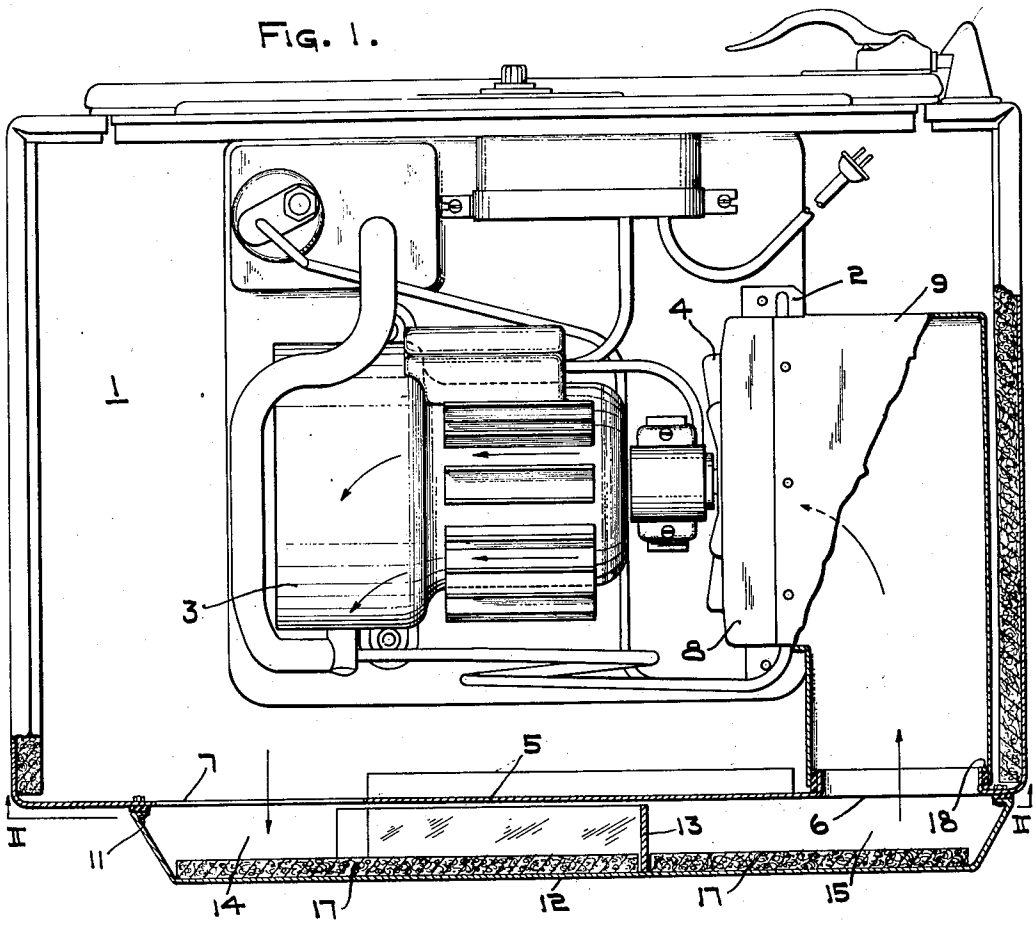
July 23, 1935. J. H. ASHBAUGH 2,009,246

REFRIGERATING APPARATUS

Filed April 11, 1932

Fig. 1.



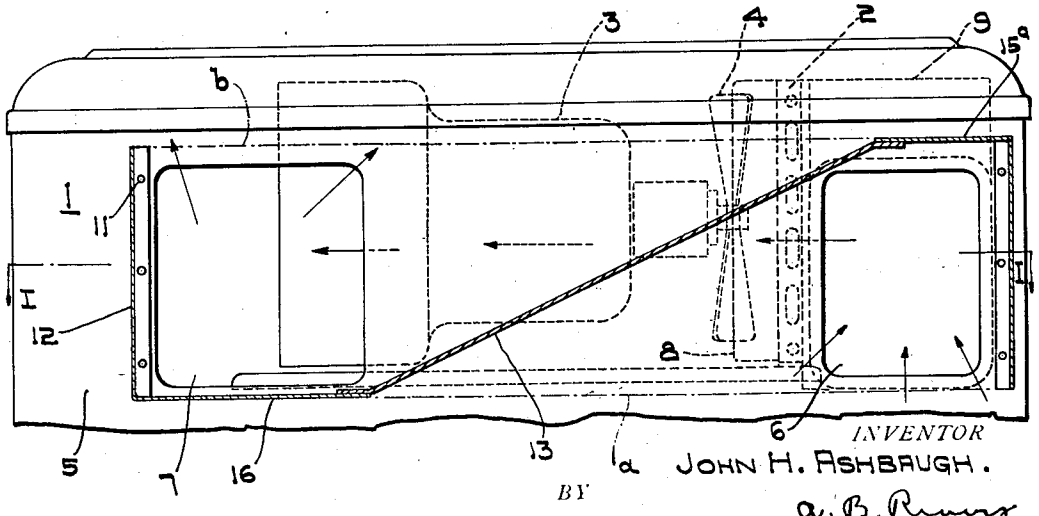


Fig. 2.

