

Jan. 22, 1946.

D. E. DAILEY

2,393,238

REFRIGERATOR

Filed Feb. 26, 1944

2 Sheets-Sheet 1

Fig. 1.

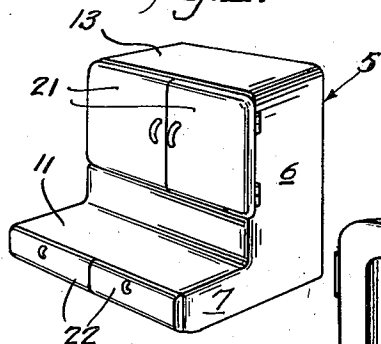
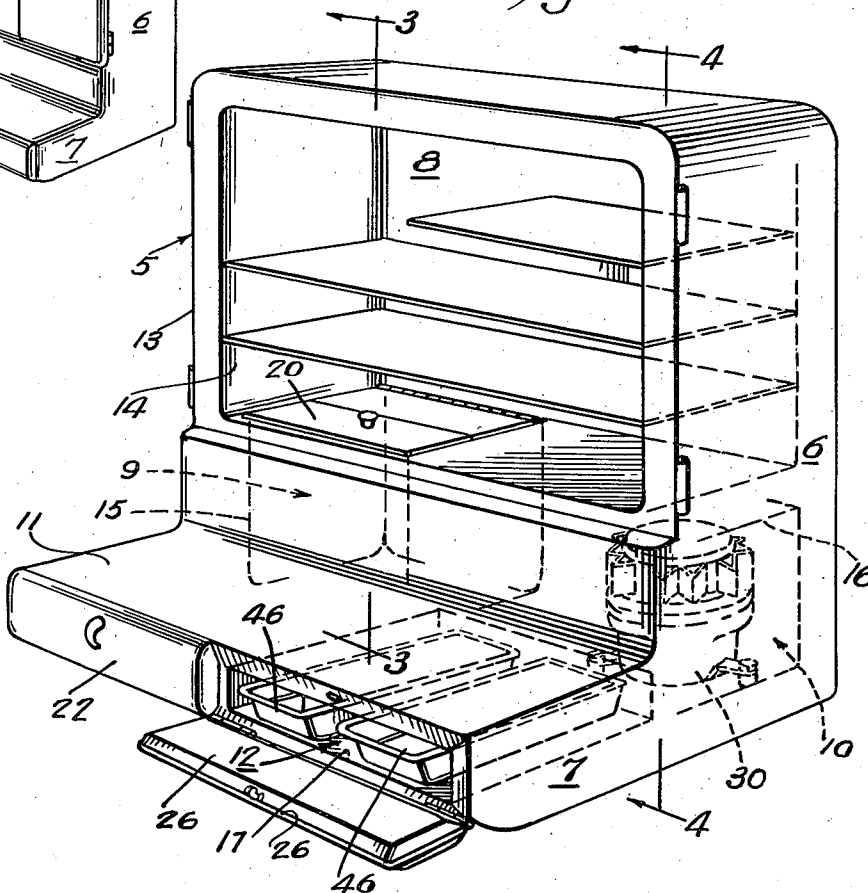


Fig. 2.



