

Dec. 6, 1949

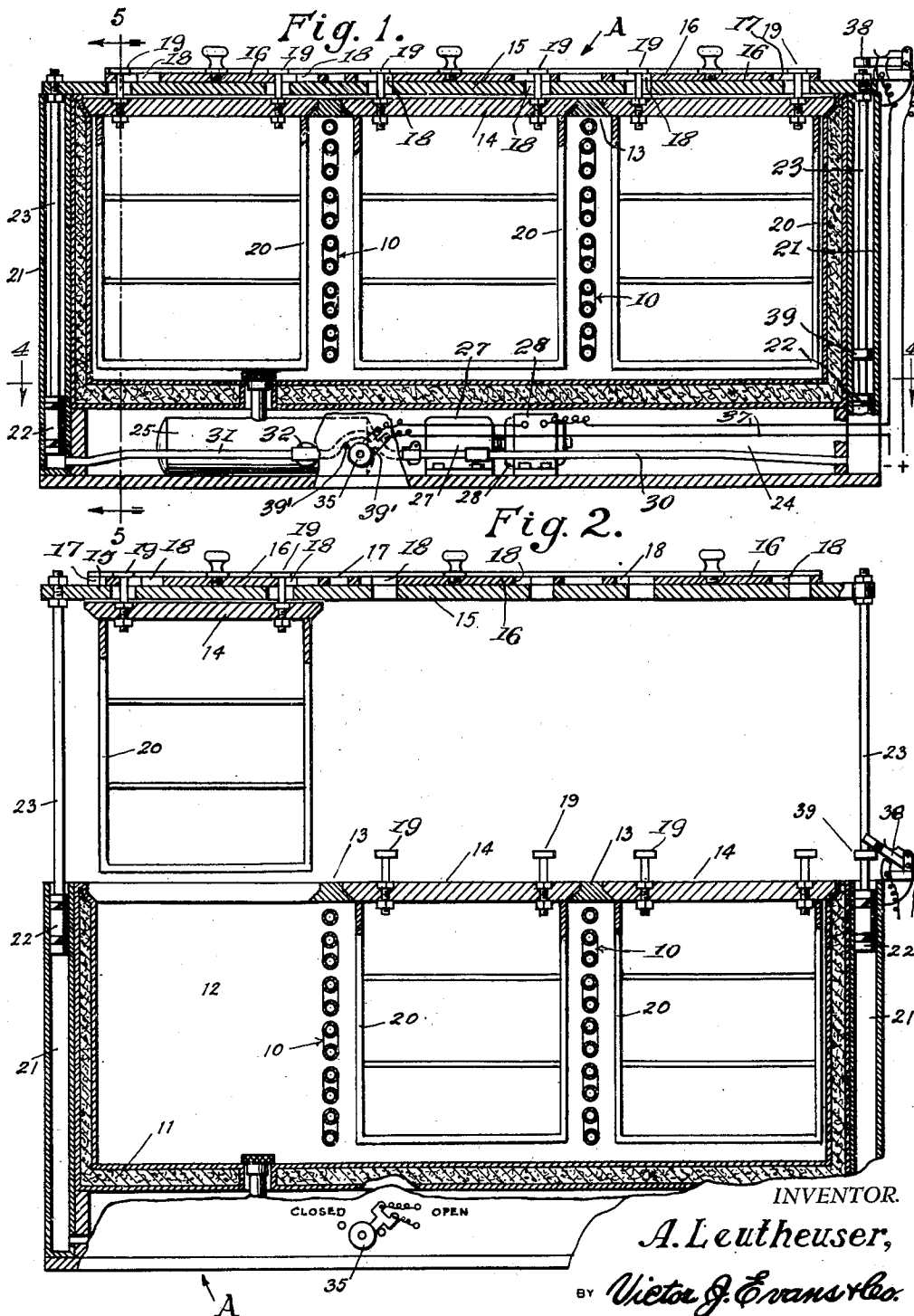
A. LEUTHEUSER

2,490,694

APPARATUS FOR RAISING AND LOWERING SHELVING
OUT OF AND INTO STORAGE CABINETS

Filed July 6, 1945

2 Sheets-Sheet 1



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Fig. 3.

