March 30, 1943. D. KATZ 2,315,337

REFRIGERATOR DOOR FASTENER

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FIG. 1.

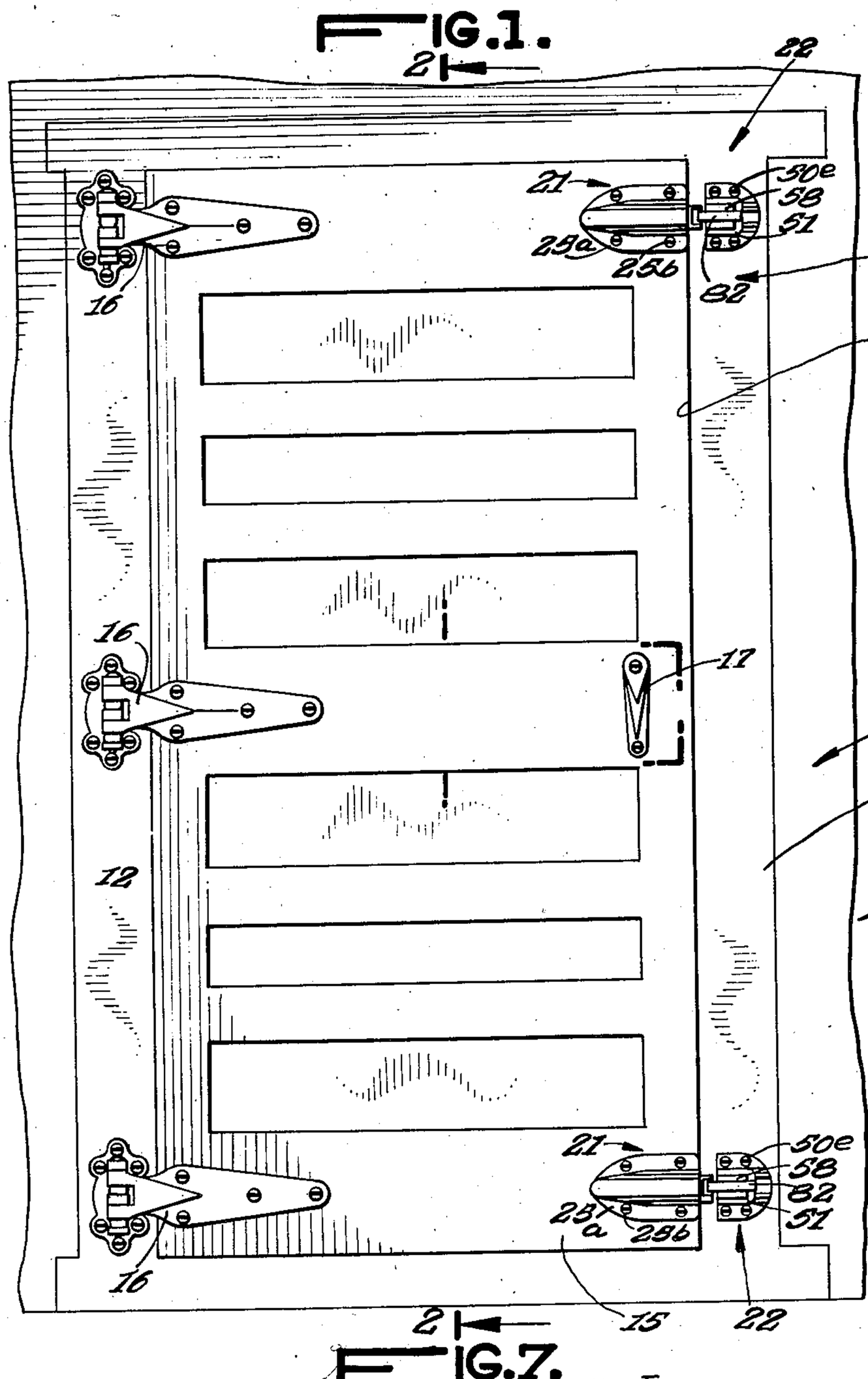

FIG. 2.

