July 24, 1934. R. T. SMITH 1,967,271

ABSORPTION TYPE REFRIGERATOR

Filed Jan. 15, 1932 3 Sheets-Sheet 1

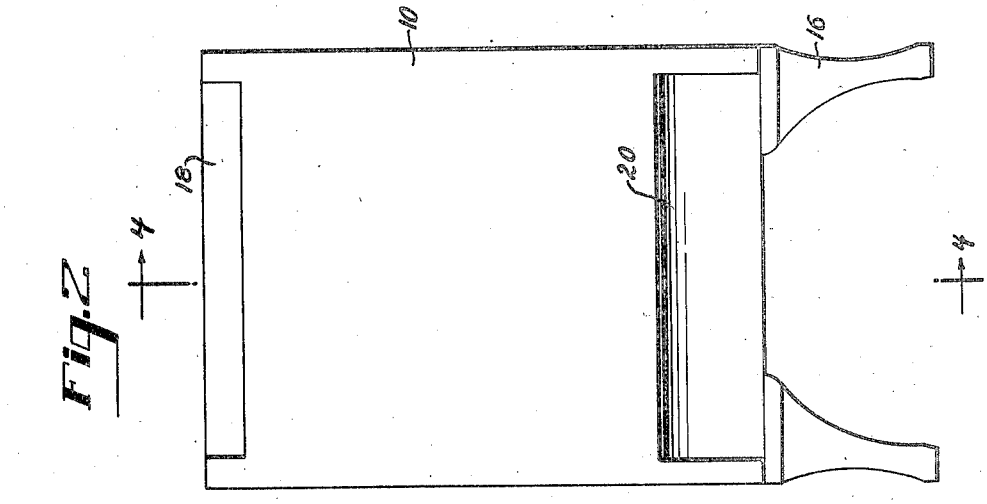


Fig. 2

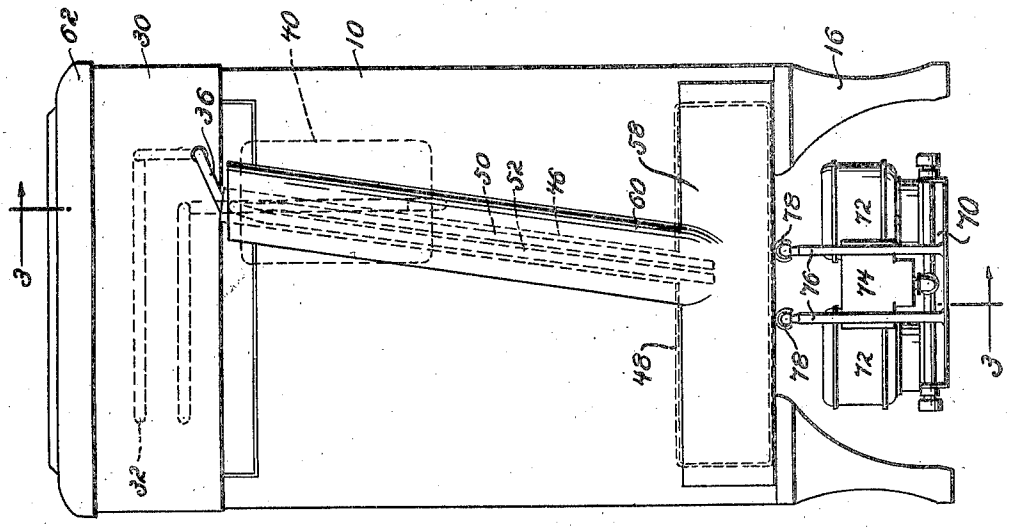


Fig. 1

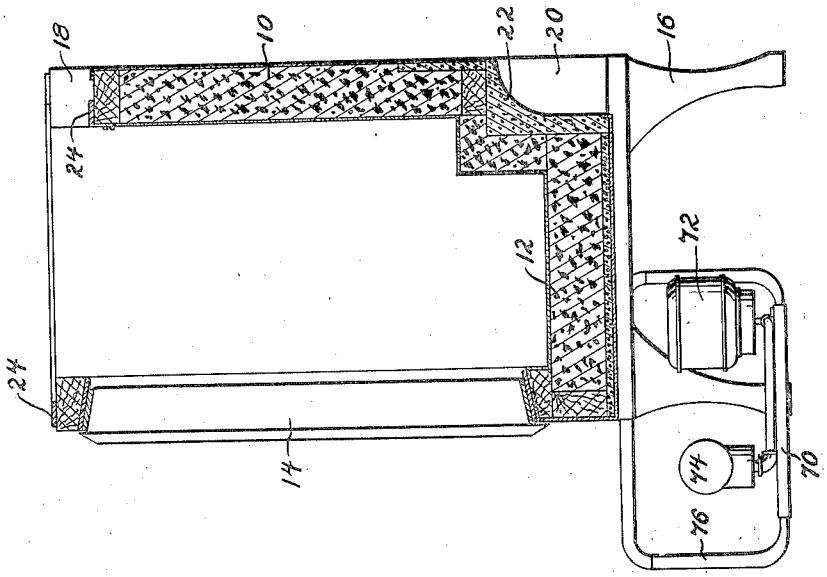
