

May 30, 1939.

C. HASS ET AL

2,160,330

DOOR MOUNTING AND LATCHING MEANS

Filed Jan. 30, 1936

2 Sheets-Sheet 1

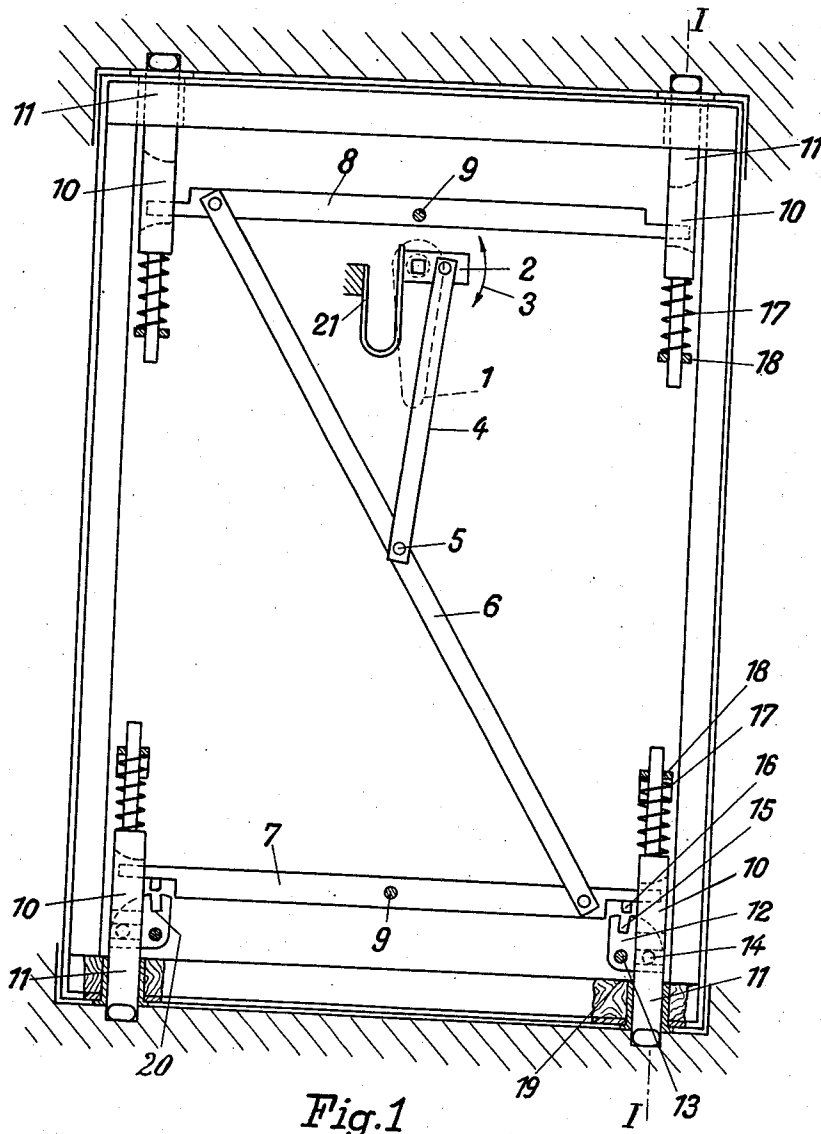


Fig. 1

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2 Sheets-Sheet 2

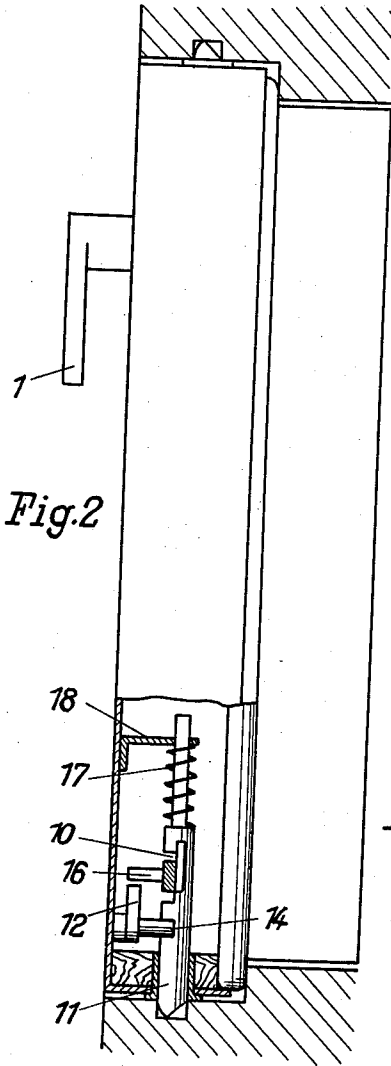


Fig. 2

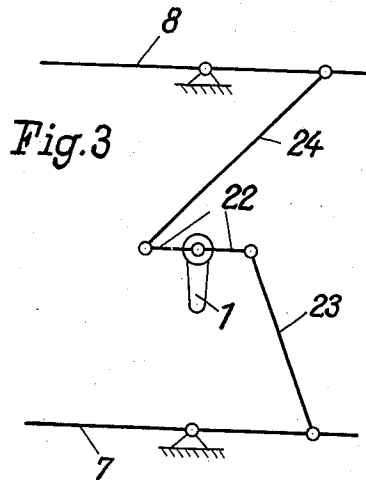


Fig. 3

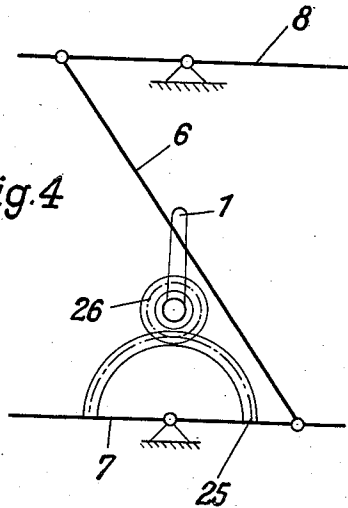


Fig. 4

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UNITED STATES PATENT OFFICE

2,160,330

DOOR MOUNTING AND LATCHING MEANS

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Application January 30, 1936, Serial No. 61,610
In Germany January 30, 1935

5 Claims. (Cl. 16-147)

The invention pertains to doors which permit opening at both sides and which are to be used especially in connection with refrigerators for the purpose of permitting the opening of the doors at one side or the other as desired according to the lighting and special characteristics of the environment.

The invention consists principally in the fact that the opening of the door at the one side and its hinging at the other are accomplished by means of the same constructional elements. This arrangement offers the advantage that the number of places at which wear might take place or at which free play is present may be reduced to a minimum, so that the door, arranged according to the invention, may with dependability be opened optionally at either the one side or the other, whereupon the side opposite to that at which it is opened is hinged.

According to the invention, in the case of the door which permits opening at both sides, the constructional elements for hinging and opening the door at the sides can, when the door is opened at the one side, hinge the door at the other side by means of the change in their position.

According to a further object of the invention, the said constructional elements consist of movable rods, the ends of which grip the door bolts serving as pivot bolts.

According to a further suggestion of the invention, the constructional elements for hinging and opening the door at the sides consist of rods which may be tipped, and the ends of which grip the door bolts.

