

April 10, 1934.

J. G. KING

1,954,136

REFRIGERATING APPARATUS

Filed Jan. 31, 1929

3 Sheets-Sheet 1

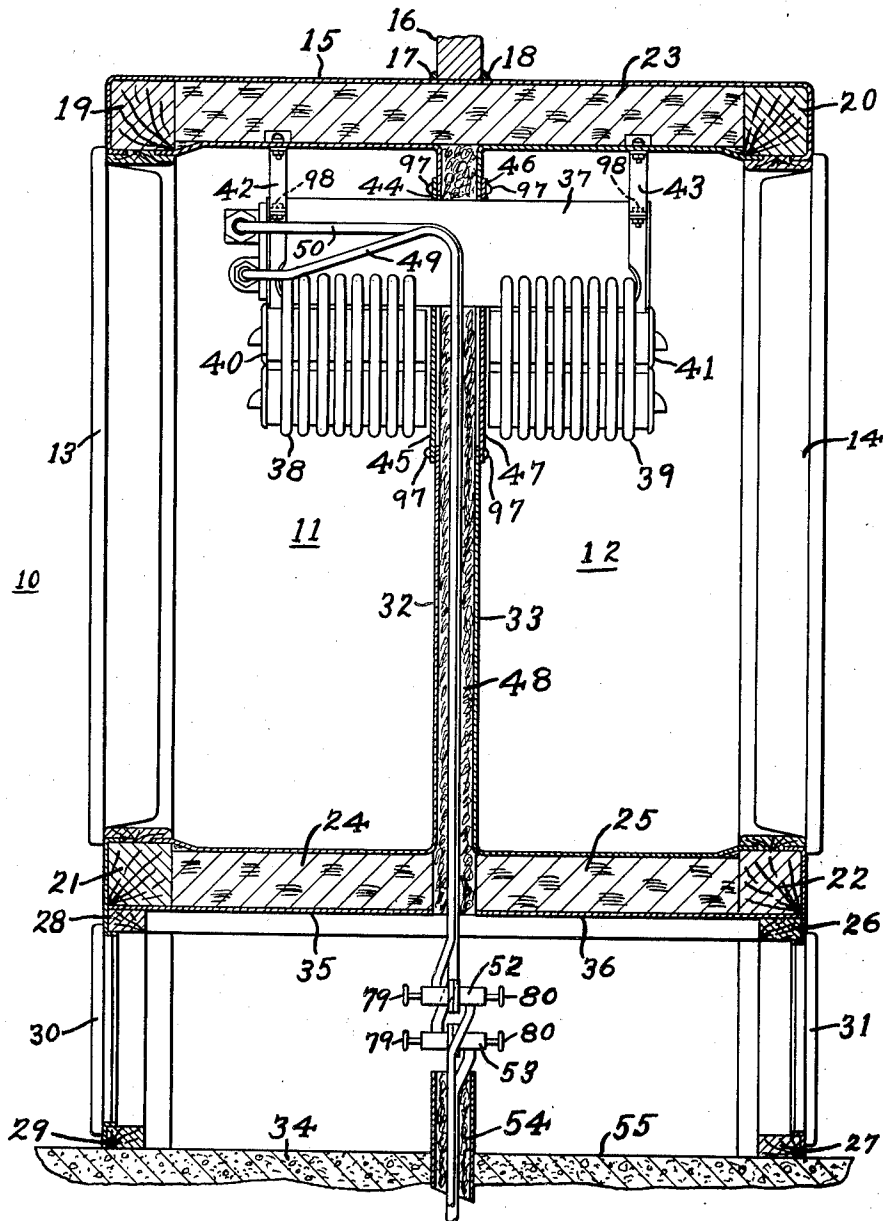


Fig. 1.

