

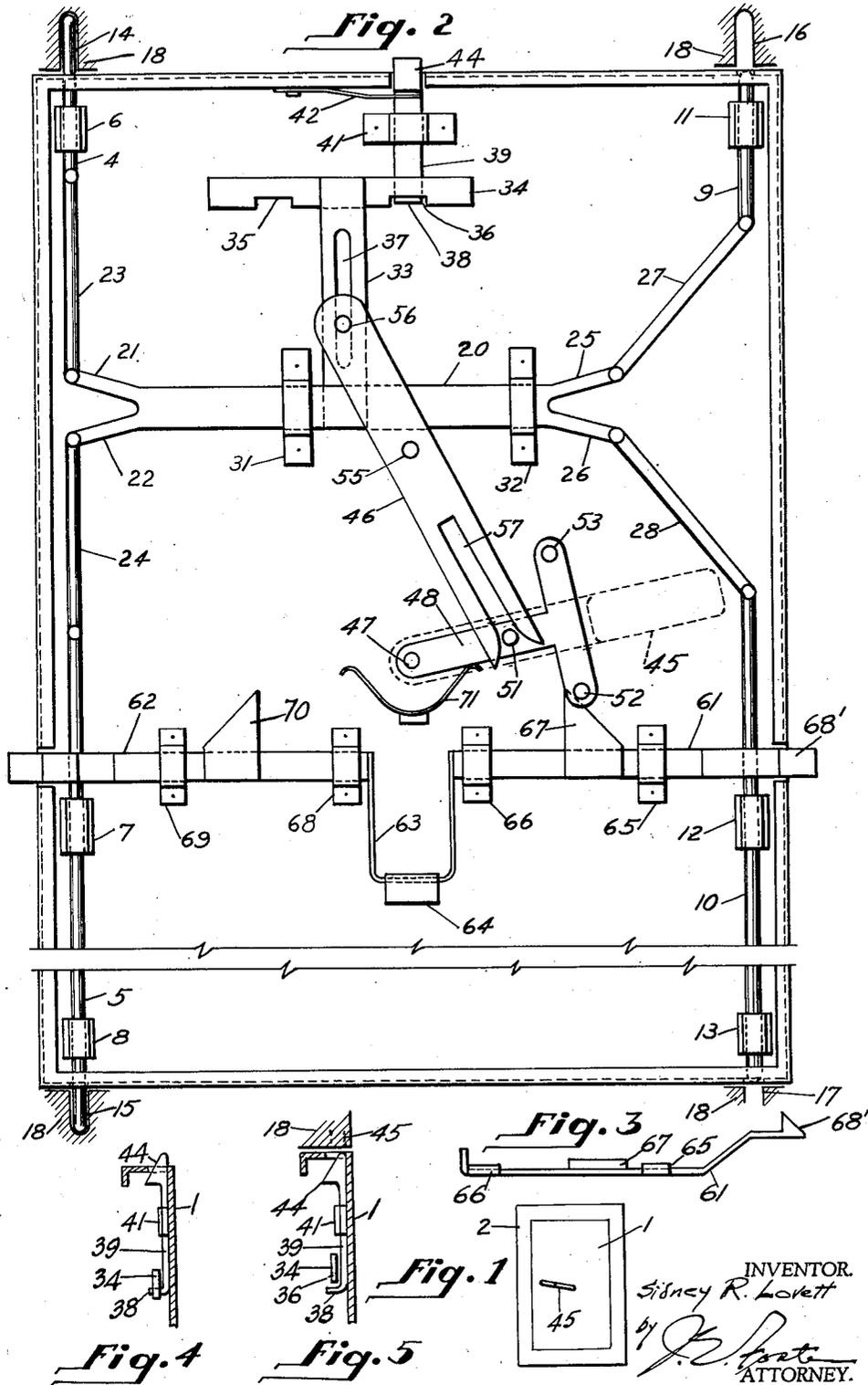
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DOOR MOUNTING AND LATCHING MEANS

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DOOR MOUNTING AND LATCHING MEANS

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My invention relates to doors, and particularly to doors arranged to be latched closed, or to be unlatched and opened, at either side.

One object of my invention, in order to unlatch the door at either side, is to provide a mechanical arrangement to selectively hinge the door at either side, opposite to the side to be unlatched.

Another object of my invention is to provide a door to be unlatched and opened at either side, with a single operating handle selectively movable to either of two positions to release the corresponding latch.

Another object of my invention is to provide a door that may be unlatched at either side by a single handle and that will be self-latching when the door is slammed closed, without any further operation of the door handle.

Another object of my invention is to provide a safety device to prevent improper operation of the handle, that might withdraw the operating hinges from supporting position, while the door is open, and thereby leave the door without support.

There are many applications where it is desirable to have a door that may be unlatched from either side. One application, for example, is a refrigerator cabinet that may be moved from one place to another. In the first location, the door might be opened more conveniently from one side, whereas, in the second location, the door might be opened more conveniently from the other side. Where the door is fixedly pivoted or hinged, however, on its cabinet structure, the door can be opened only from one side. In many cases that is inconvenient, but cannot be remedied with the fixed hinge.

