April 5, 1966 G. I. WIESE 3,243,972

REFRIGERATOR CABINET

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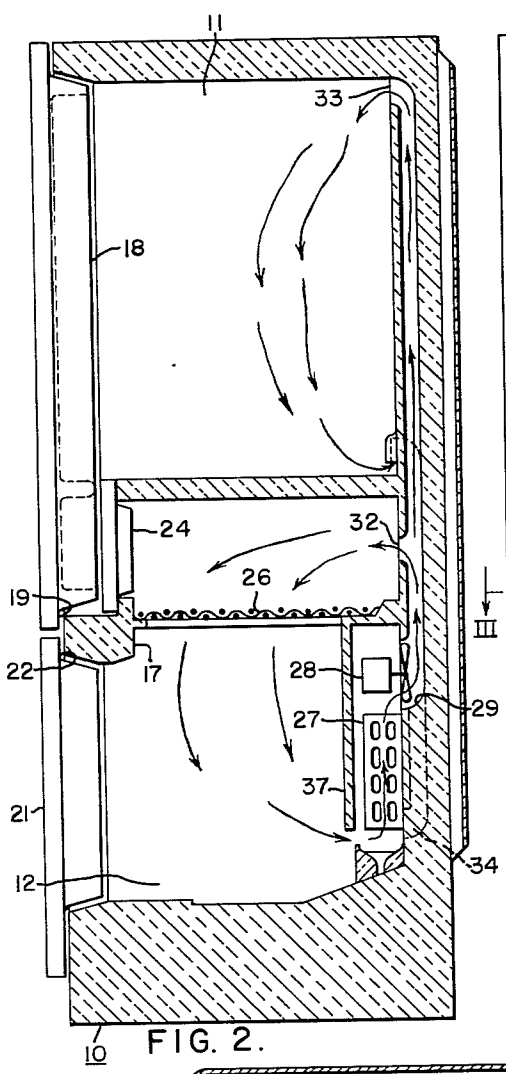

FIG. 2.

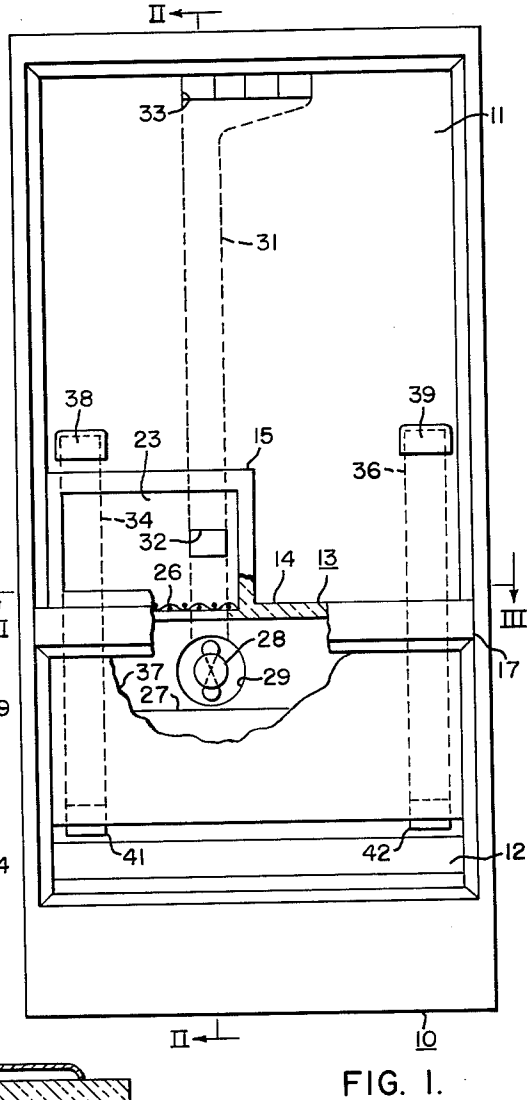

FIG. 1.

