

April 1, 1958

R. E. LEWIS

2,829,022

REFRIGERATOR WITH SLIDING SHELVES

Filed May 6, 1955

2 Sheets-Sheet 1

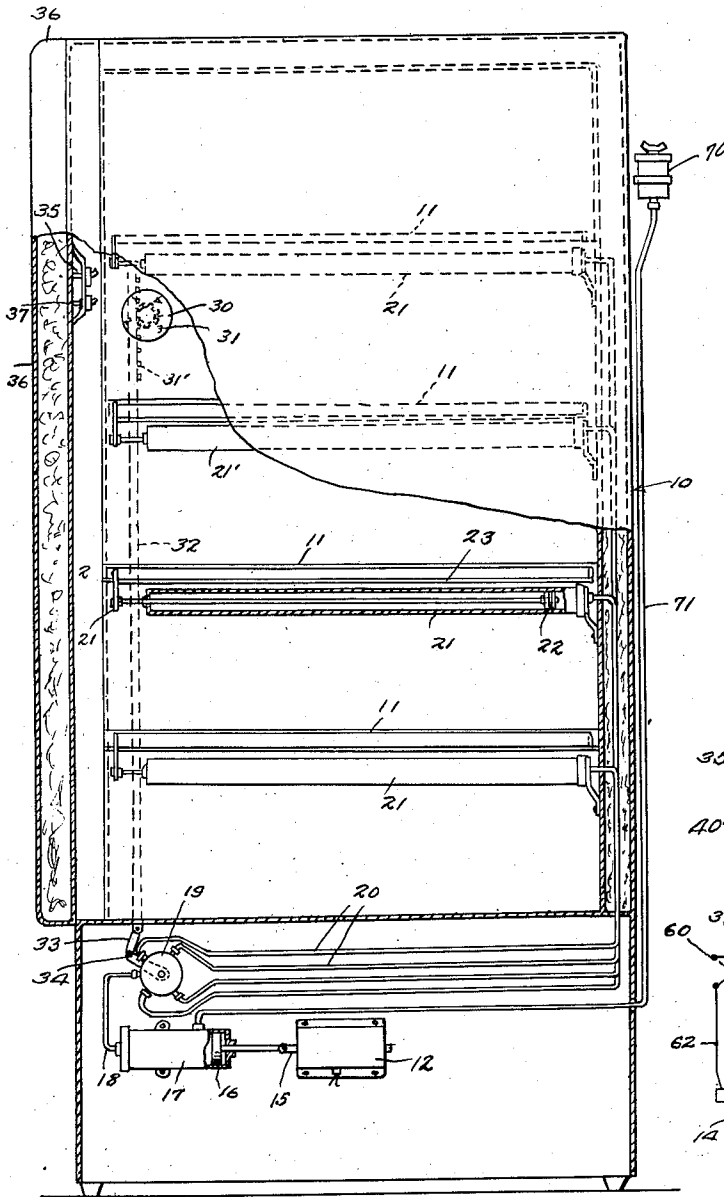


Fig. 1.

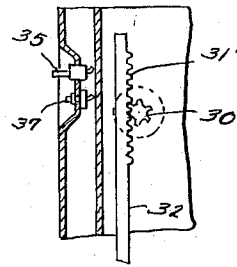


Fig. 4.

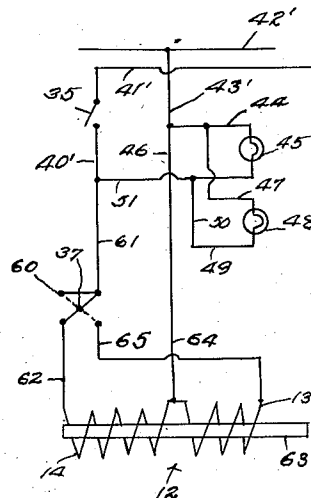


Fig. 6.

