

Aug. 18, 1936.

S. MOORE ET AL

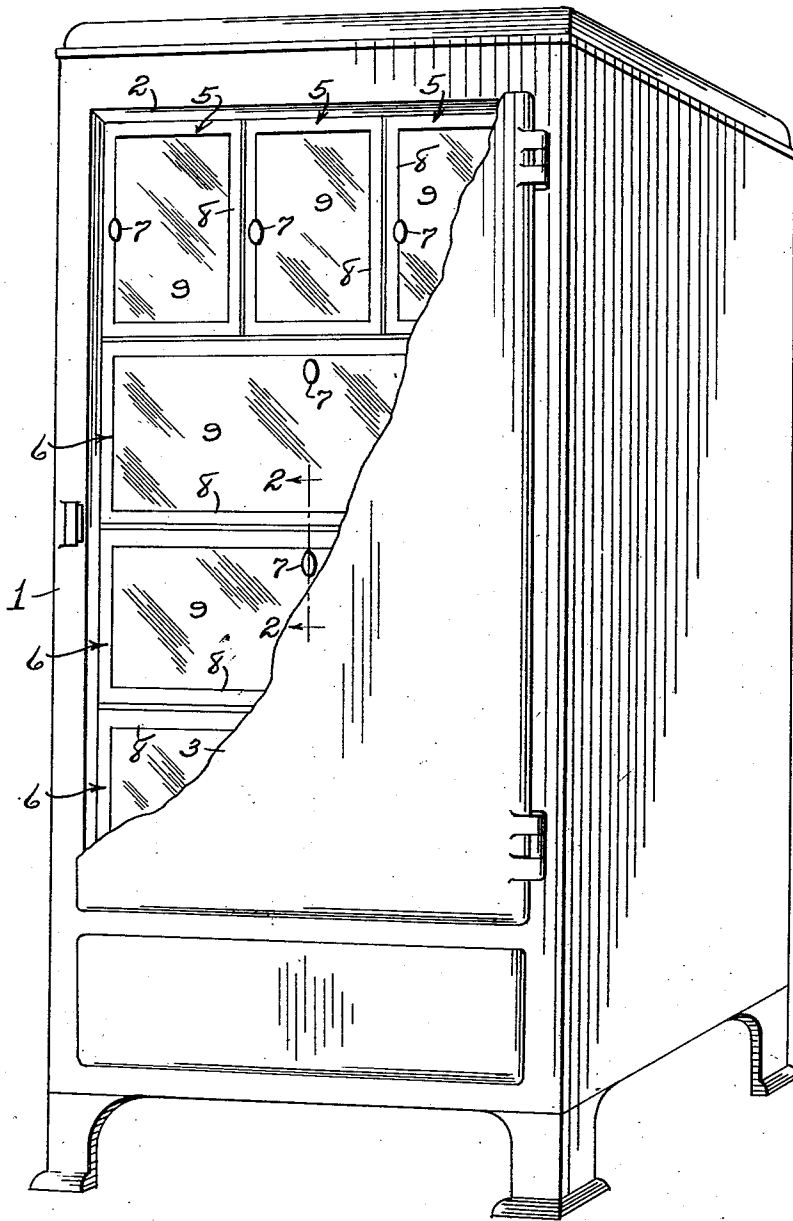
2,051,733

COLD CONSERVER

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4 Sheets-Sheet 1

Fig. 1.



Stanford Moore
William C. Lyons

INVENTORS

BY *Victor J. Evans & Co.*

ATTORNEY

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S. MOORE ET AL

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Fig. 2.