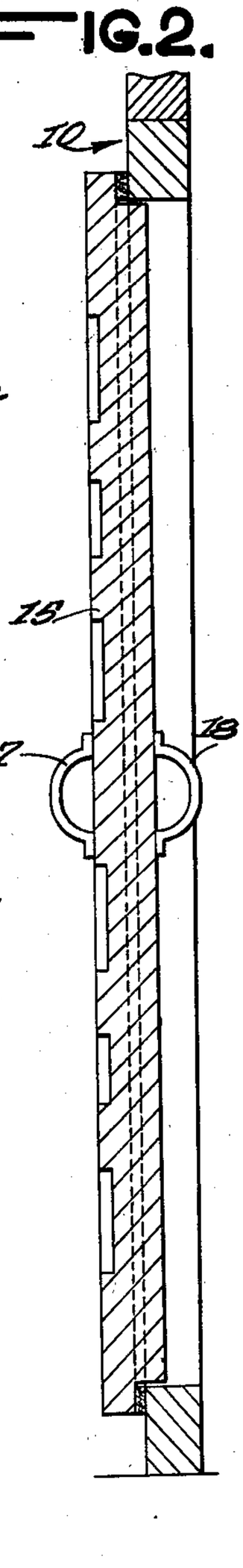

FIG. 7.

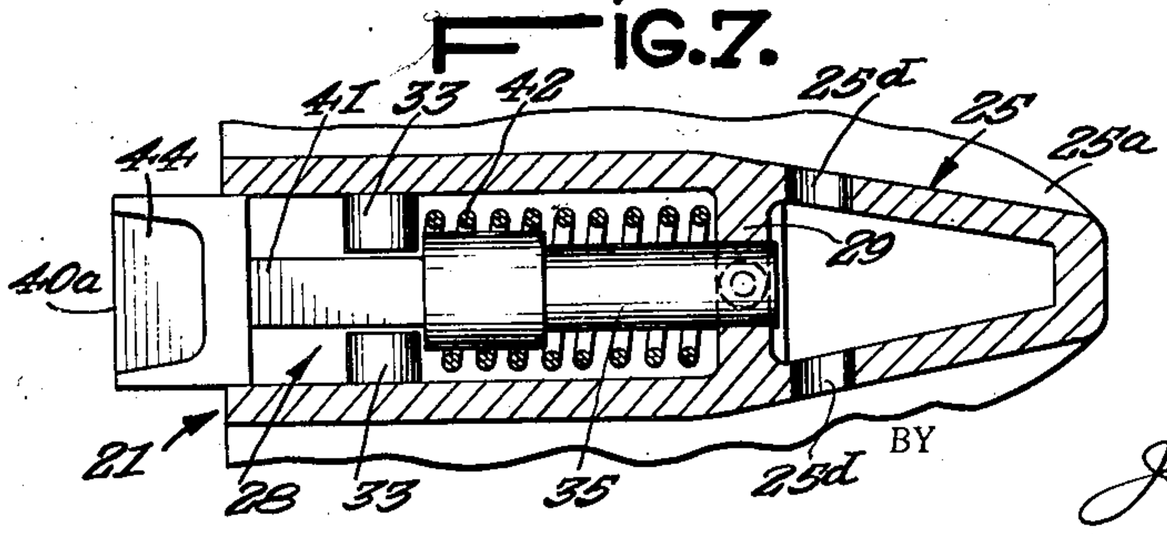

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FIG. 3.

