Aug. 27, 1935. F. SCHMIDGALL 2,012,732

DOORLATCH

Filed May 13, 1933 2 Sheets-Sheet 1

Fig. 1

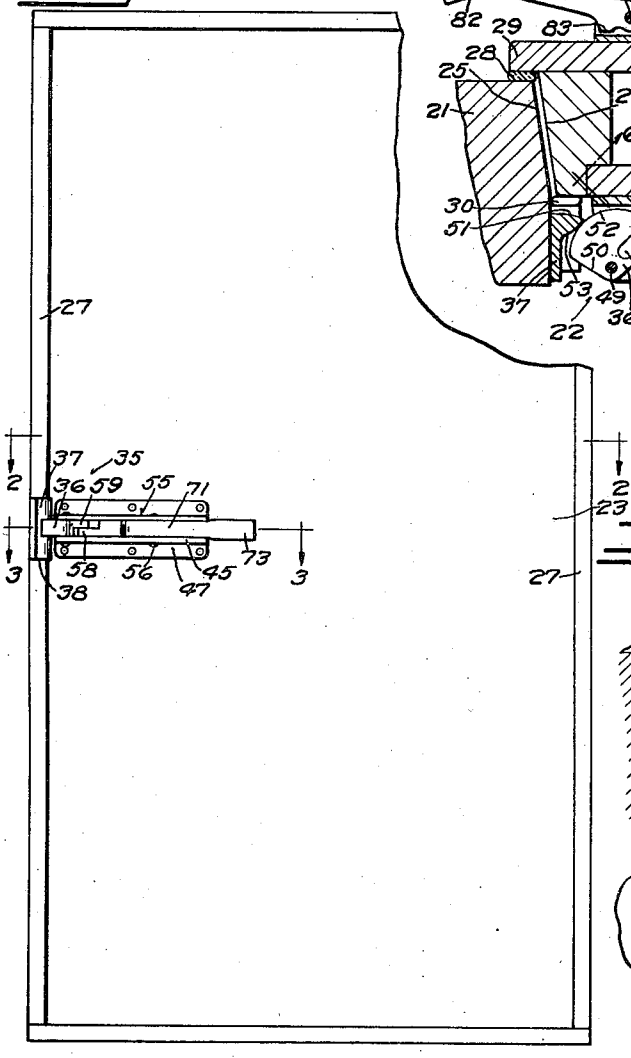


Fig. 3

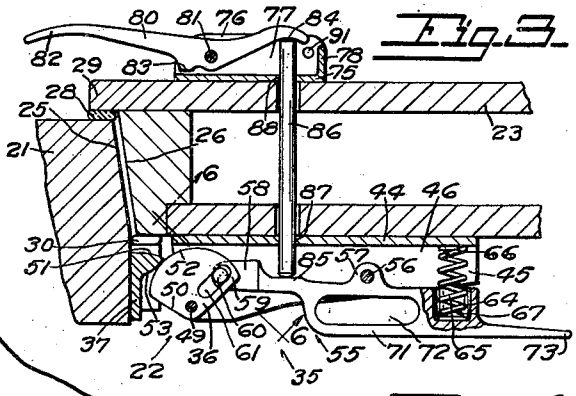


Fig. 4

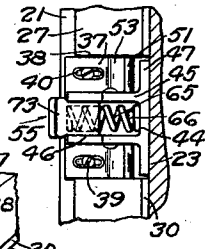


Fig. 5

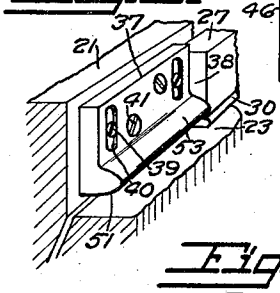


Fig. 7

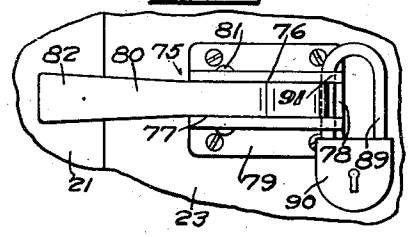


Fig. 2

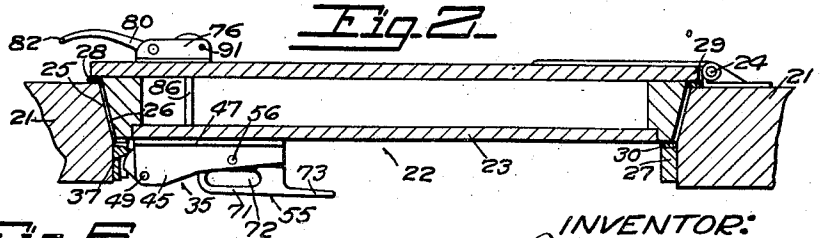
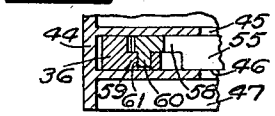


