Feb. 2, 1954 N. SCHMITT 2,668,070

LOCK MECHANISM

Filed June 5, 1951

Fig. 1

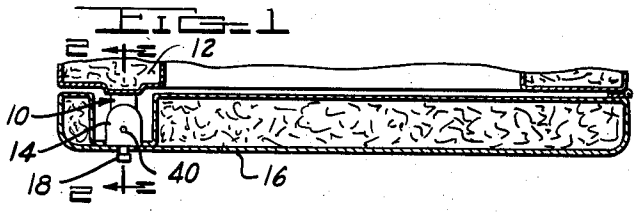


Fig. 2

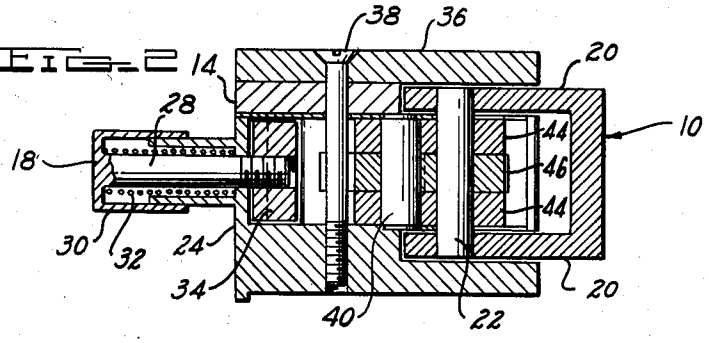


Fig. 3

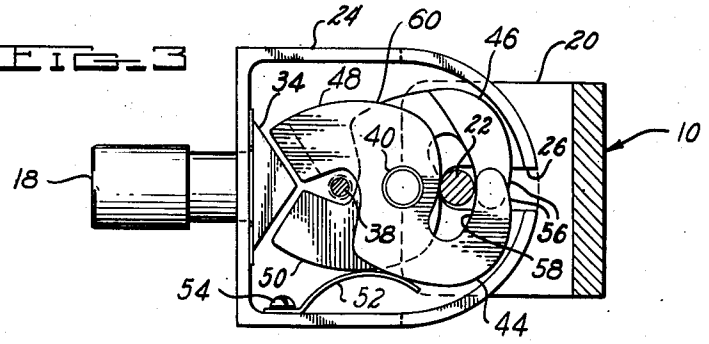
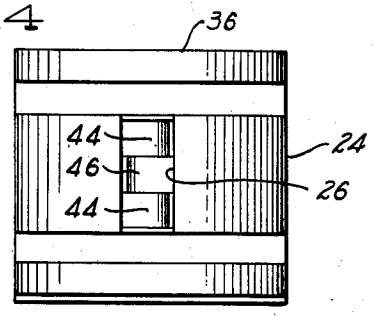


Fig. 4



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LOCK MECHANISM

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5 Claims. (Cl. 292—27)

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The present invention relates to a lock mechanism which is adapted for use with doors of refrigerators, airplanes, automobiles and the like.

It is among the objects of the present invention to provide a lock mechanism for a door which will be noiseless at all times when the door is either open or closed and which is constructed and arranged to compensate for wear of its working parts to prevent rattling, vibrating or the like thereof after it has been in use.

It is another object of the present invention to provide a lock mechanism of the foregoing character which can be opened by pushing against the push button and simultaneously pulling on the door, and which is constructed and arranged to remain closed in the event the door is not pulled simultaneously with the pushing action on the push button, thereby preventing accidental opening of the door if the push button is inadvertently depressed.

It is still another object of the present invention to provide a lock mechanism of the foregoing character in which the lock mechanism will compensate for any misalignment of the door with respect to the door frame, and which has relatively few parts which can be economically produced.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is a fragmentary sectional view of a refrigerator with a lock mechanism embodying the present invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 showing only the lock mechanism;

Fig. 3 is a top view of the lock mechanism with the top cover plate removed; and

Fig. 4 is an end elevational view of the portion of the lock mechanism installed in the door.