INVENTOR
JOHN H. ASHBAUGH.
BY
a. B. Rines
ATTORNEY

Patented July 23, 1935 2,009,246

UNITED STATES PATENT OFFICE

2,009,246

REFRIGERATING APPARATUS

John H. Ashbaugh, Longmeadow, Mass., assignor to Westinghouse Electric & Manufacturing Company, a corporation of Pennsylvania

Application April 11, 1932, Serial No. 604,590

3 Claims. (Cl. 62—116)

My invention relates to refrigerating apparatus, and particularly to cooling-air circulating means for refrigerators of the household type, water cooler type, and the like.

Refrigeration apparatus of this character comprises generally a heat-absorbing means and a heat-dissipating means, arranged in separate compartments of a refrigerator cabinet. It is the usual practice to provide devices for assisting heat dissipation from the heat-dissipating means. In accordance with my invention, I provide conduit means to circulate air so as to absorb heat from refrigerating apparatus, the conduit comprising essentially an inlet duct discharging air through a condenser into the machinery compartment, the latter forming a portion of the circulating conduit, and a discharge duct for discharging air from the machinery compartment to the outside. The inlet end or area of the inlet duct is preferably at a lower level than the discharge end or exit area of the discharge duct, whereby thermo-syphonic action is available in assisting in the circulation of air. A fan is arranged in the circulating conduit, preferably at the discharge side of the condenser, and it is arranged to direct air over the motor compressor unit. The inlet duct includes a downwardly-directed inlet duct portion, a wall aperture, and an inner duct portion for conducting air passing through the aperture directly to the condenser. The discharge duct includes a wall aperture and an upwardly directed discharge duct portion. The directions and extent of the inlet and outlet duct portions avoid interference with air circulation due to closeness of the cabinet to a wall, reduce the transmission of sound, due to the elbow bends at the inlet and discharge portions of the circulating conduit, and provide for thermo-syphonic action. Transmission of sound is further reduced by sound-deadening material applied to the inlet and discharge duct portions.

In accordance with the above, it is an object of my invention to provide an efficient air-circulating system for the heat-dissipating means of refrigeration apparatus.

A further object of my invention is to provide an air circulating conduit for a refrigerator having a downwardly-directed inlet and an upwardly directed outlet so that circulation of air is not impeded by contiguity of the inlet and outlet to a room wall.

A further object of my invention is to provide an air-circulating conduit for a refrigerator having its terminal portions constructed and arranged to resist sound transmission.

A further object of my invention is to provide an air circulating conduit for a refrigerator having its inlet disposed at a lower level than its outlet to secure the benefit of thermosyphonic action in circulating air.

It is still another object of my invention to provide an air circulating duct which will supply cool air directly to the condenser of a mechanical refrigerator.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawing, forming a part of this application, in which:

Fig. 1 is a top plan view of a compression refrigeration machine disposed in a cabinet with the lid thereof removed, with parts broken away on line I—I of Fig. 2, and showing one embodiment of my invention; and,

Fig. 2 is a portion of a back elevational view of a refrigerator cabinet taken on line II—II of Fig. 1, with the lid of the cabinet added, and showing an embodiment of my invention as utilized with a mechanical refrigerating apparatus.

Although I have shown my invention as applied to a compression refrigeration machine mounted in the top of a domestic refrigerator cabinet it is understood that my invention may be applied to any type of air-cooled refrigeration apparatus disposed at any desired point in the refrigerator cabinet.

Referring specifically to the drawing for a detailed description of my invention, numeral 1 designates generally a refrigerator machine compartment in which are disposed a motor and compressor contained in a casing 3, a fan 4, and a condenser 2, the latter being preferably surrounded by a housing 8.