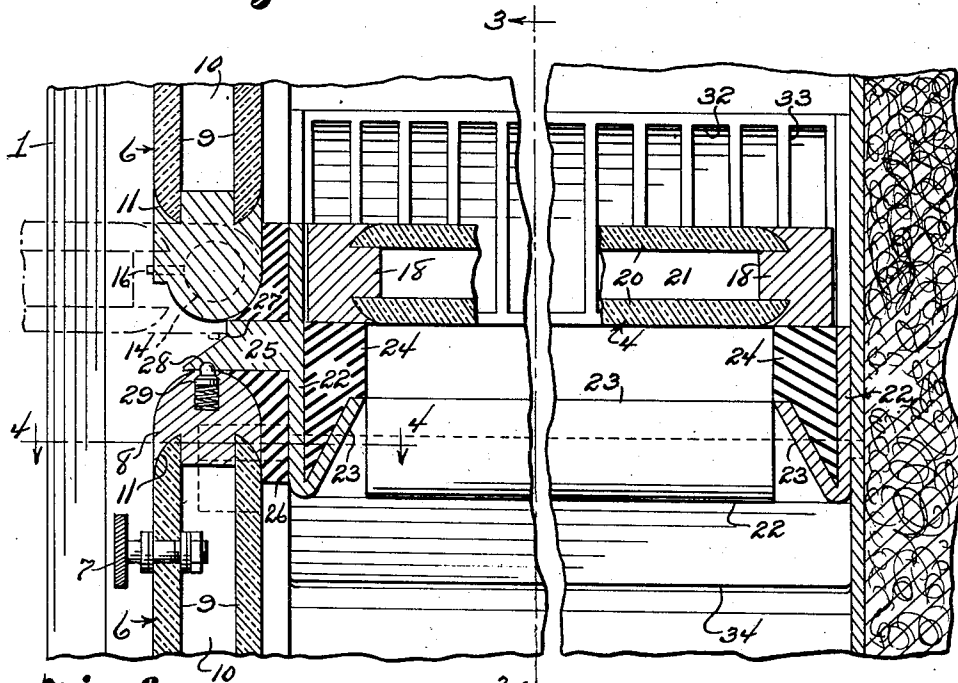
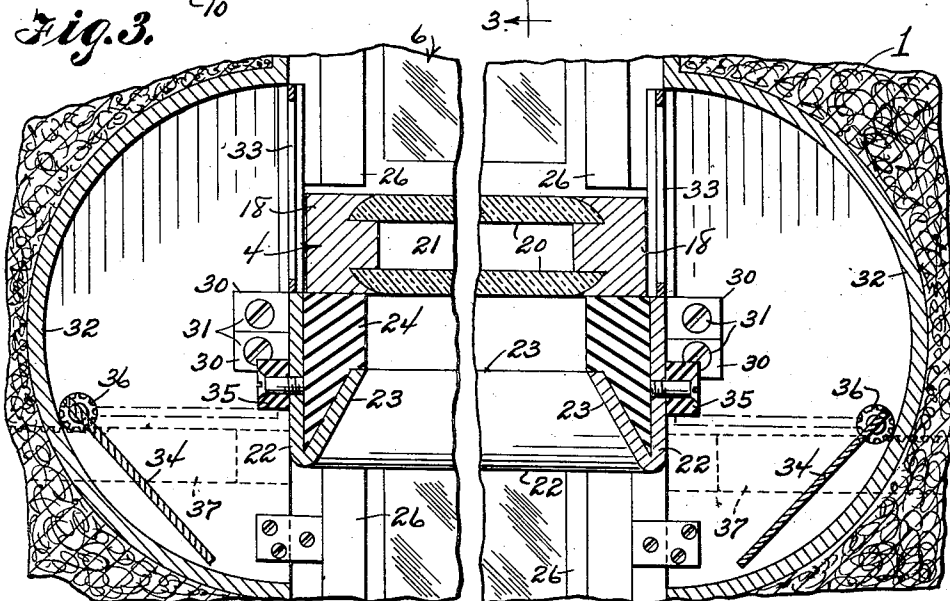


Fig. 3.



Stanford Moore
William C. Lyons
INVENTORS
BY Victor J. Evans, Jr.
ATTORNEY

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S. MOORE ET AL

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Fig. 4.