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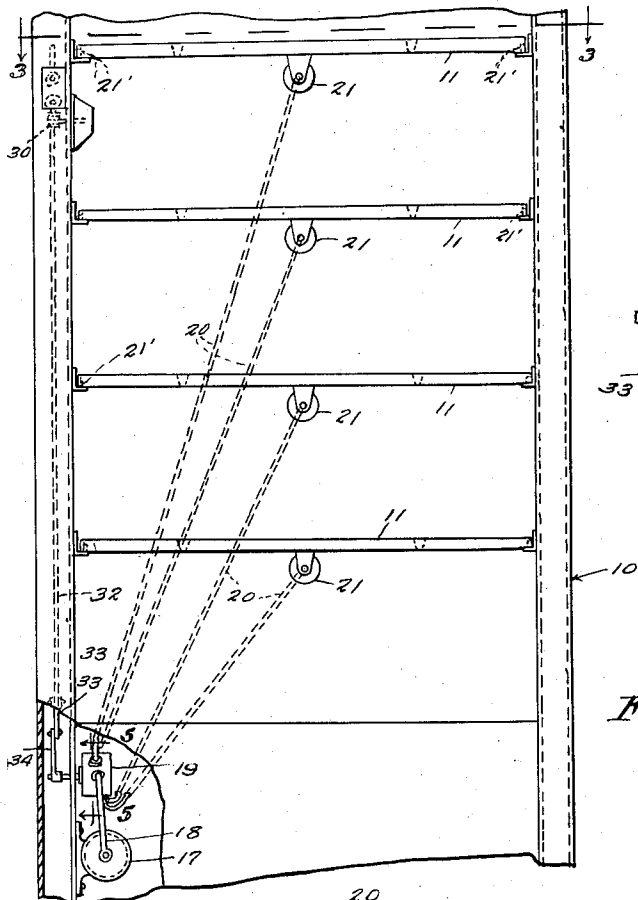


Fig. 2.

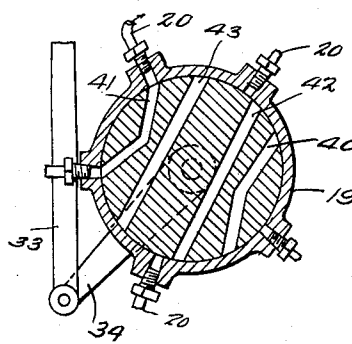


Fig. 5.

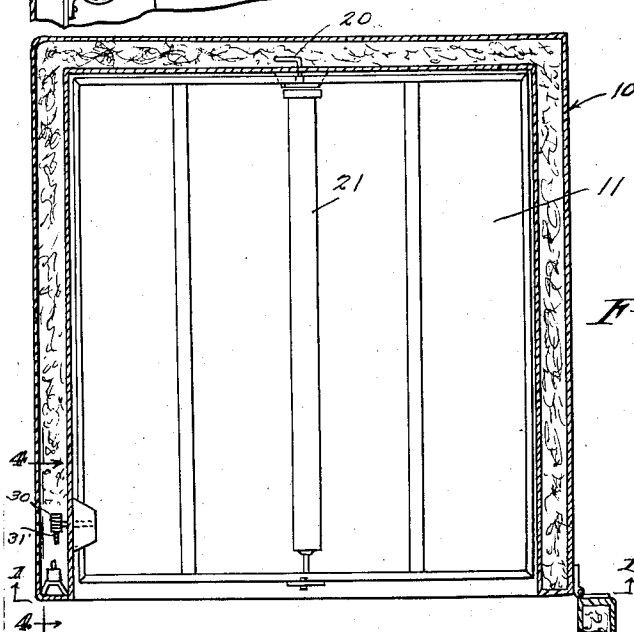


Fig. 3

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REFRIGERATOR WITH SLIDING SHELVES

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Application May 6, 1955, Serial No. 506,450

1 Claim. (Cl. 312-223)

This invention relates to a refrigerator, and more particularly to a refrigerator with automatically sliding shelves, the motion of which shelves may be selected by the activation of a master switch, whereby a selected shelf will slide outwardly from the icebox or refrigerator to a predetermined degree.

A further object of the invention is the provision of such a refrigerator wherein any one of a selected number of shelves may be slid forwardly out of the refrigerator to render ready access to the foods stored thereon.

Still another object of the invention is the provision of means whereby the shelves may be retracted into the refrigerator by actuation of the switch when their purpose is served.

Still another object of the invention is the provision of a refrigerator wherein the extension of the shelves may be accomplished substantially automatically.

A still further object of the invention is the provision of a mechanism of this character wherein the retraction of the shelves may be accomplished substantially automatically.

Other objects will in part be obvious, and in part be pointed out, as the description of the invention proceeds, and disclosed in the accompanying drawings, wherein there is shown a preferred embodiment of this inventive concept.

In the drawings:

Figure 1 is a side view, partially in section and partially in elevation, and taken substantially along the line 1-1 of Figure 3, disclosing a preferred embodiment of this inventive concept.

Figure 2 is a front view, partially in elevation and partially in section, disclosing one embodiment of this inventive concept.

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 sectional view taken substantially along the line 4-4 of Figure 3.

Figure 5 is a sectional view taken substantially along the line 5-5 of Figure 2.

