

April 14, 1942.

L. F. CLERC

2,279,558

REFRIGERATION DEVICE

Filed Sept. 20, 1940

3 Sheets-Sheet 1

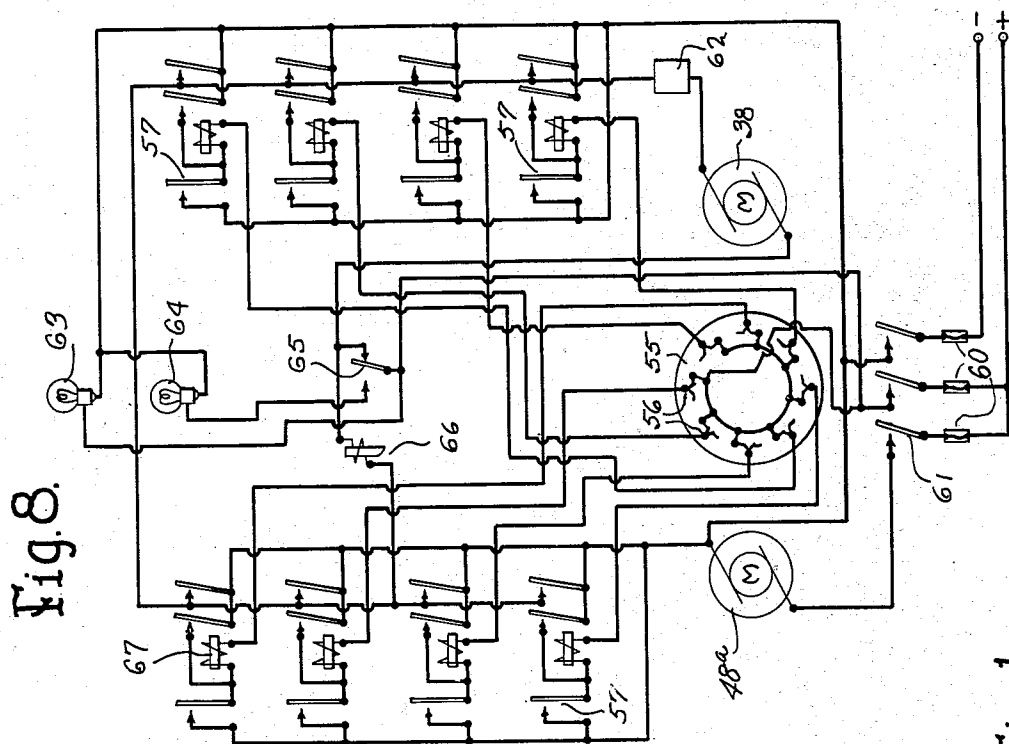


Fig. 8.