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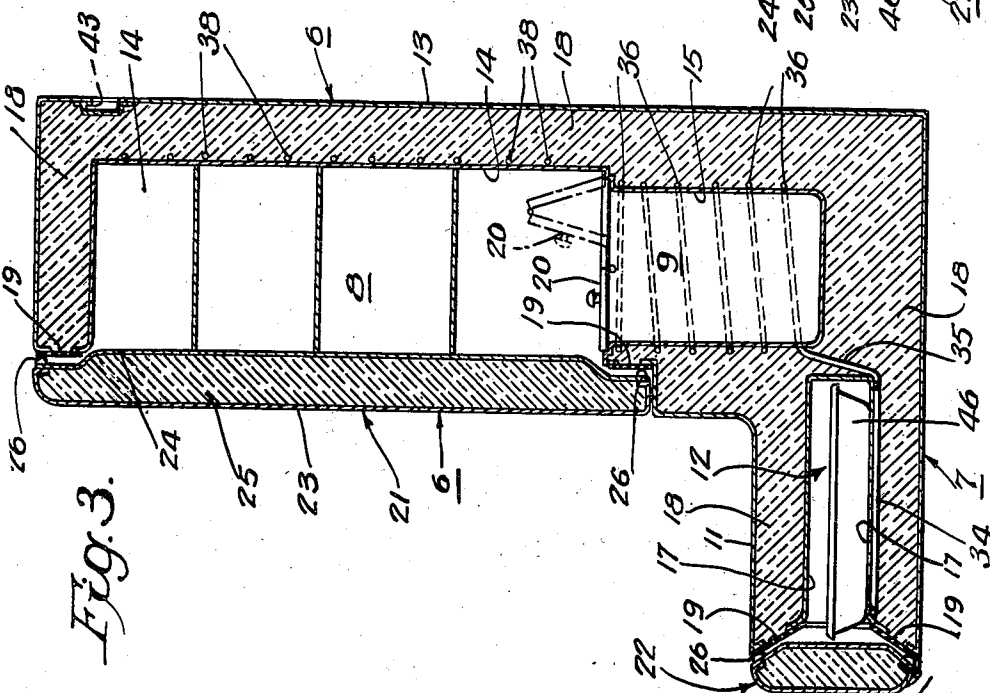
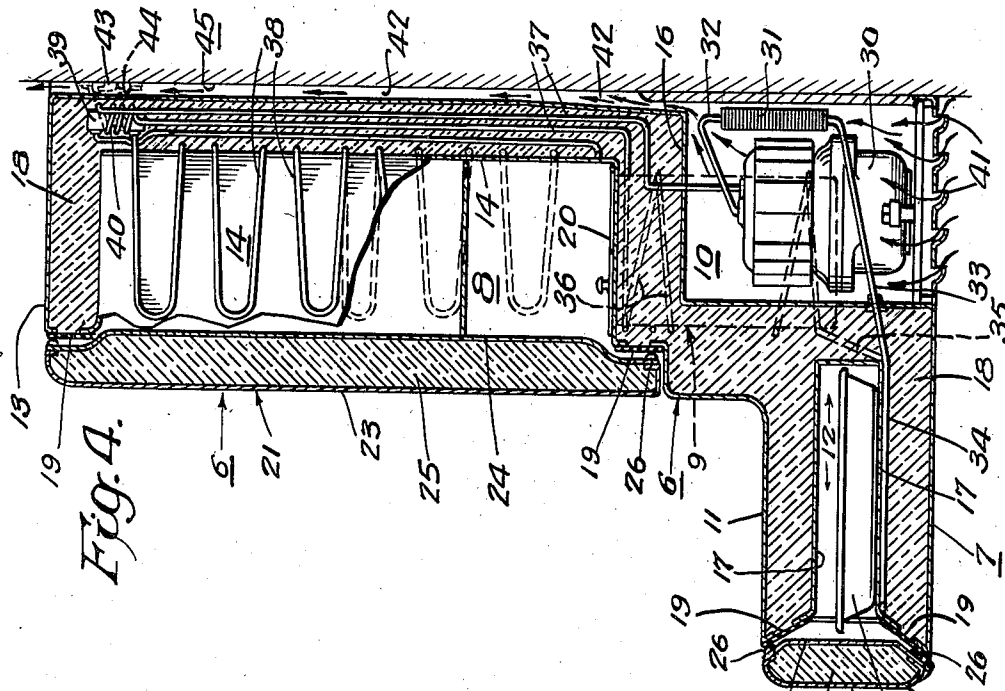
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,393,238

REFRIGERATOR

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12 Claims. (Cl. 62—89)

The present invention relates to refrigerators, and particularly to household refrigerators of the type embodying multiple cooling compartments.