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Fig. 4



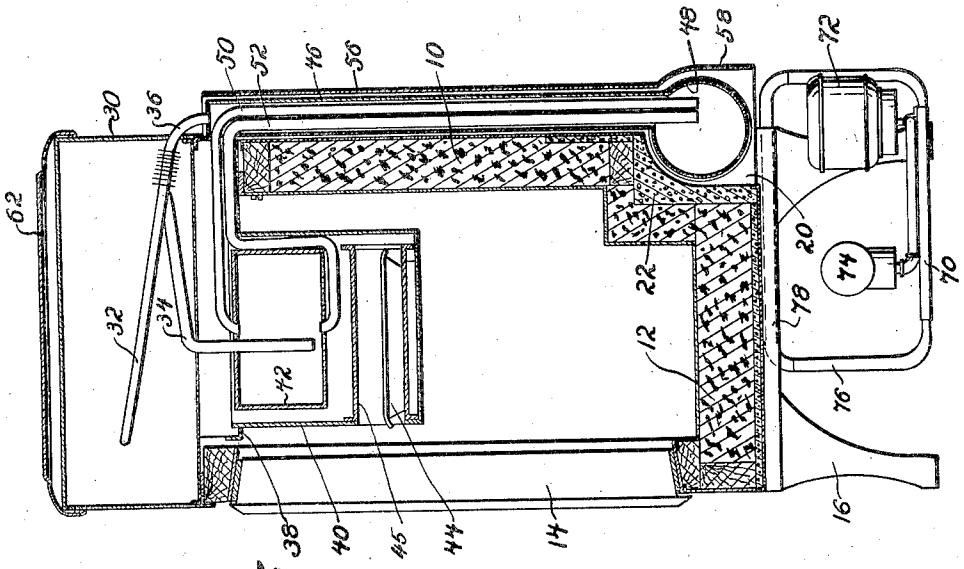


Fig. 3

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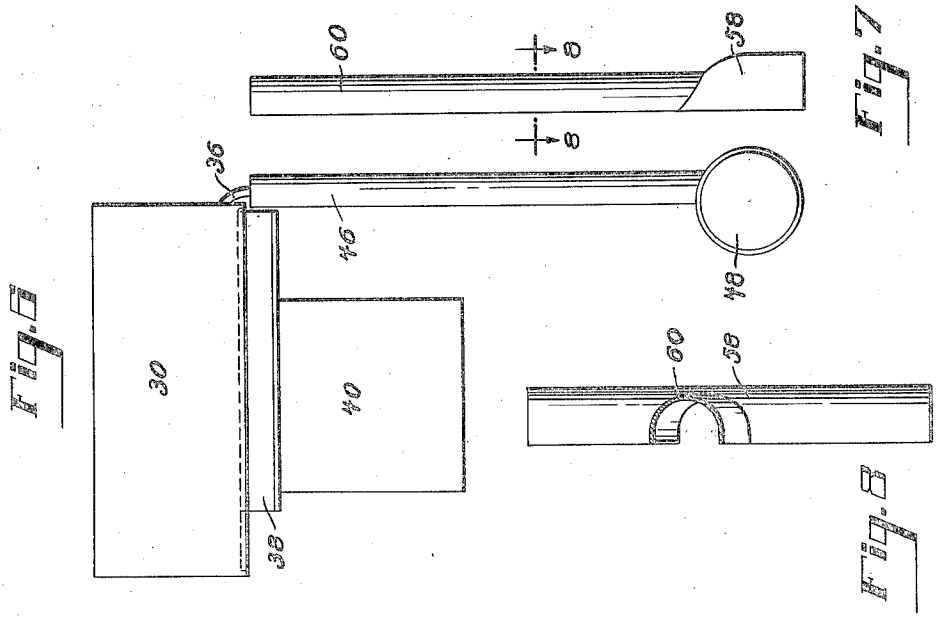


