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C. R. D'OLIVE ET AL

2,285,701

REFRIGERATOR

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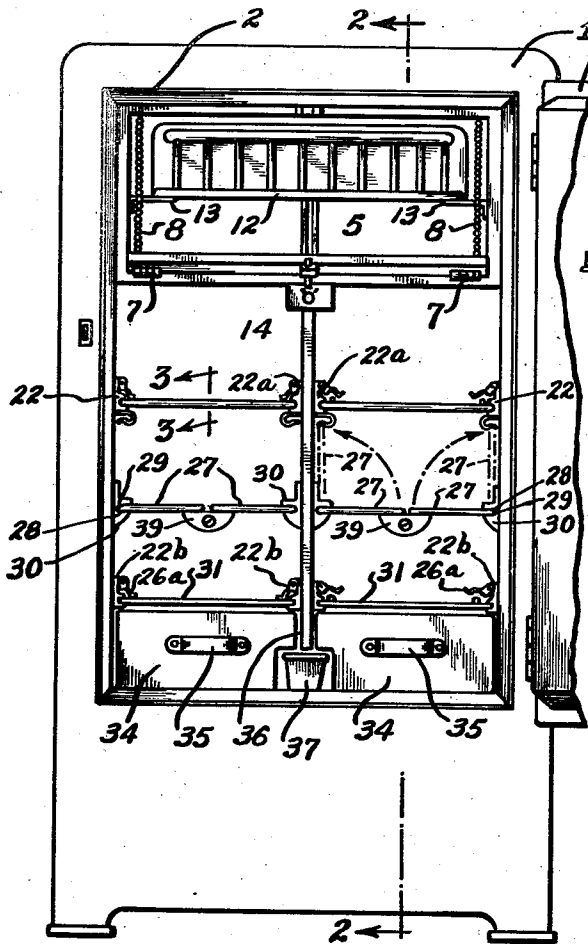


FIG. 1.

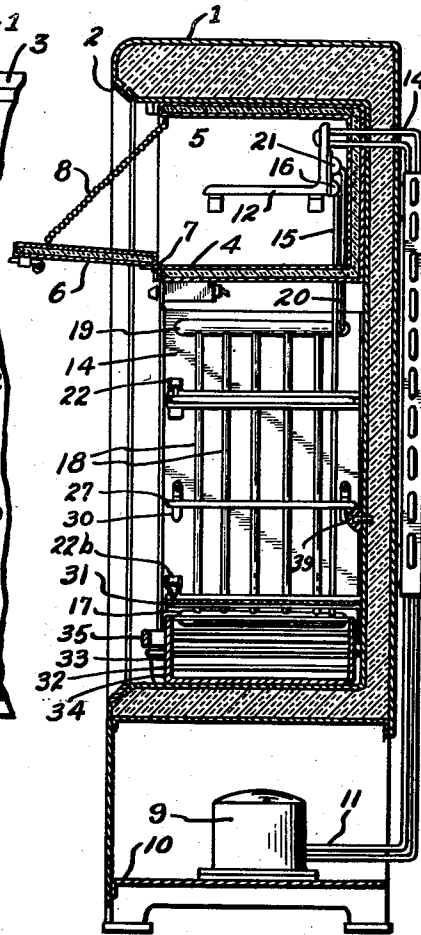


FIG. 2.

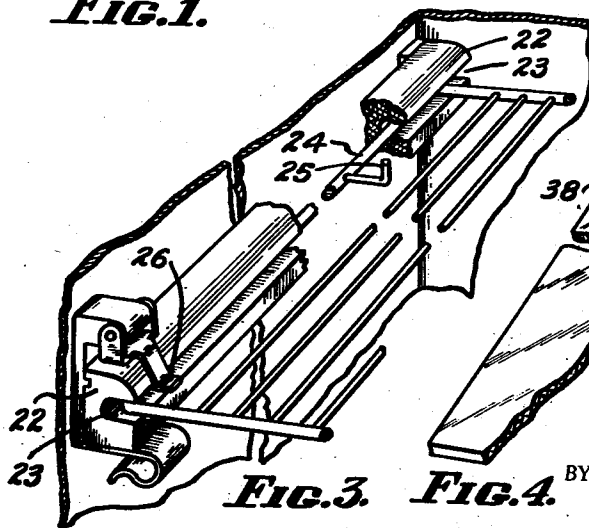


FIG. 3.