Fig. 6



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DOORLATCH

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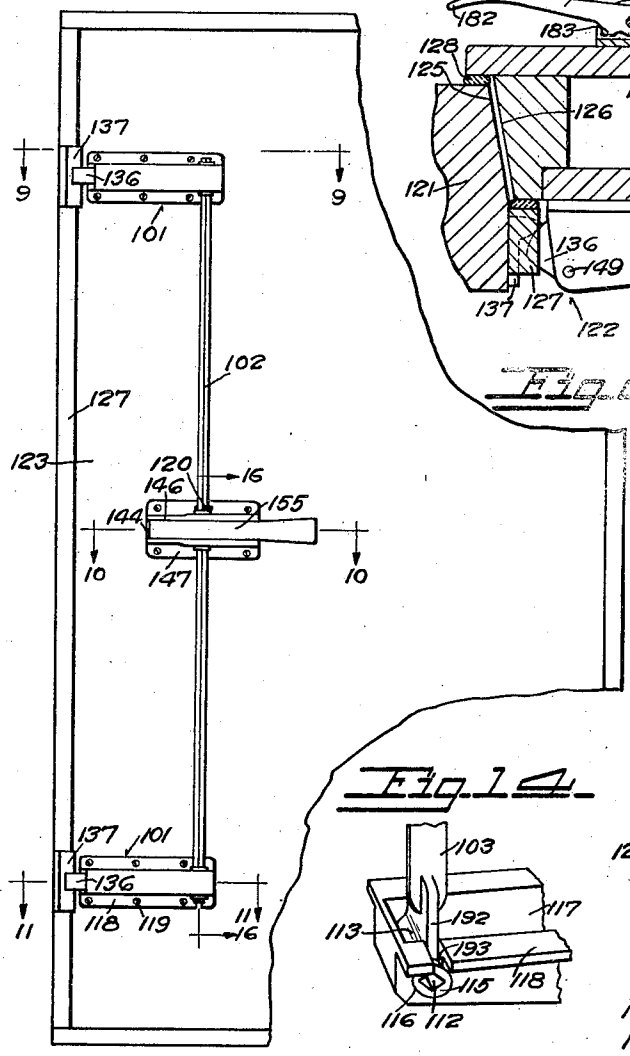


