

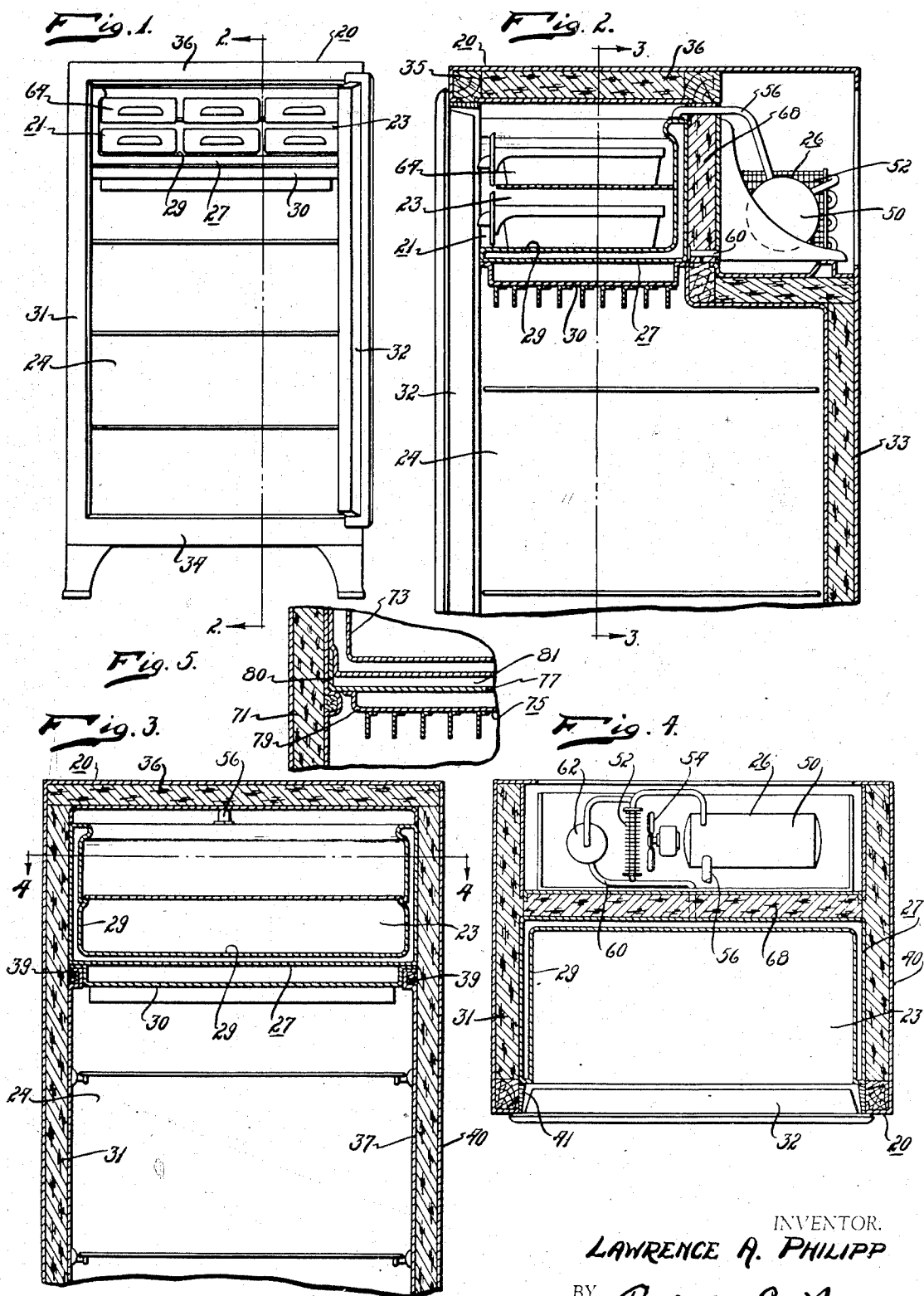
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REFRIGERATING APPARATUS

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REFRIGERATING APPARATUS

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This invention relates to refrigerating apparatus and more particularly to refrigerating apparatus of the household type.

One of the objects of my invention is to provide a new and improved arrangement for refrigerating a refrigerator cabinet.

Another object of my invention is to provide a refrigerating apparatus including primary and secondary refrigerating systems and to insure good contact between the refrigerant evaporator of the primary system with the condenser of the secondary system by providing a body of freezable liquid between these heat transfer devices so that the liquid may be frozen to a solid mass for conducting heat from said condenser to said evaporator.

Another object of my invention is to provide a refrigerating apparatus including a refrigerant cooling element arranged within a cabinet so as to divide the interior thereof into a freezing compartment and a compartment for the storage of foods to be refrigerated and so arranged as to efficiently refrigerate said compartments at different temperatures in a new and improved manner.

Another object of my invention is to provide a refrigerating apparatus including a refrigerant evaporator for refrigerating a food storage compartment and a second evaporator for freezing ice cubes, desserts and the like and for condensing evaporating refrigerant in said first evaporator whereby said first evaporator may be operated at temperatures above that which would be likely to cause the formation of ice and frost on its outer surface due to moisture deposited thereon by the circulating air in the food compartment.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a view shown partly in elevation and partly diagrammatic of a refrigerating apparatus embodying features of my invention;

Fig. 2 is a view shown partly in elevation and partly in cross section, taken along the line 2-2 of Fig. 1;

Fig. 3 is an enlarged fragmentary view in cross section, taken along the line 3-3 of Fig. 2;

Fig. 4 is a view taken along line 4-4 of Fig. 3; and

Fig. 5 is a fragmentary view of a modified form

of refrigerating apparatus embodying features of my invention.