Before explaining the present invention in detail it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings, Fig. 1 illustrates one embodiment of the present invention installed in a refrigerator unit. One portion of the lock mechanism is shown at 10 and is rigidly secured to the main body of the refrigerator unit 12. The other portion 14 of the lock unit is rigidly secured to the door 16. A push button 18 is provided for releasing the locking mechanism, and when it is desired to open the door 16, the push button 18 is depressed and a handle (not shown) is simultaneously pulled so that the door 16 can be swung open. It will be obvious to those skilled in the art that this lock mechanism can also be used with doors on automobiles, airplanes, and the like.

The portion 10 of the lock is a bracket which has upper and lower plates 20 and a pin 22 rigidly secured to said plates 20 and extending therebetween. The other portion 14 of the lock has a housing 24 with a transverse slot 26 extending into one end thereof for receiving the pin 22. At the other end of the housing 24 is installed the conventional push button 18 having the push rod 28 rigidly secured to the cap 30 and the compression spring 32 disposed between the cap 30 and the end of the housing 24 for maintaining the cap in its normal position shown in Fig. 2. On the inner end of the push rod 28 is the triangular shaped wedge member 34 whose purpose will be described more fully hereinafter.

The housing 24 has an upper plate structure 36 which can be removed by unscrewing the screw 38 to gain access to the interior of the housing 24. Fig. 3 illustrates the lock mechanism with the upper plate structure 36 of the housing 24 removed. A transverse pin 40 is disposed between the upper plate structure 36 and the remainder of the housing 24 which serves as an axis for pivotal movement of the gripping elements of the present lock mechanism.

When the pin 22 is received within the slot 26, it will be firmly gripped by the dogs 44 and 46. The dog 44 is bifurcated as can be seen best in Fig. 2 and the other dog 46 extends between the bifurcated elements. Each of the dogs 44 and 46 is pivotally mounted on the transverse shaft 40 and each of the dogs 44 and 46 has a projection 48 and 50 respectively, which extend to positions adjacent the wedge member 34.

The ends of the extensions 48 and 50 are cut at an angle to be substantially parallel with the adjacent surfaces of the wedge member 34 so that when the latter is pushed into the housing 24 it will engage the end of the projections 48

and 50 causing the dogs 44 and 46 to be pivoted around the shaft 40, thereby causing opening of the dogs 44 and 46 and releasing of the pin 22. As can be understood, when this action occurs a door or the like containing the housing 24 can be pulled open.

A flat spring 52 is secured to the housing as at 54 and engages each of the dogs 44 and 46 to bias them into a closed position. When the dogs 44 and 46 are opened by pushing on the push button 18, they will be opened against the spring pressure of the spring 52 and when the push button 18 is released said spring 52 will again close the dogs 44 and 46. When the door containing the housing 24 is opened, it can be closed merely by being swung shut and the pin 22 will engage the curved surfaces 56 of the dogs 44 and 46 and will wedge the latter apart against the spring action of spring 52, and when the pin 22 is at the bottom of the recessed slot 26 the dogs 44 and 46 will close over the pin 22 to lock the door.

An important feature of the present invention is the shape of the dogs 44 and 46. The inner curvature 58 of each of the dogs is concentric with the axis of the shaft 40. By virtue of this arrangement, the dogs 44 and 46 can become worn on their inner curvatures 58 and the spring 52 will then bias the dogs 44 and 46 further into a closed position with unworn surfaces engaging pin 22 so that such dogs 44 and 46 will always maintain a firm grip on the pin 22 and prevent vibration between the various parts. For this same purpose, a small amount of clearance is provided between the ends 48 and 50 and the wedge member 44 so that the spring 52 can always bias the dogs 44 and 46 to a full closed position without interference from the wedge member 34.

Only one spring 52 is shown in use, but it should be understood that if desired another spring may be mounted on the opposite side of the housing to act in a similar fashion as 52 acts. However, it is desired to use only one spring so that whenever necessary a remote control locking mechanism may be used and such remote control locking mechanism may be inserted on the opposite side of the dogs 44 and 46 from the spring 52. It is believed readily clear to those skilled in the art that a pin may be inserted through the housing 24 which will abut with the adjacent surfaces of the dogs 44 and 46 as at 60 to prevent pivotal movement of said dogs. This feature is particularly desirable, for example, in airplanes and the like where it is desired that the pilot be able to control the opening and closing of the doors to the plane. As can be understood, this can be carried out merely by having a remote control lever by which the pilot can release the pin which is installed at 60.