Fig. 10

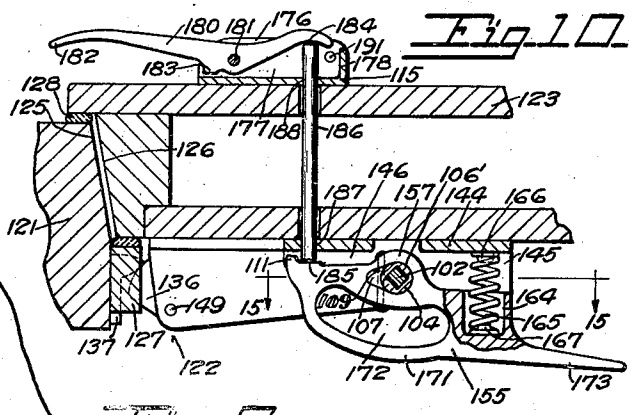


Fig. 8

Fig. 11

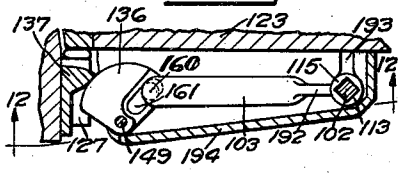


Fig. 16

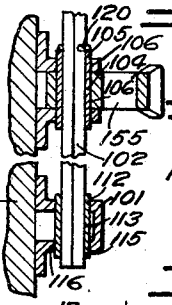


Fig. 13

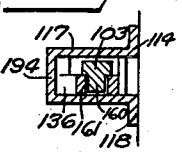


Fig. 14

Fig. 12

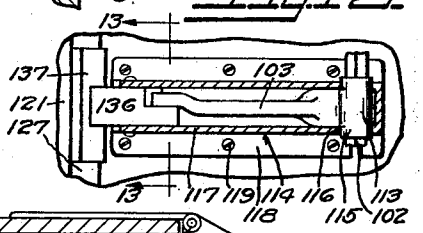


Fig. 9

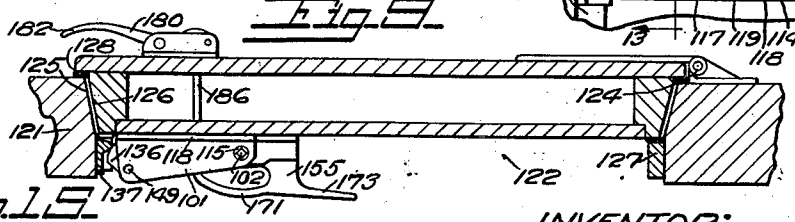
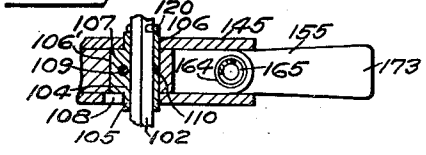


Fig. 15



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UNITED STATES PATENT OFFICE

2,012,732

DOORLATCH

Frederick Schmidgall, Cincinnati, Ohio

Application May 13, 1933, Serial No. 670,915

1 Claim. (Cl. 292—226)

My invention relates to door latches, particularly useful in latching refrigerator doors, and it is the object of my invention to provide novel compact means arranged to be placed at the inside of the door for latching the door, and novel and compact operating means for the latching means.

My invention consists in providing novel operating means for the door latching means so arranged that the door may be readily opened or closed by novel hand gripping means, so placed that the principal part of the manual force exerted upon the gripping means is directed toward swinging the door; further, in providing novel operating means comprising an operating lever having a hand-grip so related to the pivot of the lever on the door as to direct force applied upon the hand-grip toward or from the pivot for bodily moving the door; and further, in providing the lever with additional hand gripping means for swinging the lever on its pivot.

My invention consists, further, in the novel parts, and the novel construction, arrangement and combinations of parts, hereinafter more fully described and claimed.

The invention will be further readily understood from the following description and claim, and from the drawings, in which:

Fig. 1 is a side elevation of a door having my improved device applied thereto, partly broken away.

Fig. 2 is a horizontal cross-section of the same, taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged horizontal cross-section of my improved device, taken on the line 3—3 of Fig. 1, and partly broken away.

Fig. 4 is a rear end elevation of my improved latching means, partly broken away.

Fig. 5 is a perspective view, showing the keeper attached to the frame, partly broken away, without the latch.

Fig. 6 is a sectional detail view, taken in the plane of the line 6—6 of Fig. 3.

Fig. 7 is a side elevation of the outside operating means of my improved device.

Fig. 8 is a side elevation, showing my improved device employed as a double latch.

Fig. 9 is a horizontal cross-section of the same, taken on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged horizontal cross-section of the same, taken on the line 10—10 of Fig. 8, and partly broken away.

Fig. 11 is a cross-section of a detail of the same, taken on the line 11—11 of Fig. 8, and partly broken away.

Fig. 12 is a vertical cross-section of the latter, taken in the plane of the line 12—12 of Fig. 11, and partly broken away.

Fig. 13 is a cross-section of the same, taken in the plane of the line 13—13 of Fig. 12, and partly broken away.

Fig. 14 is a perspective view of a detail of the same, showing the arm in assumed position for assembling of the parts.

Fig. 15 is a cross-sectional detail view, taken in the plane of the line 15—15 of Fig. 10, and partly broken away; and,

Fig. 16 is an axial section of a detail illustrating the connections of the vertical operating rod, taken on the line 16—16 of Fig. 8, and partly broken away.

The wall 21 of the refrigerator or other enclosure is provided with a door opening 22, arranged to be closed by a door 23, suitably hinged to the wall by hinges 24, of which there may be a suitable number for properly supporting the door.

