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L. A. ANDERSON ET AL
REFRIGERATOR CABINET

2,581,618

Filed Jan. 26, 1949

2 SHEETS—SHEET 1

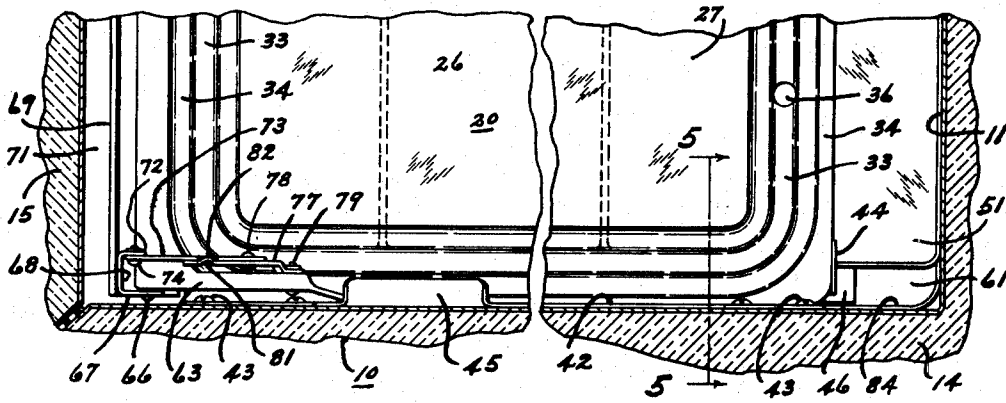


Fig. 4

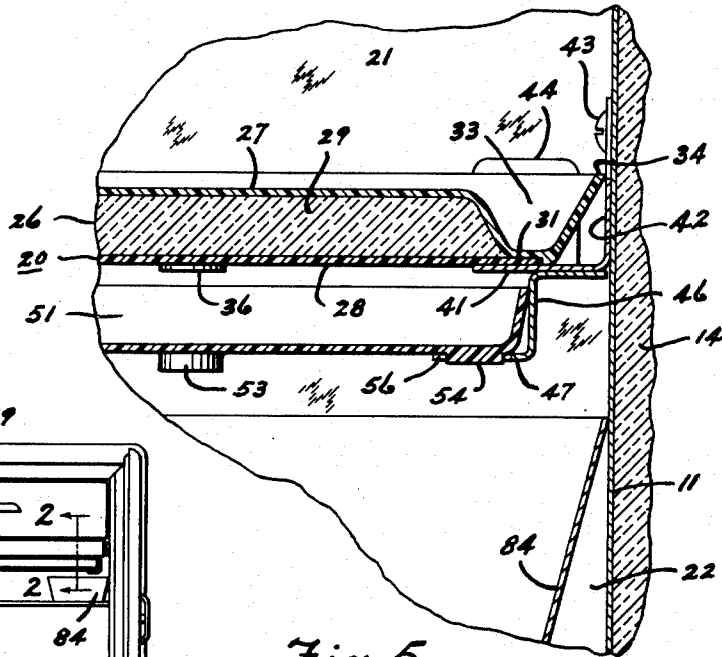


Fig. 5

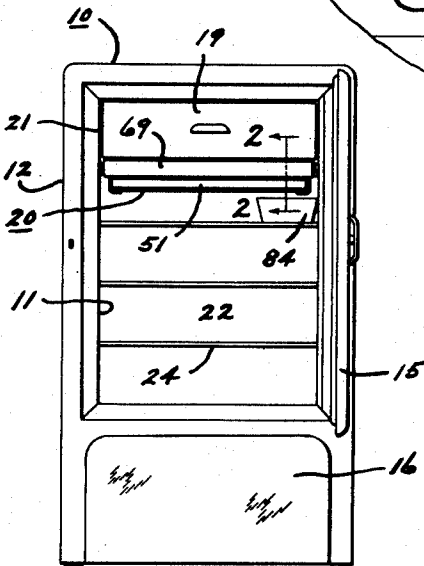


Fig. 1

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2 SHEETS—SHEET 2

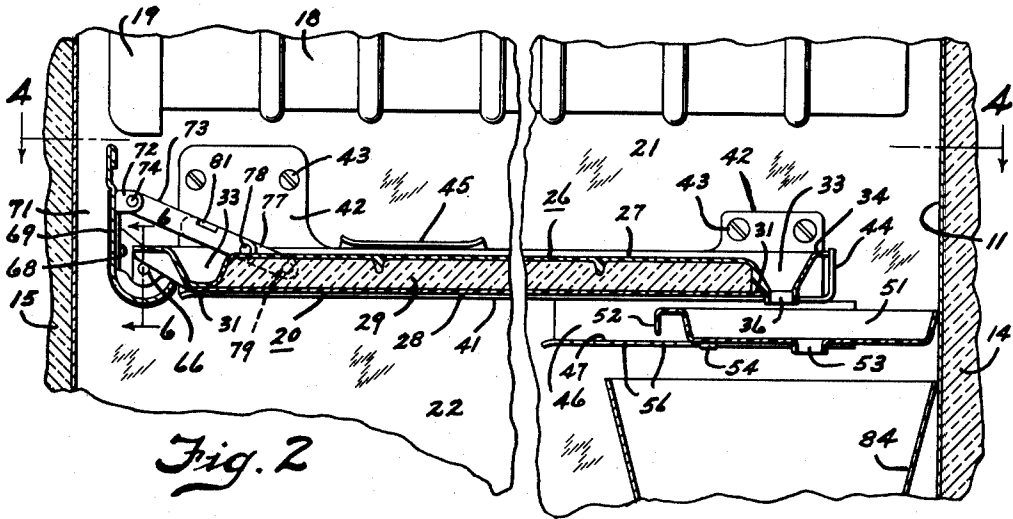


Fig. 2