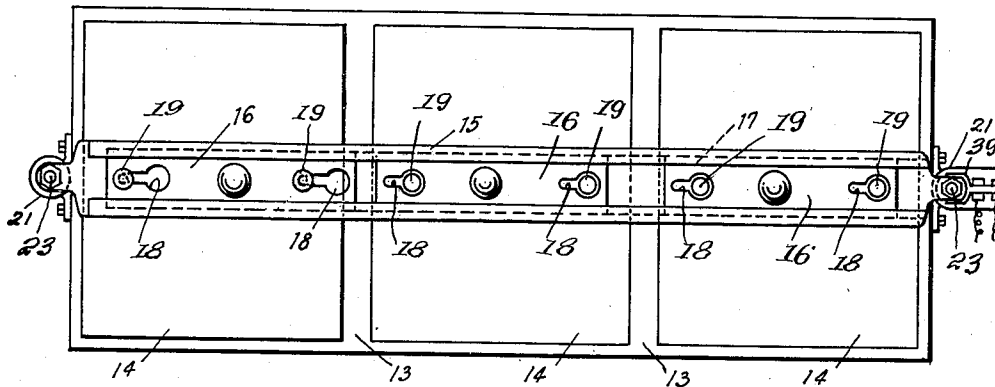


Fig. 4.

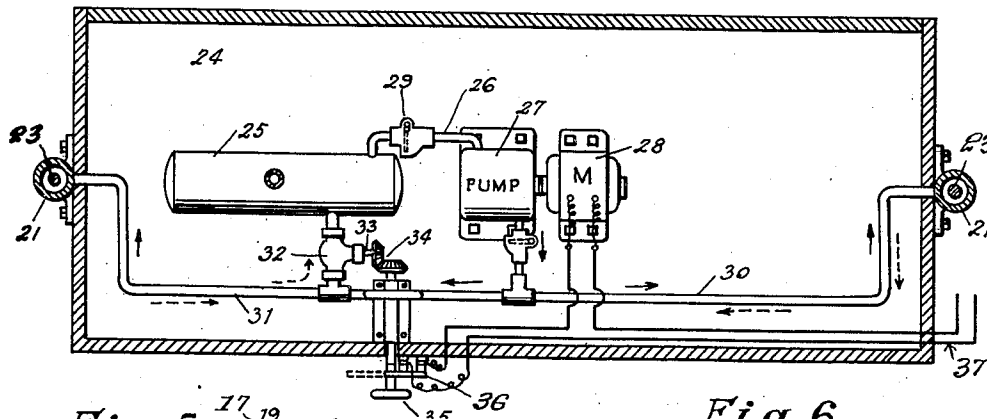


Fig. 5.

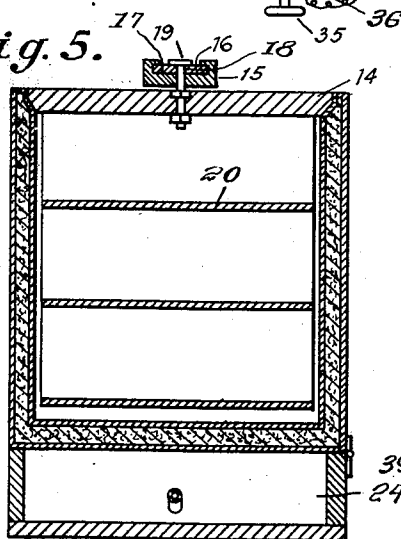
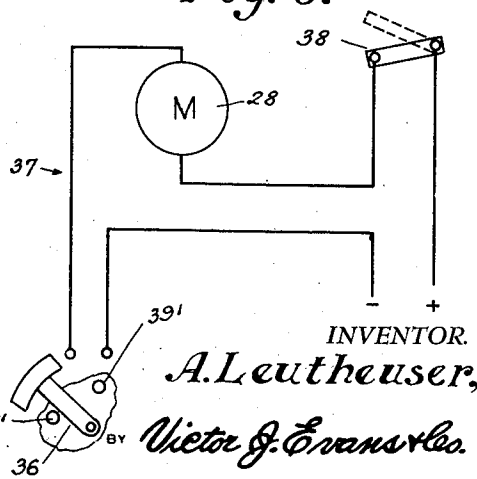


