July 23, 1957 R. E. LEWIS 2,800,381

REFRIGERATORS

Filed Oct. 11, 1954

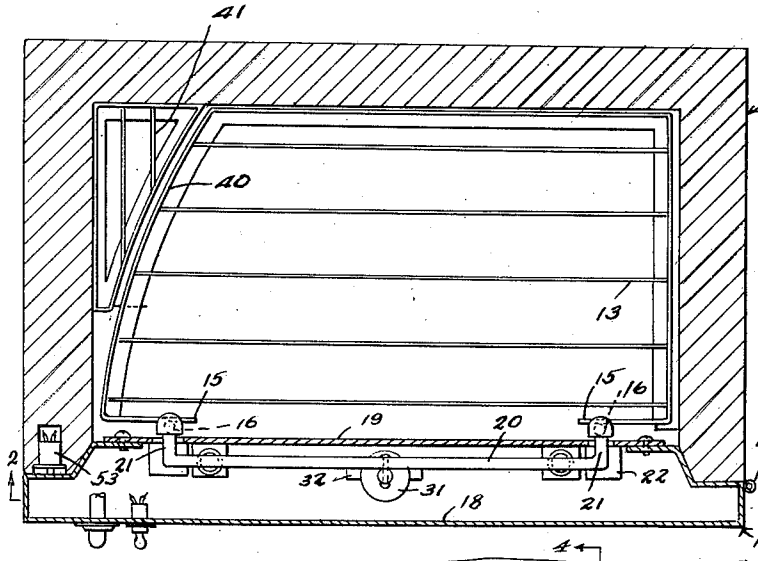


Fig. 3.

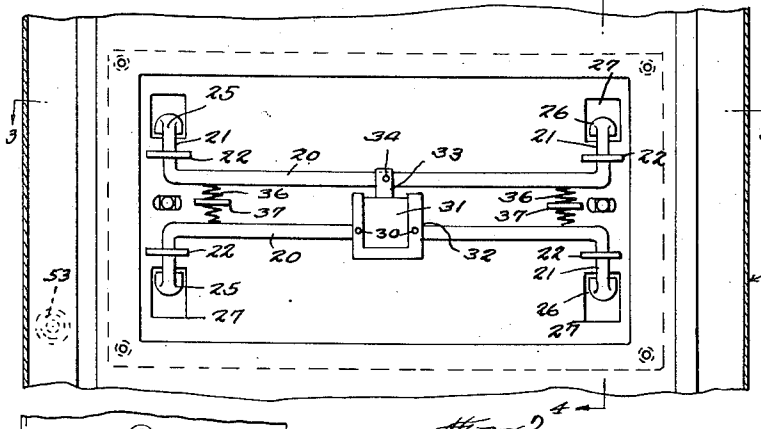


Fig. 2.

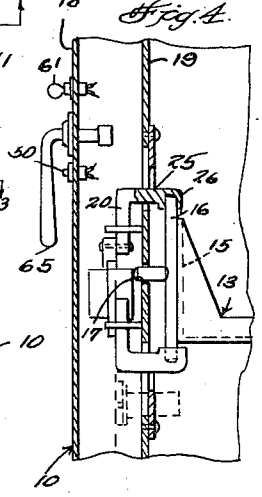


Fig. 4.

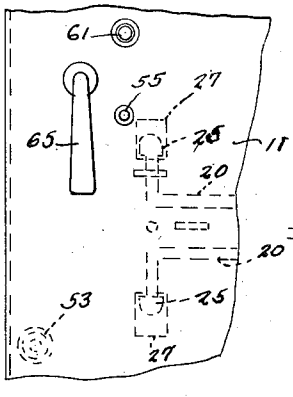


Fig. 1.

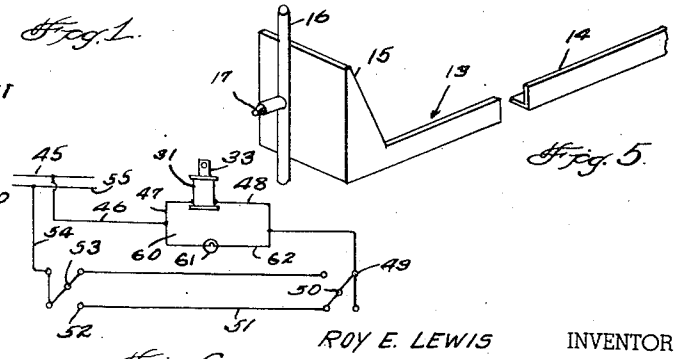


Fig. 5.

Fig. 6.

ROY E. LEWIS INVENTOR

BY Cabrow & Co.

ATTORNEYS.

United States Patent Office 2,800,381 Patented July 23, 1957

2,800,381

REFRIGERATORS

Roy E. Lewis, Atlanta, Ga.

Application October 11, 1954, Serial No. 461,495

2 Claims. (Cl. 312—274)

This invention relates to an improvement in refrigerators, and more particularly to those refrigerators of the domestic type commonly found in kitchens of households or the like.

A primary object of this invention is the provision of a means whereby a shelf within the refrigerator may be attached automatically to the door thereof in order that the same may be withdrawn from the refrigerator upon opening of the door.

An additional object of the invention is the provision of a device of this character which is adapted to be actuated externally of the refrigerator as by means of a push button on the door, which in turn actuates a solenoid to attach a selected shelf within the refrigerator to the door for ready withdrawal upon opening the door.

A still further object of the invention resides in the provision of a pilot light or the like in circuit with the above mentioned solenoid for the purpose of indicating whether or not a selected shelf is attached to the door or will remain stationary within the refrigerator upon opening of the door.

