

May 16, 1944.

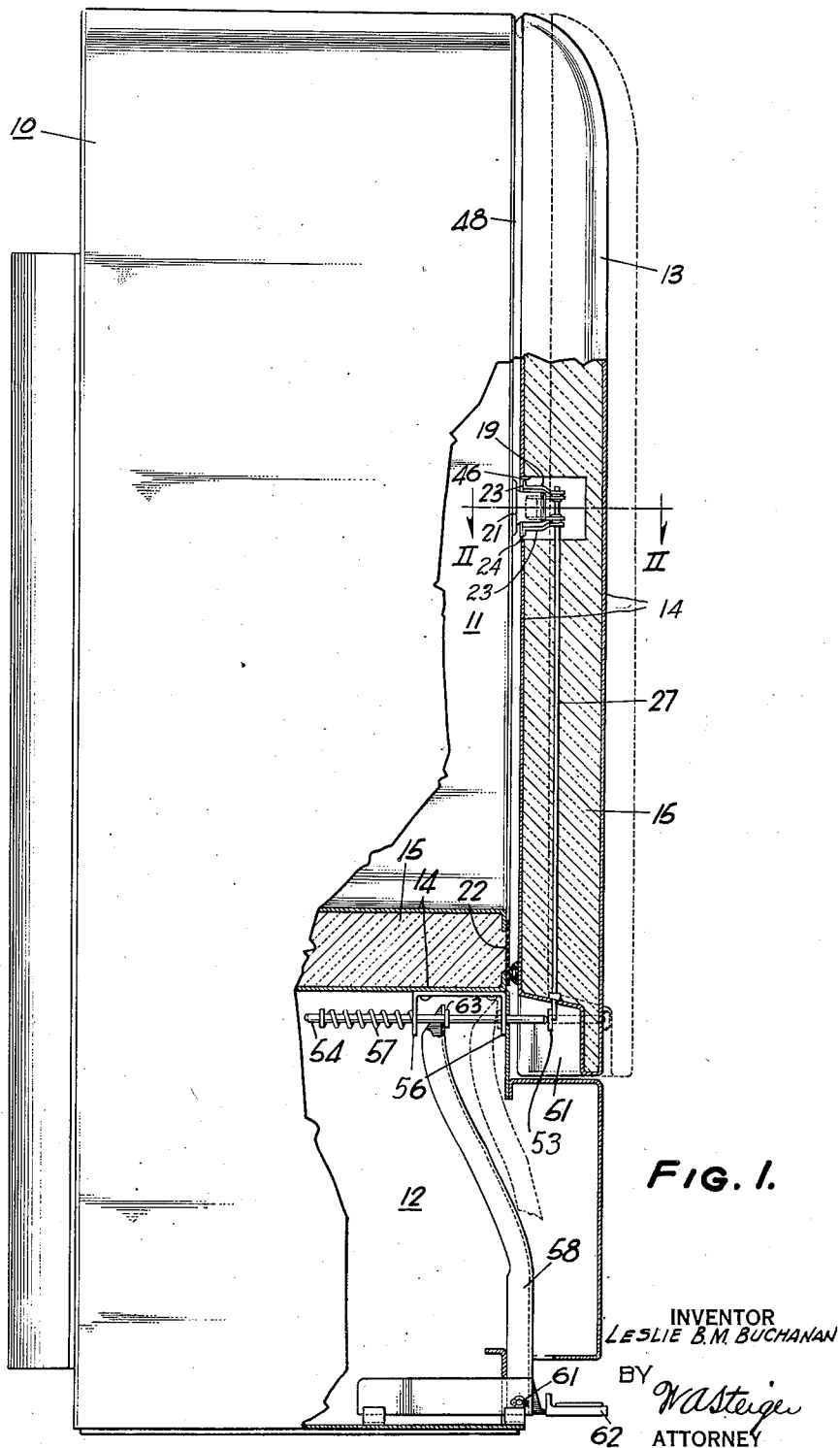
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2,348,955