The walls of the door opening are provided with inclined seats 25, in which the slanting edge faces 26 of the door are received. Seating strips 27 are secured to the walls of the door opening at the inner ends of the inclined seats. A cushion 28 is secured to the inside face of a flange 29 of the door, which extends about the outer margin of the door. A cushion 30 is secured to the outer face of the seating strip about the wall of the door opening. These cushions are compressed when the door is closed for forming a substantially hermetic seal between the door and the wall of the door opening when the door is in closed position.

Referring to Figs. 1 to 7 inclusive, the door is provided with a latch 35, the bolt 36 of which cooperates with a keeper 37, this keeper being shown secured to the wall of the door opening in a recess 38 in the seating strip. The keeper is preferably adjustable, screws 39 passing through slots 40 in the keeper and into the wall, and screws 41 passing through holes in the keeper and into the wall to hold the keeper in adjusted position. The latch and the keeper are preferably located at the inside of the door when the door is closed.

The latch comprises a base 44 having flanges 45 extending therefrom, these flanges being preferably substantially parallel and forming side walls for a channel 46 of said base. Flanges 47 of the base have suitable screws pass therethrough into the door.

The bolt 36 is shown as a pivoted bolt, pivoted on a pin 49, located in one end of said side walls

and having an engaging face 50 which coacts with the engaging face 51 of the keeper and with the outer edge of the keeper for swinging the bolt upon its pivot when the door is being closed. The bolt further has an engaging face 52 which cooperates with the edge of the keeper and the slanting engaging face 53 of the keeper, for urging the door into fully closed position and for maintaining the door in such closed position.

A lever 55 is located in the channel and is preferably guided by the side walls of said channel for aiding in steadying the same. The lever has a pivot 56 in the form of a pin located in a pivot lug 57 of said lever, the ends of said pin being located in holes in the side walls 45 and held in place, as by riveting or upsetting the ends of the pin at the outer sides of said side walls.

One end of said lever extends toward the bolt, and has articulation with said bolt for operating the same. Thus the end of the lever has a rabbet for forming a lug 58 at the end of the lever, and the bolt has a rabbet for forming a lug 59 alongside the lug 58, the respective lugs being received in the respective rabbets. The lug 58 is provided with a pin 60 fixed thereto, which is received in a slot 61 in the lug 59, so arranged and connected that swinging of the lever upon its pivot causes swinging of the bolt upon its pivot, for moving the bolt into latching and unlatched relations. The lever and bolt are snugly received between the side walls 45 of the channel 46, but are permitted free movement therebetween for ready operation of the parts.

The pin 60 is preferably spaced from the end of the slot 61 when the door is fully seated (Fig. 3) for permitting continuous urging of the door inwardly.

The lever is provided with a socket 64, the walls of which are received between the side walls 45 of the base. A spiral spring 65 is received in this socket and extends between the base and bottom of the socket. The respective ends of the spring are located about teats 66, 67, respectively on the base and on the bottom of the socket.

The lever has a hand-grip 71 shown formed by a loop of the lever about a finger-slot 72 in the lever, through which the fingers of the operator are arranged to be received. The middle portion of this hand-grip is opposite the pivot of the lever, so that the main portion of the force exerted upon the hand-grip at substantial right angles to the plane of the door is exerted upon the pivot for swinging the door upon its hinges. This hand-grip is employed principally for closing the door when the operator is inside the enclosure, as a pulling upon the hand-grip moves the door and permits the bolt to swing on its pivot for latching the door in closed position, so that cold in the inside of the refrigerator may not escape or be wasted while the operator is occupied inside the refrigerator.

The lever is further provided with a hand-grip 73 at its outer end, arranged to be employed for swinging the lever upon its pivot for operating the latch. If desired, the operator may swing the lever upon its pivot by tilting the lever when gripping the hand-grip 71, but such tilting is difficult, and the primary purpose of the hand-grip 71 is to pull upon the door by the operator inside the refrigerator for closing the door, the reaction of the swinging of the bolt upon the hand of the operator while being latched being slight and not objectionable.

Means are also provided for operating the latching means from the outside of the door. A base 75 is provided with side flanges 76, forming side walls of a channel 77 between them. This channel may have an end wall 78 at the end of the base. The base comprises flanges 79 through which screws pass into the door for fastening the base to the door. A lever 80 is pivoted between said walls on a pivot 81, extending through said lever and having its ends received and held in holes in the side walls 76. The lever is guided between said side walls.

