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REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

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Fig. 1

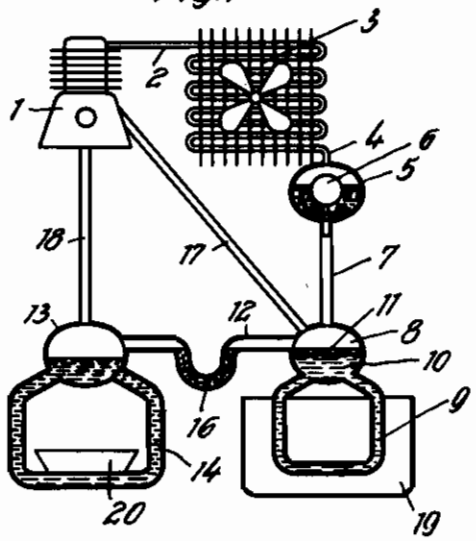
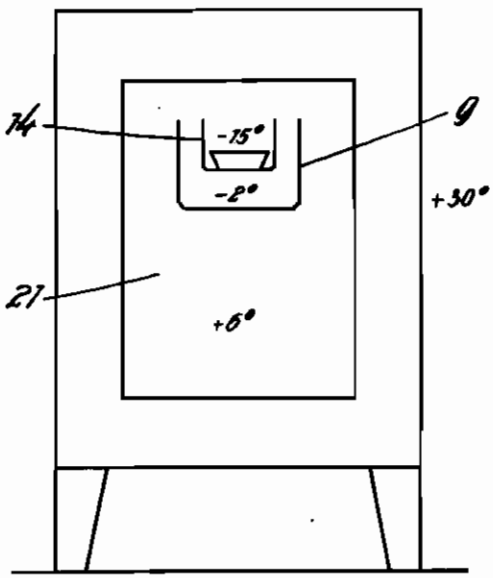


Fig. 2



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ALIEN PROPERTY CUSTODIAN

REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

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The present invention relates to improvements in refrigerating apparatus of the compression type.

In such apparatus two requirements must be fulfilled. On the one hand, it is desirable that the refrigerating apparatus be so designed as to enable a very rapid production of ice. This requirement may be fulfilled when employing refrigerants evaporating at low temperatures. On the other hand, the cooling chamber must be cooled by the evaporator and for cooling purposes low temperatures are unfavorable, since the goods to be cooled become dry owing to the low temperatures.

The object of the present invention is to provide a refrigerator cabinet equipped with a refrigerating apparatus of the compression type, whereby the two above-mentioned requirements may be fulfilled in a simple manner. According to the invention, two refrigerants differing in specific weight and evaporating at different temperatures are employed in the apparatus. A particular evaporator is employed for each of the two refrigerants so that one evaporator may be chiefly employed for the rapid production of ice, whereas the other evaporator is above all designed as a chamber cooler. The two evaporators are preferably so arranged according to the invention that in operation the two refrigerants flow automatically into the respective evaporators. This may, for instance, be attained by the fact that the liquid refrigerant flowing from the control member is at first supplied to the evaporator in which the refrigerant of greater specific weight is used and that this evaporator is provided with an overflow conduit which leads to the second evaporator containing the refrigerant of smaller specific weight. The refrigerant of greater specific weight of the refrigerant mixture flowing from the condenser into the evaporator collects in the lower part of the first evaporator vessel, whereas the refrigerant of smaller specific weight which floats on the refrigerant of greater specific weight flows into the second evaporator through the overflow conduit. The conduit connecting the two evaporators is preferably designed in the form of a liquid seal. The purpose of the liquid seal is to ensure a partial pressure of the refrigerant in each evaporator. The evaporator containing the refrigerant evaporating at a lower temperature is so designed that it may be employed for the production of ice, whereas the other evaporator is designed in the form of a chamber cooler. A particularly simple arrangement of the evaporators may be effected by arranging both evaporators one within the other in such a manner that the inner evaporator serves to produce ice and the outer as a chamber cooler.

Further details of the invention will be apparent from the following description taken in connection with the accompanying drawings, in which

Fig. 1 shows a refrigerating apparatus of the compression type according to the invention, and

Fig. 2 is a schematical arrangement of the two evaporators within the cooling chamber of a refrigerator cabinet.

Referring to Fig. 1, 1 denotes the motor-compressor set. This set forces the refrigerant through a conduit 2 into an air-cooled condenser 3 where it is liquefied. The liquefied refrigerant then flows through a conduit 4 into a tank 5 in which is arranged a float-controlled valve 6. The tank 5 contains a mixture consisting of the refrigerants differing in specific weight and employed in the apparatus. As required, the liquid mixture is supplied with the aid of the valve 6 to a collecting vessel 8 through a conduit 7, evaporator conduits 9 being secured to the vessel 8 in any suitable manner. Since the refrigerant 11 has a smaller specific weight than the refrigerant 10 it floats in the vessel 8 on the surface of the refrigerant 10. Connected to the vessel 8 is an overflow conduit 12 leading to a collecting vessel 13. The evaporator conduits 14 are secured to the vessel 13. In operation the refrigerant of smaller specific weight passes into the evaporator 13, 14. The middle portion of the conduit 12 is designed in the form of a liquid seal 18. The suction conduits 17 and 18 leading to the suction side of the compressor are connected to the vessels 8 and 13.

The refrigerant of greater specific weight is employed in the evaporator 8, 9 designed in the form of a chamber cooler. To this end, as shown in Fig. 1, heat-radiating ribs 19 are so arranged as to be in heat contact with the refrigerant conduits 9. This evaporator 8, 9 contains a refrigerant, for instance, SO_2 which evaporates at a relatively high temperature. The evaporator 13, 14 is designed in the form of an ice-producing unit shown schematically in Fig. 1 in the form of an ice tray 20. A refrigerant, for instance CH_3Cl evaporating at a comparatively low temperature is employed in the evaporator 13, 14.

As shown in Fig. 2, the evaporators 9 and 14 are arranged one within the other in such a manner that the evaporator 14 which serves to produce ice is surrounded by an evaporator 19 serving above all as a chamber cooler. As will be apparent from the temperatures indicated in Fig. 2 a natural temperature drop is attained due to the difference in temperature existing between the outside atmosphere (+20°), the cooling chamber air (+6°), the temperature (−2°) prevailing in the evaporator 9 serving as a chamber cooler, and the temperature (−15°) prevailing in the evaporator 14 serving for the production of ice.

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