DOOR LATCH MECHANISM

Filed Jan. 8, 1942

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

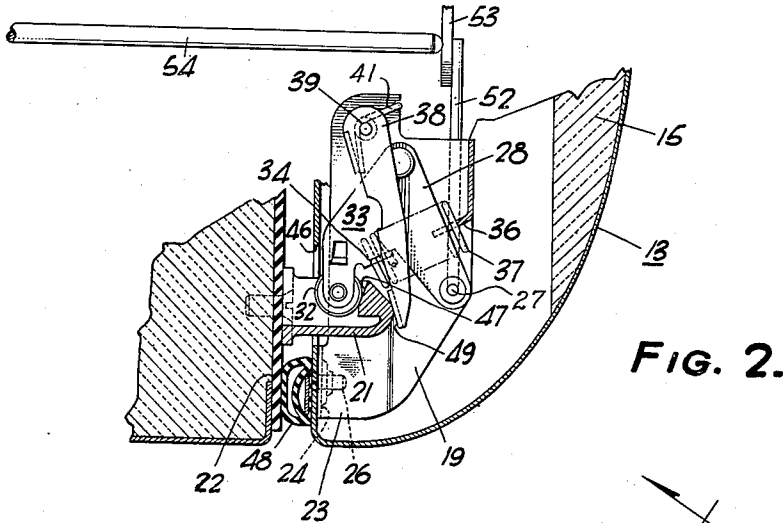


FIG. 2.

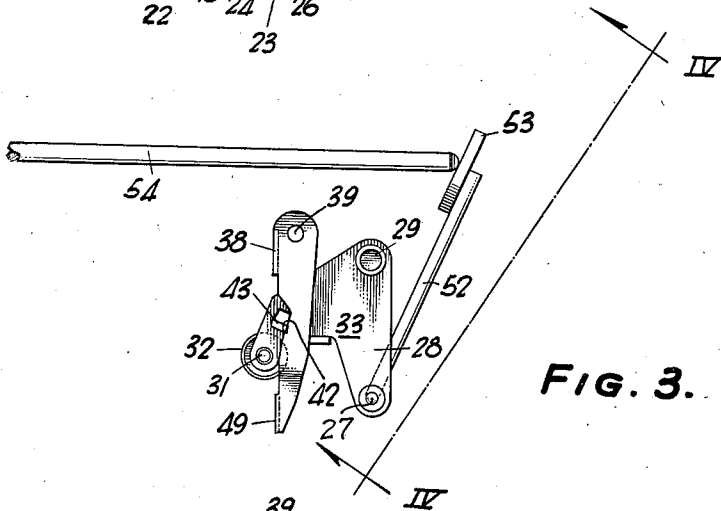


FIG. 3.

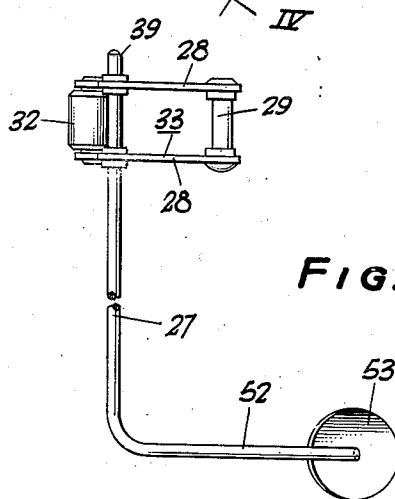


Fig. 4.

WITNESSES:

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DOOR LATCH MECHANISM

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3 Claims. (Cl. 292-255)

The invention relates to a door latch mechanism and more especially to a treadle-actuated door-opening mechanism.

It is an object of the invention to provide a door-opening mechanism of greater convenience.

Another object of the invention is to provide a treadle-operated door-opening and closing mechanism.

A further object of the invention is to provide a door-opening mechanism especially adapted for refrigerator cabinets.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a side elevation of a domestic refrigerator cabinet with parts broken away to show the door-opening mechanism of this invention;

Fig. 2 is a sectional view on the line II-II of Fig. 1, but showing the latch bolt and trigger in full;

Fig. 3 is a view of some of the latch elements of Fig. 2, showing these elements in the latch retracted position; and

Fig. 4 is an elevation of some of the latch elements shown in Fig. 3 as viewed from the plane IV-IV.