According to another suggestion of the invention, the rods which may be tipped are connected in some appropriate manner. This connection may herewith be made at two opposite sides or at the two similarly directed ends of the rods.

According to a further suggestion of the invention, only a single door handle is used for opening the door at both sides; this door handle may grip the rod which connects the tip rods, or one of the tip rods itself.

Further advantageous types of design are indicated by the drawings in which the invention is represented with the aid of several examples.

Fig. 1 shows a sectional view of a door which permits opening at both sides according to the invention;

Fig. 2 shows a section along the line I—I of Fig. 1;

Figs. 3 and 4 show diagrammatically two further ways in which the invention may be applied.

According to Figs. 1 and 2, the door handle 1

is connected to an eccentric or crank 2 and may be operated in the directions indicated by the double arrow 3. A lever 4 is jointed to the lever 2, and is connected to a further lever 5 at 5. The lever 5 forms a diagonal connection between two rocking bars or tip bars 7 and 8 which may be turned or tipped about the fixed points 9. The ends of the bars 7 and 8 are led into corresponding openings 10 of the door bolts 11 the openings 10 being somewhat greater than the size of the ends of the bars 7 and 8 so as to provide a lost motion connection between the bars and the bolts.

Upon operating the door handle 1, for instance, in the upward direction of the arrow 3, the right end of the tip bar 7 and the left end of the tip bar 8 are raised through the lever 4 and the diagonal connection 5. The raising of the left end of the bar 8, however, results simultaneously in a sinking of its right end. Because of the opening 10 in the bolt 11 at the upper lefthand corner of the door as shown in Fig. 1 the left end of the bar 8 is free to move upwardly until the right end of the bar 8 has withdrawn the upper righthand bolt 11 from the door frame. The door bolts 11 at the right side of the door, therefore, are thus drawn out of the openings in the door frame towards the inside, and the door may be opened at the right side.

By moving the tip bars 7 and 8 in one or the other direction, therefore, an opening of the door at the one side and a hinging of the same at the other side is achieved.

