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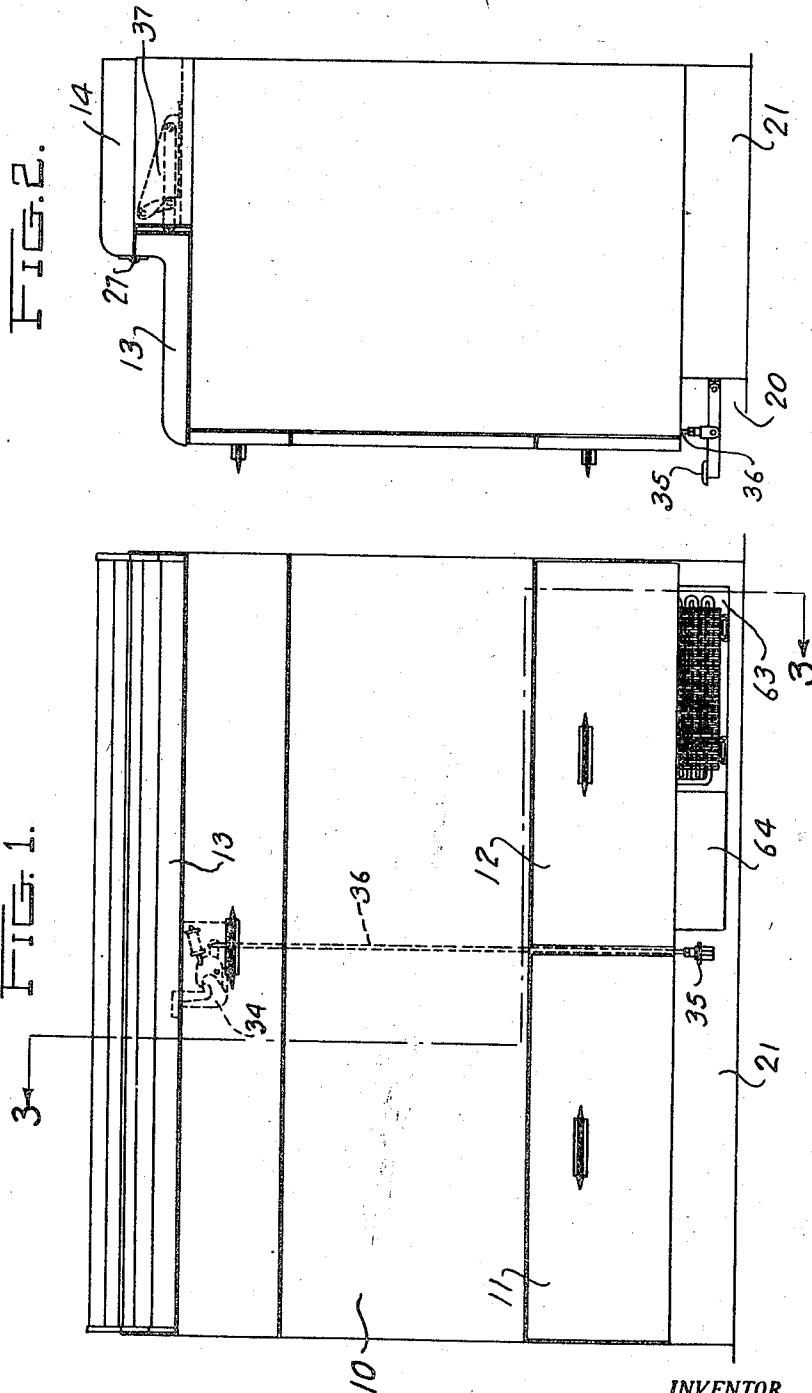
J. H. BENSON