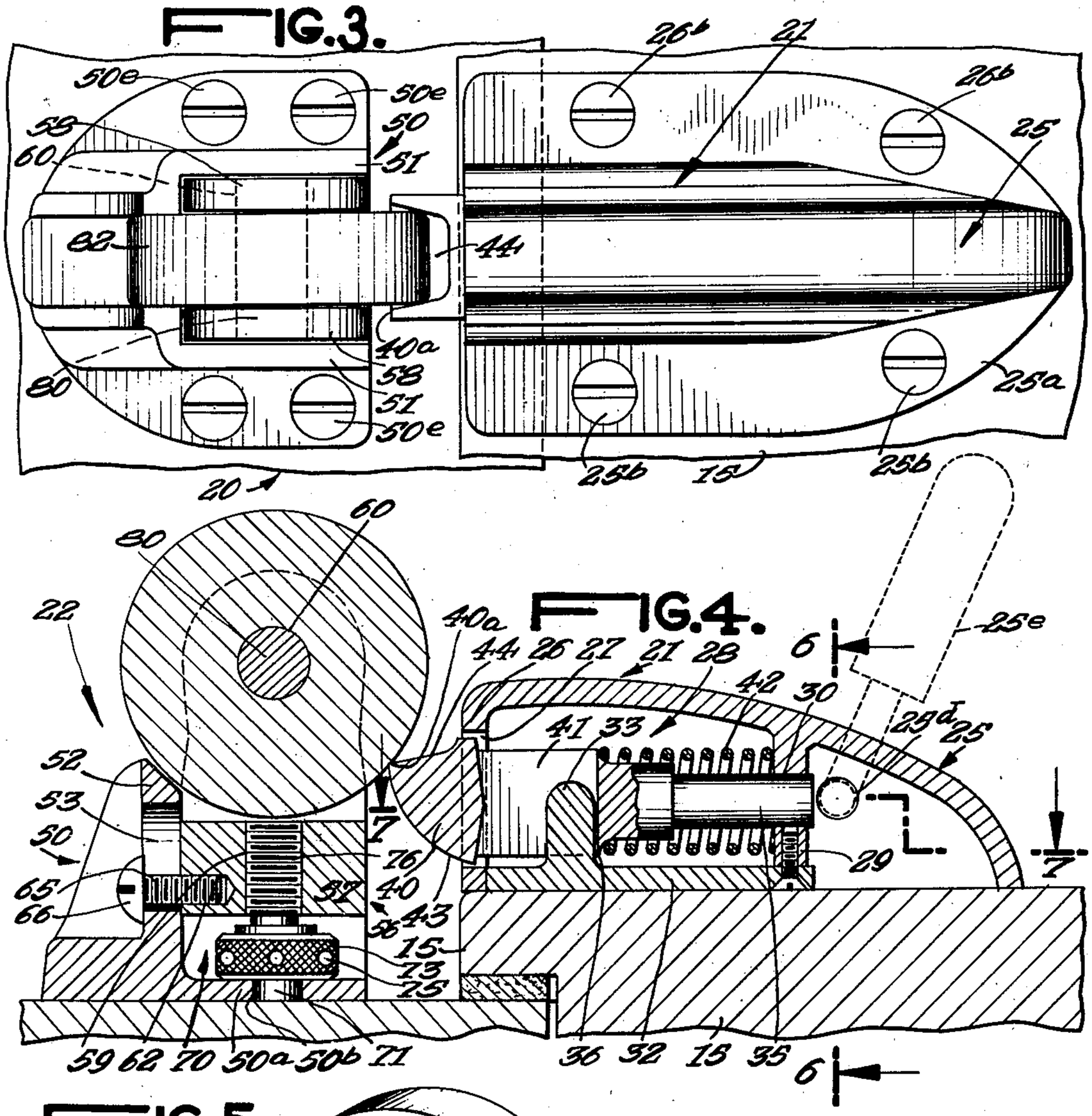


FIG. 4.

FIG. 5.