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3 Sheets-Sheet 2

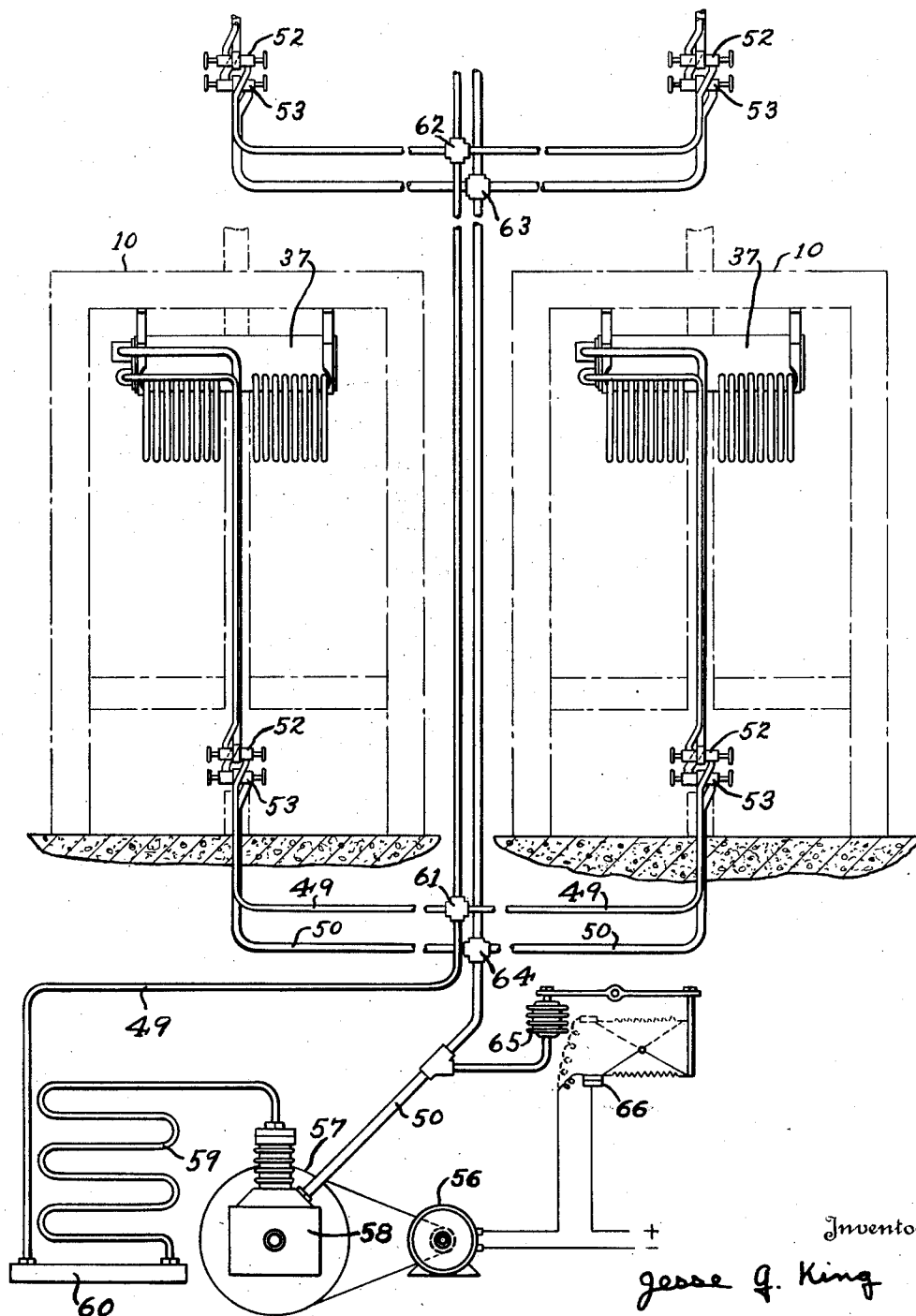


Fig. 2.

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3 Sheets-Sheet 3

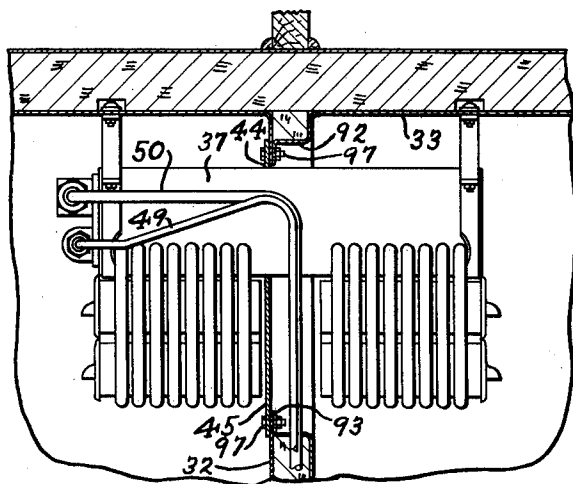


Fig. 4.

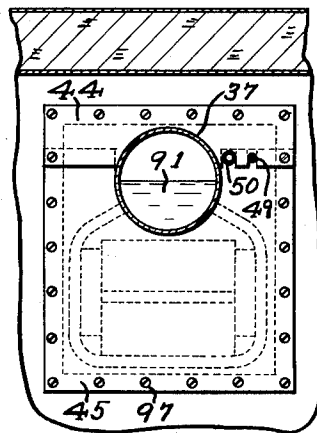


Fig. 5.