2,446,322

TOP ACCESS REFRIGERATOR CABINET

Filed March 16, 1945

3 Sheets-Sheet 1



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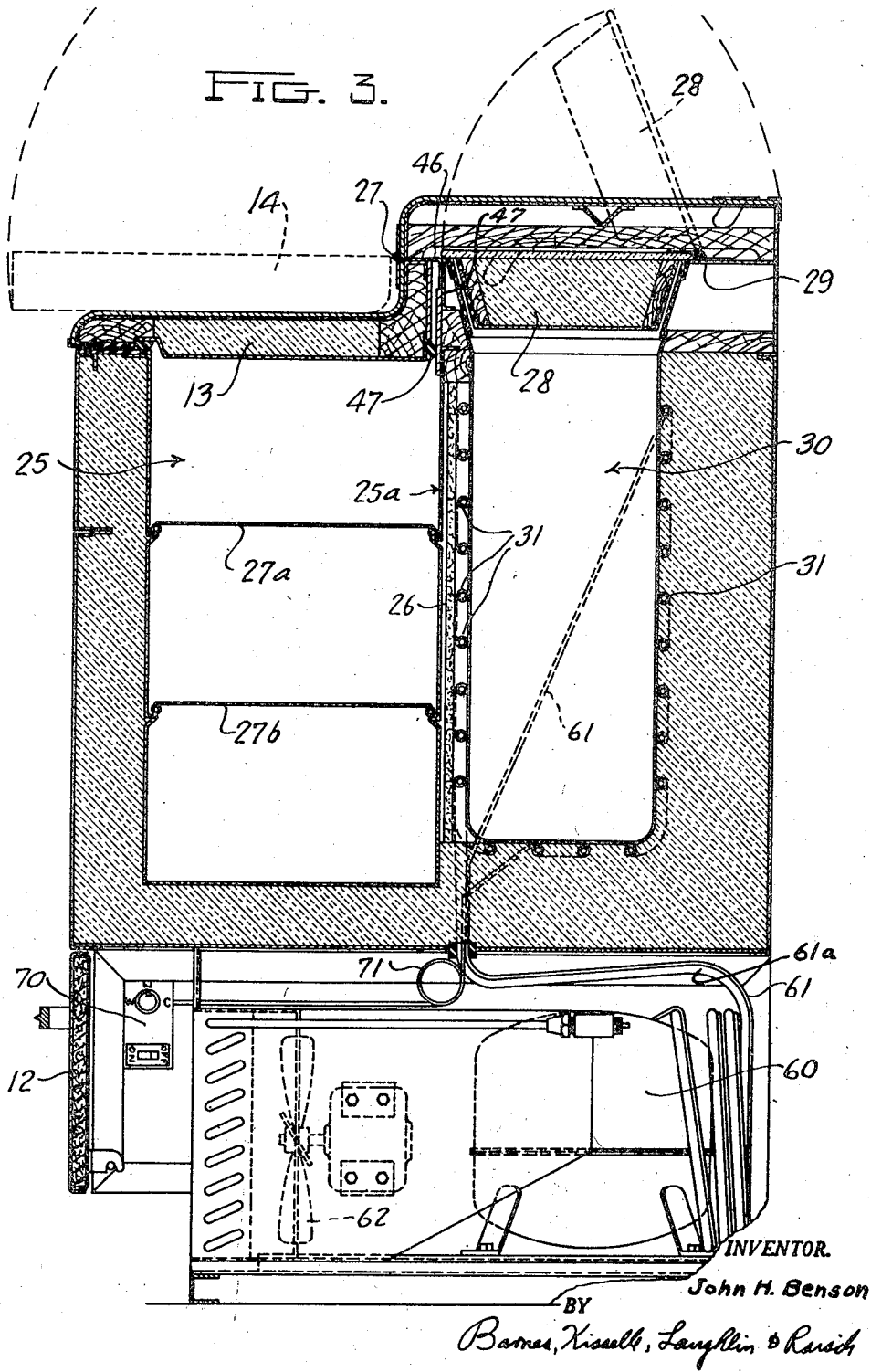
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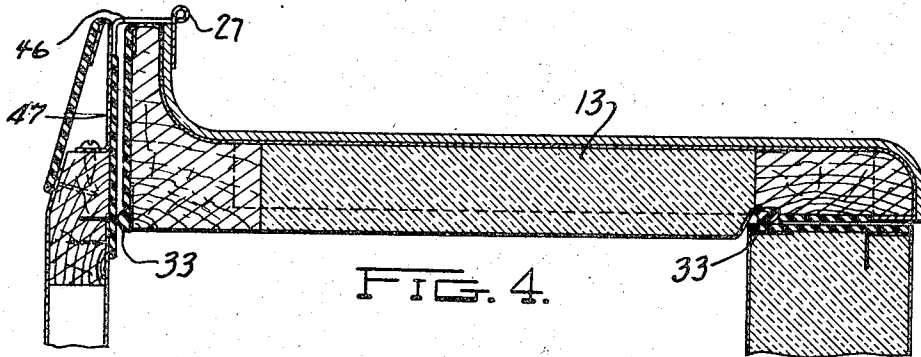


FIG. 4.