Referring now to the drawings for a detailed description of the invention, the reference numeral 10 represents a domestic refrigerator cabinet having a food-storage chamber 11 in the upper portion and a machine compartment 12 in the lower portion thereof. A door 13 is provided for the food-storage chamber 11. The food-storage chamber 11 and the door 13, respectively, are formed by spaced-apart sheets 14 or rigid material between which loose heat-insulating material 15 is packed. The door 13 is hinged adjacent a vertical edge of the food-storage chamber 11 and a spring (not shown) gently biases the door 13 to the closed position. The bias of the spring is slight so that the pressure of the door is not objectionable to a person engaged in inserting or removing articles into or from the food-storage chamber 11.

A trigger latch mechanism 19 is secured within the door 13 and a cooperating latch keeper 21 is secured to the front face or door strike 22 of the food-storage chamber 11. The trigger-latch mechanism 19 includes a housing comprising two metal plates 23 held in spaced relationship by a pin 39. Each of the plates 23 has an outwardly-turned lug 24 and each lug 24 is se-

cured by a screw 26 to the inner sheet 14 of the door.

A rod 27 runs vertically upward through the interior of the door and the upper portion of the rod is journaled in the metal plates 23 of the housing and spans the space between said plates. Two spaced-apart and approximately U-shaped plates 28 are tightly affixed at one end of their extremities to the portion of the rod 27 between the plates 23. The plates 28 are held in spaced relationship by two pins 29 and 31 and the pin 31 forms a bearing for a roller 32 located between the plates 28. The plates 28 and roller 32 form a latch bolt 33. Lugs 34 are formed on the plates 28 of the latch bolt 33 and a lug 36 is formed on the plates 23 which lugs 34 and 36, respectively, engage the ends of a compression spring 37 which biases the latch bolt 33 for counterclockwise rotation as viewed in Figs. 2 and 3.

A trigger 38 is mounted on pin 39 and is biased for clockwise rotation by a spring 41 coiled thereon. The trigger 38 consists of a frame-like metal stamping, which straddles the latch bolt 33, and extends between the latch bolt 33 and the casing 23. The two sides of the trigger frame 38 are notched to provide shoulders 42 which engage two lugs 43 cut from the plates 28 of the latch bolt 33. The lugs 43 and the shoulders 42 are so arranged that when the latch bolt 33 is moved in a clockwise direction as viewed in Figs. 2 and 3, the shoulders 42 will engage the lugs 43 on the latch bolt 33 and hold the latch bolt 33 against the bias of the compression spring 37.

The latch keeper 21 on the front edge of the food-storage chamber 11 projects therefrom, and an opening 46 is provided on the inner sheet 14 of the door 13 adjacent the latch mechanism 19, which opening 46 receives the latch keeper 21 when the door 13 is closed. The portion of the latch keeper 21 which enters the opening 46 in the door 13 comprises a surface 47 slightly inclined to the front surface of the food-storage chamber 11. The roller 32 engages the surface 47 of the keeper 21 when the door 13 is closed and is forced along the surface 47 by the compression spring 37 to bias the door 13 and its sealing gasket 48 into close engagement with the front surface of the vertical walls of the food-storage chamber 11. This action slightly compresses the gasket 48 to form a good sealing engagement between the edges of the door and the front surface of the walls of the food-storage chamber 11. The trigger 38 has a portion 49 located adjacent the roller 32. When the door

13 closes, this portion 49 engages the latch keeper 21, whereupon the trigger 38 is rotated in the counterclockwise direction, as viewed in Figs. 2 and 3, and releases the latch bolt 33 for engagement with the surface 47 of the latch keeper 21. The latch, as thus far described, is the same as the latch in the patent application, Serial No. 360,537, filed October 10, 1940, by Martin G. Sateren.

To open the door, the latch bolt 33 is moved to the keeper-releasing position by a rotation of the rod 27 in a clockwise direction, as viewed in Figs. 2 and 3. To effect such rotation, the rod 27 projects downwardly into a recess 51 formed in the base of the door and the projecting portion of the rod 27 is bent sidewardly to form a lever arm 52. A push plate 53 is secured to the extremities of the lever arm 52.