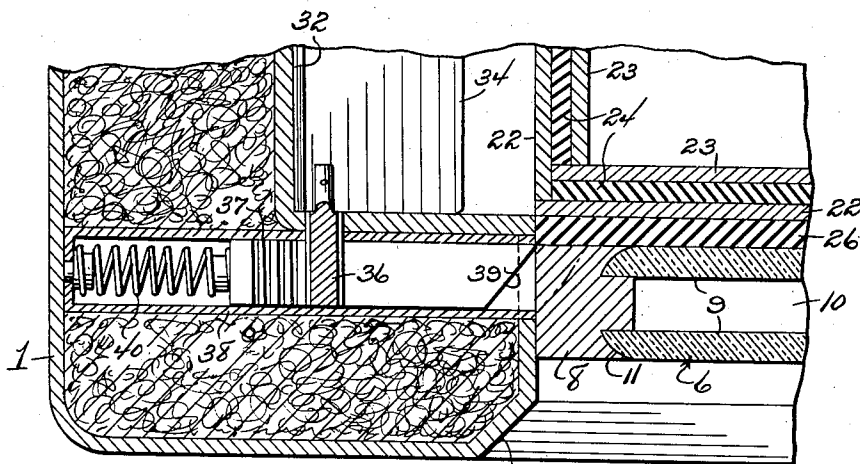


Fig. 5.

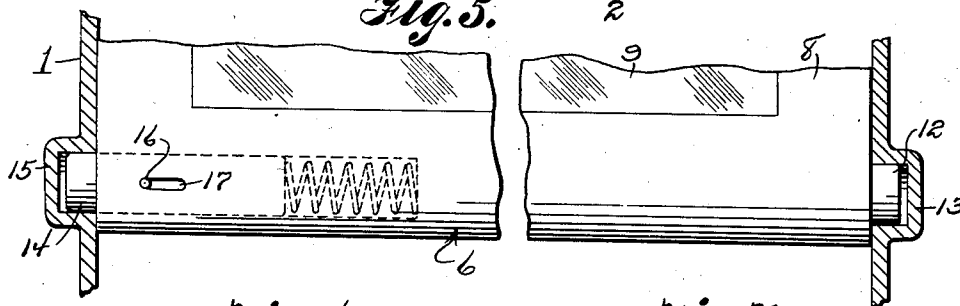


Fig. 6.

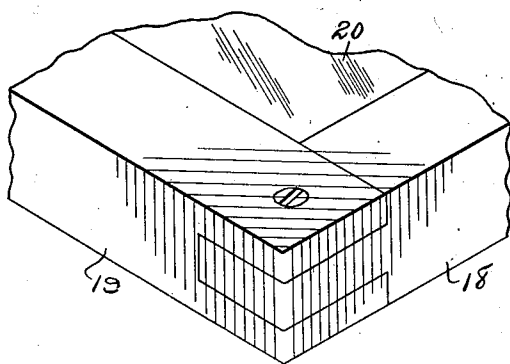
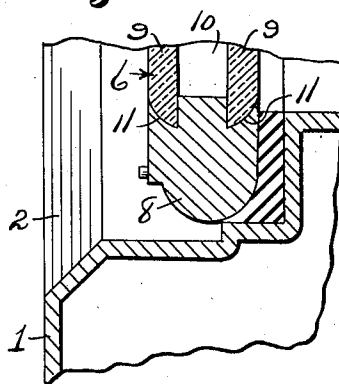


Fig. 7.



Stanford Moore
William C. Lyons

INVENTORS

BY Victor J. Evans & Co.

ATTORNEY

Aug. 18, 1936.