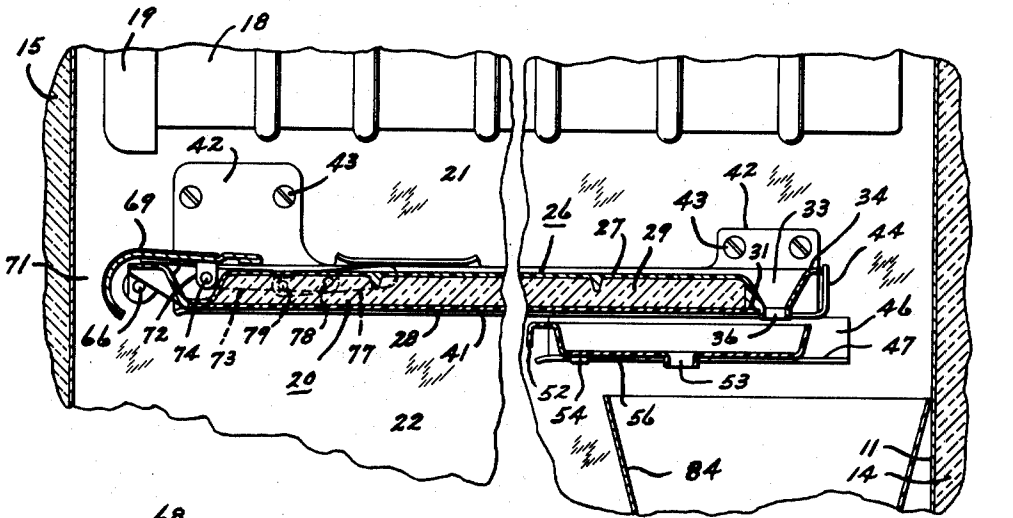


Fig. 3

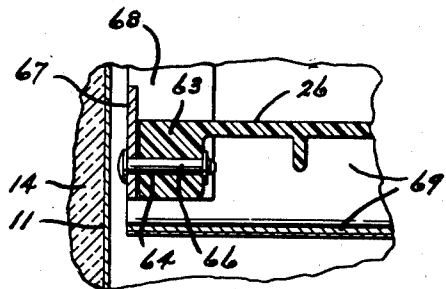


Fig. 6

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UNITED STATES PATENT OFFICE

2,581,618

REFRIGERATOR CABINET

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6 Claims. (Cl. 62-103)

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This invention relates to improvements in refrigerating apparatus and particularly household refrigerators.