More specifically, the invention pertains to improvements in the cabinet construction and compartment arrangement of a refrigerator of the kind mentioned, which improvements are designed to increase the usefulness and practicability of the refrigerator.

It is the primary object of the invention to provide a refrigerator devised to harmonize with modern kitchen cabinet units and to take up a minimum amount of space, while affording ample area for the storage of food and, in general, satisfying the requirements of a refrigerator of the stated type.

It is also an important object of the invention to provide a refrigerator cabinet capable either of being suspended on a wall or supported on a separate base, thereby providing a structure which lends itself most advantageously to general planning of modern kitchens.

Another and more specific object of the invention is to provide a hanging refrigerator structure embodying a relatively high temperature compartment for the storage of ordinary food, a relatively low temperature compartment for the storage of frozen food, and a fast freezing compartment for making ice cubes or the like, said compartments being respectively disposed to obtain the maximum efficiency for the particular purpose for which they are intended, said compartments further being arranged to afford sufficient storage space for their individual requirements without necessitating undue enlargement in the overall dimensions of the cabinet.

The invention is specially characterized by the provision of a refrigerator cabinet having a generally L-shaped cross-sectional configuration, the upright or vertical portion of said cabinet constituting a food storage area as well as providing a housing for the refrigerator unit, and the horizontal portion of the cabinet forming a worktable surface and affording a compartment for housing a low temperature evaporator element thus providing a convenient accessible area for the reception and storage of ice trays or the like.

Other objects and advantages of the invention will become apparent to those skilled in the art from the following detailed description based upon the accompanying drawings in which:

Fig. 1 is a perspective view on a greatly reduced scale illustrating the external structure of a refrigerator constructed in accordance with this invention;

Fig. 2 is a view similar to Fig. 1 but drawn on a larger scale with certain parts removed and other parts open to show the internal structure of the refrigerator;

Fig. 3 is a vertical cross-section taken substantially on line 3—3 of Fig. 2; and

Fig. 4 is a vertical cross-section taken substantially on line 4—4 of Fig. 2.

Referring more particularly to the drawings, there is shown therein a refrigerator cabinet designated in its entirety by the reference character 5. In accordance with the present invention, the cabinet 5 has a generally L-shaped cross-sectional configuration comprising an upright or vertical portion 6 and a horizontal forwardly extending portion 7, the upright vertical portion 6 defining a food storage compartment 8, a well-type storage compartment 9, and a motor-compressor housing 10; and the horizontal forwardly extending portion 7 providing a work surface 11 and containing an ice freezing compartment 12.

In the embodiment shown, an outer metallic shell 13, having the general shape indicated, forms the outside of the cabinet 5; an inner metallic liner 14 mounted within the shell 13 in spaced relation thereto defines the main food storage compartment 8; a metallic well-like member 15 located to one side of the cabinet below the main food storage compartment 8 and opening at the bottom of said compartment, forms the well-type storage compartment 9; a reentrant metallic wall portion 16 disposed at the other side of the cabinet and below the main food compartment 8 forms the motor-compressor housing 10; and, a substantially rectangular metallic lining 17 mounted forwardly of said well-like member 15 and reentrant portion 16 and supported within the horizontal portion 7 of the cabinet in spaced relation thereto, defines the ice freezing compartment 12.

The spaces between the outer shell 13 and the inner liner 14, the well-like member 15, the reentrant wall portion 16 and the rectangular lining 17, as well as the spaces between said reentrant wall portion and said inner liner and rectangular lining, are filled with suitable insulating material 18, and the gaps between the outer shell 13 and the inner liner 14 at the open front of the main food storage compartment 8 and of the ice compartment 12 are sealed by means of breaker-strips 19 (Figs. 3 and 4).

The top-access opening of the well-type storage compartment 9 is closed by means of a cover 20 preferably consisting of a plurality of hinged sections, as best shown in Figs. 2 and 3; whereas the open front of the food storage compartment 8 is preferably closed by means of laterally swinging door or doors 21, and the open front of the ice tray compartment 12 may, as shown, be closed by means of a downwardly swinging door or doors 22. The doors 21 and 22 may be and preferably are of the conventional construction including interconnected outer metallic panels 23 and inner nonmetallic panels 24 having suitable insulating material 25 therebetween

and provided with gasket strips 26 arranged to seal the access openings to said compartments 8 and 12.