Fig. 6.



INVENTOR.
A. Leutheuser,
BY Victor J. Evans & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE

2,490,694

APPARATUS FOR RAISING AND LOWERING
SHELVING OUT OF AND INTO STORAGE
CABINETS

Andrew Leutheuser, Somerset, Mich.

Application July 6, 1945; Serial No. 603,427

6 Claims. (Cl. 312-192)

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The invention relates to a deep freeze cabinet, and more especially to an apparatus for automatically raising and lowering food carriers within a deep freeze storage unit.

The primary object of the invention is the provision of an apparatus of this character, wherein food stuff can be conveniently stored within a deep freeze cabinet or the like, and when it is desired to remove a determined quantity of the stuff lowermost within the said cabinet, it can be automatically raised to accessible position outside of the latter.

Another object of the invention is the provision of an apparatus of this character, wherein its working parts are built within the cabinet, and such apparatus is under the control of the user of the cabinet, so that materials can be conveniently stored therein and removed therefrom at will, the apparatus being of novel construction and is unique in the arrangement thereof in association with the cabinet.

A further object of the invention is the provision of an apparatus of this character, wherein the shelves for the stored stuff can be selectively raised for access thereto so that a determined amount of the stuff can be removed with ease and dispatch or for original placement within the cabinet.

A further object of the invention is the provision of an apparatus of this character, wherein the carriers are raised and lowered automatically through hydraulic means electrically controlled and hand regulated for the said raising and lowering operations.

A still further object of the invention is the provision of an apparatus of this character, which is simple in construction, thoroughly reliable and efficient in operation, strong, durable, positive in the working of the same, it does not interfere with the freezing action of the cabinet, compact, assuring convenient accessibility to the cabinet, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which show the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a vertical longitudinal sectional elevation of a freezing cabinet showing the apparatus constructed in accordance with the in-

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vention incorporated therein, with the covers or lids in closed position.

Figure 2 is a view partly in elevation and partly in vertical longitudinal section with the lifter bar and one cover and its shelving structure in raised position.

Figure 3 is a top plan view of Figure 1.

Figure 4 is a sectional view taken on the line 4-4 of Figure 1 looking in the direction of the

arrows.

Figure 5 is a sectional view taken on the line 5-5 of Figure 1 looking in the direction of the

arrows.

Figure 6 is a diagrammatic detail view of the

electric equipment for the control of the apparatus.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally a portion of a deep freeze storage cabinet, which in its construction has the freezing coils 10 disposed vertically and crosswise within the body 11 in spaced relation to each other, to be disposed between freezing zones 12 interiorly of the said body of the cabinet. Adapted to interfit cover sills 13 at the top of the body 11 are covers or lids 14, which at all times lie in the same horizontal plane with each other and each when raised gives access to its companion freezing zone 12 and when lowered seals the latter.