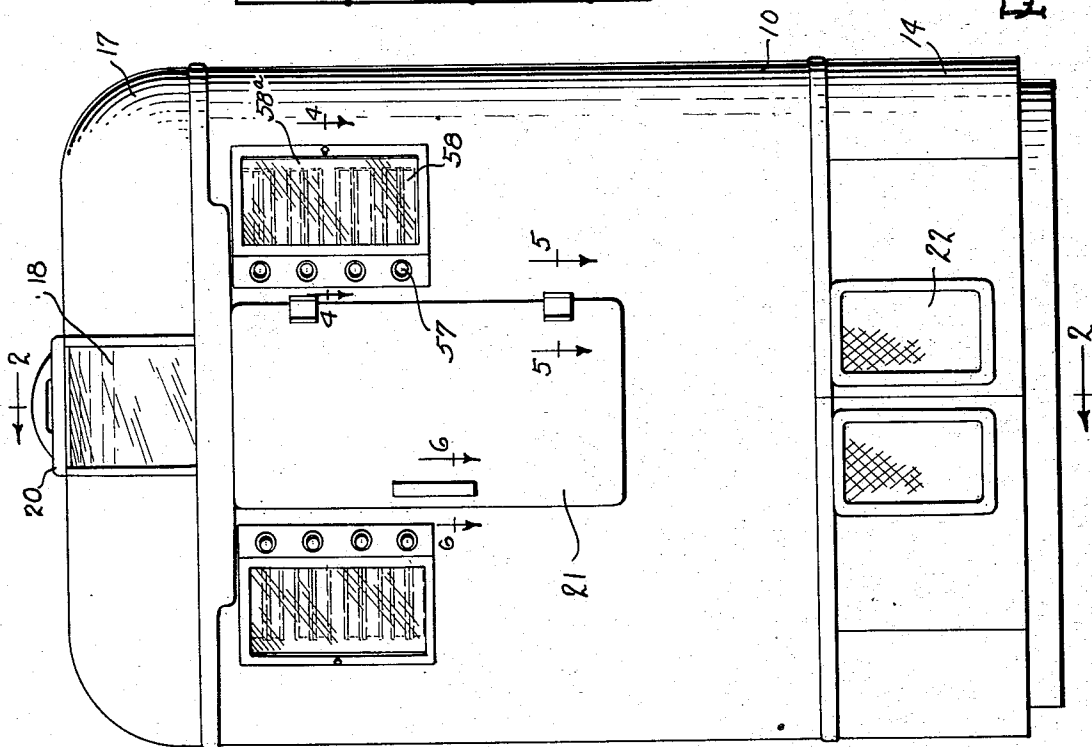


Fig. 1.