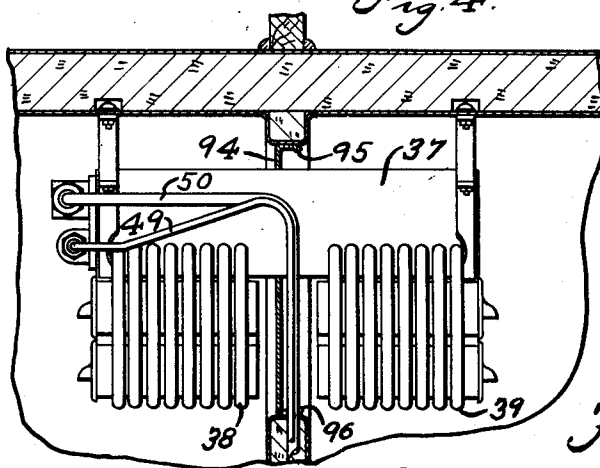


Fig. 6.

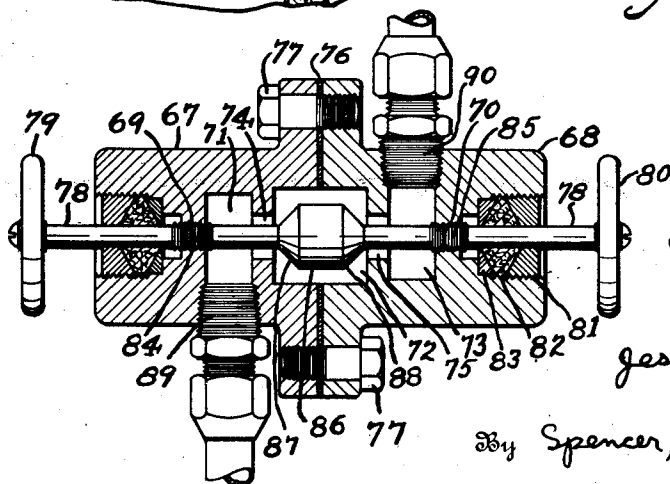


Fig. 3.

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UNITED STATES PATENT OFFICE

1,954,136

REFRIGERATING APPARATUS

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aire Corporation, Dayton, Ohio, a corporation
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Application January 31, 1929, Serial No. 336,416

10 Claims. (Cl. 62-116)

This invention relates to refrigerating apparatus and especially to a system and special form of said refrigerating apparatus.

An object of the invention is to make an economical installation of the refrigerating apparatus where the need for such apparatus rises at contiguous places.

Another object of the invention is to install a refrigerating apparatus for two adjoining places by utilizing only one tank.

Another object of the invention is to install a compound refrigerating cabinet that will serve two different adjoining places.

Another object of the invention is to provide means for shutting off the refrigerant from either side of the refrigerating cabinet.

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

In the drawings:

Fig. 1 is a cross section through a cabinet constructed according to the invention.

Fig. 2 is a preferred system for supplying refrigerant to the type of cabinet disclosed in Fig. 1.

Fig. 3 is a cross section of the valves 52 and 53 in Fig. 1.

Fig. 4 is a modification of the supporting means for the tank in Fig. 1.

Fig. 5 is an end view of the supporting means for the tank in Fig. 1 or 4.

Fig. 6 is a further modification of the supporting means of the tank in Fig. 1 or 4.

It is desirable in installing a refrigerating system in big apartment houses to make such system as simple and as economical as possible. The construction of apartment houses is generally such that the kitchen of one apartment is separated by merely a wall from the kitchen of an adjoining apartment. This invention contemplates using one cabinet that would serve both apartments and yet have separate food compartments for each apartment. The invention also provides means whereby the refrigerant can be shut off in the cooling unit from either apartment. A preferred form of the invention is illustrated by the cabinet 10 in Fig. 1. 11 and 12 are two separate food compartments with their respective doors 13 and 14 opening in opposite directions. The cabinet is placed so that it extends through the wall 16 which has been cut away or left cut away for the reception of the cabinet. The top of the cabinet 15 has the seals