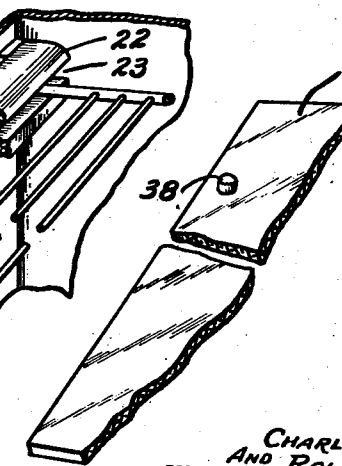


FIG. 4.



FIG. 5.

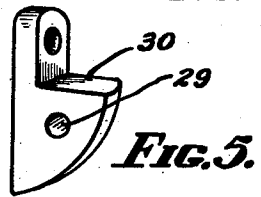


FIG. 6.

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REFRIGERATOR

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Application August 2, 1939, Serial No. 288,002

7 Claims. (Cl. 62—116)

This invention relates to refrigerators, and more particularly to two-temperature refrigerators wherein a certain portion of the space within the refrigerator is maintained at a considerably lower temperature than the other portion of the space within the refrigerator.

There has been considerable development in various types of refrigerators wherein a cold compartment is chilled by the direct expansion of refrigerant gas in an evaporator associated with the cold compartment and wherein a secondary system is established from the evaporator to another portion of the refrigerator wherein evaporating coils are positioned so that the space may be maintained at a different temperature than in the cold or freezing compartment.

Ordinarily the refrigerating system having its evaporator in a casing insulated from the main body of the refrigerator is called the primary system. The secondary system has its evaporator exposed within the refrigerator proper with its condenser element in thermal contact with the evaporator of the primary system, and it will be understood that this secondary system is normally arranged for unthrottled cycling under the sole influence of the heat of liquid refrigerant therein. Thus the secondary system is maintained in operation by the condensation of the refrigerant gases by means of the abstraction of heat therefrom by the evaporator of the primary system.

Such an application is described in the Money and Craig application, Serial No. 284,676 filed July 15, 1939, and it is toward improvements in the construction of such refrigerators that the invention set forth herein is directed.

It is an object of our invention to provide an evaporator extending medially down through the middle of the refrigerator casing so that there will be an equal distribution of cooling effect on both sides of the partition and so that the bottom coil or header of the evaporator will extend down below the main body of the refrigerator and chill compartments in the lower end of the box which are maintained as moist compartments.

It is a further object of our invention in connection with such an extension of the secondary coil or evaporator of the refrigerator to provide a drip pan which will catch the water condensed on the surface of the lower end of the evaporator without flooding the box.

It is a further object of our invention to provide a novel shelf construction which will be adaptable for adjustment and replacement with

a minimum of effort, and which will at the same time be thoroughly sturdy and inexpensive to construct.

The foregoing objects, and other objects to which reference will be made in the ensuing description, we accomplish by that certain combination and arrangement of parts of which we have shown a preferred example.

Referring to the drawing:

Figure 1 is a front elevation of a refrigerator illustrating our invention.

Figure 2 is a sectional view of the refrigerator shown in Figure 1 taken along the line 2—2 of Figure 1.

Figure 3 is a perspective detail view showing a preferred manner of mounting the shelves within the main body of the refrigerator.

Figure 4 is a detail fragmentary view of the bottom shelf which subdivides the main body of the refrigerator from the moist compartments located in the bottom of the box.

Figure 5 is an enlarged perspective view of a lug for supporting a hinged shelf such as is shown in the combination illustrated.