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3 Sheets-Sheet 2

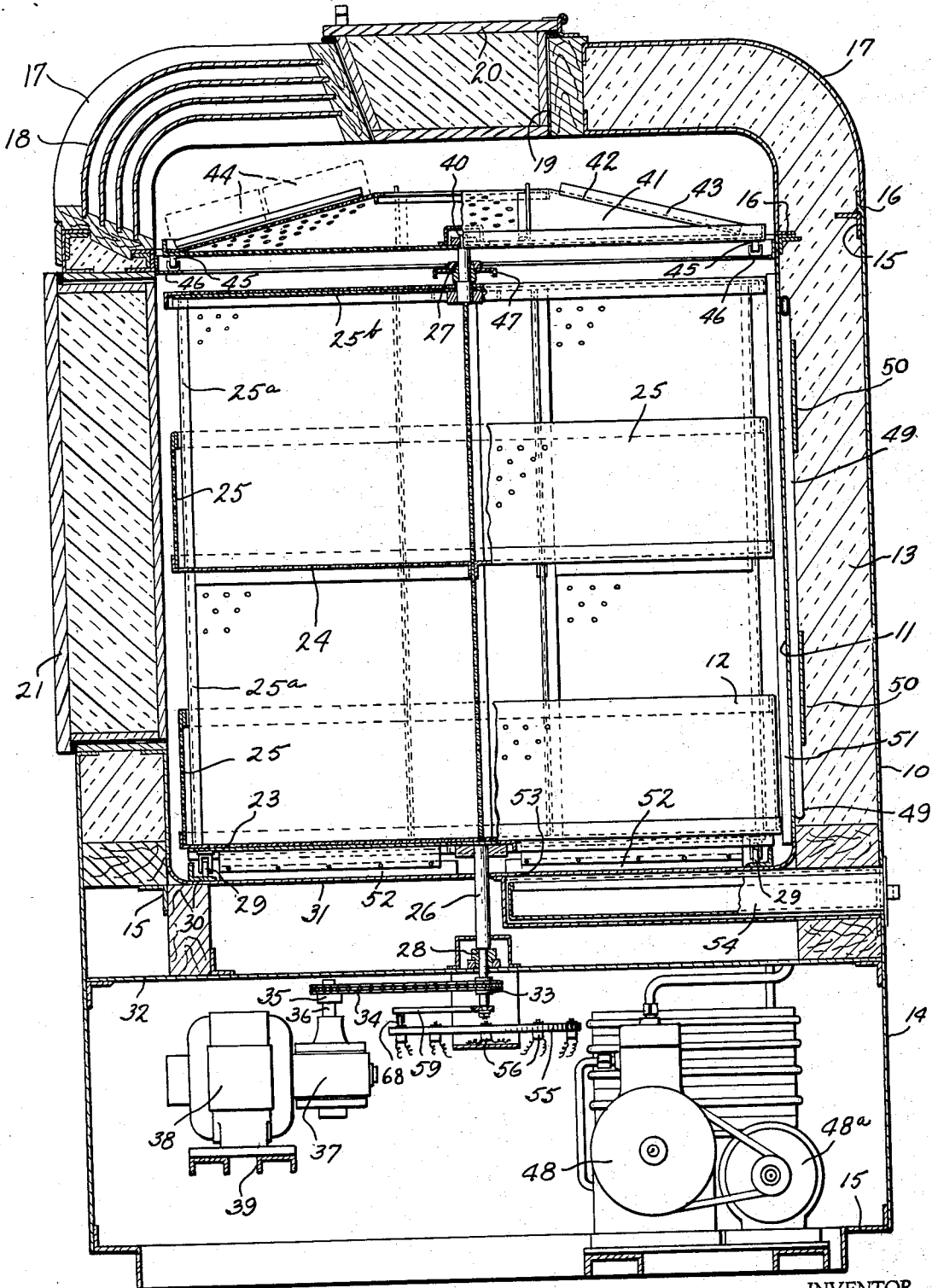


Fig. 2.

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Fig. 3.

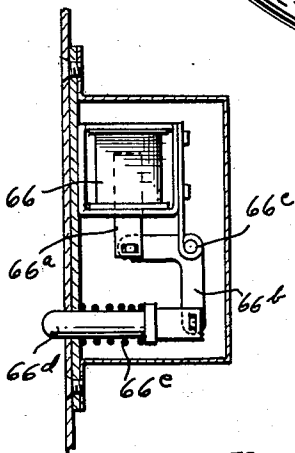
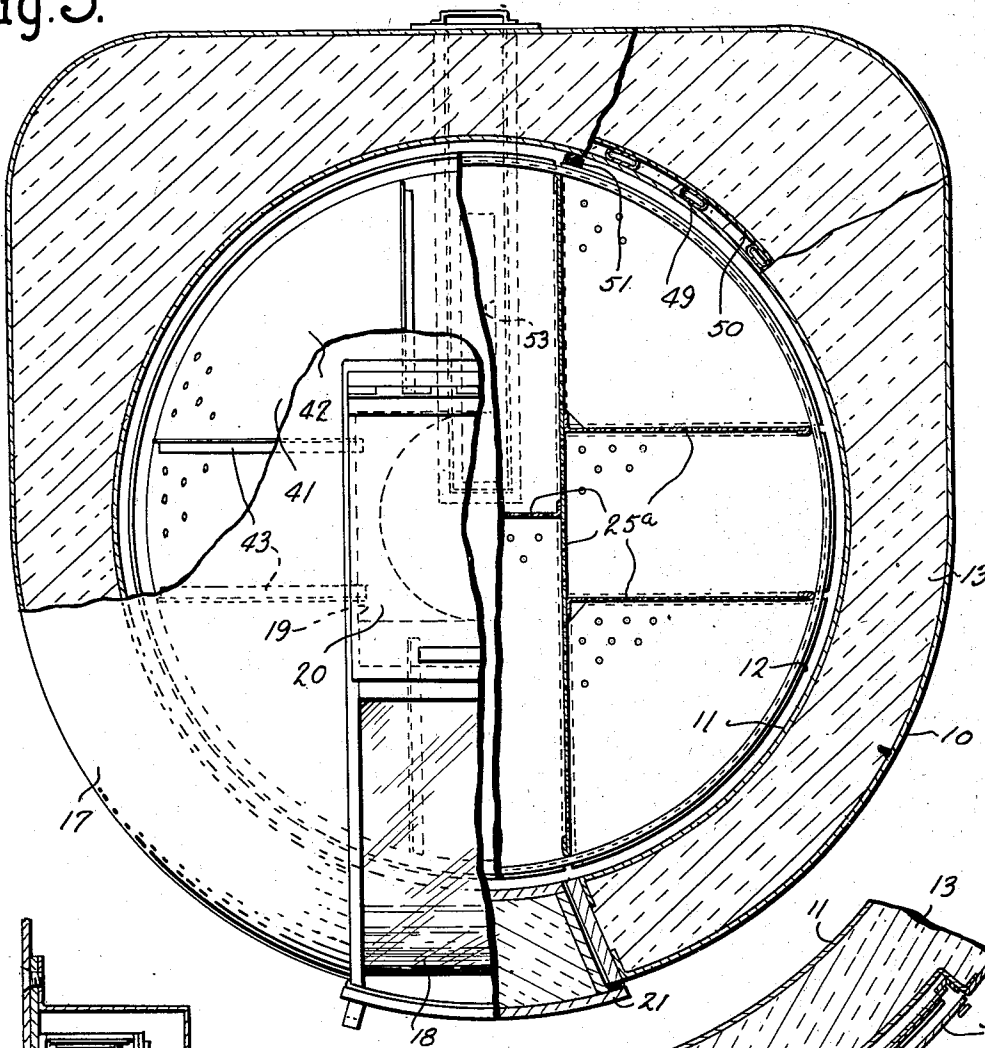