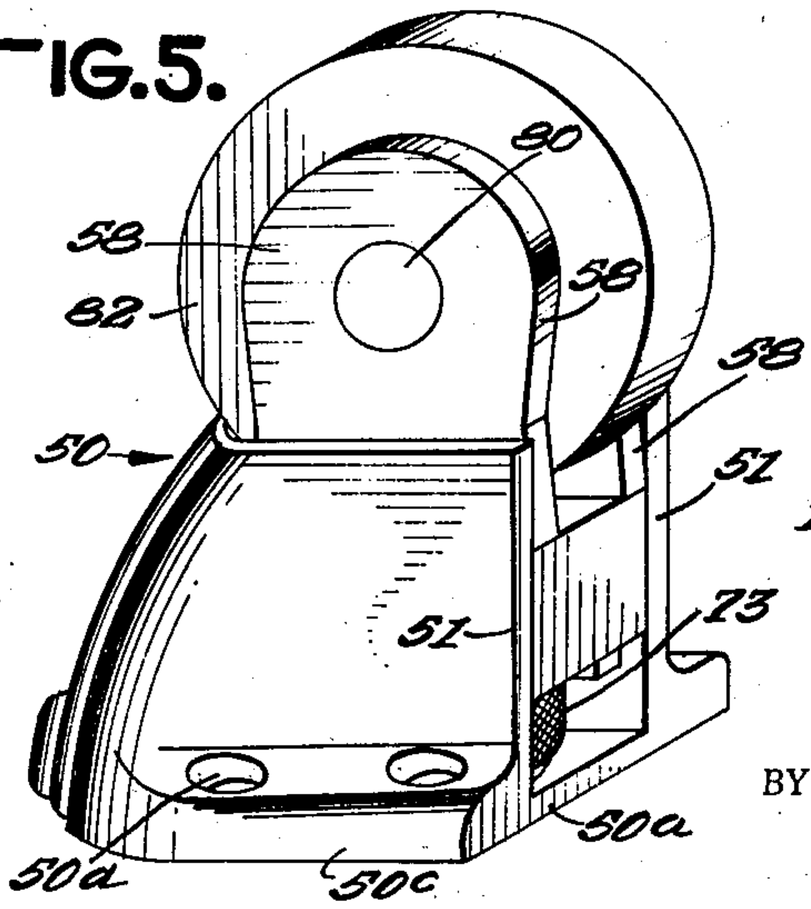
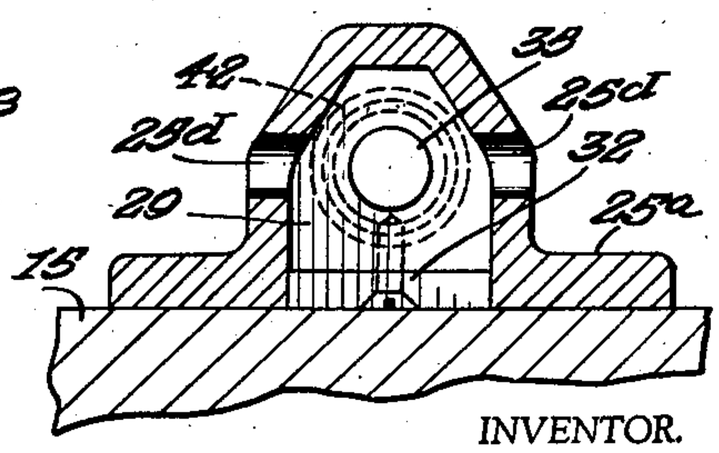


FIG. 6.



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REFRIGERATOR DOOR FASTENER

David Katz, Brooklyn, N. Y.

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2 Claims. (Cl. 292—74)

This invention relates to refrigerator doors, explosion venting doors, and the like closures, and latching means therefor.

Refrigerator and the like doors now in use, are usually provided with a spring latch having a handle which may be swung to retract the latch bolt, to permit the door to be opened. With such constructions, difficulty has been experienced because the application of a single latch to the door permits the door to sag, warp or bulge. Furthermore, with such construction, some means must be provided for opening the door from the inside. For this reason, doors of large meat refrigerators are provided with a releasing handle on the inside of the door, so that when a person enters the refrigerator and closes the door, he must operate the releasing handle from the inside to open the door. If the person carries a large article, such as a carcass in his arms, it is difficult to operate a releasing handle. It would be impractical to provide such a door with a plurality of spaced latches, each having a handle to retract the bolt, since in such case, all of the handles would have to be swung simultaneously to bolt releasing position in order to open the door.

It is therefore an object of this invention to provide a closure member of the character described, in which the difficulties described above will be obviated, the door embodying the invention being provided with a plurality of spaced latches so constructed that a tug on the door by a handle independent of the latches or a force behind the door will open the door. With such construction, any suitable number of latches may be provided, and the door made be provided with a handle of any suitable type independent of the latches, and placed on any suitable part of the door, to permit the door to be pulled open. The application of latches to spaced points on the door serve to prevent sagging, warping or bulging of the door, and produce a better closure or seal because of the plural points of application of the latches. Such a door, furthermore, can be opened from the inside without a handle. The door embodying the invention, may serve as an explosion venting door, or for any other suitable purpose.

When the invention is embodied in a refrigerator door, a person entering the refrigerator and closing the door, can open the door by pushing against it while holding an article in both hands, as it is not necessary to grasp any releasing handle.