An air circulator conduit is provided for absorbing heat from the machine compartment, comprising an air inlet duct and an outlet or discharge duct. The inlet duct comprises an outer or inlet duct portion, an aperture 6 in the wall 5 of the cabinet 1 and an inside duct portion 9. The inside duct portion 9 communicates with the housing 8 surrounding the condenser 2, and the fan 4, preferably disposed on the opposite side of the condenser 2 from the duct 9, draws air through the duct portion 9 and housing 8 to cool the condenser by concentrating incoming air thereon. The outlet or discharge duct for air passing through the machine compartment 1 comprises an aperture 7 in the wall

5 of the cabinet and an outside outlet or discharge duct portion 14.

In the preferred embodiment of my invention, the air circulating conduit is constructed and applied in the following manner: attached to the back wall 5 of the machine compartment 1 by any suitable means, such as by bolts 11, is an outside duct member 12 cooperating with the back wall 5 to provide inlet and outlet duct portions communicating with the apertures 6 and 7. The member 12 is preferably provided with a diagonal member 13 which divides a pan-like interior of the member 12 into the two duct portions 14 and 15 communicating with apertures 6 and 7, respectively. The duct portions 15 which cooperate with the air inlet aperture 6 is preferably closed at the top by a member 15a so that the sole path for air to travel into the machine compartment 1 is from below, the inlet or entrance being at the position of dot and dash line *a*. The duct portion 14 is closed below by a member 16, so that the only path for exhaust air from the machine compartment 1 is upward through the outlet at the level indicated by the dot and dash line *b*. Sound-deadening material 17 is disposed in the outside duct member 12 so that noise from the machinery in the compartment 1 is deadened. Felt 18 is also provided between the inner duct 9 and the back wall 5 of the refrigerator to provide a substantially air-tight non-rattling joint between the two.

When the fan 4 is actuated, air is drawn through the entrance at level *a* of the inlet duct, the latter including the duct portion 15, the wall aperture 6 and the duct portion 9, and then passes through the condenser 2 to the fan. The fan discharges air into the machinery compartment, the air being directed over the motor and compressor casing 3. Air is discharged from the machinery compartment through the discharge duct including the aperture outlet 7 and the duct portion 14, the exit or discharge opening of the discharge duct being at level *b*.

It will be readily seen that I have provided a means for directing air over a condenser and machinery of a mechanical refrigerator which draws air from a lower level and exhausts it at a higher level, the structure providing adequate and unimpeded flow area at all points and the difference in level of the entrance and discharge areas providing thermo-syphon circulation assisting the fan. Also, the structure is such that circulation of air for the machine compartment of a mechanical refrigerator cannot be cut off by pushing the cabinet close to a wall. Furthermore, due to the bent or angular formation of the conduit, and particularly due to the use of sound-deadening material, noise is minimized.

I have used the expression "machine compartment" to define any compartment other than the cooling compartment which contains the apparatus necessary to perform refrigeration, not including the evaporator or its equivalent.

While I have shown my invention in one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. In combination, a refrigerator cabinet including a machine compartment, a vertical wall of which is provided with air inlet and outlet apertures; a motor, compressing means, condenser and fan disposed in the machine compartment; and means cooperating with said apertures and disposed exteriorly of the vertical wall for directing air translated by the fan into and out of the machine compartment, said means comprising a hollow pan and a dividing partition cooperating with said vertical wall to provide inlet and outlet conduit portions communicating with the inlet and outlet apertures; the pan being open along its lower and upper edges for the extent of the inlet and outlet conduit portions, respectively, to provide a downwardly directed inlet for air arranged at a lower level than the upwardly directed outlet.

2. An air duct construction for a refrigerator cabinet adapted to extend outwardly from a wall thereof and comprising a hollow oblong pan engaging with the wall and having the hollow portion thereof facing the wall, partition means cooperating with the wall and the hollow interior of the pan to provide separate compartments, said wall having separate openings communicating with each compartment and each compartment having a separate opening communicating with the interior, said dividing means comprising a diagonal partition extending substantially along a hypothenuse of the oblong pan.

3. In combination, a refrigerator cabinet including a machine compartment, a vertical wall of which is provided with inlet and outlet apertures; motor and compressing means disposed in the machine compartment; and means cooperating with said apertures and disposed exteriorly of the vertical wall for directing air into and out of the machine compartment, said means comprising a hollow pan and a dividing partition cooperating with said vertical wall to provide inlet and outlet conduit portions communicating with the inlet and outlet apertures; the pan being open along its lower and upper edges for a substantial extent of the inlet and outlet portions respectively, to provide a downwardly directed inlet for air arranged at a lower level than the upwardly directed outlet.

JOHN H. ASHBAUGH.