The lever is provided with a hand-grip 82 at its outer end. The lever has a lug 83 which strikes the base as a stop for limiting movement of the lever in closing direction when the door is open, the stop being however preferably spaced from the base (Fig. 3) when the door is closed for permitting continuous urging of the door inwardly by the spring 65.

The portion of the lever in the channel is provided with a seat 84, and the lever 55 is provided with a seat 85. A rod 86 extends through holes 87, 88 in the bases 44, 75, and through the door of the refrigerator, the respective ends of the rod being loosely received in the seats 85 and 84 on the levers 55, 80.

Outward pull upon the hand-grip 82 acts to unlatch the latch, and the operator at the outside, continuing to pull outwardly upon hand-grip 82, swings the door outwardly. Outward pushing movement upon the hand-grip 73 at the inner end of the lever 55 acts to unlatch the latch, and continued outward pushing upon said hand-grip acts to swing the door outwardly. Inward swinging of the door is obtained by the operator grasping the hand-grip 71 thereon, the force of the pull being transmitted to the pivot 56, and thence to the door, for pulling inwardly on the door, the closing movement of the door acting to latch the latch as hereinbefore described.

If it is desired to lock the door, the bow 89 of a padlock 90 may be placed in holes 91 in the side walls 76 of the outer base 75, thus placing the same in obstructing relation with the inner end of the outer lever 80 for preventing operation of the latch.

When extra heavy or extra large doors are to be employed, it is found desirable to employ more than one latch. Such a use is shown in Figs. 8 to 16 inclusive, in which similar parts are designated by similar reference numerals raised to the series 100.

In these figures two latches 101 are shown. The inside lever for operating the latches is shown as a composite lever, comprising the inner lever 155, the upright rocker-rod 102, and the arms 103, the lever, rocker-rod and arms being connected for combined movements.

A hub 104 has trunnions 105 located in bearing holes 106 in the side flanges 145 and in a hole 106' in the lever 155, the hub having a lug 107 which passes through an elongation 108 of one of the holes 106 in assembling the parts. The hub is fixed to the lever by a rivet 109.

The upright rod 102 is square in cross-section and is located in a bore 110 of similar cross-section in the hub 104, so that the rod rocks with the swinging of the lever.

The lever is provided with a lug 111 which is arranged to strike the base 144 and form a stop when the door is in open relation, this lug being however spaced from the base (Fig. 10) when the door is closed to permit the spring 165 to urge the bolts 136 for drawing the door into sealing position when the door is closed.

Each end of the upright rod is located in a

square bore 112 in a hub 113 of one of the arms 103, there being one of these arms located in each of the latches 101. Each of these hubs has trunnions 115 which rock in bearing holes 116 of side walls 117 of the base 114. Each of these bases has side flanges 118, screws 119 screwing through holes in these flanges into the door. The rod 102 may be held in place by a pin 120.

The arm 103 adjacent to its hub is narrow lengthwise of its trunnions, as shown at 192, and one of the side walls 117 is provided with a slot 193 through which this narrow portion is readily received endwise when the arm is in assumed position at substantial right angles to its usual arrangement, as shown in Fig. 14, so that the trunnions may slip endwise into their respective holes, and the arm then be swung for being located between the side walls. The outer margins of the side walls are connected by a web 194 for obstructing the view of the inside mechanism and providing a flush outside for the casing, which is readily cleaned.

In my improved device the door may be opened from the inside of the refrigerator by manipulation of the inside lever 55, even if the outside lever 80 is locked, so as to permit an occupant of the refrigerator to make an exit even if the outside lever be accidentally or purposely locked.

My improved device is simple and compact in construction, and the principal working parts are placed at the inside of the refrigerator, the outside handle and its escutcheon plate being the only parts normally exposed, so that neatness in appearance is obtained.

The normally hidden parts may be made massive and need not be of superior finish, so that strength and economy are obtained.

The parts are so constructed and arranged that simplicity and convenience in operation are obtained, permitting the door to be readily and quickly opened and closed.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

In a door latch, the combination of a base, door latching means, said base having outwardly extending flanges forming side walls of a channel, a lever in said channel having operative connection with said door latching means, said lever having a hand-grip, a pivot between said side walls and said lever at the middle portion of said hand-grip, said lever provided with a socket at the side of said pivot, said socket having walls received between said side walls, and a coil spring between said side walls of said base and the bottom of said socket.

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