Fig. 6.

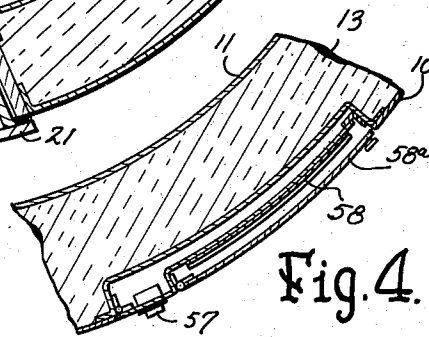


Fig. 4.

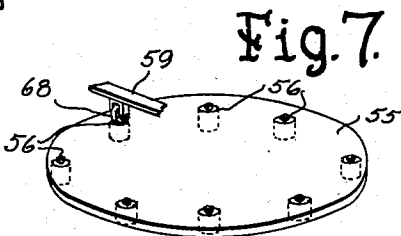


Fig. 7.

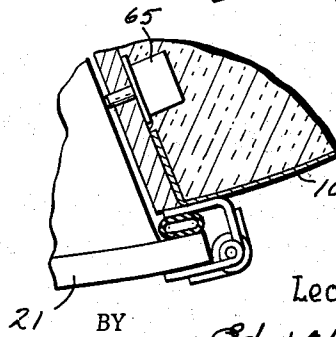


Fig. 5.

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UNITED STATES PATENT OFFICE

2,279,558

REFRIGERATION DEVICE

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Application September 20, 1940, Serial No. 357,573

12 Claims. (Cl. 62—89.5)

This invention relates to refrigeration apparatus and particularly to a mechanical refrigeration device which may be employed in stores, meat markets, and the like, for the efficient handling of perishable merchandise. It can also be used as a domestic refrigerator.

An object of the invention is the provision of a device of the character referred to which has a plurality of storage compartments, all of which are made equally accessible from the outside of the cabinet.

Another object of the invention is the provision of a refrigerator cabinet having a rotating storage section provided with a plurality of compartments and means for automatically controlling the selection of the compartments.

Another object of the invention is the provision of a refrigerator cabinet having means for automatically defrosting the interior thereof.

Another object of the invention is the provision of a refrigerator cabinet having a readily accessible display section at the top.

Another object of the invention is the provision of a cabinet having a rotating storage section with means to insure the safety of the users thereof.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time to the accompanying drawings forming part of this disclosure, in which drawings:

Fig. 1 is a front elevation of a refrigerator cabinet embodying my invention.