A further object of this invention is to provide a highly improved latch for a door of the character described, which will be durable, efficient and reliable, and which will stand up under varying conditions, and which may be used either on refrigerator doors or explosion venting doors, or the like closures, and which can be used either with a smaller door or a large door or a heavy door or a light door.

Yet a further object of this invention is to provide a highly improved latch of the character described, of such construction that blows caused by slamming of the door and impact of the latch bolt on the keeper will be efficiently taken up, resisted or dissipated.

Still a further object of this invention is to provide a highly improved keeper structure for a latch of the character described, which may be rapidly set and adjusted to the latch bolt structure to accommodate variations in offset between the door and frame planes.

A yet further object of this invention is to provide a highly improved latch of the character described, which will give efficient and effective sealing and which yet permits the latch to close easily.

Still another object of this invention is to provide a strong, rugged and durable closure member, and latching means therefor, which shall be relatively inexpensive to manufacture, easy to install, which shall be smooth and positive in operation, yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown one of the various possible illustrative embodiments of this invention:

Fig. 1 is a front elevational view of a closure member, and latching means therefor, embodying the invention:

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a front elevational view of the latching structure;

Fig. 4 is an axial, cross-sectional view of the latching structure and showing a padlock in dotted lines to prevent opening of the door;

Fig. 5 is a perspective view of the keeper structure;

Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 4; and

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 4.

Referring now in detail to the drawings, 10 designates a closure and latching means therefor, embodying the invention. The same comprises a door jamb 11 having vertical parallel side portions 12 and 13, and a door 15 within said door jamb and hinged to the vertical portion 12 by hinges 16. The door 15 is provided with a handle 17 of any suitable type on the outside thereof, and may also optionally be provided with a handle 18 on the inside thereof.

For the purpose of illustration, the door 15 is shown to be provided with a pair of latching or locking structures 20, independent from the handle 17, it being understood that any suitable number of said latching structures may be provided. Each latching or locking structure 20 comprises a latch 21 fixed to the door adjacent the edge 15*a* thereof and adapted to cooperate with a keeper 22 fixed to the vertical portion 13 of the door jamb 11.

Each latch 21 comprises a casing 25 attached to the door 15, in any suitable manner, and provided with an end wall 26 adjacent the edge 15*a* of the door and formed with an opening 27 through which a latch bolt 28 within the casing, projects. The casing 25 may be formed with outwardly extending flanges 25*a* having screw threaded openings to receive screws 25*b* for attaching the casing to the door. The casing 25 is open on the side thereof facing the door and is formed with a transverse partition 29 parallel to the end wall 26, and formed with an opening 30 aligned with the opening 27.

Fixed to the partition 29 and contacting the front face of the door 15, is a plate 32 provided with a pair of projections 33 extending away from said plate. The bolt 28 has a stem 35, slidably passing through the opening 30. It is formed with a shoulder 36 mediately the ends thereof. At the forward end of the bolt 28, is a wedge shaped head 40 interconnected to the stem by a web portion 41 slidably received between the spaced projections 33. On the stem 35 and between the shoulder 36 and the partition 29, is a coil compression spring 42. The head 40 has a curved under surface 43 and an inclined front surface 44 and is formed with an edge 40*a* between said surfaces. It will be noted that there is no means on the casing 25 to retract the bolt.

Each keeper 22 comprises a member 50 fixed to portion 13 of the door jamb 11. Member 50 comprises a rear plate 50*a* contacting the door jamb, and a pair of forwardly projecting parallel walls 51 and a rear wall 52. Member 50 of the keeper has flanges 50*c* formed with openings 50*d* to receive screws 50*e* for attaching said member to the door jamb. The rear wall 52 is formed with a slot 53, perpendicular to plate 50*a*, for the purpose hereinafter appearing.

Slidably mounted between the walls 51 is a member 56 having a rectangular wall 57 parallel to the wall 50*a*, and a pair of parallel forwardly extending ears 58. Wall 57 is formed with a central screw threaded opening 59, and the ears 58 are formed with aligned openings 60. At the side of wall 57 which contacts the wall 52 of member 50, is a screw threaded opening 62. Loosely extending through the slot 53 is a screw 65 screwed within the screw threaded opening 62. Screw 65 has a head 66 at one end contacting the outer surface of wall 52. When screw 65 is loosened, member 56 may be moved along the axis of the screw threaded opening 59, in the manner hereinafter appearing.