The rod 27 is rotated by means of a push rod 54 located in the machine compartment 12 of the refrigerator cabinet 10, which rod 54 is adapted for endwise movement in the general direction in which the portion of the door 13 adjacent the push plate 53 moves during the initial opening movement of the door 13. The push rod 54 extends through openings in the downwardly-extending legs 56 of a C-shaped metal strip which is secured at its center to the lower wall of the food-storage chamber 11. A spring 57 biases the push rod 54 to the retracted position.

A generally L-shaped lever 58 is journaled on a pin 61 in the machine compartment 12 and the lower leg of the lever 58 extends forwardly from the machine compartment and is provided with a treadle 62 adapted to be depressed by the foot of the person wishing to open the door 13. The upper extremity of the lever 58 engages a collar 63 on the push rod 54 to push the rod 54 forwardly.

It will be apparent from the above that the foot pressure on the treadle 62 pushes the rod 54 and the push plate 53 forwardly with respect to the door 13 of the food-storage chamber 11, and that this forward movement of the push plate rotates the rod 27 and moves the latch bolt 33 to the keeper-releasing position as shown in Fig. 3. Further downward movement of the treadle 62 produces further motion of the push rod 54 to move the door from its fully closed position. This action is shown by the dotted lines of Fig. 1. The push imparted to the door by the push rod 54 will, furthermore, swing the door 13 open a substantial distance against the action of the weak hinge spring so that the door may be caught with the elbow or body of the person wishing to gain access to the food-storage chamber 11 and moved to the fully open position. When said person releases the door 13 by merely moving away therefrom, the hinge spring returns the door 13 to substantially its closed position, in which position the trigger 38 strikes the latch keeper 21 and releases the latch bolt 33 for engagement with the keeper 21.

It will be apparent from the above description that this invention provides a door-opening mechanism for a refrigerator cabinet which is of great convenience and that the door of the cabinet may be opened by the device of this invention without the use of hands and will also be closed when the door is released without requiring the use of the hands of the person gaining access to the cabinet.

While I have shown my invention in but one form, it will be obvious to those skilled in the

art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a door and a jamb therefor, a latching and door-opening device for said door, said device comprising a latch bolt on said door, a keeper for said latch bolt, said keeper being secured to the door jamb, said latch being adapted for movement to a keeper-engaging position and a keeper-releasing position, means for biasing said latch bolt to the keeper-engaging position, a push plate on said door adapted for limited movement in the general direction in which the portion of the door adjacent to the push plate moves during the initial opening movement of the door, an operative connection between the latch bolt and the push plate to move said latch bolt to the keeper-releasing position when the push plate is moved in said direction, and means for pushing said push plate in said direction to move said latch bolt to the keeper-releasing position and thereafter push said door from its closed position adjacent the door jamb.

2. In a door and a door jamb therefor, the combination of a latching and door-opening device for said door, said device including a latch bolt on said door, a keeper for said latch bolt, said keeper being secured to the door jamb, said latch being adapted for movement to a keeper-engaging position and a keeper-releasing position, means for biasing said latch bolt to the keeper-engaging position, a trigger for retaining the latch bolt in the keeper-releasing position, means for actuating said trigger to release said latch bolt when the door is moved from an open position to a substantially closed position, a push plate on said door adapted for limited movement in the general direction in which the portion of the door adjacent to the push plate moves during the initial opening movement of the door, an operative connection between the latch bolt and the push plate to move said latch bolt to the keeper-releasing position when the push plate is moved in said direction, and means for pushing said push plate in said direction to move said latch bolt to the keeper-releasing position and thereafter push said door from its closed position adjacent the door jamb.

3. In a latch mechanism for a door, said door being hingedly secured at one of its edges to a door frame, the combination of a rod journaled on said door adjacent to an edge of the door remote from said hingedly secured edge thereof, a latch bolt secured to said rod to rotate therewith, a latch keeper secured to said door frame, said rod being adapted to rotate said latch bolt from a keeper-engaging position to a keeper-releasing position, means for biasing said latch from the keeper-releasing position to the keeper-engaging position, a lever arm on said rod, a push plate on said lever arm, said push plate being so positioned on said rod that a movement of said plate in the general direction in which said door opens rotates said latch from the keeper-engaging position to the keeper-releasing position, and means for pushing said push plate in the door-opening direction when the door is closed to move said latch from the keeper-engaging position to the keeper-releasing position.

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