Figure 6 is an enlarged perspective view of a back wall supporting lug.

The refrigerator illustrated comprises a casing 1 having a front opening 2 with a hinged door 3 arranged to close the front opening.

An insulated panel 4 extends out from the back wall forming a cold compartment 5 in the top part of the box for the primary refrigerating system and its evaporator.

The cold compartment is closed by means of an insulated door 6 mounted on a horizontal hinge 7 and with chains 8 for limiting the downward movement of the insulated door 6.

The primary refrigerating system in the embodiment of the invention illustrated has a compressor 9 located in the bottom of the refrigerator, the compressor and assembly being mounted on a shelf 10.

Compressed gas passes through the conduit 11 to a condenser of suitable type which may be mounted at the rear of the casing 1 as indicated in Fig. 2, and thence to the evaporator 12 which is supported on brackets 13. The suction line to the compressor is illustrated at 14.

The cold chamber evaporator has a shelf-like construction which makes it possible to place aluminum ice cube trays in metal-to-metal contact with the walls of the evaporator. Below the shelf-like extension of the evaporator there is a chamber within which ice cream may be frozen or other frozen foods or confections pre-

pared. The details of the various elements of the refrigerating system are not given as they form no particular part of this invention.

The main body of the refrigerator in which foods to be maintained at a normal temperature slightly above freezing is indicated at 14, the space being subdivided and made accessible for storage of various articles by shelving which will be subsequently described.

A discharge for the secondary refrigerating system evaporator is indicated at 15, the refrigerant fluid passing to the conduit 15 from a header 16 of a secondary condenser disposed in thermal contact with the primary evaporator 12 as described and claimed in the copending application of Money and Craig above referred to. The secondary system evaporator consists of two metal plates welded together and having cavities arranged between the plates to permit the flow of the refrigerant gases. Referring to Figure 2, a bottom header 17 is formed into which the refrigerant fluid passes from the conduit 15.

The refrigerant fluid expands up through the recessed portions 18 to the top header recess 19 from which a conduit 20 returns to the primary evaporator through the header 21 in the secondary condenser.

As illustrated, the medially upright evaporator forming the cold producing means for the secondary cooling system subdivides the main storage portion of the refrigerator into two compartments.

Referring to the detailed drawing in Figure 3, we have shown wall brackets 22 which preferably are of hard rubber or Bakelite and which have grooves 23 therein into which the end bars 24 of shelf assemblies are housed.

The shelf assembly illustrated in Figure 3 has a stop 25 which abuts against a latch 26 when the shelf assembly is withdrawn from its normal position in the box. The stop 25 prevents the shelf from being drawn clear out of the box, and is a convenient arrangement when it is desired to clean the various parts of the box. If it is desired to completely remove the shelf assembly, the latch 26 is elevated which permits the stop bar 25 to pass underneath the latch. In this position of adjustment the shelf assembly may be completely withdrawn from the box.

Arranged along and riveted or bolted to the secondary evaporator walls we have shown the brackets 22a which serve the same purpose as the brackets 22 excepting that they provide the supports for the inner bars of the upper shelf assembly.

Below the slidable shelf assembly illustrated in Figure 3 we have shown hinged shelf-like members 27 having end bars 28 which pass through openings 29 in the bracket lugs 30. These lugs are secured to the outer side walls of the box and along the medially arranged secondary evaporator. As illustrated in Figure 1 these shelves may be swung upwardly to provide spaces for taller articles than will be received between the shelves, such as milk bottles or soft drink bottles.

At the bottom of the refrigerator the lugs 22b are arranged to support slidable glass panels 31 which insulate the bottom compartments 32 within which we have shown pans 33 which provide moist compartments.

It will be observed that the lugs 22a and 22b arranged along the refrigerator walls and the secondary evaporator casing together with the

glass plates 31 insulate the chambers 32 from the refrigerator proper.

These moist compartments are provided with food storage baskets 34 having handles 35 by which the baskets may be withdrawn from the refrigerator.