Wall 50*a* of member 50 is formed with a bore 50*b* co-axial with the screw threaded opening 59. Rotatably mounted on member 50 is an adjusting screw 70 having a stem 71 disposed within the bore 50*b*. Above the stem 71 is a wheel 73 formed with a plurality of spaced openings 75 adapted to receive an instrument inserted therein to rotate the member 70. Extending above the wheel 73 is a screw threaded portion 76 screwed within the threaded opening 59.

It will now be understood that when the screw 65 is loosened, and member 70 is rotated, member 56 will be moved up or down depending upon the direction of rotation of the adjusting member. After member 56 has been adjusted to proper position, the screw 65 may again be tightened.

Within the openings 60 is a transverse pin 80 traversing the space between the ears 58. On the pin 58 is a roller 82 rotatable about the axis of said pin. The edge 40*a* of the head 40 of the bolt between the curved surface 43, and the inclined surface 43, contacts the roller 82 when the door is slammed shut, preferably at such a point that a plane passing through the edge 40*a* and the axis of the pin 80 makes an angle of between 40 and 50 degrees with a plane parallel to the door and passing through said edge 40*a*. Good results have been obtained when said angle is substantially 45 degrees.

It will now be understood that the door is closed by a plurality of spaced latches, and the door may be opened by pulling on the single handle 17 of any suitable type and placed wherever desired, independent of the location of the latches. Furthermore, the door may be opened by a force applied from the inside. The provision of plural points of application of latches produces a better closure or seal, and prevents sagging, warping or bulging of the door. The door may be opened from the inside without necessity for a releasing handle. The adjustment of the keeper or strike is a micrometer adjustment to accommodate varying conditions.

The door will open in the event of an explosion on the inside, and hence the invention may be embodied in explosion venting doors.

The handle 18 is applied to the inside of the door for convenience, since a push against the door from the inside will open the door.

Because of the contact of the bolt with the roller at a point on the roller which makes an angle of between 40 and 50 degrees with the axis of the roller relative to the plane of the door, the door will easily shut and yet will be effectively kept closed. It has been found that an angle of substantially 45 degrees is most preferable for this purpose, although the angle may be changed by adjusting the keeper. The fact that the roller can rotate about its axis facilitates closing of the door.

The wedge shaped head of the bolt co-acting with the roller gives efficient and effective sealing and yet permits the door to be easily closed.

The side walls of the casing 25 may be formed with openings 25*d* located back of the bolt to receive the hasp of a padlock 25*e*, to lock the latch against opening.

It will be noted that roller 82 serves as a cam to retract the bolt when the door is slammed shut or forced open.

It will be further noted that with the improved

construction the keepers may be on the door and the latches on the door jamb.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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

1. A latch adapted to be attached to a door, and comprising a housing member having an end wall adapted to be disposed adjacent the edge of the door, and a cavity open on the side of said member toward the door, and flanges adapted to contact the door provided with openings to receive fastening means for attaching said member to the door, said member being formed with a transverse partition within said cavity parallel to said end wall and spaced therefrom and formed with an opening aligned with the opening in said end wall, said partition having an end edge disposed within said cavity and spaced back from the surfaces of said member which are adapted to contact the door, and a flat plate fitted within said member to close the space between the partition and the end wall and contacting the edge of said partition, means to attach said plate to said partition, a bolt slidably mounted within said member and having a portion projecting through the opening in the end wall, and a shank slidably received within the opening in said partition, a spring interposed between said partition and an enlarged portion of the bolt, and disposed within the space between the partition and end wall, said bolt being formed with an opening, and said plate being formed with a projection extending into said opening.

2. A latch comprising a casing member having an open side and being formed with an end wall having an opening, and a transverse partition parallel to and spaced from said end wall and formed with an opening aligned with the opening in said end wall, a closure member adapted to close the chamber between said end wall and partition and attached to the edge of said partition and fitted within said casing member, a bolt within said chamber having a head projecting through the opening in said end wall, and a shank slidably received within the opening in said partition, a spring within said chamber interposed between said partition and head to project said bolt, said bolt being formed with an opening, and said closure member being formed with a projection extending into the opening in the bolt to limit projection thereof.

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