S. MOORE ET AL

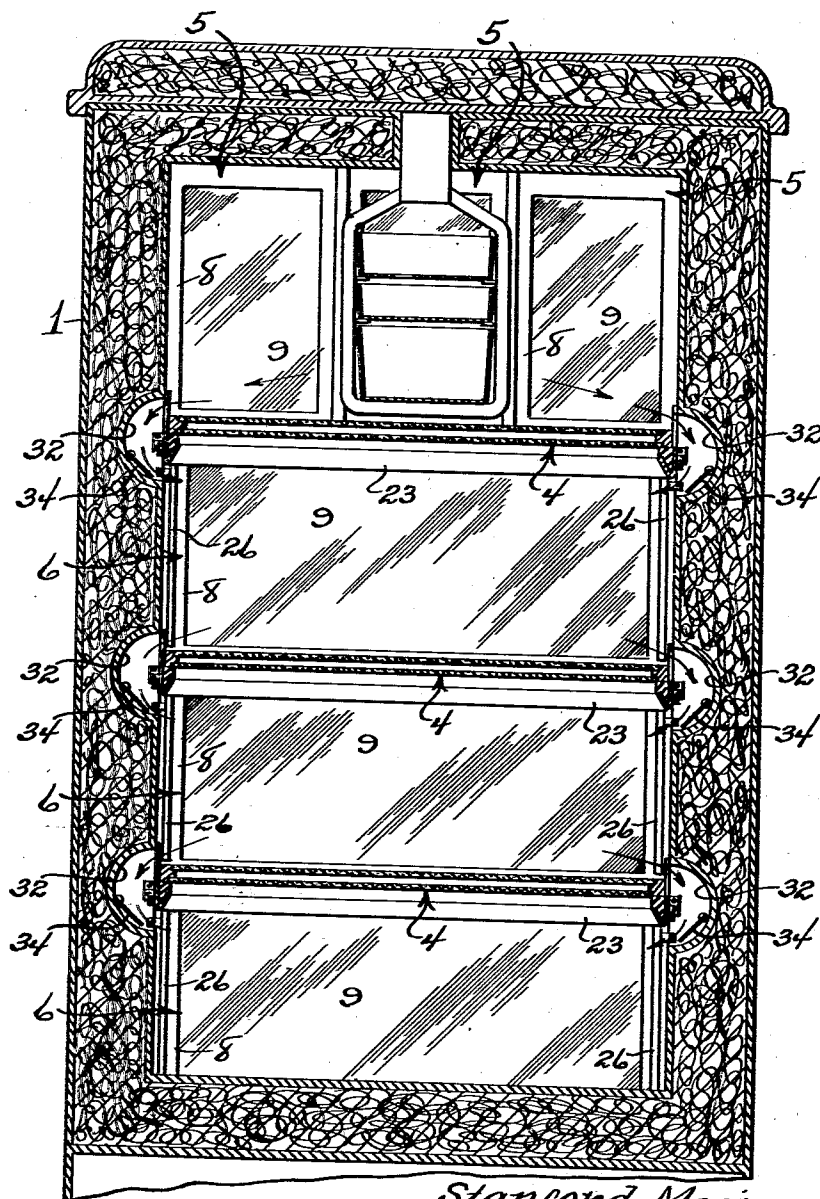
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Fig. 5.



Stanford Moore
William C. Lyons INVENTORS
BY Victor J. Evans & Co.
ATTORNEY

UNITED STATES PATENT OFFICE

2,051,733

COLD CONSERVER

Stanford Moore and William C. Lyons,
Oklahoma City, Okla.

Application February 4, 1935, Serial No. 5,007

4 Claims. (Cl. 62-48)

This invention relates to refrigerators and similar cooling devices and has for the primary object the provision of a device of this character which will have maximum efficiency with minimum operating costs.

Another object of this invention is the provision of means for dividing the refrigerator into compartments each opened and closed by a door and communicative with the compartments adjacent thereto when the doors occupy compartment-closing position so that air circulation may be had between the compartments and each compartment to become non-communicative with the compartment thereabove when the door of the respective compartment is moved into open position which will prevent a down flow of cold air to the compartment which is open, consequently materially reducing the loss of cold air from the refrigerator during the time in which a compartment may be open and thereby conserve operating costs in maintaining the compartments at a desired temperature.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangements of parts to be hereinafter more fully described and claimed.

For a complete understanding of the invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a perspective view, partly broken away, illustrating a refrigerator constructed in accordance with our invention.