Fig. 2 is a vertical section, with parts in elevation and parts broken away, taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a top plan view of the device illustrated in Fig. 1, with parts broken away to illustrate the relative portion of the parts.

Fig. 4 is a fragmentary detail in section, taken on the line 4—4 of Fig. 1, and illustrating the arrangement of the push buttons and name plate elements.

Fig. 5 is a fragmentary detail taken on the line 5—5 of Fig. 6, showing the arrangement of the spring actuated hinge.

Fig. 6 is a fragmentary detail taken on the line 6—6 of Fig. 1, illustrating the solenoid locking device for the door.

Fig. 7 is a perspective view of the selector disc and circuit breaker.

Fig. 8 is a diagrammatic view illustrating the electrical circuits employed in my device.

Referring now more particularly to the draw-

ings, it will be seen that in general my improved refrigerator cabinet comprises an outer housing or shell 10, an inner shell 11, and a rotatable storage section 12. I provide a suitable layer of insulation 13 between the shells 10 and 11. The lower part 14 of the cabinet consists of a single shell which provides a housing for the principal mechanical parts of the device. The outer shells 10 and 14 are secured by suitable means to a skeleton framework made up of fabricated angle iron as a 15, into the desired shape to form the contours shown in Figs. 1, 2 and 3. It will be noted that the outer and inner shells 10 and 11 are broken as at 16, so that there is a minimum of heat and cold conduction between the top 17 and the side members. The top 17 is preferably formed of wood and is provided with windows 18 made of a transparent plastic material and an opening 19, over which is fitted the cover 20.

The cabinet is provided at the front with a large door 21, through which access is had to the interior. Ventilating doors 22 are provided at the bottom of the compartment housing the mechanical elements.

The rotatable storage section 12 consists of two perforated shelves 23 and 24; each of which is divided into eight compartments (Fig. 3). The shelves 23 and 24 are provided with perforated outside walls 25, which are approximately half as high as the space between the two shelves 23 and 24, so that commodities carried in the compartments can be readily reached when the compartments are positioned in front of the door 21. The division wall 25a of the compartments are also perforated, but extend the full distance between the shelves 23 and 24 and between the shelf 24 and the section cover 25b, and serve as supports.

The shelves 23 and 24 are supported on a shaft 26 which is journaled at top and bottom in bearings 27 and 28. The principal weight of the rotatable section 12 is supported by the wheels 29 arranged to travel on the track 30, which is mounted on the member 31 which is welded or otherwise suitably secured to the framework 15.

Another horizontal member 32 is secured to the framework 15 and is adapted to support the bearing 28 and other elements hereinafter described. The shaft 26 is driven by a sprocket 33, chain 34 and a sprocket 35 which is mounted at the end of the shaft 36, which is driven through the reduction gear assembly 37 by the motor 38, the latter being supported as at 39, by

members comprising part of the framework 15.

At the upper end of the shaft 26 is keyed, as at 40, a circular perforated display rack 41, which is provided with a sloping upper surface 42, which is partitioned into sections by the retainer members 43, to provide a plurality of display spaces, adapted to carry baskets or other containers which are visible through the windows 18 and accessible through the opening 19. The rack 41 is supported by wheels 45 which are arranged to travel in the track 46 mounted on the horizontal member 47 which is secured to the framework 15.

The refrigeration machine 48 and its driving motor 48a are positioned in the bottom of the cabinet. The machine 48 is connected to the coils 49 which extend along the outside of the inner shell 11. The coils are preferably held in direct contact with the shell 11 by means of one or more clamps 50, which extend around the shell 11, from either side of the door 21 to the back, where their ends are fastened together by bolts and nuts or other suitable means.

In order to reduce to a minimum the layer of frost which accumulates on the interior of the shell 11, I provide a scraper 51, which is preferably made of hard rubber and secured to the outer periphery of the rotatable section 12.

