

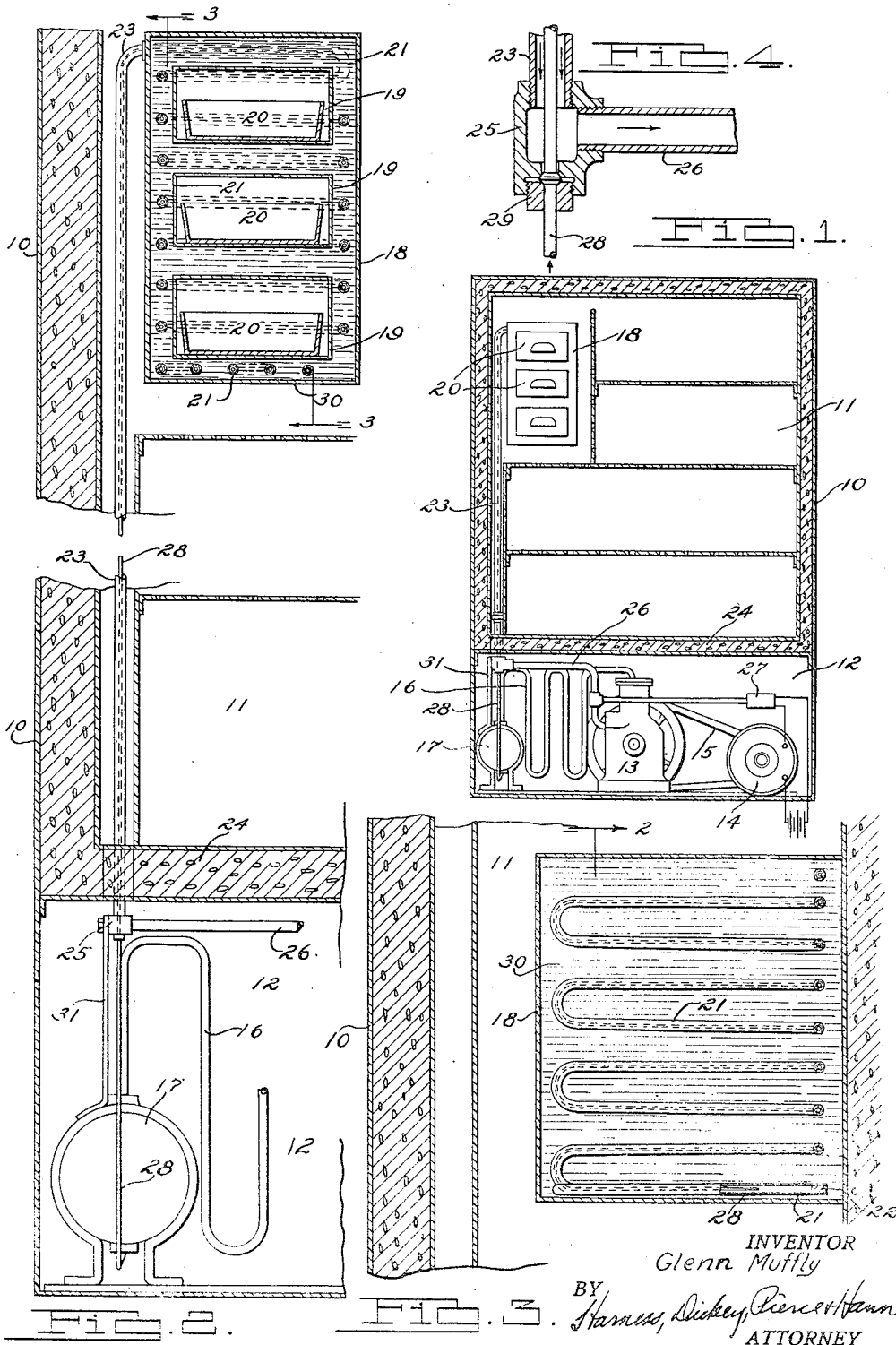
May 19, 1931.