17 and 18 where it passes thru the wall 16. It is also preferred to have the seals extending around the cabinet in order to have no sound conveying openings from one apartment to the other. The cross section of the cabinet in Fig. 1 discloses the usual frame work 19, 20, 21, 22, 26, 27, 28 and 29 and also the insulation such as cork 23, 24, 25. In the lower part of the cabinet are located the valves 52 and 53 more particularly described later in connection with Fig. 3. These valves are accessible from either direction thru the outside panels 30 and 31. The size of the lower compartment is a matter of design as in the construction disclosed in Fig. 1 only sufficient room is required in order to operate the valves 52 and 53. A food compartment 11 has the inside lining 32 and the compartment 12 has a corresponding inside lining 33. The lower valve compartment is separated from the food compartment by the panels 35 and 36 in addition to the insulation 24 and 25. A single boiler or tank or header 37 of a cooling unit extends from one compartment to the other through openings in the inner linings 32 and 33. It is preferred to have this tank 37 supported at each end by the supports 42 and 43. If desired these supports can be disengaged from the tank by removing the bolts 98. While the cooling unit may be of any suitable form it is preferred to have one or more depending ducts or tubes 38 and 39 in each compartment. Trays 40 and 41 are suitably supported within the tubes 38 and 39. While the cooling unit may be of any suitable form it is preferably of the float controlled flooded type such as disclosed in Patent 1,556,708 issued to R. G. Osborn on October 13, 1925. A high pressure refrigerant supply line 49 and a low pressure refrigerant return line 50 is preferably connected at one end of the tank 37 and extends preferably through the space between two linings 32 and 33 to the lower compartment where the valves 52 and 53 are inserted in each line. The pipes then extend through an opening 54 in the floor 55. The space 48 between the inner linings 32 and 33 may be filled with Kapok or other insulation material if desired. The openings through the inner linings 32 and 33 may be covered by the plates 44, 45, 46 and 47. If desired only two plates 44 and 45 may be used as disclosed in Fig. 4, in which case the inner lining 33 for example is bent over to form a flange 92 about the hole and having another flange 93 to be bolted to the lining 32 and the plates 44 and 45 by the bolts 97. As disclosed in Fig. 5 the plates 44 and 45 over-lap with openings for the tank 37

and refrigerant lines 49 and 50. Refrigerant 91 is disclosed inside the tank in Fig. 5.

The preferred system of installing these refrigerator cabinets is disclosed in Fig. 2. In a basement or other out of the way place a motor 56 is connected to the pulley 57 of a compressor 58. The refrigerant from the compressor passes to the condenser 59 and then to the receiver 60 where it is drawn as desired up thru the high pressure tube 49. The tube 49 has one or more branches at the joint 61 and also one or more branches at the joint 62. Each of these branches leads to two or more cabinets preferably of the design disclosed in Fig. 1. It is obvious that a single cabinet might be installed at any place instead of the cabinet of Fig. 1. The refrigerant returns to the compressor 58 through the line 50 and one or more joints 63, 64. A valve 65 regulates the running of the motor 56 through the snap switch 66. As disclosed in this figure two cabinets such as those disclosed in Fig. 1 serve four apartments and connections are also disclosed to the upper floors of the apartment house.

A modification of the plates around the tank is disclosed in Fig. 6. In this modification a single plate 94 with the spring flange 95 is preferably welded to the tank 37 before the tubes 38 and 39 are connected thereto. In installing the plate 94 closes openings between the two compartments with a tight friction fit. The spring flange 95 is cut at 96 for the passage of the tubes 49 and 50.

The construction of the preferably similar valves 52 and 53 are disclosed in the cross section of Fig. 3. The valve consists of two casing members 67 and 68 with the washer 76 therebetween and fastened by the machine screws or bolts 77. The valve has the central chamber 72 and two side chambers 71 and 73. Beyond 71 and 73 are the two screw threaded restrictions 69 and 70. A shaft 78 extends through the valve to either side thereof. This shaft has the threads 84 and 85 for the screw threaded restrictions 69 and 70. The enlarged circular portion 86 with its beveled sides 87 and 88 constitutes a double valve and the restrictions 74 and 75 between the chambers constitutes a double valve seat. Surrounding the shaft at either end as it emerges from the valve is the packing nut 81, the packing 82 and metal washer 83. Handles 79 and 80 are placed at each end of the shaft. Connection 89 extends from the chamber 71 to a refrigerant line. Likewise connection 90 extends from the chamber 73 to a refrigerant line. The chamber 71 may be the inlet and the chamber 73 the outlet or the reverse. It is customary in turning off a valve to turn in the clock-wise direction. Accordingly if the handle 79 is turned in the clock-wise direction the enlarged part of the shaft 86 will advance towards the right until the beveled surface 88 engages with the restricted opening 75 to shut off the passage of refrigerant there-through. On the other hand after the handle 80 is revolved clock wise the shaft will be advanced to the left until the beveled surface 87 engages with the restricted opening 74 to shut off the passage of refrigerant. It is also obvious that the movement of either handle in its counter-clock-wise direction will also shut off the refrigerant. In other words the refrigerant can be shut off from either the left or right hand side of the valve disclosed in Fig. 3, by an extreme motion in either clock-wise or counter-clock-wise direction.