These compartments 8 and 12 and the well-type storage compartment 9 are cooled by operation of suitable refrigerating means. Preferably a primary refrigerating system is used to cool the ice tray compartment 12 and the well-type storage compartment 9, and a closed secondary system utilized to cool the main food storage compartment 8.

In the arrangement more clearly shown in Fig. 4, a motor-compressor 30 and a condenser 31, in communication therewith through a pipe 32, are suitably mounted within the housing 10. Leading from the condenser 31, is a liquid line 33 which discharges into a series of cooling coils 34 arranged in heat exchange relationship with the lining 17 defining the ice tray compartment 12. The series of cooling coils 34 communicate directly through an extension 35 with a second series of cooling coils 36 wound about and in heat exchange relation with the metallic well-like member 15 forming the well-type storage compartment 9. A return line 37 connects the second series of cooling coils 36 and a motor-compressor 30 thus completing the circuit of the primary refrigerating system.

In the arrangement more clearly shown in Fig. 4, the secondary system utilized to cool the main food storage compartment 8 comprises an evaporator portion consisting of a series of coils 38 in heat exchange relation with the back and side walls of the metallic inner liner 14 defining said compartment 8. The series of cooling coils 38 communicates with a secondary condenser portion 39 located above said coils and conveniently arranged in heat exchange relation with the primary system, preferably with the return line 37 thereof which, for that purpose, may have a coil section 40 wound about said secondary condenser portion. The association and operation of the primary-secondary system of the above-described type are well-known in the art and form no part of the invention, and accordingly, a detailed description of the construction and operation thereof may be dispensed with herein.

However, it is pointed out that according to the present invention means is provided to effect proper cooling of the motor-compressor 30 and condenser 31 and for that purpose louvers 41 are formed in the bottom of the housing 10 below said unit and a duct 42 extends upwardly from the top of said housing and along a corresponding portion of the back of the cabinet thus providing a path for the free circulation of air within said housing 10.

Also, according to this invention, the cabinet is provided with suitable recesses, preferably bayonet slots as indicated at 43, disposed for engagement with hangers 44 on a wall 45 or the like so that the cabinet may be supported in hanging position.

In use, the cabinet 5 may be hung on the wall in the manner above stated, or may be supported on a separate base such as a table, kitchen base-cabinet or the like. It is to be noted that in mounting the cabinet care should be taken to provide sufficient clearance for an ample supply of air to and adequate circulation within the motor-compressor housing 10.

It will be understood that the refrigerator cabinet, when supported in position, should be so located that the work surface 11 will be at the

proper level so that said surface may be utilized to advantage when placing or removing the food in or out of the cabinet. It will further be appreciated that the work surface 11 becomes useful in providing additional area for the preparation of food, etc.

The particular construction of the cabinet provides a compartment arrangement which will satisfy ordinary needs for the storage of various types of foods to the best advantage. Thus, the main storage compartment 8 provides adequate space and is most suitable for the storage and preservation of ordinary food; the well-type storage compartment is most convenient for the storage and preservation of frozen foods; and the forwardly extending ice tray compartment 12 beneath the work surface portion 11 is most suitably situated for convenient handling of the ice trays indicated at 46 in the drawings. Moreover, the location and arrangement of the ice tray compartment 12 is such that it does not interfere with the space afforded for the storage of ordinary or frozen foods in their respective compartments 8 and 9.

It is believed that the invention, the mode of construction and assembly of its physical embodiment, and its advantages will be readily understood from the foregoing without further description; and it is to be understood that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are capable of wide variations within the scope of the appended claims.