Fig. 7

Fig. 6

Fig. 8

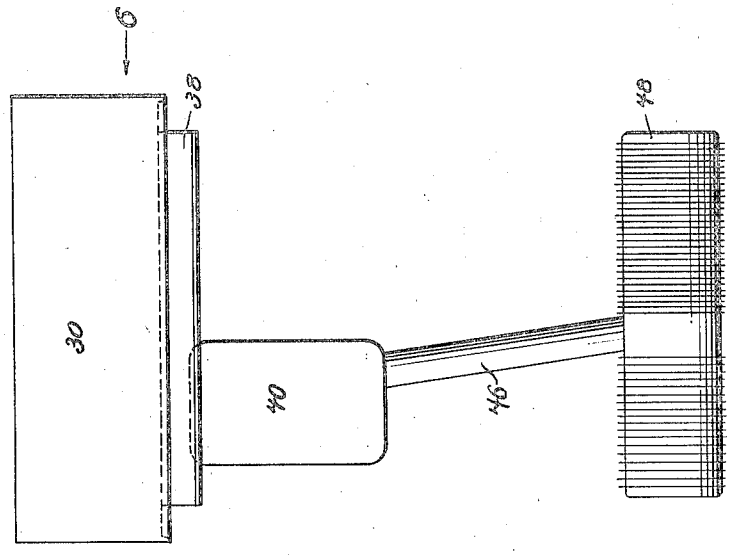


Fig. 5

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Patented July 24, 1934 1,967,271

UNITED STATES PATENT OFFICE

1,967,271

ABSORPTION TYPE REFRIGERATOR

Russell T. Smith, Greenville, Mich., assignor to Gibson Refrigerator Company, Greenville, Mich., a corporation of Michigan

Application January 15, 1932, Serial No. 586,847

13 Claims. (Cl. 62—118)

This invention relates to improvements in absorption refrigerator assemblies, and is embodied in a novel form of refrigerator which, as a whole, includes three major sections, assembled to form a complete domestic absorption refrigerator. The sections are a cabinet, an absorption unit adapted to be mounted as a unit on said cabinet, and a heater unit adapted to be mounted under said cabinet, and between the legs thereof, and between the cabinet bottom and the floor.

The construction is such that units may be mounted on and removed from cabinets without disassembly, so that in the event of failure of any unit, after it is once mounted on a cabinet, and the refrigerator installed in the home, the defective unit may be removed bodily and another substituted, in a few minutes, the defective unit then being brought back to the factory for restoration and repair. Thus is eliminated the necessity of attempting to ascertain the defect, in a defective unit, while it is in a home, such attempts usually causing great inconvenience and annoyance to the user of the refrigerator. Further, the construction permits defective units to be sent to the factory, there to be serviced under factory supervision, usually more satisfactory than that of field mechanics.

Other advantages, due to the novel construction disclosed, need not be specifically mentioned here being readily apparent to one skilled in the art.

A further object is an absorption refrigerator which is more attractive in appearance and more economical of space than absorption refrigerators now on the market.

Still further objects will readily occur to those skilled in the art upon reference to the following description and the accompanying drawings in which

Figure 1 is a back view of an embodiment of the invention.

Figure 2 is a similar view, but with the absorption unit removed, and with the heater unit not shown.

Figures 3 and 4 are cross sectional views on lines 3—3, and 4—4 of Figs. 1 and 2, respectively, the heater unit being shown.

Figure 5 is a front view of the absorption unit per se.

Figure 6 is a side view of the same, on arrow 6, Figure 5.

Figure 7 is a side view of the back shield.

Figure 8 is a cross section view on line 8—8 of Figure 7.

The cabinet

The cabinet of the invention includes a box having an insulated back 10, insulated side walls, an insulated bottom 12, an open top, and an insulated front having an opening, closed by an insulated, hingedly mounted door 14, shown as not being in section. The box is supported on legs 16, so that, between the bottom and the floor, may be disposed a heater unit, the latter and its mounting, being described below. The box also contains food shelves, not shown.