An object of our invention is to provide an improved drip tray arrangement within a refrigerator cabinet.

Another object of our invention is to provide an improved drip tray device within a storage chamber of a refrigerator cabinet and located below an evaporator of a refrigerating system mounted in the chamber for partitioning the interior of the chamber into an upper sharp freezing compartment and a lower relatively warmer food storage compartment.

Still another object of our invention is to provide a combined drip tray and partitioning device for the interior of a refrigerated chamber of a household refrigerator cabinet which has movable portions adapted to adjust air passages about the partition so as to increase or decrease the amount of air circulated therearound and between compartments on either side thereof for controlling the temperatures therein.

A further object of our invention is to provide a trim strip or decorative cover which will conceal a partitioning means, utilized to divide the interior of a chamber of a household refrigerator cabinet into upper and lower compartments, from view by a person standing in front of the cabinet when the cabinet door is open.

A still further and more specific object of our invention is to provide a trim or decorative cover pivotally carried by the front of a drip pan or partitioning means within a refrigerator cabinet and which is slightly spaced from and extends parallel to the inner face of the cabinet door to provide a relatively narrow vertically elongated air-flow passage around the partition means, and which cover is adjustable relative to the partition for reducing the vertical elongation of the narrow passage to permit increased air-flow therethrough.

Incident to the main objects of our invention as set forth above, numerous other objects and advantages will become apparent from the following description and claims, reference being had to the accompanying drawings.

In the drawings:

Fig. 1 shows a refrigerating apparatus of the household type with the cabinet door leading to the refrigerated chamber thereof in open position;

Fig. 2 is an enlarged fragmentary sectional view taken on the line 2-2 of Fig. 1, showing a combined drip tray and partitioning device constructed in accordance with our invention;

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Fig. 3 is a view similar to Fig. 2, showing parts of the combined device moved to an adjusted position;

Fig. 4 is a fragmentary section taken on the line 4-4 of Fig. 2, showing a plan view of one side portion of the partitioning device;

Fig. 5 is an enlarged fragmentary sectional view taken on the line 5-5 of Fig. 4, showing one of the supporting tracks for the partitioning device secured to a side wall of the cabinet chamber; and

Fig. 6 is a fragmentary sectional view taken on the line 6-6 of Fig. 2, showing the trim cover pivotally mounted to the front edge of the partition.

Referring to the drawings, for illustrating our invention, we have shown in Fig. 1 thereof, a refrigerating apparatus of the household refrigerator type including a cabinet 10 comprising inner and outer sheet metal walls 11 and 12 respectively having any suitable insulating material 14 therebetween (see Figs. 2 and 4). The inner metal wall 11 forms a liner for a chamber within cabinet 10 and which chamber has an access opening in the front thereof normally closed by door 15. Outer walls 12 extend downwardly beyond the bottom of the insulated chamber to form a machine compartment in the lower portion of cabinet 10, closed by a door 16. An evaporator 18 (see Figs. 2 and 3), having a front cover or closure member 19 (see Fig. 1), of a closed refrigerating system is mounted in the upper portion of the cabinet chamber and may be supported from the top wall of the chamber. Evaporator 18 is preferably of the sheet metal variety provided with refrigerant expansion ducts in its walls and forming a sharp freezing sleeve or sleeves. The outer walls of evaporator 18 are spaced from the top, back and side walls of the chamber and from the inner face of door 15 to permit circulation of air thereover and therearound as will be hereinafter described. The evaporator 18 is connected, by suitable conduits, with a conventional refrigerant liquefying and condensing unit (not shown) located within the machine compartment behind door 16. Such a unit ordinarily comprises a motor-driven compressor and a condenser. Operation of the compressor withdraws refrigerant evaporated in the evaporator 18, compresses the same and forwards it to the condenser where it is cooled and liquefied prior to its return to the evaporator 18. The refrigerating effect produced by evaporation of refrigerant in evaporator 18 cools and causes a thermo-siphon circulation of air within the insulated chamber of the refrigerator cabinet 10.