From the foregoing description, it will be seen that the present invention provides a lock mechanism which is constructed and arranged to compensate for wear of the dogs 44 and 46 so as to prevent rattling of the same, said lock mechanism being further characterized in that it has a relatively few parts which can be easily manufactured so as to produce the present invention at a relatively low price.

Having thus described my invention, I claim:

1. A latch adapted to engage a pin comprising a frame structure having a slot formed in one end for receiving the pin, a transverse shaft mounted in said frame structure inward of said slot, a pair of oppositely disposed dogs pivotally mounted on said shaft for holding said pin, the holding surfaces of each of said dogs being substantially concentric with the axis of said shaft, a spring actuated push rod mounted in the other end of said frame structure and having its one end extending toward said transverse shaft, projections extending from said dogs to opposite sides of said one end of the push rod and adapted to be spread apart when the latter is pushed inwardly against the action of its spring to open said dogs, and spring means for biasing said dogs to a closed position.

2. A latch adapted to engage a pin comprising a frame structure having a slot formed in one end for receiving the pin, a transverse shaft mounted in said frame structure inward of said slot, a pair of oppositely disposed dogs pivotally mounted on said shaft for holding said pin, the holding surfaces of each of said dogs being substantially concentric with the axis of said shaft, a spring actuated push rod mounted on the other end of said frame structure and having its one end extending toward said transverse shaft for limited axial movement, projections extending from said dogs to opposite sides of said one end of the push rod and adapted to be spread apart when the latter is pushed inwardly against the action of its spring to open said dogs, the inner limit of movement of said push rod being such that said dogs will retain a limited hold on said pin, and a spring means for biasing said dogs to a closed position.

3. A latch adapted to engage a pin comprising a frame structure having a slot formed in one end for receiving the pin, a transverse shaft mounted in said frame structure inward of said slot, a pair of oppositely disposed dogs pivotally mounted on said shaft for holding said pin, the holding surfaces of each of said dogs being substantially concentric with the axis of said shaft, a spring actuated push rod mounted on the other end of said frame structure and having its one end extending toward said transverse shaft, projections extending from said dogs to opposite sides of said one end of the push rod and adapted to be spread apart when the latter is pushed inwardly against the action of its spring to open said dogs, and spring means for biasing said dogs to a closed position, said projections being spaced a limited distance from the end of said push rod so that they do not engage said push rod when the latter is spring biased to its outermost position.

4. A latch adapted to engage a pin comprising a frame structure having a slot formed in one end for receiving the pin, a transverse shaft mounted in said frame structure inward of said slot, a pair of oppositely disposed dogs pivotally mounted on said shaft for holding said pin, the holding surfaces of each of said dogs being substantially concentric with the axis of said shaft, the outer surfaces of each of said dogs being curved so that the pin can be pressed against such outer surfaces to open the dogs, a spring actuated push rod mounted on the other end of the frame structure and having its one end extending toward said transverse shaft, projections extending from said dogs to opposite sides of said one end of the push rod and adapted to be spread apart when the latter is pushed inwardly against the action of its spring to open said dogs, and spring means to bias said dogs to a closed position.

5. A latch adapted to engage a pin comprising a frame structure having a slot formed in one end for receiving the pin, a transverse shaft

mounted in said frame structure inward of said slot, a pair of oppositely disposed dogs pivotally mounted on said shaft for holding said pin, the holding surfaces of each of said dogs being substantially concentric with the axis of said shaft and shaped so that as the holding surfaces nearest the distal ends of the dogs are worn away or the radius of such last named holding surfaces are in any other way increased, the remaining holding surfaces will effectively engage said pin and draw the same further into said slot when the dogs are fully closed, a spring actuated push rod mounted on the other end of said frame structure and having its one end extending toward said transverse shaft, projections extending from said dogs to opposite sides of said one end of the push rod and adapted to

be spread apart when the latter is pushed inwardly against the action of its spring to open said dogs, and means to urge said dogs to a closed position.

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