The upper edge of the back wall is cut down, somewhat, between the sides, as indicated at 18, for purposes to be described. The lower portion of the back wall, and the bottom of the box are formed to provide a large recess 20, completely lined with asbestos, or other insulation, indicated at 22.

The box, as a whole, is metal clad. That is to say, it is covered with sheet metal, which on the front, and sides at least, is enamelled or otherwise finished, to enhance the appearance of the refrigerator.

The upper edge of the box is provided with flat rubber gaskets or seals 24.

It will be noted that while the cabinet is shown and described as having a completely open top, it might well be made with a closed top having a large opening for reasons appearing below.

The absorption unit

The absorption unit of the invention includes a sheet metal water tank 30 of the same horizontal area as the box. The tank contains a condenser 32 and is completely closed, except where its condenser connections 34 and 36 pass thru the tank bottom and the tank back, respectively.

Under the tank, and permanently secured thereto is a trough like member 38 from which, in turn, is suspended the evaporator shell 40, the latter surrounding the evaporator receiver 42, which is also secured to and suspended from the member 38. The front of the shell, facing the door 14, is cut open to permit ice cube trays 44 being introduced into and withdrawn from the tray compartment 45, suitably supported in the shell.

In back of the member 38, and secured to it, so as to suspend therefrom, is an expansion tube 46, which at its lower end is connected to an absorber boiler or shell 48, the latter being dimensioned to be received in and fill the recess 20 in the cabinet. The expansion tube and the absorber shell are sealed, except where the absorption tube 50 and the liquid return tube 52, which are telescoped in the expansion tube, and which dip into the absorber shell, pass thru the expansion tube, on their way to the evaporator receiver, and except where the condenser connection 36 opens into the upper closed end of the expansion tube.

Removably secured to the cabinet back is a sheet metal back shield which covers the cabinet back, the expansion tube, and the absorber shell, when these are conjoined, the shield being de-

formed at its bottom, at 58, in accordance with the curvature of the shell 48, and also being provided with an elongated vertical deformation 50, which surrounds the expansion tube. The deformations provide a duct thru which air may pass, from near the floor, to a point above the upper end of the expansion tube. The shield may be of one piece construction but is preferably of two parts, 58 and 60, welded to each other.

On the top of the water tank 30 is a supplementary cover 62, which is removably secured thereto by the friction between the parts, in the manner of a slip cover.

The heater unit

The heater unit of the invention includes a base plate 70 upon which are supported the heaters 72 and the fuel receptacle 74. The base plate is mounted on the lower portions of hangers 76 which are suspended in and from rails 78 secured to the floor of the cabinet, the upper portions of the hangers being slidable in the rails so that the heater unit may be drawn forwardly, to expose the fuel receptacles (Fig. 4) or may be slid back to conceal the heater unit to place it in operative position. The heater unit as a whole, is removable from the rails 78, the connection being of such a nature as to permit this removal.

The assembly

The assembly of the units, on the cabinet, may be readily effected in the following manner:

The heater unit, including the base plate and the parts supported thereon, may be positioned in the rails and may be slide back to position the parts properly.

The absorption unit, shown by itself in Figures 5 and 6 is held above the cabinet, with the absorption shell adjacent the center part of the cabinet back. The unit is then lowered so that the evaporator parts will disposed themselves in the cabinet, the absorption shell being then alined with, tho in back of and slightly out of the recess 20. The unit is then moved forwardly or until the water tank is seated firmly on the upper edges of the cabinet walls, and the absorption tank is properly disposed in the recess. The shield (Figs. 7 and 8) is then secured to the back of the cabinet and the cover 62 is slipped on the water tank.

In the event any one of the units proves defective, it may be removed from the cabinet readily and without difficulty, in a manner that will be obvious from the foregoing.

Now having described the invention and the preferred embodiments thereof, it is to be understood that the said invention is to be limited, not to the specific details herein set forth, but only by the scope of the claims which follow:

What I claim is:

1. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, the upper end of the cabinet being open, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank of greater lateral dimension than the open end of the cabinet and adapted to rest on and cover the upper edges of the cabinet walls to form a top for the cabinet, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube.

2. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, the upper end of the cabinet being open, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank of greater lateral dimension than the open end of the cabinet and adapted to rest on and cover the upper edges of the cabinet walls to form a top for the cabinet, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, the tank containing a condenser connected to the expansion tube and to the evaporator.

3. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank so constructed and arranged as to rest on and cover the upper edges of the cabinet walls to form a top, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, the evaporator being connected to the shell by tubes telescoped in the expansion tube and dipping into the shell.

4. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank so constructed and arranged as to rest on and cover the upper edges of the cabinet walls to form a top, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, the tank containing a condenser connected to the expansion tube and to the evaporator, the evaporator being connected to the shell by tubes telescoped in the expansion tube and dipping into the shell.

5. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank so constructed and arranged as to rest on and cover the uper edges of the cabinet walls to form a top, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, the cabinet having a recess in its back, near the bottom into which may be disposed the shell.

6. In a refrigerator, a cabinet having a back

wall, side walls, and a bottom, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank so constructed and arranged as to rest on and cover the upper edges of the cabinet walls to form a top, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, the tank containing a condenser connected to the expansion tube and to the evaporator, the evaporator being connected to the shell by tubes telescoped in the expansion tube and dipping into the shell, the cabinet having a recess in its back, near the bottom, into which may be disposed, the shell.

7. For use with a refrigerator cabinet having a back wall, side walls, and a bottom wall, an integrated absorption unit comprising a tank, an evaporator disposed under, suspended from and supported by the tank, an expansion tube suspended from said tank and disposed at the back thereof, and a shell at the lower end of the tube, said absorption unit being adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit.

8. For use with a refrigerator cabinet having a back wall, side walls, and a bottom wall, an integrated absorption unit comprising a tank, an evaporator disposed under, suspended from and supported by the tank, an expansion tube suspended from said tank and disposed at the back thereof, and a shell at the lower end of the tube, the tank containing a condenser connected to the expansion tube and to the evaporator, the evaporator being connected to the shell by tubes telescoped in the expansion tube and dipping into the shell, said absorption unit being so constructed and arranged as to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit.

9. In a refrigerator, a cabinet having four side walls and a bottom wall, an absorption unit in said cabinet having an absorber shell at the back of the cabinet, near the bottom, rails secured to and disposed under said bottom wall, and a heater unit suspended from said rails and disposed under said bottom, said unit being slidable on said rails to a position under said absorber shell.

10. In a refrigerator, a cabinet having a back-wall, side walls and a bottom, and an absorption unit, so constructed and arranged as to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said unit including a depending absorber shell near the bottom of the cabinet rails secured to and disposed under said bottom wall, and a heater unit for the absorber shell suspended from said rails and disposed under said bottom, said heater unit being slidable on said rails and being removable from said cabinet as a unit, and without disassembly of either the cabinet or the heater unit.

11. In a refrigerator, a cabinet having a back wall, side walls, and a bottom, and an absorption unit, adapted to be applied to and removed from the cabinet as a whole and without disassembly of either the cabinet or the unit, said absorption unit comprising a tank so constructed and arranged as to rest on and cover the upper edges of the cabinet walls to form a top, an evaporator suspended from and supported by said tank and adapted to be disposed in the cabinet when the tank is in place on the cabinet, an expansion tube secured to the tank at the back thereof, and suspended therefrom so as to be behind the cabinet when the tank is in place, and a shell at the lower end of the expansion tube, rails secured to and disposed under said bottom wall, and a heater unit suspended from said rails and disposed under said bottom, said unit being slidable on said rails to a position in heating relation with the shell, and being removable as a unit, and without disassembly of either the cabinet or the heater unit.

12. In a refrigerator of the intermittent absorption type having a cabinet with front and back walls, side walls, a bottom wall and an open top, an integral absorption unit having a portion adapted to rest on and seal the top of the side walls and form a top for the cabinet, said unit having a depending absorber-generator shell so constructed and arranged as to be positioned at the rear and bottom of the cabinet when the unit is in place on the cabinet, and a heating unit suspended from the bottom wall of the cabinet and movable to a position in heating relation to the absorber-generator shell.

13. In a refrigerator of the intermittent absorption type having a cabinet with front and back walls, side walls, a bottom wall and an open top, the cabinet also having a recess formed in the back and bottom walls, an integral absorption unit including a tank so constructed and arranged as to rest on the top of the side walls and form a top for the cabinet, said absorption unit including a depending absorber-generator shell adapted to fit in the recess at the rear and bottom of the cabinet, and a heating unit suspended from the bottom wall of the cabinet and movable to a position in heating relation to the absorber-generator shell.

RUSSELL T. SMITH.