Bridging the covers or lids 14 longitudinally of the body 11 is a horizontally arranged lifter bar or rail 15 having in-turned edges (Fig. 5) forming a slideway 17 for carrying slidable release latches 16 at the upper exposed face of such bar or rail. Each latch is formed with key-hole shaped slots 18 for receiving and releasably engaging headed keepers 19 which play through clearances in the bar or rail 15 when in a lowered position, there being preferably two keepers 19 to each of a plurality of shelving structures 20, which interfit their companion zones 12 when in a lowered position. Each shelving structure 20 at its top carries in its union with the lid or cover 14 next thereto the keepers 19 for uncoupling connection with the bar or rail 15, and such structure provides a carrier for food stuff to be stored within the cabinet A. One or all of the shelving structures 20 can be coupled or uncoupled to or from the bar or rail 15 through the use of the latch or latches, as should be obvious, from Figure 2 of the drawings.

Exteriorly of the ends of the body 11 of the

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cabinet A are vertically arranged opposed piston cylinders 21 having slidable therein pistons 22, their stems 23 being connected at the outer ends to opposite ends of the bar or rail 15, so that through reciprocation of the pistons 22 the said bar or rail will be raised or lowered and concurrently therewith the shelf structures latched thereto.

Within a chamber 24 lowermost within the cabinet A and built within the body 11 is a fluid storage tank 25 from which leads a supply pipe 26 to a pump 27, which is driven by an electric motor 28, the pipe being fitted with a return check valve 29 to prevent back flow of fluid to the tank 25. To and from the cylinders 21 are fluid lines 30 and 31, respectively, which through a branch 32 communicate with the tank 25. The branch 32 is fitted with a turn valve 33 which through meshing gears 34 has connection with hand control 35 exposed outside of the cabinet A at one side thereof, so that the valve 33 can be opened and closed by hand.

This control has associated therewith an electric switch 36 for opening and closing an electric circuit 37 having the motor 28 therein, and also for opening and closing this circuit 37 is an automatically operated switch 38, which is arranged in the path of a striker 39 on the stem 23 of one of the pistons 22, the arrangement of the switch 38 being such that when the bar or rail 15 is fully raised, such switch will be opened for shutting off the working of the motor, and then when the bar or rail becomes fully lowered, this switch will be brought to closed position. However, the switch 38 only completes the closing of the circuit 37 when the valve 33 is in closed position, but when such valve 33 is open, the circuit is open. The lowering of the bar or rail 15 automatically closes the switch 38 by engagement therewith. The stops 39' are provided for the switch 36, to limit movement thereof in either direction by the hand control 35. When the bar or rail 15 is in lowered position, the switch 38 is closed but the valve 33 and switch 36 controlled thereby is open resulting in the electrical circuit to motor 28 being interrupted. To raise the bar or rail 15, hand control 35 is turned closing valve 33 and switch 36 thereby causing motor 28 to actuate the pump 27 which in turn forces fluid into lines 30 and 31 to cylinders 21, as indicated by the solid arrows in Figure 4, causing pistons 22 to rise and thus elevate the bar or rail 15, moving therewith one or all of the shelving structures 20. When the bar or rail 15 has been elevated to its final position, the motor circuit is interrupted by striker 39 opening switch 38. To lower the bar or rail 15, hand control 35 is turned in the opposite direction, opening valve 33 and switch 36. The opening of valve 33 will allow the fluid to return by gravity, as well as by the pressure exerted on the pistons 22 by the weight on 15, to the tank 25, as indicated by the dotted arrows in Figure 4. With the lowering of 15, the lids or covers 14 close the cabinet A with the shelving structures 20 depending within the freezing zones for the freezing of their loads. The fluid for operating the pistons 22 may be oil or other fluid having a low freezing point and unharmed to food.