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1,806,019

REFRIGERATING MECHANISM

Filed Dec. 10, 1929



UNITED STATES PATENT OFFICE

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REFRIGERATING MECHANISM

Application filed December 10, 1929. Serial No. 413,102.

This invention relates to refrigerating mechanism, and particularly to the evaporating unit thereof and the connection between the evaporating unit and the compressing and condensing mechanism, the principal object being the provision of a new and novel construction for these parts.

Another object is the provision of a connection of improved design between the evaporator and the remaining mechanism of a mechanical refrigerating mechanism, whereby a single tube only will be apparent in the refrigerating compartment between the units.

Another object is the provision of a tube within a tube connecting the inlet and outlet side of an evaporator of a mechanical refrigerator system with the condenser and compressor unit of such system.

Another object is the provision of an evaporating unit for a refrigerating system comprising a coiled tube open at one end only, and in which means are provided for discharging liquid refrigerant into or adjacent to the closed end thereof.

Another object is the provision of an evaporating unit for a mechanical refrigerating system, including a coiled tube enclosing a smaller tube of substantially the same length, serving as means for introducing liquid refrigerant into the evaporator.

Another object is the provision, in a mechanical refrigerating system of the household type including a refrigerator cabinet having a cooling compartment and a unit compartment, of an evaporator positioned in the cooling compartment, and a compressor and condenser positioned in the unit compartment, the evaporator being connected to the compressor by a single line of tubing extending through the wall separating the cooling compartment from the unit compartment, and said single line of tubing enclosing therein a capillary tube connecting the evaporator with the condenser.

Other objects of the present invention will be apparent from the following specification, reference being had to the accompanying drawings, in which;

Fig. 1 is a more or less diagrammatic

front elevation of a mechanical refrigerator of the household type, the front face thereof being broken away to better illustrate the mechanism contained therein.

Fig. 2 is an enlarged fragmentary partially sectioned view of the brine tank, and part of the cooperating mechanism of the refrigerator shown in Fig. 1, and taken as on the line 2—2 of Fig. 3.

Fig. 3 is a vertical sectional view taken as on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged sectional view taken axially through the connection between the refrigerant feed and suction lines.

In all refrigerating mechanism of the mechanical refrigerating type, it is necessary to connect the evaporating unit with the compressing unit and the condensing unit by a pair of tubes or passages, one of which constitutes the feed line for carrying the liquid refrigerant to the evaporator, and the other of which constitutes the suction line for carrying away the gasified refrigerant from the evaporator to the compressor. In conventional constructions, these two tubes are formed entirely separate from each other, and separate passages are usually provided in any wall through which such tubes must be passed. One of the principal objects of the present invention is to form such tubes in concentric relation, one within the other, whereby, from the standpoint of appearance, but a single tube connects the evaporator with the compressing and condensing mechanism, and which not only improves the appearance of the mechanism as a whole, but necessitates only a single opening in any wall through which the tube must pass.

It is also conventional practice to employ a coil of tubing for the evaporating unit of a mechanical refrigerating system. In the use of such coiled tubing, it is conventional practice to introduce the refrigerant from the feed line at one end of the coil, and to conduct the refrigerant gasified therein from the opposite end through the refrigerant suction line. A separate tube is thus provided connected to each end of the coil. It is another object of the present invention

to provide a construction of this type in which one end of the coil is permanently closed, the refrigerant being introduced into the closed end of the coil by means of a capillary tube extending through the coil from the open end thereof and discharging into the coil at a point adjacent the closed end thereof.

Referring to the accompanying drawing, I show in Fig. 1 a refrigerator cabinet 10 having in the upper end thereof a cooling compartment 11, and in the lower end thereof a unit compartment 12. As in conventional constructions, in the unit compartment 12 is positioned a compressor 13 driven from a motor 14 by means of a belt 15. The discharge side of the compressor 13 is connected to the condenser 16 which discharges into the receiver 17.