In refrigerators it has been common practice to provide a drip pan below an evaporator spaced a substantial distance from the side walls of a cabinet chamber and to freely or unrestrictably circulate air therearound within the chamber. In such refrigerators the free circulation of air within a chamber maintains substantially the entire interior of the chamber at or near the same temperature. In the present disclosure we provide a partitioning means in the form of a two-part drip tray arrangement cooperating with walls of the cabinet chamber in a novel manner to divide the chamber into two compartments so as to enable the maintenance of a temperature gradient between the compartments. The partitioning means is constructed so as to be adjustable for changing or regulating the amount of air circulated from one to the other of the compartments. In Fig. 1 of the drawings a partitioning means generally represented by the reference character 20, carried upon suitable supports or tracks, is disposed below evaporator 18 and divides the insulated cabinet chamber into an upper sharp freezing compartment 21, containing evaporator 18, and a lower food storage chamber 22 provided with a plurality of food supporting shelves 24. Our partitioning means 20 includes a stationary part or drip tray 26 comprising a top wall 27 and a bottom wall 28 having suitable insulating material 29 therebetween (see Figs. 2 and 5). These walls of tray 26 are formed of any suitable molded plastic material and are cemented or secured to one another at the points indicated by the reference character 31 to hermetically seal the insulation 29 therebetween. Top wall 27 of tray 26 is provided with a trough 33 inwardly of its edges 34 and extending entirely around the same. A drain opening 36 is provided in trough 33 for conveying drip water, dripping upon tray 26 from evaporator 18 during defrosting thereof, out of the trough. This stationary part 26 of the partition extends continuously across the insulated chamber of cabinet 10 between the side walls of liner 11 (see Figs. 4 and 5) and extends from a point spaced a substantial distance from the rear wall of liner 11 to a point spaced a short distance from the inner face of door 15 (see Figs. 2 and 3). Part or pan 26 is supported upon horizontal ledges 41 provided on metal brackets 42, each secured to a side wall of liner 11 by screws 43. Brackets 42 are also provided with an upstanding ear 44 at their rear end against which back edge 34 of pan 26 abuts in order to form stops for this pan so as to position same the proper spaced distance from the rear wall of the cabinet chamber. The brackets 42 each have an upper inwardly directed part 45 overlapping the side edges of the pan 26 of partition 20 and holding this pan against vertical movement. The back portion of brackets 42 have a shorter bracket 46 welded or otherwise suitably secured thereto and provided with a horizontal ledge or track portion 47. The ledges or tracks 47 support a movable part of the partition means 20 and this part is in the form of a wide, short molded plastic or the like tray 51, having an integral handle portion 52 and provided with a drain opening 53 (see Fig. 2). Each side portion of tray 51 has an integral extension or lug 54 depending from the bottom wall thereof. The track or ledge portion 47 of the short brackets 46 is provided with a plurality of spaced apart cutout portions or notches 56 for a purpose to be presently described. The lugs 54 on tray 51 fit into horizontally aligned notches 56 so as to retain the

tray in any one of a plurality of moved or adjusted positions. Tray 51 extends continuously across the cabinet chamber intermediate its side walls but has its ends spaced from the liner 11 by brackets 46 (see Fig. 5), at the sides of the chamber to provide openings 61 at the rear corners of the chamber (see Fig. 4).

The front corners of pan 26 are thickened to provide bosses 63 (see Figs. 4 and 6) having an opening 64 therein receiving a pin 66. Each pin 66 pivotally secures a metal bracket 67 to pan 26. The brackets 67 have a flat portion 68 welded or otherwise suitably secured to a front trim cover 69. This cover 69, while being pivotally mounted to pan 26 by brackets 67 and pins 66, normally extends parallel to and spaced from the inner face of door 15 to provide a narrow vertically elongated somewhat restricted passage 71 between partition means 20 and the door 15. Each of the brackets 67 have an inwardly directed ear 72 formed thereon (see Figs. 2 and 4). These ears 72 each have an arm 73 pivotally mounted thereto by a rivet or pin 74. The other end of each arm 73 is pivotally connected to the central part of another arm 77 by a pin or rivet 78. The one end of arms 77 are pivotally connected to the tray 26 by suitable pins or the like 79 (see Fig. 4). The end portion of arms 77, opposite the end secured to pan 26, are provided with an indentation 81 which fits in a cutout portion 82 in arms 73 to form a rigid but foldable brace for normally holding the trim cover 69 in its vertical position as shown in Fig. 2 of the drawings. The arms 73 and 77, together with their linkage pins provide a toggle-like means or movable device which is restrained from movement beyond a certain position by the lug or indentation 81 fitting in the cutout portion or notch 82 and bearing against the wall thereof.