The lower end of the medially arranged secondary evaporator 36 forms a little independent refrigerating system in the lower compartment. When moisture condenses on the lower end 36 of the medially arranged secondary evaporator, a pan 37 is provided to catch the drip.

The glass panels 31 which insulate the moist compartments in the base of the refrigerator have stops 38 which abut against latches 26a of the lugs 22a and 22b, and which may be elevated to permit the glass panels to be withdrawn for cleaning.

In the case of the intermediate shelves 27 which are pivoted at the sides to swing upwardly, we have shown brackets 39 formed of Bakelite or hard rubber which support the inner ends of the shelves when they are lowered to receiving position.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a refrigerator having a primary refrigeration system including an evaporator, an insulated compartment in which said evaporator is located, a closed secondary system including a condenser arranged in thermal contact with the primary system evaporator, and an evaporator located in the main compartment within the refrigerator outside of said insulated compartment, said evaporator forming a vertically extending medial wall in said main compartment, and having a lower end extending beyond said main compartment and insulated therefrom, and moist compartments arranged alongside of said extension of said evaporator.

2. In a two-temperature refrigerator having an insulated freezing compartment which contains an evaporator of a primary refrigeration system, a closed secondary system which contains an evaporator which extends beyond the freezing compartment medially down the refrigerator subdividing the refrigerator into two cold compartments, and a moist compartment below said two cold compartments, said secondary system evaporator having its lower end extending down into the space occupied by said moist compartment.

3. In a two-temperature refrigerator having an insulated freezing compartment which contains an evaporator of a primary refrigeration system, a closed secondary system which contains an evaporator which extends beyond the freezing compartment medially down the refrigerator subdividing the refrigerator into two cold compartments, and a moist compartment below said two cold compartments, said secondary system evaporator having its lower end extending down into the space occupied by said moist compartment and subdividing said moist compartment into two compartments.

4. In a two-temperature refrigerator having an insulated freezing compartment which contains an evaporator of a primary refrigeration system, a closed secondary system which contains an evaporator which extends beyond the freezing compartment medially down the refrigerator subdividing the refrigerator into two cold compartments, and a moist compartment below said two cold compartments, said secondary sys-

tem evaporator having its lower end extending down into the space occupied by said moist compartment, and panels of non-conducting material arranged horizontally between said secondary system evaporator and the side walls of the refrigerator, thereby insulating said moist compartment.

5. In a two-temperature refrigerator, a primary system having an evaporator and a condenser, a secondary system comprising a condenser in heat exchange relationship with the evaporator of the primary system and also comprising an evaporator extending vertically within the interior of the refrigerator, and shelves of insulating material secured between said secondary evaporator and the side walls of the refrigerator at a point only slightly above the lowermost portion of said evaporator whereby there is formed in the lower part of the refrigerator a substantially independent moist compartment from which heat is extracted only by the lower portion of said secondary evaporator.

6. In a two-temperature refrigerator, a primary system having an evaporator and a condenser, a secondary system comprising a condenser in heat exchange relationship with the evaporator of the primary system and also comprising an evaporator extending vertically within the interior of the refrigerator, and a pair of

glass shelves secured between said secondary evaporator and the side walls of the refrigerator at a point somewhat above the lowermost portion of said evaporator whereby there is formed in the lower part of the refrigerator a pair of moist compartments from which heat is extracted only by the lower portion of said secondary evaporator.

7. In a two-temperature refrigerator, a primary system having an evaporator and a condenser, a secondary system comprising a condenser in heat exchange relationship with the evaporator of the primary system and also comprising an evaporator extending vertically within the interior of the refrigerator, shelves of insulating material secured between said secondary evaporator and the side walls of the refrigerator at a point somewhat above the lowermost portion of said evaporator whereby there is formed in the lower part of the refrigerator a substantially independent moist compartment from which heat is extracted only by the lower portion of said secondary evaporator, and means disposed below said secondary evaporator for catching the drip therefrom and serving to maintain humid conditions within said compartment.

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