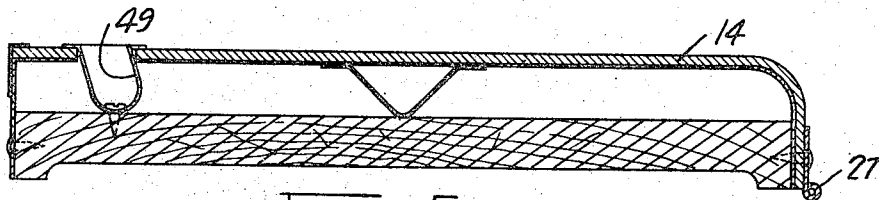


FIG. 5.

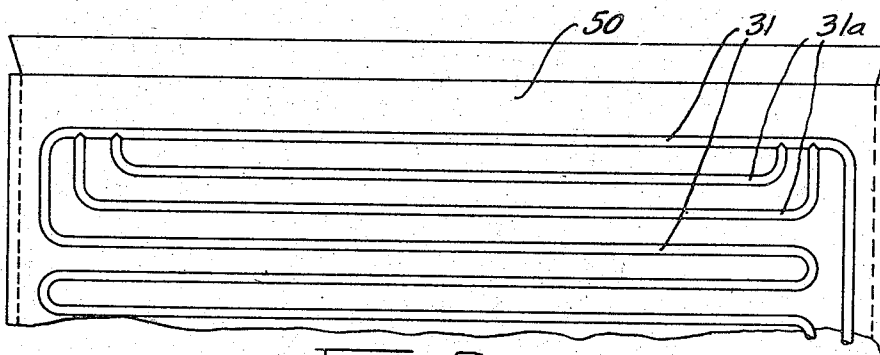


FIG. 6.

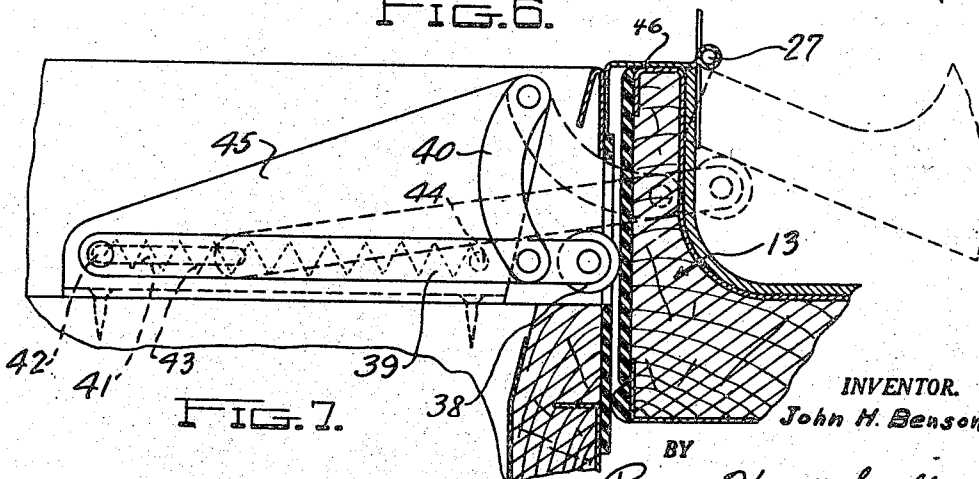


FIG. 7.

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TOP ACCESS REFRIGERATOR CABINET

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5 Claims. (Cl. 62-89)

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This invention relates to a refrigerator structure and has particularly to do with a refrigerator cabinet for domestic use.

In the present type of single door refrigerator, a great loss of efficiency results from the fact that the entire door must be opened when any small article is desired from the refrigerator. The present invention contemplates a refrigerator construction and several compartments separately accessible but all using the same compressor and evaporator unit as the medium of cooling. It is an object to provide a freezing chamber and a normal food storage refrigeration chamber in one unit, heat withdrawal from the latter chamber being through a wall common to both chambers and over a large area. A further object is the avoidance of freezing temperatures in the food storage compartment a condition which keeps a desirable high humidity in the chamber and avoids the necessity of defrosting.

An additional object of the invention is to provide a two-temperature refrigerator wherein access to one or other of the compartments does not affect the temperature of the other one because of air spillage.

A further object is to provide ample storage for bottles or other large containers such as gallon milk jugs, watermelons, etc., which may not be placed in a conventional refrigerator without removing one or more shelves from the cabinet; another object is to provide a refrigerator with several work top surfaces.