I also provide a scraper 52 on the bottom of the section 12. The lower scraper 52 is adapted to move the frost, dislodged from the sides by the scraper 51, into an opening 53, formed in the member 31 and hence into a removable catch receptacle 54, which is slidably mounted under the member 31.

I will now describe the control and selection means employed with this cabinet. It will be remembered that the shelves 23 and 24, comprising the rotatable section 12, are partitioned into eight compartments each. Therefore I provide eight control stations for the rotation of section 12. The controls include a non-conductive selector disc 55, which is provided with eight electrical contact elements or switches 56 arranged in predetermined positions thereon, and connected to a source of electrical energy and respectively connected to push button switches 57 (Figs. 1 and 8) which are positioned on the front exterior of the cabinet. There is a push button switch 57 for each two compartments positioned one above the other.

Opposite each switch 57 on the exterior of the cabinet (Fig. 1) are positioned two identification plates 58, each of which identifies the contents of one of the compartments. The plates 58 are covered by a glass door 58a.

A member 59 (Fig. 2) is secured to the shaft 26 and is adapted to rotate above the selector disc 55. The member 59 is provided with a wheel or roller 60 which is adapted to strike the respective switches 56 and break their electrical contacts. As each switch 56 is contacted the circuit in which it is located is opened. Inasmuch, however, as each such circuit also has a push button switch 57 therein, nothing happens electrically unless both switches of each such circuit are closed at the time of the striking. That condition exists only if a push button 57 has been manually operated.

In Fig. 8, I illustrate the wiring diagram of the various circuits. In this view the main circuit commences and finishes at the bottom of the diagram. The reference character 60 indicates the main fuses and 61 the main switches. In the circuit which operates the motor 38, I 75

insert a double acting set of chimes 62 which signals the starting and stopping of the motor 38. I also provide display lights 63, which are on all the time, and box lights 64 which are controlled by a door switch 65. In addition thereto I provide a solenoid door locking device 66, which will be described more in detail hereinafter. The door locking device 66 is intended to keep the door 21 locked while the rotating section 12 is in motion, for safety purposes. The locking device 66 is controlled through relays 67 positioned in the push button 57 circuits.

In Fig. 5, I illustrate the spring arrangement for holding the door 21 in closed position. In Fig. 6, I show a detail of the solenoid device 66 used to lock the door 21, while the rotating section of the cabinet is in operation.

In this view Fig. 6, the device is shown adapted to be positioned in the wall 10 of the cabinet. The device comprises a solenoid 66, a heavy core 66a which is held in elevated position when the solenoid is energized, and falls by gravity when the solenoid is de-energized. The core 66a is secured to a rocker arm 66b pivoted at 66c. At the other end of the rocker arm 66b is the plunger 66d which serves as a locking pin. A spring 66e, assisted by the weight of the core 66a, holds the locking pin out of locking position when the solenoid is not energized.

The operation of the device can be readily understood from the foregoing. The device is first connected to a suitable source of electrical current. The desired commodities are then placed in their respective compartments and the labels or markers are positioned on the outside of the cabinet adjacent the several push button switches. If it is desired to reach a certain compartment the push button for that compartment is pushed closing a circuit, which actuates the motor 38 causing the section 12 to rotate. The closing of that circuit also energizes the relay 67 which in turn causes the locking device 66 to be actuated, thereby causing the door 21 to be held in locked position while the section 12 continues to rotate. Upon the commencement of rotation of the section 12, the chimes 62 will ring indicating that the device is operating.

The section 12 will rotate until the contact breaker 68 strikes the switch 56 which is in the same circuit with the push button just operated. When the breaker 68 strikes the switch 56, its circuit will be opened and the motor 38 will stop. By the same token the section 12 will stop its rotation and the compartment corresponding to the push button just operated will then be in front of the door 21. At the same instant the door locking solenoid 66 will be de-energized so that the door 21 may be opened. Likewise the solenoid of the chimes 62 will be de-energized, and under the influence of its return spring the striker will again cause the chimes to ring, indicating the completion of that operation. The process is repeated every time one of the push buttons 57 is operated.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a refrigeration device, including an outer shell, an inner shell, and coils of a refrigerating machine in contact with said inner shell, the combination of a storage section rotatable in the space defined by said inner shell, the said storage section consisting of two or more shelves secured to one another by means of perforated walls, there being also a display section comprising another shelf positioned above said storage shelves,

and means including tracks for supporting said shelves.