In the structure disclosed the part or pan 26 of partitioning means 20 is described as being stationary yet it is removable at will from the cabinet chamber for facilitating cleaning of the interior of the chamber. The spaces or passages 61 at the rear corners of the cabinet chamber and the space or passage 71 between the trim cover 69 of the partitioning means 20 and the inner face of door 15 provide, when these parts of the partitioning means are in the position shown in Figs. 2 and 4 of the drawings, a limited or restricted flow of air between the two compartments 21 and 22. Incidentally this is the position of various parts of the partitioning means 20 during defrosting of the evaporator 18. In this position of the partitioning means 20 a limited amount of air flows upwardly through the passage 71 adjacent door 15 and over walls of the evaporator 18 (see Fig. 2) where it is cooled and caused to flow downwardly over the two drip pan parts 26 and 51 of the partition 20 toward the rear corners of the chamber. This cooled air then flows through the passages 61, adjacent the ends of drip pan part 51 at the rear corners of the chamber, into the lower food storage compartment 22. This limited air circulation between compartments 21 and 22 is satisfactory under certain conditions but frequently increased circulation is desired. When increased circulation of air between compartments 21 and 22, above the normal limited circulation described, is desired the trim cover 69 at the front end of the partition 20 is moved about its pivotal mounting by raising the arm 77 of the toggle device and moving 75 same in a direction toward and in substantially

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the same horizontal plane with the top of the partition pan part 26 as shown in Fig. 3 of the drawings. When the toggle device is moved as described and as shown in Fig. 3 of the drawings it is received in trough portions 33 along the sides of pan 26. The drip pan part 51 of partition 20 is also moved relative to partition part 26 or away from the chamber rear wall into any one of its adjusted positions, afforded by the notches 56, such, for example, as into the position shown in Fig. 3 of the drawings. While I have shown pan 51 in both of its extreme positions it is to be understood that this pan can be moved into any one of a plurality of intermediate positions to afford the air circulation desired. Thus cover 69 while providing a decorative trim strip for concealing the partitioning means from view of a standing person's eyes also serves to increase or decrease air circulation through the front air passageway 71. The swinging of trim cover 69, as described, to the position illustrated in Fig. 3 of the drawings reduces the vertical elongation of passage 71 and consequently minimizes the restriction to flow of air therethrough. To move the pan part 51, away from the rear chamber wall the handle portion 52 of pan 51 is grasped by the hand and elevated so as to raise the pan and elevate the integral depending projections 54 out of the two rear notches 56 in track or slide 47. This pan 51 is then slid forwardly of the cabinet chamber and again lowered so that the projections 54 will fit into certain other of the notches 56 near the front of the track or slide 47. The circulation of air upwardly from compartment 22 through the passage 71 is therefore no longer a restricted flow through a vertically elongated passage and flow of air downwardly from compartment 21 into compartment 22 is no longer restricted to the chamber rear corners or passages 61 or to a narrow passage along the chamber back wall. Thus with parts of the partitioning means 20 in the position shown in Fig. 3 of the drawings, air may freely flow upwardly through the passage 71 and downwardly between the rear edge of pan part 26 and the chamber back wall to thereby increase the circulation of air above the normal restricted or limited circulation thereof between the compartments 21 and 22. Such increased circulation of air will cause the temperature of the lower food storage compartment 22 to be reduced. It is to be understood that the pan 51 can be slid upon track 47 to any one of a plurality of adjusted positions depending upon the number of notches 56 provided so that the circulation of air around the back of partition 20 and between compartments 21 and 22 can be increased or decreased as desired.