Figure 2 is a fragmentary sectional view taken on the line 2-2 of Figure 1.

Figure 3 is a sectional view taken on the line 3-3 of Figure 2.

Figure 4 is a fragmentary sectional view taken on the line 4-4 of Figure 2.

Figure 5 is a fragmentary plan view illustrating the door mounting.

Figure 6 is a fragmentary perspective view illustrating either a door or tray frame.

Figure 7 is a fragmentary perspective view illustrating a door seal.

Figure 8 is a vertical sectional view showing the air circulation between the compartments of the refrigerator.

Referring in detail to the drawings, the numeral 1 indicates a refrigerator box or case provided with a doorway or entrance 2, the walls of which are beveled to form a seat to accommodate a main door 3. Arranged within the box or case are spaced superimposed shelf supporting mediums removably supporting shelves 4 forming in

the box or case a plurality of superimposed compartments and the uppermost compartment is divided into intermediate and side chambers, which are communicative with each other and each chamber is closed by a door 5. The intermediate chamber is preferably employed for accommodating the cooling unit of the refrigerator while the other chambers and compartments are employed for the accommodation of foodstuffs and the like. The compartments below the uppermost compartment are each closed by a door 6. The doors 5 are hingedly mounted to swing about a vertical axis while the doors 6 are mounted to swing about a horizontal axis and the doors 6 when in open position or arranged horizontally align with the shelves so that articles may be rested on said doors 6 either when being removed or replaced in the compartments. The doors are equipped with handles 7 and are of transparent construction so that the contents of the compartments may be viewed without the opening of the doors 6 and 5 and after the opening of the door 3 and in some instances the door 3 may be omitted from the refrigerator if desired. However, it is preferable that the door 3 be employed so that should one of the doors 5 or 6 be broken, atmospheric temperature would be prevented from reaching the interior of the box or case due to said door 3. The doors 5 and 6 are each constructed from a frame 8 grooved to form spaced seats to receive spaced transparent or glass panels 9 forming therebetween a dead air space 10. It is preferable that the edges of the panels be beveled, as shown at 11, and the seats shaped accordingly so that the panels and frame will not interfere with the door occupying a closed position. The frame 8 is provided with a pintle 12 to fit in a socket 13 and upon the opposite side thereof has a slidable spring pressed plunger 14 received in a seat 15. The pintle 12 and plunger 14 cooperate in forming a hinge for the door and one that will permit the door to be readily removed and replaced whenever desired. The plunger 14 is equipped with a pin 16 operating in a slot 17 of the frame 8 whereby the plunger 14 may be easily slid against the action of the spring to disengage said plunger from the seat 15 when desiring to remove or replace the door.

Each tray 4 consists of a frame 18 having a removable side 19 and is provided with seats to accommodate spaced transparent or glass panels 20 forming therebetween a dead air space 21. The dead air spaces of the doors and trays materially reduce the formation of frost on these parts and the dead air spaces of the doors materially insu-

late the compartments to atmospheric temperature while the dead air spaces in the trays aid in insulating the compartments from one another.

The tray supporting mediums each include
 5 frame elements 22 removably secured to the walls of the box or case and consists of front, side and rear elements each carrying flanges 23 to form wedge-shaped seats for cushion supporting elements 24 on which rest the trays. The cushion
 10 elements 24 cooperate with the frames and the trays in providing seals between the compartments. The front frame elements have longitudinally arranged ribs or projections 25 forming seats for cushion elements 26. The cushion elements 26 are abutted by the doors when the latter are in compartment-closing position. The ribs
 15 25 are shouldered, as shown at 27, to form stops to be engaged by the doors when moved into open position and which support said doors horizontally and in alignment with the trays. The ribs 25 are also equipped with seats or sockets 28 to be engaged by spring pressed catches 29 carried by the doors for retaining the doors in closed position. The frame elements 22 are equipped with
 20 flanges 30 apertured to receive fasteners 31 which secure the frame elements to the walls of the box or case.