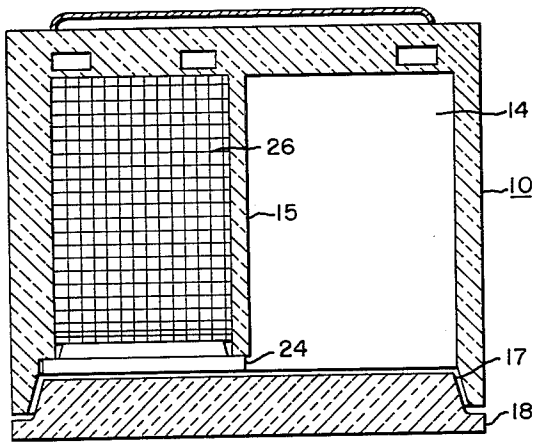

FIG. 3.

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REFRIGERATOR CABINET

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This invention relates to refrigerator cabinet structures and more particularly to a domestic refrigerator cabinet having a plurality of compartments which are maintained at different temperatures.

With the increased need for greater freezer storage space, domestic refrigerators having a separate large frozen food storage compartment have increased in popularity. These refrigerated cabinet structures generally are provided with a closure member for the top, or above, freezing or fresh food compartment, and a separate drawer, or door, for the bottom, or below, freezing or frozen food compartment.

The provision of ice storage, or ice making apparatus in such two compartment refrigerators has heretofore presented numerous problems in that such apparatus or storage space is of necessity provided in the freezer compartment. With the numerous uses for ice cubes, especially during the warm weather, there is a constant opening of the large freezer door or drawer, with entry of warm air to the below freezing compartment and a resultant frost accumulation. In addition, many freezer compartments are located adjacent the bottom of the refrigerator cabinet, requiring the user to stoop when unloading the ice storage facility.

It is therefore an object of the present invention to prevent entry of large amounts of warm air to the freezer compartment when it is desired to obtain ice therefrom.

Another object of the invention is to facilitate removal of ice cubes from a refrigerated cabinet of the domestic type.

A further object of the invention is to provide an ice storage compartment for a domestic refrigerator which is easily accessible to the user, and is readily adaptable to refrigerator freezer cabinets as presently manufactured.

For a better understanding of the invention, reference should be had to the accompanying drawings wherein:

FIGURE 1 is a front elevational view of a refrigerator cabinet showing the invention employed therein and having portions of the structure broken away for clarity;

FIG. 2 is a vertical sectional view taken along line II—II of FIG. 1 showing additional details of the cabinet of FIG. 1; and

FIG. 3 is a transverse sectional view taken along line III—III of FIG. 1 showing a portion of the invention in greater detail.

Referring to the drawings, especially FIGS. 1 and 2, there is shown a refrigerated cabinet of the domestic refrigerator freezer type. The cabinet 10 comprises wall structure defining an upper compartment 11 maintained at above freezing temperatures, and a lower compartment 12 maintained at below freezing temperatures. The upper compartment 11 and lower compartment 12 are separated by a divider wall 13 comprising a horizontal portion 14 and an L-shaped portion 15, both of which extend from the rear wall of the cabinet 10 to the front of the cabinet. A mullion 17 is horizontally disposed across the front of the cabinet 10, and the horizontal portion 14 of the divider wall 13 has its front edge connected thereto.

The front opening of the compartment 11 has a closure member in the form of a hingedly supported door 18 of rectangular shape, having its lower edge 19 disposed adjacent the mullion strip 17 when in the closed position.

The lower compartment 12 is provided with a closure member 21 having its upper edge 22 disposed adjacent the mullion strip 17, and serving to close that portion of the compartment front opening lying below the mullion strip from the outside ambient.

Referring again to FIG. 1, it should be noted that the L-shaped portion 15 of the divider wall 13 defines a small portion 23 of the compartment 12 disposed above the mullion strip 17, which is accessible when the door 18 is in the open position. An inner door 24 is disposed adjacent the forward edge of the L-shaped portion 15 to provide a seal between the air flowing in the lower compartment 12, which is below freezing, and the air flowing through the upper compartment 11 which is at a higher temperature.