What is claimed is:

1. In a device of the class described, the combination of a refrigerator cabinet having an open top portion, transverse sills across said cabinet at the open top portion thereof, a plurality of lid members removably supported by said open

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top portion and said sills to form closures for the open portion of said cabinet, shelving structures adapted to carry commodities and positioned within said cabinet, a T-shaped keeper attached to each lid member, a lifter bar reciprocably movable relative to said cabinet and having a channel-shaped groove extending lengthwise thereof, a plurality of latching bars slidably mounted in said channel-shaped groove, each latching bar having an elongated slot cooperating with one of said T-shaped keepers, each slot formed from a circular opening adapted to pass the keeper freely and an elongated opening of a width less than the diameter of said circular opening and merging therewith whereby each latching bar is adapted to engage a keeper whereby its attached lid and shelving structure can be selectively withdrawn from the cabinet by said lifter bar, piston rods fastened to opposite ends of said lifter bar, pistons secured to said piston rods, cylinders secured to and exteriorly of said cabinet and slidably receiving said pistons, a pumping device, an electric motor for driving the same, a reservoir having fluid therein, pipe means including a check valve placing said reservoir in communication with said pump, conduit means connecting said pump to said cylinders for supplying fluid thereto for moving said pistons, a return duct means between said conduit means and said reservoir, said return duct means including a valve therein, a manually-operated shaft secured to said valve for opening and closing the same, an electrical circuit connecting said motor to a source of energy, a limit switch in said circuit, a striker attached to one of said piston rods and adapted to actuate said switch to open the same to stop said motor at limit of travel of said lifter bar, a starting switch means in said circuit and actuated by said manually-operable shaft, whereby rotation of said shaft to close said valve will close said starting switch means to cause actuation of said motor to force fluid through said conduit means to said cylinders to raise said lifter bar and whereby reverse rotation of said shaft will open said valve and said switch means to stop the motor and to drain the fluid from said cylinders back into said reservoir thereby lowering said lifter bar.

2. In a device of the class described, the combination of a refrigerator cabinet having an open top portion, transverse sills across said cabinet at the open top portion thereof, a plurality of lid members removably supported by said open top portions and said sills to form closures for the open portion of said cabinet, shelving structures positioned within said cabinet, a reciprocating lifting device, means associated with said device for selectively engaging said lids to withdraw a shelving structure from said cabinet, hydraulic means attached to the exterior of said cabinet and said lifting device for imparting translative movement to the same to raise and to hold the same at a raised position, a motor for activating said hydraulic means, a limit switch means connected to said motor and said lifting device for stopping the former upon the latter reaching its limit of travel, a manually-operable device for rendering the hydraulic means ineffective to hold said lifting device in a raised position and a starting switch for said motor operable by said manually-operable device.

3. In a device of the class described, the combination of a refrigerator cabinet having a plurality of openings in the top thereof, a plurality

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of closure lids for said openings, respectively, having shelving structure depending from said lids, lifting means for selectively engaging said closure lids for raising the same and lowering the same into said cabinet, hydraulic means connected to the lifting means for imparting trans-
lative motion to the same to raise and to hold the same in a raised position, and means associated with the hydraulic means for controlling the operation of the same.

4. A cabinet having an opening in its top, a lid for said opening, means for raising and lowering the lid comprising a member and means for releasably latching said lid to said member, a carrier rack connected to said lid, electric means for controlling and regulating the first named means and fluid means included in the first named means.

5. A cabinet having an opening in its top, a lid for said opening, a shelving structure depending from said lid, means for raising and lowering the lid vertically including a mechanism adapted to releasably latch said lid to said means, electric means controlling and regulating the first named means, fluid means included in the first

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named means and automatically and hand operated switches included in said electric means.

6. A cabinet having an opening in its top, a lid for said opening, a shelving structure depending from said lid, means for raising and lowering the lid including a mechanism adapted to releasably latch said lid to said means, electric means controlling and regulating the first named means, fluid means included in the first named means, automatically and hand operated switches included in electric means and means controlled by the hand switch for regulating the fluid means.

ANDREW LEUTHEUSER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,003,302	Miller et al.	June 4, 1935
2,076,173	Cocks	Apr. 6, 1937
2,236,095	Ginter	Mar. 25, 1941
2,390,030	Paulson	Nov. 27, 1945