2. In a refrigeration device such as defined in claim 1, the combination of an electric motor, a circuit for said motor, and means associated with said circuit and controllable from the exterior of said shells for pre-selecting a storage compartment of said storage section and automatically stopping the rotation of said storage section, when the compartment selected reaches a predetermined position.

3. In a refrigeration device such as defined in claim 1, including a door in said shells, the combination of a plurality of selector switches adjacent the exterior of said door, there being a switch for each compartment of said storage section, an electric motor for rotating said storage and display sections, and circuits for said motor and said switches arranged so that upon the closing of any one of said switches the storage and display sections will rotate until the compartment corresponding to that switch is in alignment with the door in said shells, whereupon the storage display sections will automatically stop.

4. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of an electric motor for rotating said storage section, selector switches on the exterior of said shells adjacent said door, circuits for said motor and said switches and electrical means for locking said door, said electrical locking means being arranged in said circuits so that the said door remains closed while the said storage section is rotating.

5. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of a motor for rotating said storage and display sections, push button switches adjacent said door, circuits for said switches and said motor, a non-rotating, non-conductive disc concentric with said storage section, circuit breakers in said disc, there being a circuit breaker for each of said circuits, and a member rotatable with said storage section and adapted to consecutively actuate said circuit breakers, whereby the rotation of said storage and display sections may be stopped at predetermined positions.

6. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of a window in said shells positioned above and in alignment with said door, and one or more inclined platforms on said display shelf, arranged to be moved past the said window during the rotation of said storage and display shelves.

7. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of a window in said shells positioned above and in alignment with said door, and one or more inclined platforms on said display shelf, arranged to be moved past the said window during the rotation of said storage and display shelves, the said inclined platforms being perforated, and

divided into a plurality of display spaces, there being a display space above and in alignment with each one of the compartments of the said storage section.

8. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of a window in said shells positioned above and in alignment with said door, and one or more inclined platforms on said display shelf, arranged to be moved past the said window during the rotation of said storage and display shelves, the said inclined platforms being perforated, and divided into a plurality of display spaces, there being a display space above and in alignment with each one of the compartments of the said storage section, and there being a second door in the top of said shells through which the said display spaces are made accessible from the outside.

9. In a refrigeration device as defined in claim 1, including a door in said shells, the combination of an electric motor for rotating said storage section, selector switches on the exterior of said shells adjacent said door, circuits, for said motor and said switches and electrical means for locking said door, said electrical locking means being arranged in said circuits so that the said door remains closed while the said storage section is rotating, and audible signal elements in the said circuits to indicate the rotation and stopping of said storage section.

10. The combination defined in claim 1, wherein the said rotatable storage section is provided with vertical and horizontal wiping blades adapted to contact the inside surfaces of said inner shell, there being a removable collector basin extending through the said outside shell, the interior of said basin being in communication with an opening in the said inside shell, whereby accumulations of frost and the like removed from the inside walls of said inner shell, by the said wiping blades, may be collected in said basin and readily removed from the device.

11. The combination defined in claim 1, including a dead air space located below the said rotatable storage section, and positioned between the said inner shell and a false bottom extending between the walls of the said outer shell, there being a collector basin in said dead air space, the interior of said basin being in communication with the interior of said inner shell.

12. The combination defined in claim 1, including a dead air space located below the said rotatable storage section, and positioned between the said inner shell and a false bottom extending between the walls of the said outer shell, there being a collector basin in said dead air space, the interior of said basin being in communication with the interior of said inner shell, and a live air space below said dead air space, the said live air space being arranged to house the motor and other power elements used to rotate the said storage section.

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