It will be seen in the examination of the

various figures that two separate compartments may be provided for serving different apartments with the use of one cabinet and one tank. It will also be seen that if the occupant using compartment 11 for example through careless use of an ice pick in removing the trays 40 should puncture one of the tubes 38 or 50 and then leave and lock her apartment before the leak is discovered that the occupant using compartment 12 could quickly and easily shut off the refrigerant by the handle 80 before a large part of the refrigerant had leaked out into the apartments of the users of compartments 11 and 12. It will also be seen that the bolts 97 and 98 being removable that the tank 37 can be easily taken out and reinstalled or replaced if desired.

The invention may be further modified if desired by installing the motor, compressor and condenser in the bottom of the cabinet and thus supplying two different compartments with one operating machine. A duplicate structure of the cabinet disclosed in Fig. 1 is not limited to the use in two separate establishments but might be used in one establishment where two separate compartments are desired. For example a store might have the cabinet centrally installed so that compartment 11 might be used for meats on the meat side of the store and compartment 12 for cheese, butter and other perishables on the grocery side of the store. Furthermore in places where a family owns a store and lives in the rear of the store the cabinet may be installed on the dividing line between the two and a front compartment 11 for example might be used to store the perishables of the store and 12 the perishables of the household. One compartment might be made of greater size than the other if desired. Furthermore, in apartment houses for example, the cabinet construction may be built in instead of being a separate cabinet inserted in an opening in the wall.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a refrigerator cabinet, two separate compartments, a removable cooling unit for refrigerating material extending into each compartment and having duct means depending from the cooling unit into each compartment.

2. In a refrigerator cabinet, two separate compartments, a cooling unit for refrigerating material extending from one compartment into the other, a removable plate about said cooling unit and aiding in separating the compartments.

3. In a refrigerator cabinet, two separate compartments, a cooling unit for refrigerating material extending from one compartment into the other, each end of said cooling unit being removably supported in each compartment and one or more removable plates separating said compartments.

4. A refrigerator system comprising apparatus for cooling refrigerant and creating pressure, one or more pipes from said apparatus, one or more branches from said pipes, said branches terminating in a cooling unit, said cooling unit extending into a plurality of compartments, and a valve accessible from each compartment for controlling the flow of refrigerant to and from said cooling unit.

5. A refrigerating cabinet having compartments opening in different directions, a tube for

conducting a refrigerant for cooling said compartments, and a valve operated from either of said compartments for controlling the flow of refrigerant through said tube.

5 6. Refrigerating apparatus comprising a cabinet having separate compartments, a cooling unit extending into each compartment, refrigerant lines connected to said cooling unit, a valve apparatus for said refrigerant lines, said valve apparatus comprising a shaft extending through
10 said valve apparatus, a double valve at substantially the middle of the shaft, two valve seats on either side of said double valves and operating means attached to each end of the shaft.

15 7. In a refrigerator cabinet, two horizontally disposed storage compartments separated by a vertical wall, an elongated unitary cooling element for refrigerating material having substantially the same configuration throughout its
20 length and extending through said vertical wall into each of said compartments, and said cooling element being removable as a unit from said compartments.

25 8. In a refrigerator cabinet, two compartments disposed in substantially the same hori-

zontal plane and separated by a vertical wall, a cooling element for refrigerating material extending through said vertical wall into each of said compartments, and said cooling element being removable as a unit from said compartments.

9. A refrigerating system comprising apparatus for cooling refrigerant and creating pressure, a plurality of pipes extending from said apparatus, a plurality of branches extending from said pipes, said branches terminating in a cooling unit, said cooling unit extending into a plurality of compartments, and a valve disposed in each of said branches for controlling the flow of refrigerant to and from said cooling unit, means on each of said valves for actuating same, said means being accessible from each of said compartments.

10. In a refrigerator cabinet, two separate compartments, a cooling element for refrigerating material extending into each compartment, duct means depending from the cooling element into one of said compartments, and said cooling element being removable as a unit from said compartments.

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