According to the principles of my invention, the door is provided with a pair of hinge pins on each side, that are controlled by a connecting bar to render one pair or the other operative to hinge the door on the selected side. A latch bolt is also provided on each side of the door; and a single handle on the front of the door serves to operate the connecting bar to position one pair on the other of the hinge pins, and then to retract the proper latch bolt on the opposite side of the door.

By suitable lost-motion connections between the handle and the connecting bar, and also between the handle and the latch bolts, the parts are provided with a floating freedom that permits the door to be self-latching on both sides.

As a safety precaution, the connecting bar is prevented from being operated by a safety latch when the door is open, since operation of the bar

at that time would withdraw the hinge pins and leave the door entirely without support. When the door is closed against the jamb of its cabinet or compartment, the safety latch is moved to release the connecting bar so the bar can be selectively and freely operated by the handle to determine the side of opening of the door.

One arrangement of the mechanism for a door, constructed according to my invention, is shown in the accompanying drawing in which

Figure 1 is a front elevation of a cabinet provided with a door of my invention;

Figure 2 is a schematic elevational view of the mechanism on the back of a door;

Figure 3 is a plan view of a side latch bolt, showing the passing space for a hinge pin;

Figure 4 is a side view of the safety latch for the connecting bar, in the open position of the door; and

Figure 5 is a similar view of the latch of Fig. 4 in the closed position of the door.

As shown in the drawing, a door 1 for a cabinet or compartment 2 is provided on its back surface with mechanism to permit the door to be opened from either side.

A pair of hinge pins 4 and 5 are disposed in bearings 6, 7 and 8. A similar pair of hinge pins 9 and 10 are disposed in bearings 11, 12 and 13.

The hinge pins 4 and 5, when extended to operating position, fit into cups or hinge bearings 14 and 15, that support the door through the hinge pins. The other hinge pins 9 and 10, when extended, fit into cups or hinge bearings 16 and 17 in the door jamb 18.

Both sets of hinge pins are operated by a connecting or cross-bar 20, that serves also as an interlock bar to assure proper operation of the hinge pins in pairs.

The cross-bar 20 is provided with two pivot fingers 21 and 22 pivotally connected to links 23 and 24, that are, in turn, connected to the pins 4 and 5, respectively.

Similarly, two pivot fingers 25 and 26 of bar 20 are connected to links 27 and 28 that are connected to the pins 9 and 10.

The connecting cross-bar 20 extends one pair of pins when moved towards those pins, and, at the same time, withdraws the other pins. Two straps 31 and 32 serve as bearings, to support the cross-bar. The cross-bar is provided with a vertical operating arm 33 having a central longitudinal slot 37. The top of the arm 33 is provided with a latching plate 34 having two notches 35 and 36 in its lower edge, to receive a latching

flange 38 of a safety latch 39. The latch is slidably supported in a strap bearing 41 and is normally biased upward by a leaf spring 42 to cause the latching flange to engage and seat in one of the slots 35 or 36.

5 The upper end of the safety latch 39 is provided with an inclined edge 44 that is arranged to engage a suitable element 45 on the jamb 18, to force the latch 39 downward to release position when the door is in closed position. When
10 the door is open, the safety latch is biased upward. Since the cross-bar will then be in one of its terminal positions, the latch will be in one of the slots 35 or 36, to prevent operation of the cross-bar while the door is open.

15 The cross-bar is operated by the single door-handle 45 through a transfer bar 46. The handle is connected to a shaft 47 extending through the door. A handle arm 48 of T-shape is connected to the inner end of the shaft 47 to be operated by
20 the handle 45. The handle arm 48 is provided with a pin 51 to operate the transfer bar 46; and with two pins 52 and 53 to operate the door latches, as will be presently explained.

25 The transfer bar 46 is pivoted on a pivot pin 55, and is provided with a pin 56 at its upper end, to fit into the slot 37 in the operating arm 33 of the cross-bar. The lower end of the transfer bar 46 is bifurcated by a slot 57, into which the pin 51 of the handle arm 48 fits to oscillate
30 the transfer bar to control the selection of the hinge pins according to the side of the door that is to be unlatched.

35 The door is provided with two latch bolts 61 and 62, that are normally biased to latching positions by a spring 63, here shown as a U-shaped leaf spring supported at its middle by a bracket 64.

40 The latch bolt 61 is slidably supported between two strap bearings 65 and 66. An inclined reaction plate 67 is secured to the bolt and is located in the path of the arc of pin 52 on the handle arm 48. As the handle and its arm are pressed downward at the position indicated, the pin 52
45 presses down on the inclined surface of the plate 67 and forces the latch bolt 61 to the left. The latch finger 68 at the outer end of the latch bolt is thereby withdrawn from its keeper in the door jamb, and the door is released to swing open
50 about the hinge pins 4 and 5.