Figure 6 is a schematic wiring diagram.

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

Having reference now to the drawings in detail, there is generally indicated at 10 a refrigerator cabinet of generally conventional construction provided with a plurality of shelves 11, which shelves are preferably made of a single piece or stamping of stainless steel or the like. Positioned in the base of the refrigerator is a push and pull solenoid 12, consisting of a pair of oppositely disposed windings 13 and 14 (see Figure 6), the solenoid having a piston 15, connected with a hydraulic piston 16 in a cylinder 17. The cylinder 17 has a tubular member 18 which leads to a master selector valve 19, to be more fully described hereinafter, from which extend a plurality of tubular members 20, the number being dependent

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upon the number of shelves in the refrigerator, and each tubular member 20 leading to a selected shelf. Each shelf 11 is mounted upon a plurality of rollers 21 which are journaled in the sides of the box for rotative movement for moving the shelf forwardly or rearwardly. Upon the actuation of the control valve, in a manner to be more fully described hereinafter, any one of a selected shelf 11 may be moved forwardly, by the introduction of hydraulic fluid from the cylinder 17 through the pipe 20 to its associated cylinder 21, which energization occasions the moving of a piston 22 longitudinally of the cylinder 21, which in turn operates to move the shelf 11 outwardly of the refrigerator.

Obviously, reverse movement of the solenoid by means of switch 37 to withdraw the fluid from hydraulic cylinder 17 will occasion retrograde movement of the shelf into the interior of the refrigerator. The selection of the shelf is accomplished by means of an illuminated dial 30, having indicia 31 thereon, which dial is provided with gear teeth on its rear extremity, which engage the teeth 31' of a rod 32 which extends downwardly to a link member 33 pivotally connected to arm 34 that controls the four-way selection valve 19. As best shown in Figure 5, the valve 19 includes a plurality of passageways 40, 41, 42 and 43, each of which leads selectively to one of the shelves indicated by the indicia on dial 30. Obviously, by turning the knob 30 to a selected point of indicia, a selected shelf 11 may be ejected from the refrigerator.

A switch 35 actuated by engagement with the door 36 of the refrigerator, serves through a circuit to be hereinafter described, to illuminate dial 30 the interior of the refrigerator and energize the solenoid. A second switch 37 may serve to energize through a circuit also to be more fully described hereinafter the actuating mechanism for a selected shelf, provided the dial 30 has been preset to such determination, alternately extending or retracting said shelf.

Referring now to the wiring diagram as disclosed in Figure 6, the switch 35 is indicated as being positioned between wires 40' and 41' the cold line 42' being connected as by a connection 43' and 44 to the refrigerator illuminating bulb 45. A further sector of the wire 46 extends through wire 47 to a lamp 48, which is adapted to illuminate the dial 30. A wire 49 leads from bulb 48 back through wires 50 and 51 to the wire 40' and through the switch 35. A second switch 37 is adapted to be closed from wire 61 to wire 62 through the solenoid coil 14, and thence through wire 64, in order to actuate the solenoid core 63 which will, in the manner previously described, extend one of the shelves from the refrigerator when switch 37 is positioned at terminal 60 which leads to wire 65 to solenoid coil 13, thereby reversing solenoid core 63 and retracting the shelf.

From the foregoing, it will be seen that upon suitable positioning of the selector switch 30 and actuation of the rod 32, the multiple selector valve 19 will be energized to actuate a particular shelf to extended position. Conversely, upon the reversal of the switch 37, the shelf will be retracted into the refrigerator, and the door may be closed.

A receptacle 70 is provided on the outside or the exterior of the refrigerator for the containing of fluid, and communicates through a tube 71 with the valve 19, in order that a sufficient supply of hydraulic fluid may be maintained at all times.

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

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

I claim:

In a refrigerator including a base and side walls, said side walls having internally positioned spaced apart pairs of horizontal guides thereon, a plurality of shelves slidable in said guides, a fluid operator, comprising a hydraulically actuated piston and piston rod, and a cylinder for said piston positioned beneath each shelf, means securing the outer end of each of said piston rods to the forward edge of its associated shelf, a master operator located in said base, hydraulic fluid conducting tubes connecting said master operator to each fluid operator, a selective

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valve interposed in said tubes between said master operator and said fluid operators, a solenoid connected to said master operator, said solenoid including a pair of winding coils, a core slidable in said coils, said core being connected to said master operator, and a reversing switch connected to said coils, selectively to energize said coils whereby said core may be moved in one direction to effect extension of a selected shelf and may be moved in the opposite direction to retract a selected shelf.

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