To employ the portion 23 of the freezer compartment for ice cube storage or ice making apparatus, there is provided a shelf, in the form of a wire rack 26 horizontally disposed between the compartment portion 23 and the main compartment 12. The use of a wire rack 26 as a shelf member provides openings between the compartment portion 23 and the compartment 12 for the circulation of air therebetween.

As is best shown in FIGS. 1 and 2, the cabinet 10 is provided with a refrigerating system for maintaining the desired temperatures of the compartments 11 and 12, which system includes a heat exchanger in the form of a refrigerant evaporator 27. The refrigeration system is of the compressor-condenser-evaporator type well known in the art, and for the purposes of the present description only the heat exchanger 27 has been shown.

Both compartment 11 and compartment 12 are cooled by the flow of air circulating from the evaporator 27 into the compartments and back to the evaporator in a circuitous path. To transfer air from adjacent the evaporator 27 there is provided an electric fan 28 disposed adjacent an opening 29 in the duct structure 31. The duct structure 31 has a pair of openings 32 and 33 connecting with the portion 23 of the lower compartment and the upper compartment 11 respectively. A pair of return ducts 34 and 36 are provided, one adjacent either side of the compartment 11, for return of air from the compartment to the evaporator 27.

When the fan 28 is in operation, air flow follows the general path indicated by the arrows shown in FIG. 2. Air enters the duct 31 and travels upwardly, some entering the portion 23 of the lower compartment 12 through the opening 32, then travelling downwardly through the wire rack 26 into the main portion of compartment 12. A cover plate 37 is disposed adjacent the evaporator 27 and extends between the side walls of the compartment 12. The cover plate 37 prevents air from flowing directly back through the opening 29, and forces the air to flow downwardly through the compartment 12 and below the lower edge of the cover plate 37 to the evaporator 27. The remainder of the air travelling upwardly through the duct 31 is exhausted into the compartment 11 through the opening 33. Air, after passing downwardly through compartment 11, enters the ducts 34 and 36 through the openings 38 and 39 respectively, and travels downwardly, entering the compartment 12 through the openings 41 and 42 adjacent the evaporator 27.

From the foregoing it should be evident that the various objects of the invention are achieved by the novel cabinet structure disclosed. The portion 23 of the lower compartment provides an ice storage or ice making enclosure which is readily accessible to the user while the freezer compartment door 21 remains in the closed position.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not

so limited, but is susceptible of various additional modifications without departing from the spirit thereof.

What is claimed is:

1. A refrigerator comprising wall structure defining a fresh food compartment and a frozen food compartment, both of said compartments having access openings, and a pair of doors one of which is adapted to close a major portion of the frozen food compartment access opening and the other of which is adapted to close the fresh food compartment access opening and the portion of the frozen food compartment access opening not closed by said one of the pair of doors.

2. A refrigerator comprising wall structure defining a fresh food compartment and a frozen food compartment, said frozen food compartment including a portion for quick freezing of ice cubes and the like, a door for all of the frozen food compartment except the ice cube portion thereof, and another door for the fresh food compartment and the ice cube portion of the frozen food compartment.

3. A refrigerator comprising wall structure defining a fresh food compartment and a frozen food compartment, said frozen food compartment including a portion for quick freezing of ice cubes, a pair of generally rectangular doors for said cabinet, the fresh food compartment and the ice cube portion of the frozen food compartment being located behind one of said doors, and the remainder of said frozen food compartment being located behind the other of said doors.

4. A refrigerated cabinet comprising wall structure defining

a first compartment maintained at above freezing temperatures and having a front opening,

a second compartment maintained at below freezing temperatures and having a front opening,

a door hingedly supported on said cabinet and covering said first compartment front opening,

a closure member for said second compartment front opening, and

said cabinet having a mullion strip disposed between said door and said closure member,

said mullion strip dividing said second compartment front opening such that a portion of said opening is adjacent said door.

5. A refrigerated cabinet comprising wall structure defining

a first compartment maintained at above freezing temperatures and having a front opening,

a second compartment maintained at below freezing temperatures and having a front opening,

said wall structure including a divider wall having an L-shaped portion disposed between said first compartment and said second compartment,

a mullion strip on said cabinet having said first compartment front opening and said L-shaped wall portion disposed on one side thereof and said second compartment opening disposed on the opposite side thereof, and

a rectangular closure member covering said first compartment opening and having one edge adjacent said mullion strip.

