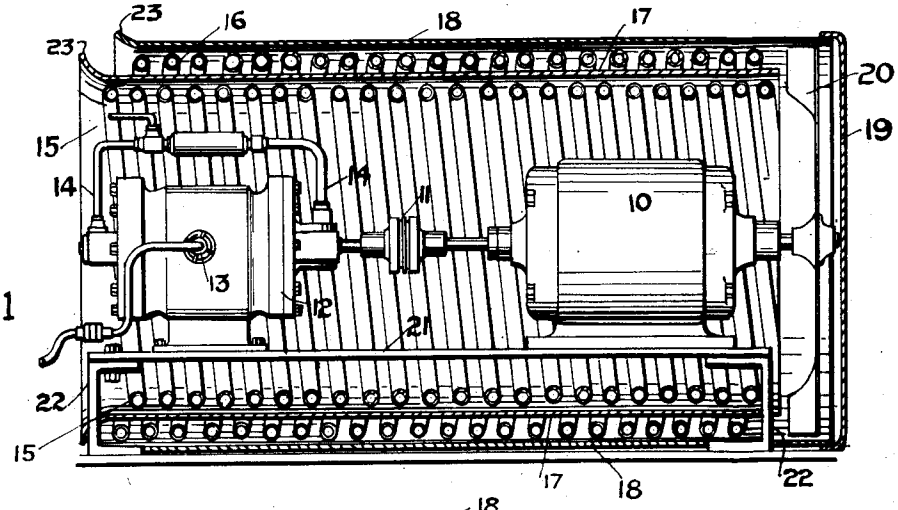
Feb. 7, 1933. E. A. HAMPSON 1,896,080

REFRIGERATION UNIT

Filed Oct. 10, 1927

Fig.1



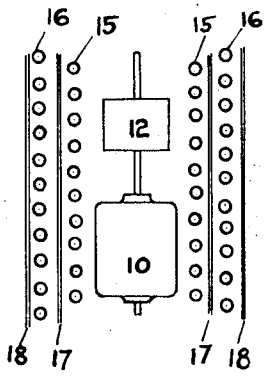


Fig.3

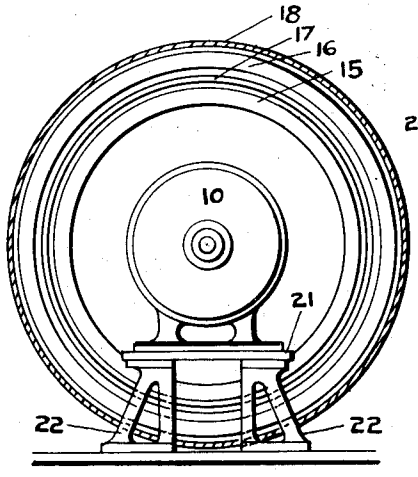


Fig.2.

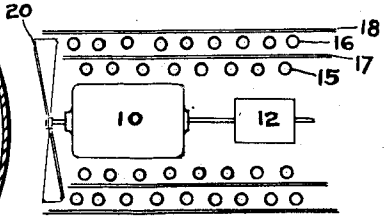


Fig.4

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UNITED STATES PATENT OFFICE

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REFRIGERATION UNIT

Application filed October 10, 1927. Serial No. 225,152.

In mechanical household refrigeration units it appears that such a machine embodying an air-cooled condenser is ordinarily much more desirable than the type of machine embodying a water-cooled condenser since with the air-cooled condenser there is no necessity for connecting pipes to the machine for leading water to and from the condenser for cooling.

The invention disclosed relates particularly to an air-cooled refrigeration unit, and an object of the invention is to provide an improved arrangement of the parts of the unit, and to provide a construction wherein the unit is so arranged and the parts so positioned that it will be compact and sightly. A still further object of the invention is to provide a construction for a mechanical refrigeration unit such that not only the condenser is cooled, but in addition, the compressor and motor may be advantageously cooled by the same means providing the air flow for cooling the condenser coils.

Further, it is an object of the invention to provide a unit of such construction that it may be mounted either in vertical or horizontal position, there being certain advantages in one or the other mounting, depending more particularly on the type of compressor employed and also depending upon whether the unit is to be cooled by forced draft of air or merely by natural air circulation.

The above specifically enumerated objects of the invention, together with other and further objects thereof will become readily apparent on a reading of a specification when considered in connection with the drawing wherein Figure 1 is substantially a side elevation of the unit with parts broken away; and

Fig. 2 is an end elevation of the construction shown in Fig. 1.

Figs. 3 and 4 are diagrammatic showing modified constructions.

In the drawing, an electric motor for driving the unit is indicated at 10, which motor is connected by a coupling means 11 to the shaft of a compressor 12.

Compressor 12 is shown as having an inlet at 13 and outlets at 14 discharging into a common condenser pipe 15 which is coiled about the motor compressor unit and extends substantially from end to end thereof.