A further object is to provide a top closure balance means with a foot release to permit foot operation.

Other objects and features of the invention relating to details of construction and operation will be evident in the following detailed description and claims.

In the drawings:

Fig. 1 illustrates a front elevation of the refrigerator structure.

Fig. 2 is a side elevation.

Fig. 3 is a sectional view on line 3-3 of Fig. 1.

Figs. 4 and 5 illustrate enlarged views of the door construction shown in section in Fig. 3.

Fig. 6 is an elevation of the liner and a portion of the evaporator coil which defines the freezing chamber.

Fig. 7 is a sectional view illustrating the mechanism used to provide a balancing force on the front cooling compartment.

In the drawings, in Fig. 1, the front of the refrigerator is shown at 10 with two opening panels 11 and 12. Panel 11 may be a header for

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an unrefrigerated utility drawer. Panel 12 is a front closure for a compressor compartment. The top is of two level constructions as shown in Fig. 2 with a front first level panel 13 and a raised back panel 14. The base of the cabinet is recessed at 20 for foot room and the entire cabinet is mounted on supports in such a way that a sub-base 21 is formed underneath the cabinet.

This base compartment serves to insulate the refrigerating compartments from the floor and also serves as a sound deadening chamber for the compressor compartment located at one end of the refrigerator cabinet. In Fig. 3 the main storage compartment is shown at 25. The panel 13 referred to in the description of Fig. 1 serves as the door for the compartment 25.

Panel 13 in Fig. 1 is hinged at 27 so that it may be lifted to provide access to chamber 25. When the top 13 is down it serves as a work space. Within chamber 25 are sliding shelves 27a and 27b which may be shifted to accommodate bottles, large jugs, watermelons and the like.

The hinge 27 also serves to pivotally mount the panel 14 which may be lifted and swung forward to expose a closure door 28 hinged at 29. This door closes a deep chamber 30 which can be used as a freezing chamber. An evaporator is formed around the chamber 30 by coils 31 which serve also to cool the chamber 25 through wall 25a. Tubes 31a (Fig. 6) act as traps or reservoirs being connected to the top outlet line of the evaporator.

At the back, bottom, and sides of the evaporator chamber 30, there is about four inches of insulation. In front and at the bottom of compartment 25 is about two and one-half inches of insulative material. Between the compartments, however, a dead air space about one inch in thickness is provided with some sheet insulation 26. This insulation is controlled to keep the temperature on wall 25a above freezing and yet to maintain, by conduction, a temperature of from 37° to 47° F. or any other temperature desired for normal refrigeration. This wall 25a is large in area by comparison with the cubic content of compartment 25. Thus the temperature of wall 25a can be maintained at a temperature high enough to prevent frost formation and even excessive condensation. This results in a relatively high humidity in compartment 25, a good condition for normal good storage.

Fig. 4 illustrates the manner in which panel 13 is sealed when in closed position. The hinged point of the panel is at 27. A rubber seal member 33 is provided around the opening to give the

necessary sealing when the door 13 is in closed position. A suitable latch 34, shown in dotted lines in Fig. 1, is provided to keep the door 13 in closed position. This latch may be operated by foot pedal 35 which acts through a rod 36.

The panel 13 is biased or balanced to an opening position by a mechanism shown generally at 37, in Fig. 2. This mechanism is shown more in detail in Fig. 7 where the rear portion of the panel 13 is shown. A roller 38 is mounted on the end of a slide 39 bearing against the back of panel 13 some distance below the hinging point 27. The movement of the slide 39 is controlled by a radius member 40 and a slot 41 where a pin 42 holds the slide 39. A spring 43 pulls the pin 42 toward a stationary pin 44 on a mounting plate 45. There is thus a constant opening pressure on panel 13 and when the latch 34 is released panel 13 will spring upwardly to about the angle shown in dotted lines in Fig. 7 from which position panel 13 can be swung manually to overlay panel 14 for full access to chamber 25. The panel 14 is closed against the action of spring 43. This will also cushion the fall of lid 13 to prevent injury to a person's fingers, should the lid be accidentally dropped. Hinge pivot 27 is kept in proper location on the cabinet by having certain hinge members at either end of the piano-type hinge fastened rigidly to the cabinet. In Fig. 3, an angle member 46 is shown attached to the cross piece 47 on the divider wall between compartments 25 and 30.