Formed in walls of the box or case are bypass chambers 32, which chambers establish communication between the compartments and the
 30 bypass chambers are so located that their point of communication with the compartments will be above and below the trays. Gratings 33 are provided for the bypass chambers where the latter communicate with the compartments above
 35 the trays to prevent articles in the compartments supported by the trays from falling into the bypass chambers. The gratings are supported by the tray supporting mediums.

Gate type valves 34 are journaled in the bypass chambers for opening and closing said chambers and carried by the tray supporting mediums are cushion abutting strips 35 to be engaged by the
 40 valves when the latter assume position of closing the bypass chambers. The mounting for the valves is in the form of pintles fitting in journals and secured to the pintles are pinions 36 meshing with rack bars 37 slidably mounted in guides 38
 45 formed in the walls of the box or case. The guides 38 extend to the doorway of the box or case and the rack bars have beveled faces 39 which are urged outwardly of the guides by coil springs 40 so that the beveled faces of the rack bars will be engaged by the doors when in closed
 50 position urging the rack bars inwardly of the guides and positioning the valves 34 to permit free circulation of air through the bypass chambers so that the air from one compartment may pass to another compartment. The doors when moved
 55 to an open position free the rack bars and due to the influence of the springs 40 the valves 34 are engaged with the strips 35 and close the bypass chambers cutting off air circulation from one compartment to another. This permits any
 60 one of the compartments to be opened and the air circulation is interrupted from the open compartment to the compartments thereabove which prevents cold from the compartments above the open compartment from descending therein and
 65 escaping to the atmosphere. When the doors are

closed and the gate valves open, circulation of air throughout the various compartments will be unobstructed consequently permitting the chilled air from the cooling unit to descend downwardly through the various compartments while the
 5 warm air ascends to contact with the cooling unit.

Having described the invention, we claim:

1. In a refrigerator, a box having a main chamber, a plurality of superimposed tray supporting mediums arranged in the chamber and removably
 10 secured to the walls of the box, trays removably supported by said mediums and dividing the main chamber into a plurality of compartments, a door hinged to each tray supporting means and when in an open position adapted to be arranged in a
 15 plane with a tray, said box having bypass chambers in walls thereof communicating with the compartments above and below the trays, valves for opening and closing the bypass chambers, and means between said valves and the doors to close
 20 the valves on the opening of the doors and to permit opening of said valves on said doors moving into closed position.

2. In a refrigerator, a box having a main chamber, a plurality of superimposed tray supporting
 25 mediums arranged in the chamber and removably secured to the walls of the box, trays removably supported by said mediums and dividing the main chamber into a plurality of compartments, a door hinged to each tray supporting means and when
 30 in an open position adapted to be arranged in a plane with a tray, said box having bypass chambers in walls thereof communicating with the compartments above and below the trays, valves for opening and closing the bypass chambers,
 35 guides carried by the box, spring pressed rack bars slidable in said guides, means connecting the rack bars to the valves, said rack bars having beveled faces to be engaged by the doors on the latter occupying closed position to move the valves
 40 into open position, said spring pressed rack bars automatically closing the valves on the opening of the doors.

3. In a refrigerator, a box having a main chamber, a plurality of frame elements secured to the
 45 walls of the box, cushion elements carried by said frame elements, trays supported by said cushion elements and forming the main chamber into a plurality of compartments, doors hinged to the frame elements for opening and closing the com-
 50 partments, cushion elements carried by the frame elements to engage the doors, and means carried by the box and controlled by the movement of the doors to open and close the compartments to one another in accordance with the position of the
 55 doors.

4. In a refrigerator, a box having a main chamber, a plurality of removable trays mounted in the main chamber to divide the latter into compartments, a door for each compartment, said box
 60 having bypass chambers communicating with the compartments above and below the trays, gratings between the bypass chambers and the compartments where said bypass chambers communicate with the compartments above the trays, and valve
 65 means for opening and closing the bypass chambers in accordance with the positions of the doors.

STANFORD MOORE.

WILLIAM C. LYONS. 70