In the upper portion of the cooling compartment 11 is positioned the brine tank 18 of conventional construction, and incorporated therein are one or more conventional pockets 19 in which are received conventional freezing trays 20. Between the pockets 19 and the walls of the brine tank 18 is positioned an evaporator formed of a plurality of coils of tubing 21. The coiled tubing 21 is closed at its lower end as at 22 (see Fig. 3), and coiled upwardly therefrom to the upper end of the brine tank 18, through which it passes and extends downwardly as at 23. The tubing 23 extends downwardly through the insulated wall 24, separating the compartments 11 and 12, where it connects into a fitting 25, the interior of which is connected by the tube 26 to the intake side of the compressor 13. The fitting 25 is preferably rigidly supported from the receiver by means of a suitable bracket such as 31.

Any suitable or conventional type of suction controlled mechanism 27 may be connected, if desired, into the tubing 26 for controlling the operation of the motor 14. A so-called capillary tube 28 connected at one end to the receiver 17, extends upwardly therefrom into the fitting 25, where it is suitably sealed against leakage by means of a compression nut such as 29, and continues upwardly through the tube 23 and on through the coils 21 to a point adjacent the closed end 22 of the coils 21.

The tubing 28, which is of sufficiently small size as to permit ready passage of refrigerant between it and the interior walls of the tubing 23 and coils 21, is preferably of such a bore as to meter the liquid refrigerant from the receiver 17 into the coil 21 at the proper rate of flow required for suitable continual operation of the refrigerating mechanism. Where it is not desired to depend upon the size of the tube 28 for controlling the flow of refrigerant to the evaporator, any suitable type of expansion or

other control valve (not shown) may be inserted in the tubing 28 between the receiver 17 and the connection 25, to effect the desired control of the feed of liquid refrigerant to the evaporator.

In operation, liquid refrigerant from the receiver 17 is fed through the tube 28 to the closed end of the coil 21, where it is discharged into the interior of the coil 21. The liquid refrigerant thus discharged into the lower end of the coil 21 will tend to fill the interior of the coil and, in absorbing heat from the brine 30 within the brine tank 18, will be gasified and passing upwardly will be drawn from the coil 21 through the tube 23 through the tube 26 back to the intake side of the compressor.

With this construction, it will be apparent that as far as appearance is concerned, but a single tube connects the evaporator with the mechanism below the wall 24, and that but a single passage must be provided in the wall 24 for the concentric tubes 23 and 28. This not only simplifies installation of the mechanism, but improves the appearance of the same considerably. Furthermore, in making the evaporator of the concentric tubes described, but one opening must be provided in the brine tank for the passage of such tube, which effects a saving in the cost of production and renders the possibility of leaks at this point considerably less. Furthermore, inasmuch as it is preferable to form the tube 23 and the coils 21 from a continuous length of the concentric tubes described, there is no possibility of leakage of refrigerant in the compartment 11. Furthermore, due to the fact that there is but one supporting connection between the evaporator and the walls of the brine tank, any expansion or contraction of the coils within the brine tank will have no tendency to loosen the connection or to induce rupture of the coils.

While I have shown the tube 28 as extending into closely adjacent relationship with the closed end 22 of the coils 21, it will be obvious that it is not essential to the broader aspects of the invention that the tube 28 be extended fully to this degree, as satisfactory results may be obtained by stopping off the tube 28 between the ends of the coil 21.

These and other formal changes may be made in the specific embodiment of the invention described without departing from the spirit or substance of the broad invention, the scope of which is commensurate with the appended claim.

What I claim is:

In a mechanical refrigerating system, in combination, a cabinet provided with a cooling compartment and a unit compartment separated by a wall, an evaporator in said cooling compartment, a compressing and a

condensing unit in said unit compartment,
a motor for driving said compressor, a pair
of tubes, one positioned within the other for
at least part of its length, extending from
5 said evaporator through said wall and forming
intake and discharge passages for said
evaporator, the outer of said tubes being
connected to said compressor unit and the
inner of said tubes comprising a capillary
10 tube connected to said condensing unit and
forming the sole metering means for controlling
the flow of liquid refrigerant to said
evaporator, and means controlled by variation
in pressure within the outer of said
15 tubes for controlling the operation of said
motor.

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