Referring to the drawing, there is shown a refrigerating apparatus of the household type, comprising in general a cabinet 20 and a refrigerating system 21, which system is adapted to efficiently refrigerate, at different temperatures, compartments 23 and 24 of the cabinet. The refrigerating system 21 consists of a refrigerant condensing element 26, and a refrigerant cooling element 27. The cooling element 27, as shown, is horizontally disposed within the cabinet 20, dividing the interior thereof into the compartments 23 and 24. This cooling element consists of a refrigerant evaporator 29 for cooling compartment 23, and a second refrigerant evaporator 30 for cooling compartment 24.

The evaporators 29 and 30 are thermally connected so that evaporator 29 serves to condense evaporated refrigerant in evaporator 30. With this arrangement evaporator 29 may be operated to produce low temperatures in compartment 23, in which compartment substances to be frozen, such as desserts and ice, may be stored, while the second evaporator 30 may be operated to produce higher temperatures in compartment 24 suitable for refrigerating foods, and yet at temperatures above that which would be likely to cause the formation of ice and frost on its outer surface due to moisture deposited thereon by the circulating air in the food compartment.

The cabinet 20 is preferably constructed of heat insulating walls including side walls 31, top wall 32, rear wall 33, bottom wall 34 and front wall 35. The inner walls of the cabinet are formed by a metallic liner 37. Preferably the liner 37 is provided with a coating of vitreous enamel, such as porcelain, to provide neat and finished appearing walls which may be easily cleaned. The inner lining 37 is formed about the side walls 31 and the rear wall 33 with an inwardly extending channel-shape flange 39, on which the cooling element 27 is supported. An outer metallic casing 40 encloses the walls of the cabinet. In the front wall 35 is provided an opening 41 through which the compartments 23 and 24 are accessible. A hinged door 32 is provided for closing and opening 31.

The condensing element 26 includes a motor compressor unit 50, condenser 52 and motor driven fan 54. It is understood however that any suitable condensing unit may be used. In the chosen unit the compressor withdraws gaseous refrigerant from evaporator 29 through

conduit 56, compresses the refrigerant and delivers it to the condenser wherein it is liquefied and from which it is delivered to evaporator 29 through conduit 60 under the control of high side float 62.

Preferably the condensing unit is intermittently operated and in order to control the operation of the unit any suitable thermostat of the well known types may be used. The thermostat may be arranged to be responsive to changes in temperatures in evaporator 30 or evaporator 29 or the circulating air in either compartment 23 or 24.

Evaporator 29 may be employed for supporting ice pans 64 for freezing ice cubes.

Evaporator 30 may be operated at any desired temperature depending upon the solution of refrigerants or mixture of fluids therein. One form of maintaining a temperature differential between the primary system evaporator 29 and the secondary system evaporator 30 is to limit the amount of refrigerant in the secondary system. Another form of maintaining a temperature is to employ an amount of volatile refrigerant in the secondary system and also a predetermined quantity of inert gas such as air to create partial pressures therein to thus render the secondary system less effective to transfer heat from the secondary system to the primary evaporator 29.

The entire system is readily removable from the cabinet because the entire system is secured to a removable wall portion 68 which permits the system to be slid forwardly through opening 41 from the cabinet.

In order to provide an apparatus including primary and secondary systems and have provisions for readily removing one system from the other and yet have good thermal contact between the two systems during operation thereof I have provided the apparatus shown in Fig. 5. In this figure wall 71 corresponds to wall 31 of Fig. 1 and evaporator 73 corresponds in all respects to evaporator 29 of Figs. 1 to 4. However in Fig. 5 evaporator 75 is somewhat different than the secondary evaporator 30 of Figs. 1 to 4. The evaporator 75 is also the condenser of the secondary system and includes two sheets of metal, namely, upper sheet 77 and lower sheet 79. The upper sheet 77 has an upturned flange 80 which extends around all four peripheral edges to form a basin 81. This secondary evaporator or system 75 occupies the same space in the cabinet as does evaporator 30 and forms the top wall of the food compartment the same as evaporator 30.

By the above arrangement the evaporator 73 may be readily removed from evaporator 75 since the flange 80 need not be secured to evaporator

73. All that is necessary is to slide the unit out of the cabinet opening 41 as described in connection with Figs. 1 to 4 and the evaporators 73 and 75 are readily separable.

In the operation of the device shown in Fig. 5 it is essential that there is good thermal contact between devices 75 and 77 and in order to accomplish this I fill the basin 81 with water so that there is water extending between and in contact with the entire bottom wall of device 73 and top wall of device 75. When this water freezes by the action of evaporator 73 there is provided a very good thermal contact for conducting heat from the secondary system to the primary evaporator 73.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. Refrigerating apparatus comprising a cabinet, a primary refrigerating system readily removable from and insertable into said cabinet and including a refrigerant evaporator, a secondary system positioned in said cabinet in close proximity to the evaporator of said primary system and a substance positioned between said evaporator and secondary system to be influenced by the condition of the primary system so that it becomes a frozen mass under certain operating characteristics of the primary system to provide a solid as the sole heat conducting element between the primary and secondary systems and a liquid when the primary system remains inoperative for a certain length of time under which latter conditions the primary system may be readily removed from the cabinet.

2. Refrigerating apparatus comprising, a cabinet, a primary refrigerating system, readily removable from and insertable into said cabinet and including a refrigerant evaporator, a secondary system positioned in said cabinet in close proximity to the evaporator of said primary system, and a congealable substance positioned between said evaporator and secondary system which is adapted to be maintained in a frozen state by the action of said evaporator thereby providing a solid thermal bond of uniform heat conducting characteristics as the sole heat conducting element between said evaporator and said secondary system, said substance being liquified only after said evaporator has been inoperative for a certain period of time under which condition the primary system may be readily removed from the cabinet.

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