While we have emphasized the changes in temperature that can be maintained within compartment 22 it is to be understood that the adjustability of air circulation is also important from the standpoint of regulating the humidity within compartment 22. For example, the higher temperature maintained in compartment 22 by the restricted amount of air circulating between the compartments 21 and 22 (see Figs. 2 and 4) tends to create a relative high humidity condition within compartment 22, because there is not enough air circulated from compartment 22 over walls of evaporator 18 to cause the removal of any appreciable amount of moisture from the air. Conversely, when the passages about the partitioning means 20 are

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opened or unrestricted to increase the air circulating between the compartments 21 and 22 ample air-flow over the walls of evaporator 18 is provided to remove a greater amount of moisture from the air and consequently a lower relative humidity is prevalent in compartment 22.

A can or receptacle 84 is located on the upper food supporting shelf 24 and the parts of the partitioning means 20 are constructed and arranged to at all times direct drip water flowing from evaporator 18 and received upon or in the pans 26 and 51 into this receptacle. For example, drip water flowing from evaporator 18 upon pan part 26 of partition 20 is directed into the trough 33 and flows from this trough into the pan part 51 by way of the drain opening 36. The arrangement of the pans relative to one another and the location of the drain openings 36 and 53 are such that the pan 51 receives drip water from pan 26, irrespective of its adjusted position along track 47, and directs the drip water into receptacle 84. When water accumulates in receptacle 84 the receptacle is removed from the cabinet chamber and emptied.

It should be apparent from the foregoing that our novel combined drip pan and partitioning means provides an improved refrigerator cabinet wherein the user may quickly and readily regulate or adjust air circulation around the partitioning means and between the compartments on either of two sides thereof. The arrangement of the partitioning means provides an effective defrosting pan which prevents water dripping from the evaporator during defrosting thereof from falling into the lower food storage compartment. The movability of parts of the partitioning means relative to one another also provides a winter and/or summer adjustment for obtaining the proper refrigerating results within the cabinet chamber in accordance with ambient climatic conditions exteriorly of the refrigerator cabinet.

While the cover 69 provides a decorative trim strip for concealing the partitioning means from the view of a person's eyes it also serves to increase or decrease air circulation through the front air-flow passage.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. In combination, a refrigerating apparatus including a cabinet having walls defining a chamber therein provided with an access opening normally closed by a door, a partition dividing said chamber into an upper compartment and a lower compartment, a closed refrigerating system associated with said cabinet and including an evaporator disposed in said upper compartment for cooling and causing circulation of air within said chamber, said partition comprising a stationary part extending continuously across said chamber from one side wall to the other side wall thereof and from a point spaced a short distance from said door to a point spaced a considerable distance from the rear wall of said chamber, said partition also comprising a movable part closing a substantial portion of said space between said stationary part of said partition and said chamber rear wall and having its ends spaced a short distance from said chamber side walls, a trim cover pivotally mounted at the front edge of said stationary part of said partition and extending upwardly therefrom in spaced parallel relation

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to the inner face of said door, the space between said trim cover and said door permitting a normal limited circulation of air upwardly from said lower compartment over said evaporator, the spaces between the ends of said movable part of said partition and said chamber side walls permitting a normal limited circulation of air downwardly from said upper compartment into said lower compartment, and said trim cover being tiltable about its pivotal mounting inwardly toward the face of said partition and said movable part of said partition being slidable away from said chamber rear wall for increasing the circulation of air between said compartments above said normal limited circulation thereof.

2. In combination, a refrigerating apparatus including a cabinet having walls defining a chamber therein provided with an access opening normally closed by a door, means comprising a stationary portion and a movable portion cooperating with one another to form a partition dividing said chamber into an upper compartment and a lower compartment, a closed refrigerating system associated with said cabinet and including an evaporator disposed in said upper compartment, said stationary portion of said partition extending continuously across said chamber from one side wall to the other side wall thereof and from a point spaced a short distance from said door to a point spaced a substantial distance from the rear wall of said chamber, a trim cover pivotally mounted at the front edge of said stationary partition portion and extending upwardly therefrom in spaced parallel relation to the inner face of said door, said movable portion of said partition extending across said chamber intermediate said side walls thereof and substantially closing said space between the back edge of said stationary partition portion and said chamber rear wall, said partition being arranged within said chamber so as to permit a normal limited circulation of air between said compartments through the space intermediate said trim cover and said door, and said trim cover being tiltable about its pivotal mounting inwardly toward the face of said partition and said movable partition portion being slidable away from said chamber rear wall for increasing the circulation of air between said compartments above said normal limited circulation thereof.