The other latch bolt 62 is similarly supported by bearing straps 68 and 69, and provided with an angle plate 70.

55 A handle-biasing spring 71 raises the handle sufficiently to move the pin 52 out of the way of the plate 67, so the latch bolt can be forced home by the U-shaped bolt spring 63 when the door is slammed closed.

60 Thus, by the construction shown, the operation of the cross-bar by the handle, and the releasing of the latch bolts by the handle, are effected through lost motion connections that leave the handle mechanically free of the cross-bar, and of the latch bolts. Thus, the door may be self-latched when reclosed, without any further operation
65 of the handle to move the latch bolt to latching position.

70 The construction shown, embodying my invention, thus provides a doubly-hinged, selectively operable and self-latching door that may be readily applied to cabinets, vaults, compartments or rooms, and opened on either side at the will of the operator and according to his convenience.

75 My invention has been shown as described, merely for illustrative purposes, and it may be

variously modified without departing from the spirit and scope of the invention, as set forth in the appended claims.

I claim as my invention:

1. Door mounting and latching means for a 5 door to open at either side in a frame, comprising hinge pins adapted to be mounted at each side on the back of the door, an interlock bar connection between the hinge pins to withdraw one set from the frame while anchoring the other set for operation, an operating lever for the interlock bar,
10 a biased latch bolt to be mounted at each side edge of the door, handle means to be mounted on the front of the door, lost motion means operative by the handle to retract either latch bolt, a biased latch for the interlock bar, said latch being operative, when the door is in open position, to prevent operation of the interlock bar while the door is open, and being movable by the frame to release the interlock bar when the door is closed. 20

2. Door mounting and latching means for a door to open at either side in a frame for the door, hinge pins to be mounted on the door, at each side, to extend into the frame to support the door for swinging movement, a latch bolt to be
25 mounted at each side of the door to engage a complementary keeper on the side of the frame, an interlock bar between the hinge pins to selectively withdraw one set of hinge pins while the other set is placed in operating position in the frame, a single handle to be mounted on the door
30 movable to either of two terminal positions to select the side of the door to open, means controlled by the handle to operate the interlock bar and then to release the selected latch bolt, and a biased safety latch normally to be held in non-latching position relative to the interlock bar by the frame when the door is closed, but
35 movable to latch the interlock bar against operation while the door is open, to prevent operation of the interlock bar while the door is open at either side. 40

3. Door mounting and latching means for a door to permit the door to be hinged at either side in a frame and to be opened at the other side, 45 comprising hinge pins adapted to be mounted on the door, at each side hinge brackets in the door frame for receiving the hinge pins, a floating biased latch to be mounted on each side of the door to engage a complementary keeper on the frame, a
50 front handle movable to either of two terminal positions, an interlock bar movable to two terminal positions and connected between the hinge pins to permit only one set to be anchored at one time, at the respective terminal positions of the bar, 55 a pivoted arm to operate the interlock bar by one end of the arm to anchor a selected pair of hinge pins, this pivoted arm having a lost motion connection with the handle at the other end of the arm, and a biased latching device to latch the interlock bar in either terminal position when the door is open, and out of the frame but adapted to be held in unlatching position by the frame
60 when the door is closed, so the operating hinge pins cannot be withdrawn while the door is open. 65

4. Door mounting and latching means for a door to open at either side in a frame, comprising hinge pins adapted to be mounted at each side on the back of the door, a cross-bar connection between the hinge pins to withdraw one set from the frame while inserting the other set for operation, a pivoted operating lever for the cross-bar, a spring biased latch bolt adapted to be mounted at each side edge on the back of the door and to extend laterally therefrom to engage 75

an appropriate keeper on the frame, a pivoted handle to be mounted on the front of the door with means to be disposed behind the door and to be operated by the handle, first to operate the lever for the cross-bar to one terminal position to move and position a selected set of hinge pins into the frame, and, second, to retract the latch bolt on the opposite side edge of the door to permit the door to open, the handle-operated means being movable to engage means on the pivoted lever and on the latch bolts to operate the lever and the selected latch bolt.

5. Door mounting and latching means for a door to open at either side in a frame, comprising a first set of hinge pins adapted to be mounted at one side edge of the door, a second set of hinge pins adapted to be mounted at the other side edge of the door, operating rods for each set of hinge pins, an interlocking connecting bar between the operating rods for the two sets of hinge

pins, an operating lever to operate the connecting bar with a lost-motion connection to insert one set of hinge pins and to withdraw the other set in anchored sockets in the door frame, the operating lever being bifurcated at one end to receive an operating pin for the lever with a lost-motion action, a handle to be pivotally mounted on the front of the door, a member to be mounted behind the door and operated by the handle, said member carrying the operating pin for the bifurcated lever, a biased latch bolt adapted to be mounted on each side edge of the door and to extend laterally to engage an appropriate keeper on the frame, the handle-operated member carrying a pair of spaced pins for engaging means on, and retracting, a selected one of the latch bolts, according to the position to which the handle is moved.

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