I claim:

1. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a refrigerated main food compartment and a refrigerated well-type compartment below said main food compartment, and said horizontal portion forming a work surface below the main food compartment and forwardly of the well-type compartment and housing an evaporator element so as to provide a refrigerated area within said last-mentioned portion, and means for supporting said cabinet in an elevated position.

2. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing; and said horizontal portion providing a work surface and containing an ice compartment beneath said surface.

3. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment in the upper and major section thereof and a well-type storage compartment in the lower and minor section thereof, and said horizontal portion providing a work surface below said food compartment and forwardly of said well-type compartment and containing an ice tray compartment beneath said surface.

4. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a main food compartment and a well-type compartment, said hori-

zontal portion forming a work surface below the main food compartment and forwardly of the well-type compartment and containing an ice tray compartment beneath said surface, a primary refrigerating system associated with said well-type compartment and said ice tray compartment for cooling the same, and a secondary refrigerating system in heat exchange relation with said primary refrigerating system and associated with the main compartment for cooling the latter.

5. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a main food compartment and a well-type compartment, said horizontal portion forming a work surface below the main food compartment and forwardly of the well-type compartment and containing an ice tray compartment beneath said surface, a primary refrigerating system associated with said well-type compartment and said ice tray compartment for cooling the same, and a secondary refrigerating system in heat exchange relation with said primary refrigerating system and associated with the main compartment for cooling the latter, and means on said cabinet for supporting the same in elevated position and clear of an opposed underlying surface.

6. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing; said horizontal portion providing a work surface below the food storage compartment and forwardly of the well-type storage compartment and containing an ice tray compartment beneath said surface, and refrigerating means cooperatively associated with said compartments for cooling the same and including a motor-compressor and condenser mounted within said housing.

7. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing; said horizontal portion providing a work surface below the food storage compartment and forwardly of the well-type storage compartment and containing an ice tray compartment beneath said surface, refrigerating means cooperatively associated with said compartments for cooling the same and including a motor-compressor and condenser mounted within said housing, and means in the cabinet for admittance and circulation of air within said housing to cool the motor compressor and condenser therein.

8. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing; said horizontal portion providing a work surface below the food storage compartment and forwardly of the well-type storage compartment and containing an ice tray compartment, refrigerating

means cooperatively associated with said compartments for cooling the same and including a motor-compressor and condenser mounted within said housing, and means on the cabinet for supporting the same in elevated position above an opposed underlying surface.

9. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing, said horizontal portion providing a work surface below the food storage compartment and forwardly of the well-type storage compartment and containing an ice tray compartment, refrigerating means cooperatively associated with said compartments for cooling the same and including a motor-compressor and condenser mounted within said housing, means in the cabinet for admittance and circulation of air within said housing to cool the motor-compressor and condenser therein, and means on the cabinet for supporting the same in elevated position above an opposed underlying surface.

10. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said vertical portion containing a food storage compartment, a well-type storage compartment, and a motor-compressor housing; said horizontal portion providing a work surface below the food storage compartment and forwardly of the well-type storage compartment and containing an ice tray compartment, refrigerating means cooperatively associated with said compartments for cooling the same and including a motor-compressor and condenser mounted within said housing, means in the cabinet for admittance and circulation of air within said housing to cool the motor-compressor and condenser therein, and means on said cabinet for suspending the same in elevated position from a wall structure.

11. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, different areas of said cabinet being occupied respectively by a well-type storage compartment, a refrigerating-apparatus compartment, and a refrigerated main food storage compartment, the latter compartment occupying an area of the said vertical portion of the cabinet, said horizontal portion forming a work surface and including an area providing a compartment beneath said surface for the freezing of water and food.

12. In a refrigerator, a cabinet of generally L-shaped cross-sectional configuration comprising a substantially vertical portion and a forwardly extending substantially horizontal portion, said cabinet including an area in said vertical portion providing a refrigerated main food storage compartment and an area providing a refrigerated well-type compartment disposed at a level below said food storage compartment, said horizontal portion forming a work surface below and forwardly of the main food compartment and including an area providing a freezing compartment beneath said surface.

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