3. A refrigerating apparatus comprising in combination, a cabinet including walls defining a chamber therein having an access opening normally closed by a door, a closed refrigerating system associated with said cabinet and including an evaporator mounted in the upper portion of said chamber and being spaced from walls thereof, a horizontal partition below said evaporator dividing said chamber into an upper compartment and a lower compartment, a trim cover pivotally mounted at the front edge of said partition and extending substantially perpendicular therefrom in spaced substantially parallel relation to the inner face of said door, said trim cover cooperating with said door and terminating adjacent the lower front portion of said evaporator to provide a relatively narrow vertically elongated air passage between said compartments, toggle-like means having a connection with said cover and with said partition bracing and maintaining said cover in said position, and said toggle-like means being movable to swing said cover about its pivotal mounting in a direction toward the rear of said partition to locate said cover in substantially the same horizontal plane with said

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partition for reducing the vertical elongation of said air passage.

4. A refrigerating apparatus comprising in combination, a cabinet including walls defining a chamber therein having an access opening normally closed by a door, a closed refrigerating system associated with said cabinet and including an evaporator mounted in the upper portion of said chamber and being spaced from walls thereof, an insulated non-metallic partition below said evaporator dividing said chamber into an upper sharp freezing compartment and a lower food storage compartment, a trim cover pivotally mounted at the front edge of said partition and extending upwardly therefrom in spaced substantially parallel relation to the inner face of said door, said trim cover cooperating with the front bottom portion of said evaporator to conceal the space between said partition and the evaporator, said trim cover also cooperating with said door to provide a relatively narrow vertically elongated passage intermediate said partition and said door for the circulation of air past said partition and between said compartments, toggle-like means having a connection with said cover and with said partition for bracing said cover and maintaining same in said position, and said toggle-like means being movable to swing said cover about its pivotal mounting toward the top face of said partition for reducing the vertical elongation of said air passage.

5. In combination, a refrigerating apparatus including a cabinet having walls defining a chamber therein provided with an access opening normally closed by a door, a single partition dividing said chamber into an upper compartment and a lower compartment, a closed refrigerating system associated with said cabinet and including an evaporator disposed in said upper compartment in spaced relation to said partition for cooling and causing circulation of air within said chamber, said partition comprising a stationary part extending continuously across said chamber and extending from a point spaced from said door to a point spaced from the rear wall of said chamber, said partition also comprising a movable part normally restricting the flow of air between said compartments at the space intermediate said stationary partition part and said chamber rear wall, a trim cover pivotally mounted at the front edge of said stationary partition part and extending upwardly therefrom in spaced relation to the inner face of said door with its upper edge terminating adjacent the lower front portion of said evaporator, the space between said trim cover and said door permitting a limited circulation of air between said compartments, said trim cover being tiltable about its pivotal mounting inwardly within the space between said partition and said evaporator toward said chamber rear wall and downwardly toward the top of said partition, and said partition movable part being slidable away from said chamber rear wall for increasing the circulation of air between said compartments above said normal limited circulation thereof.

6. A refrigerating apparatus comprising in combination, a cabinet including walls defining a chamber therein having an access opening normally closed by a door, a closed refrigerating system associated with said cabinet and including an evaporator mounted in the upper portion of said chamber and being spaced from walls thereof, a single partition spaced from and being substantially horizontally disposed below said

evaporator dividing said chamber into an upper compartment and a lower compartment, a trim cover pivotally mounted at the front edge of said partition and extending substantially perpendicular therefrom in spaced substantially parallel relation to the inner face of said door, said trim cover cooperating with said door and having its upper edge terminating adjacent the lower front portion of said evaporator to provide a relatively narrow vertically elongated air passage between said compartments, and said trim cover being movable within the space between said partition and said evaporator about its pivotal mounting in a direction toward the rear of said partition to swing said cover into substantially the horizontal plane of said partition and thereby reduce the vertical elongation of said air passage.

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