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REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

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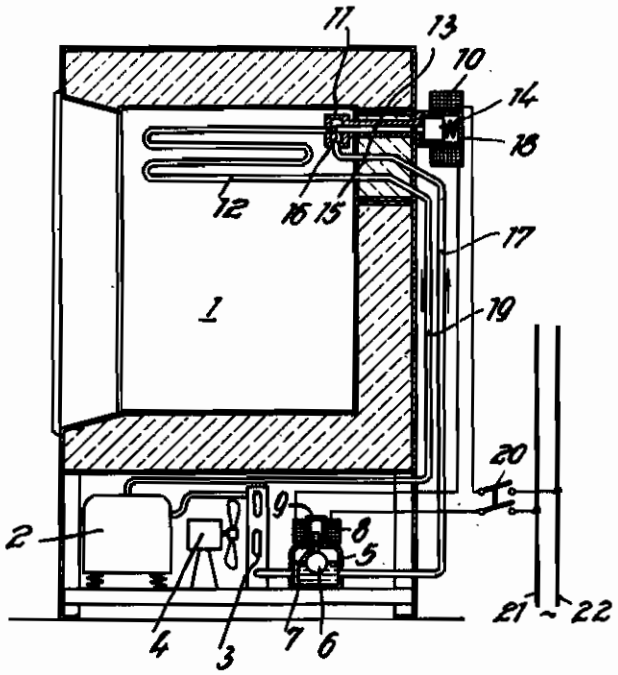

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ALIEN PROPERTY CUSTODIAN

REFRIGERATING APPARATUS OF THE COMPRESSION

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The present invention relates to improvements in refrigerating apparatus of the compression type, and more particularly to a control therefor.

In my prior Patent No. 2,161,960, dated June 13, 1939, I have described a control mechanism for refrigerating apparatus of the compression type, whereby the flow of the refrigerant into the evaporator is rendered as uniform as possible. To this end, the refrigerant which is connected in a collecting tank flows to the evaporator through a valve which is spaced from the point where the collecting tank is located and which is controlled by a float in accordance with the liquid level of the refrigerant in the tank. The float then adjusts a resistance lying in the circuit of an electromagnet which serves to operate the control valve intermediate the collecting tank and the evaporator.

In the arrangement described in my prior patent, the electromagnet of the control valve is located at a point within the cooling chamber of the refrigerator and in the immediate vicinity of the evaporator. It has now been found that with such an arrangement of the electromagnet in the cooling chamber, the temperature therein will be increased to some extent since the electromagnet is excited continuously.

It is therefore the object of this invention to provide a refrigerating apparatus with an electromagnetically controlled valve of the type described above, in a manner so as to avoid a heating of the cooling chamber. For attaining this object, an arrangement may be provided in which the electromagnet of the control valve is located at a point outside of the cooling chamber. To this end, the entire valve mechanism, including the valve as such and the electromagnet for operating the same, may be arranged outside of the cooling chamber or, according to a preferred embodiment of the invention, the valve as such may be located within the cooling chamber and be adjusted by an electromagnet arranged outside of the cooling chamber by means of a valve piston or connecting rod extending through the refrigerator casing.

The accompanying drawing illustrates diagrammatically one embodiment of the present invention applied to a household refrigerator of the compression type.

Referring to the drawing, the refrigerator consists of a cooling chamber 1 underneath which are arranged the motor compressor set 2, the condenser 3, a ventilator 4 for circulating the cooling air, and a float tank 5. In the latter is placed a float 6 secured to an iron core 7. The iron core 7 cooperates with a coil 8 which is arranged about a socket 9 on the upper end of the float tank 5 at a point outside of the cooling system. The iron core 7 then moves within the socket 9 and the coil 8 in upward or downward direction, depending upon the liquid level of the condensate in the tank 5. The coil 8 lies in the circuit of an electromagnet 10 serving to operate a valve 11. The latter controls the flow of the liquid refrigerant into the evaporator 12 arranged in the upper part of the cooling chamber 1. The valve 11 comprises a valve rod 13 extending through the refrigerator casing and having secured to its outer end an armature 14. A tube 15, which serves for guiding the valve rod 13, extends at the inner end, that is, within the cooling chamber, into a valve chamber 18 which is connected with the condenser 3 through the conduit 17. The tube 15, which extends through the refrigerator casing, is provided on its outer end, that is, on the outside of the refrigerator casing, with a chamber 16 housing the armature 14 and carrying on its outside the coil 10. A compression spring 23 serves for holding the valve rod 13 normally in closing position. The vaporous refrigerant flows from the evaporator 12 through a conduit 19 back into the suction side of the compressor 2. The control circuit for the electromagnet 10 is connected to the alternating current supply circuit 21, 22 through a switch 20.

The above described arrangement operates as follows: Since as above described the iron core 7 is secured to the float 6, it moves within the coil 8 and the socket 9 in upward or downward direction depending upon the liquid level of the condensate in the tank 5. At a high liquid level the float 8 assumes the position shown in the drawing so that the resistance of the coil 8 is reduced to such an extent that the force of the electromagnet 10 is sufficient to open the valve 11 against the force of the compression spring 23. The valve 11 therefore permits the refrigerant to flow into the evaporator 12 through the conduit 17. Accordingly, the liquid level in the tank 5 lowers and the iron core 7 moves in downward direction. The increase in resistance of the coil 8 caused thereby, weakens the exciting current of the electromagnet 10 to such an extent that the valve 11 is again closed under the action of the compression spring 23.

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