When the door bolts 11 at the right side of the door are drawn into the door, the segment 12 at the right side of the door (which segment, due to the fact that it may be turned about the fixed point 13, and due to the fact that it engages in an opening of the lower portion of the door bolt 11 by means of a pin 14) is turned a corresponding amount about the fixed point 13. In this way, the slot 15 in the segment 12 (which slot in its position of rest occupies a position opposite a corresponding stop 16 of the tip bar 7) is displaced in such a way that an engagement of the stop 16 in the slot 15 is impossible. In this example of the invention only a single door handle is present; if, however, as is usually the case, two door handles are present, the second door handle cannot at this stage be used for opening the door at the other side, since the segment 12 prevents any movement of the tip bar 7.

If, on the other hand, after the opening of the door at the right side, the door handle 1 is released, the door bolts 11 are moved in an out-

ward direction under the influence of the springs 17 (which are constrained by the permanent stops 18), which movement extends beyond the position of the door bolts in the indicated locking position. The extent of this movement is limited by the distance of the segment 12 from the inner edge 19 of the door frame. By means of this movement of the door bolts 11 towards the outside, beyond the locking position, the segment 12 is turned towards the right around the turning point 13 out of the position indicated, so that the stop 16 is again prevented from engaging in the slot 15 of the segment 12 and a movement of the tip bar 7 as well as an opening of the door from the other side is rendered impossible.

If the door is opened at the left side to begin with, then a corresponding locking takes place through the movement of a segment 20 arranged in a similar manner.

A plate spring 21 lies advantageously in contact with the square of the door handle crank, which spring may be replaced purposely by another restraining medium and which renders the determination of the indicated initial position of the door handle easier. This is of particular advantage whenever the door handle is constructed so as to close according to the process which is so well known in the production of automobile door locks the lock being arranged inside the pivotal shaft of the handle 1, since in this case, the plate spring 21 effectively prevents the undesired carrying along of a corresponding coupling part.

In the application example of Fig. 3 the door handle 1 works upon a double lever 22 which is connected with the similarly directed right sides of the tip bars 7 and 8 by means of levers 23 and 24. The remaining construction may be carried out according to the manner indicated in Figs. 1 and 2. According to Fig. 4, a toothed segment 25 is arranged on the lower or upper tip bars 7 or 8, which toothed segment is connected with a toothed gear 26 of the door handle 1. The tip bars 7 and 8 are coupled through a diagonal connection 6 in the same way as in the Figs. 1 and 2, so that the movement and operation of the parts are in every essential respect similar.

The possibilities of the invention are by no means exhausted with the application examples given, for they may be carried out in various other construction forms. In this connection, it is entirely immaterial whether the operation of the door bolts and the transmission members takes place by means of one or two handles. The field of application of the invention is furthermore not confined to doors for refrigerators; the fundamental principles underlying the invention may be purposely carried out everywhere where it is desirable to have a simple and reliable hinging at one side or the other side of a door-like

construction which permits opening at both sides.

We claim:

1. Door mounting and latching means comprising two pairs of vertically aligned bolts, one pair on each of two opposite sides of a door, a manually movable element, and means actuated by movement of said element in one direction to maintain the first pair of bolts in hinging position and withdraw the second pair from hinging position, and actuated by movement of said element in the opposite direction to maintain the second pair in hinging position and withdraw the first pair from hinging position, said means comprising rocking bars engaging the corresponding bolts of both pairs, lever means pivotally connected to opposite ends of said bars so that upon rocking of one bar in one direction, the other bar moves simultaneously in the opposite direction, and means connecting said manually movable element and said lever means.

2. A device according to claim 1, said lever means including a single diagonally disposed lever member connecting one end of one bar with the opposite end of the other bar, said manually movable element comprising a single handle connected to said lever member to actuate the same.

3. A device according to claim 1, said lever means including a single lever member having pivotal connection with one end of one bar and the opposite end of the other bar, means including said bars for maintaining the hinging bolts in hinging relation, and a manually movable element comprising a single handle having operative connection with said lever member to actuate the same.

4. In door hinging and latching means including vertically disposed pairs of extensible bolts at opposite sides of a door, a pair of transversely disposed rocking bars having connection at each end with one of said bolts, a pivoted segment associated with and movable by one of said bolts and including means cooperating interlockingly with means on one end of a bar to lock said bolt in extended position.

5. In door hinging and latching means including vertically disposed pairs of extensible bolts at opposite sides of a door, a pair of transversely disposed rocking bars having connection at each end with one of said bolts, said rocking bars having common connecting means at opposite sides of their pivot points, a pivoted segment associated with and movable by one of said bolts and including means cooperating interlockingly with means on one end of a bar to lock said bolt in extended position.

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