In Fig. 5 the top panel 14 is shown. A finger recess 49 is provided to facilitate the opening thereof about the hinge point 27. It will be noted in Fig. 3 that closure member 14 overlies the heavier insulating closure 28 which pivots at 29 and which also is provided with a proper seal for the low temperature chamber 30. In Fig. 6 a side elevation of the metal container 50 that defines the chamber 30 is shown. The tubes 31 of the evaporator are also illustrated. These tubes may be made in accordance with my Patent No. 2,306,772, issued December 29, 1942, or made of stamped sheet metal construction as shown in my Patent No. 2,371,215, issued March 13, 1945.

In Fig. 3 a compressor unit is shown generally at 60 from which a capillary tube 61, soldered in heat exchange relation to suction tube or return line 61a, leads upwardly to the evaporator tubes 31. A cooling fan 62 draws cool air through an opening 63 in the front of the sub-base 21 of the cabinet. Rails are provided for the support of the compressor unit so that upon removal of panel 12, the compressor may be pulled forward for cleaning and repair. An opening 64 beside the condenser is provided for the exit of air in the event that the back of the cabinet is entirely sealed by the wall against which it is placed. The compartment is so baffled that air drawn into the condenser is directed to the outlet 64. A cold control 70 is mounted inside panel 12 (Fig. 3) set to hold the deep wall to limits of 0° F. plus or minus 5° F., 0° F. plus or minus 10° F., etc. The cold control capillary tube is shown at 71.

An advantage of the cooling system above described is that defrosting is unnecessary except in unusual cases. Insulation on the evaporator coils by reason of their being embedded in the wall of the sharp freeze chamber causes the wall exposed to the normal refrigeration chamber to be above 32° F. and it will not collect frost. Slight frost in the chamber 30 can be readily scraped out.

The most frequently used compartment 25 is opened from the top so that there is no spillage of cold air and, of course, the compartments are separately accessible.

Only one thermostatic control is needed for the entire unit since chamber 30 will be maintained at about 0° F. or below as required for frozen food storage, and compartment 25 will be maintained at a higher temperature. The overall heat transfer per square foot has been reduced because of the large area of surface 25a. Thus the temperature of this surface may be above 32° F. to prevent frost formation and yet normal food storage temperatures are easily maintained in chamber 25.

I claim:

1. In a refrigerator cabinet, a long freezing chamber, a food storage chamber, one in front of the other, each insulated and independently accessible from the top, a wall separating the two chambers having less insulation than any of the other insulated walls of the two chambers, means to cool the freezing chamber to a relatively low freezing temperature, said separating wall serving to effect heat withdrawal from the other of said chambers to cool the same to normal food storage temperatures.

2. In a refrigerator cabinet a long freezing chamber, a food storage chamber, one in front of the other, each insulated and independently accessible from the top, a vertical common wall separating the two chambers having less insulation than any of the other insulated walls of the two chambers, an evaporator wall forming a part of said common wall for cooling the freezing chamber to a relatively low temperature below freezing, the amount of surface of said common wall being determined to effect cooling of the food storage chamber to normal food storage temperatures with no point below freezing.

3. A dual purpose refrigerating cabinet having a low temperature storage compartment defined by an evaporator for long storage periods, and a higher temperature storage compartment for short storage periods, which comprises waist-high closure means each independently accessible from the top, a common wall separating the two storage compartments, said common wall comprising one wall of the evaporator and one wall of the higher temperature storage compartment with insulation therebetween, said wall of the higher temperature storage compartment being maintained above freezing for cooling said compartment.

4. A waist-high refrigerating cabinet having a freezing chamber, a food storage chamber, one in front of the other, each accessible independently from the top, separate top closure members for said chambers positioned at spaced vertical levels, means for automatically opening one of said closure members, releasable means for locking said one closure member in closed position, a wall separating said chambers and means to cool the freezing chamber to a relatively low freezing temperature, said separating wall serving to effect a heat withdrawal from said food storage chamber to cool the same to normal food storage temperatures.

5. A waist-high refrigerating cabinet having a food storage chamber and a freezing chamber separated by a common wall, an evaporator surrounding said freezing chamber to cool it to a relatively low freezing temperature, that portion of the evaporator passing through said common wall serving to cool said food storage chamber to

normal food storage temperatures, top closure members for each of said chambers positioned at spaced vertical levels, means for urging one of said closure members to assume an opened position, latch means for locking said closure member closed, and foot operable means for releasing said latch means to automatically open said closure member.

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