engageable with said abutment means, said spring being compressed only upon said independent retracting movement of the latching member.

6. A door latch comprising a latch bolt, a link connected to said latch bolt, a second link disposed at an angle to said first link and connected thereto, a spring urging said latch bolt to latching position, means including an abutment for said spring and a stationery stop against which said abutment bears enabling retraction of said latch bolt against the full force of said spring independently of movement of said second link, and means for moving said second link to actuate said abutment away from said stop thereby to retract said latch bolt without compressing said spring.

7. A door latch comprising a latch bolt, a link connected to said latch bolt, a second link disposed at an angle to said first link, a pin and slot connection between said links, an abutment member bearing against said pin, a spring bearing against said abutment member at one end and said latch bolt at the opposite end, a stop for said pin enabling retraction of said latch bolt against the full force of said spring without moving said second link, and means for actuating said second link to move said pin over said stop to enable retraction of said latch bolt without compressing said spring.

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