A further object of the invention is the provision of a device of this character having means in association therewith insuring the continued attachment of the shelf to the door, when the same is initially associated therewith, regardless of the continuation of electric current to energize the solenoid.

A further object of the invention is the provision of a second switch adapted, upon closing of the refrigerator door, automatically to de-energize the solenoid, in order that the shelf will normally remain within the refrigerator until the solenoid is re-energized.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawing, wherein there is shown the preferred embodiment of this inventive concept.

In the drawings:

Figure 1 is a fragmentary front elevational view of a portion of a refrigerator door associated with a refrigerator embodying features of the instant inventive concept, certain concealed elements thereof being indicated in dotted lines.

Figure 2 is a vertical sectional view taken substantially along the line 2—2 of Figure 3, as viewed in the direction indicated by the arrows, and interiorly of the outer surface of the refrigerator door.

Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 2 as viewed in the direction indicated by the arrows.

Figure 4 is a fragmentary sectional view taken substantially along the line 4—4 of Figure 2.

Figure 5 is a perspective view, partially broken away, showing certain constructional details, and;

Figure 6 is a schematic wiring diagram of the device of the instant invention.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawing in detail, there is generally indicated at 10 a refrigerator of any desired conventional construction provided with an outer door 11 hinged as at 12 to the open front of the refrigerator. The refrigerator is provided with shelf 13, of normal conventional configuration, but including channeled side walls 14 and a pair of inwardly directed upturned flanges 15. Each flange is provided, as best shown in Figure 5, with a vertically extending bar or rod 16, which projects a relatively slight distance above and below the marginal edge of the vertical flange 15. A transversely extending stud or nut 17 is secured to a midpoint of each of rods or bars 16 for a purpose to be more fully described hereinafter.

Refrigerator door 11 is comprised of an outer wall 18 and an inner wall 19, and fixed to the inner wall 19 on the side thereof between it and the outer wall 18 are a pair of spaced apart transversely extending bars or rods 20, each of which terminates in a pair of right angularly disposed end portions 21, which extend through brackets 22 or bushings, secured to the inner wall 19 of the refrigerator.

Each of extending portions 21 terminates in an inwardly extending portion 25, which is provided with a grooved extremity 26 adapted to extend through apertures 27 in the inner wall 19 of door 11, and which may be clampingly engaged over the extremities of each of rods or bars 16.

Fixedly secured as by means of bolts 30 to one of bars 20 is a solenoid coil 31, including a frame 32, and an armature (not shown) including a projecting arm 33, the latter being secured by means of a bolt 34 to the other of arms or bars 20. It will now be readily apparent that upon energization of the solenoid coil 31, the bars 20 will be drawn towards each other, the energization to be described more fully hereinafter, and clamped, by means of the clamping heads 26, over the ends of the bars 16 to engage the shelf 13 with the door 11.

Upon de-energization of the solenoid, springs 36 carried by brackets 37 in the refrigerator door serve to bias the bars 20 to disengaging position, and release the shelf from its relationship with the door.

As best shown in Figure 3, the shelf 13 includes an arcuate surface 40, to enable the same to readily rotate with the door, and the segment of the refrigerator space not covered by the shelf 13 contains a stationary shelf 41, in order that all the available space within the refrigerator may be employed.

Having reference now to the energization of the solenoid, current is applied, as best shown in Figure 6, from hot line 45 through a lead 46 and a branch 47 to solenoid coil 31. The current returns through a lead 48 and a switch pole 49 through a switch 50. From the switch 50, when in closed position, a lead 51 extends to a terminal 52, which is adapted to be closed by a switch 53, from which in turn a line 54 leads to a cold line 55.

Thus when both switches 50 and 53 are closed a circuit is established through the solenoid coil 31 to energize the same and clamp the shelf to the refrigerator. The actuating button for switch 49 is disclosed at 55, and extends exteriorly of the refrigerator. Obviously, pressure upon the switch button 55 will serve to close the circuit to energize the solenoid 31. Simultaneously with such deenergization, current flows through wire 60 to a pilot light 61, and returns to the line through a lead 62. When the pilot light 61 is illuminated it will thus be apparent that the shelf 13 is attached to the door.

The switch 53, as best shown in Figure 1, is preferably embedded in the edge of the refrigerator 10 adjacent the outermost point of door 11, and is adapted, upon

closure of the door **11**, to be actuated to de-energize the solenoid, whereupon the shelf **13** will become disengaged from the door and, until re-energization of the solenoid by means of button **55**, will remain in the refrigerator.

An operating handle **65** for opening the door in the conventional manner is obviously provided.

From the foregoing it will now be seen that there is herein provided an improved refrigerator, which accomplishes all of the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. In combination, a refrigerator including a hinged door, a shelf in said refrigerator, supporting means for said shelf, a pair of vertical bolts fixed to the front of said shelf, confronting pairs of keepers for said bolts, means movably mounting said keepers on said door, spring means normally urging said keepers to released position, electro-magnetic means connected with said mounting means for moving said keepers to bolt engaging position, an electric circuit connected to said electro-magnetic means, and a switch interposed in said circuit.

2. In combination, a refrigerator including a hinged door, a shelf in said refrigerator, supporting means for said shelf, a pair of vertical bolts fixed to the front of said shelf, confronting pairs of keepers for said bolts, means movably mounting said keepers on said door, spring means normally urging said keepers to released position, electro-magnetic means connected with said mounting means for moving said keepers to bolt engaging position, an electric circuit connected to said electro-magnetic means, a switch interposed in said circuit, and a pilot light interposed in said circuit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,938,470	Teller et al.	Dec. 5, 1933
2,514,032	Dean et al.	July 4, 1950