As shown, the condenser comprises two concentric coils the outer one of which is indicated by 16 and there is provided between the two coils 15 and 16 a shell 17 which separates the two sets of coils and which shell 17 serves the purpose of guiding the air current flowing over the condenser coils. Outside of the outer condenser coils 16 and surrounding them, there is provided a further shell 18, which also serves to direct air currents about the coils, the shell 18 being provided with a head 19 which head 19 further serves for directing the air currents relative to the coils.

On the shaft of electric motor 10 positioned as shown in the drawing, that is, on the end of the motor shaft other than that connected to the compressor, there is mounted an air propelling member 20 shown as a centrifugal fan. While the fan as shown in the drawing is connected to the end of the motor shaft remote from the compressor it will, of course, be perfectly obvious that the fan may be connected to the drive shaft somewhere between the motor and the compressor casing, and that the fan may be of any type which will cause air to be propelled through the channels formed by shells 17 and 18 and head 19.

As shown, the motor and compressor are mounted on a base plate 21 and in order that the unit may be conveniently mounted, there are attached at the ends of the unit to this base plate bracket members 22 which can be secured in any convenient manner to the structure upon which the unit is to be mounted.

When electric motor 10 is operating to drive compressor 12 and compress the refrigerating gas, fan 20 will be rotated and as shown in the drawing air will be drawn through the inner shell 17 from the compressor end, and in passing through this shell will more or less cool the compressor, the motor and the inner condenser coils, the air then passing into the space between shells 17 and 18 and back to the compressor end to cool

the outer condenser coil in its passage through the space between the two shells.

In order to prevent any appreciable tendency to form a more or less closed air circuit from the space between these shells back into the inner central space, the lips of shells 17 and 18, at their open ends, are shown as somewhat flared outwardly as at 23 so that the warm air will be directed away from the central intake.

While the unit is shown in Fig. 1 as provided with a positively driven fan for moving the air therethrough, it will be obvious that should it be desirable to employ an air-cooled unit without a positively driven fan, the unit can be turned to a vertical position as shown in Fig. 3, then by removal of head member 19 the natural air draft through the shells caused by the normal tendency of the air to rise as it is warmed can be used for the cooling of the unit, and in such case due to the removal of head 19, the air-flow would be upwardly from the bottom end of the unit to the top end through both the inner and outer shells without reversal of the air current as is particularly shown in connection with the fan construction illustrated in Fig. 1.

It is also readily apparent that with head 19 removed and a different type of fan substituted, that is, a mere pusher type, as shown in Fig. 4, air can be drawn through both the inner and outer shells in either direction depending on the direction of blading of the fan.

These various structures just described have been only diagrammatically illustrated since with the description given it is perfectly obvious from the drawing that the unit may be cooled as stated.

It is thought that on consideration of the drawing presented and of the description relating thereto, it will be perfectly apparent that applicant has provided a compact and advantageous construction for a refrigeration unit, and that advantages of the construction are derived by the placing of the condenser coils entirely surrounding the mechanical portion of the unit in its longitudinal dimensions, since thus an adequate length of tubing can be employed in the condenser to provide ample radiating surface.

I claim:—

1. A refrigeration unit comprising a motor and a compressor, a condenser coil surrounding the motor and compressor and having portions radially spaced from one another and a plurality of annular shell members positioned relative the condenser coil, and acting as baffles to direct a cooling air flow over the condenser coil, one of said shell members being located between said radially spaced portions.

2. In refrigerating apparatus, the combination of a motor, a compressor, a condenser consisting of a plurality of coils of pipe concentrically arranged about a vertical axis around said motor and compressor and a vertically disposed cylinder shaped baffle interposed between the inner and outer coils whereby air may be caused to circulate over said compressor and said motor and the coils inside the baffle due to the draft resulting from the transfer of heat to the air from the coils, compressor and motor while the coils outside of the baffle may be cooled by another air stream.

3. A refrigerating unit including a motor, a compressor, a plurality of concentrically disposed condenser coils surrounding the motor and the compressor and means for directing currents of air in different directions over said condenser coils, said means including a cylindrical baffle interposed between said coils and a fan adapted to be driven by said motor and disposed adjacent one end of said baffle.

4. In a refrigerating unit of the compressor type the combination of a motor, a compressor, a fan, a condenser and guide means for directing air currents over said condenser, said condenser comprising a plurality of concentrically disposed coils of pipes and said guide means including a baffle interposed between the inner and outer coils.

5. In a refrigerating unit, the combination of a motor, a compressor, a device for discharging heat to the atmosphere including a coil having portions radially and laterally spaced from one another and concentrically disposed about said motor and said compressor, and a vertically disposed annular baffle member interposed between said portions of said coils for isolating the same from one another, and for preventing the flow of air from one portion to another, whereby each portion of the coil discharges heat substantially independently of the discharge from another portion, and a plurality of natural drafts of cooling air are caused to flow over said coil and over said motor and compressor.

Signed at Chicago, in the county of Cook, and State of Illinois, this 7th day of July, A. D., 1927.

EDWARD A. HAMPSON.