6. A refrigerated cabinet comprising wall structure defining

an upper compartment maintained at above freezing temperatures and having a front opening,

a lower compartment maintained at below freezing temperatures and having a front opening,

a horizontal mullion strip disposed on the front of said cabinet,

a closure member for said upper compartment having its lower edge disposed adjacent said mullion strip in the closed position and

said lower compartment having a portion thereof disposed above said mullion and having its front opening adjacent said upper compartment closure member, and

a closure member for said lower compartment having the upper edge thereof disposed adjacent said mullion strip in the closed position.

7. A refrigerated cabinet comprising wall structure defining

an upper compartment maintained at above freezing temperatures having a front opening,

a lower compartment maintained at below freezing temperatures having a front opening,

said wall structure including a divider wall separating said above freezing compartment from said below freezing compartment,

a horizontal mullion strip disposed at the front of said cabinet,

said divider wall including a horizontal portion having the front edge thereof disposed adjacent said mullion strip and

an L-shaped portion disposed above said mullion strip such that a portion of said below freezing compartment is located above said strip, and

a rectangular movable closure member for said upper compartment having a lower edge thereof disposed adjacent said mullion strip when in the closed position such that said above freezing compartment and said portion of said below freezing compartment are accessible when said closure member is in an open position.

8. A refrigerated cabinet comprising wall structure defining

an upper compartment maintained at above freezing temperatures having a front opening,

a lower compartment maintained at below freezing temperatures having a front opening,

said wall structure including a divider wall separating said above freezing compartment from said below freezing compartment,

a horizontal mullion strip disposed at the front of said cabinet,

said divider wall including a horizontal portion having the front edge thereof disposed adjacent said mullion strip and

an L-shaped portion disposed above said mullion strip such that a portion of said below freezing compartment is located above said strip,

a shelf member disposed in said portion of said below freezing compartment and having an opening provided therein for passage of air between said portion and said below freezing compartment,

a rectangular movable closure member for said upper compartment having a lower edge thereof disposed adjacent said mullion strip when in the closed position

and a movable closure member covering the front opening of said portion of said below freezing compartment located rearwardly of said upper compartment closure member.

9. A refrigerated cabinet comprising wall structure defining

a first compartment maintained at above freezing temperatures and

a second compartment maintained at below freezing temperatures,

said wall structure including a divider wall located between said first compartment and said second compartment having an L-shaped portion defining an ice storage portion of said second compartment,

a heat exchanger for cooling said first and second compartments,

duct structure having an opening adjacent said heat exchanger interconnecting with said ice storage portion of said second compartment, and

air translating means for circulating air in a closed path from said heat exchanger through said duct structure, said ice storage portion and said second compartment, to said heat exchanger.

10. A refrigerated cabinet comprising wall structure defining

an upper compartment maintained at above freezing temperatures having a front opening,

a lower compartment maintained at below freezing temperatures having a front opening,

said wall structure including a divider wall separating said upper compartment from said lower compartment,

a horizontal mullion strip disposed at the front of said cabinet,

said divider wall including a horizontal portion having the front edge thereof disposed adjacent said mullion strip and

an L-shaped portion disposed above said mullion strip such that a portion of said lower compartment is located above said strip,

a shelf member disposed in said portion of said lower compartment and having an opening provided therein for passage of air between said portion and said lower compartment,

a heat exchanger for cooling said upper and lower compartment,

duct structure having an opening adjacent said heat exchanger interconnecting with said lower compartment portion,

air translating means for circulating air in a closed path from said heat exchanger through said duct structure to said lower compartment portion, and through said opening in said shelf to said lower compartment and said heat exchanger.

References Cited by the Examiner

UNITED STATES PATENTS

2,080,239	5/1937	Summers	62—443
2,430,456	11/1947	Dailey	62—334
3,133,423	5/1964	Devery	62—419

FOREIGN PATENTS

1,237,138	6/1960	France.

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