Sept. 8, 1936. E. WENDLER 2,053,453

REFRIGERATOR VENTILATING DEVICE

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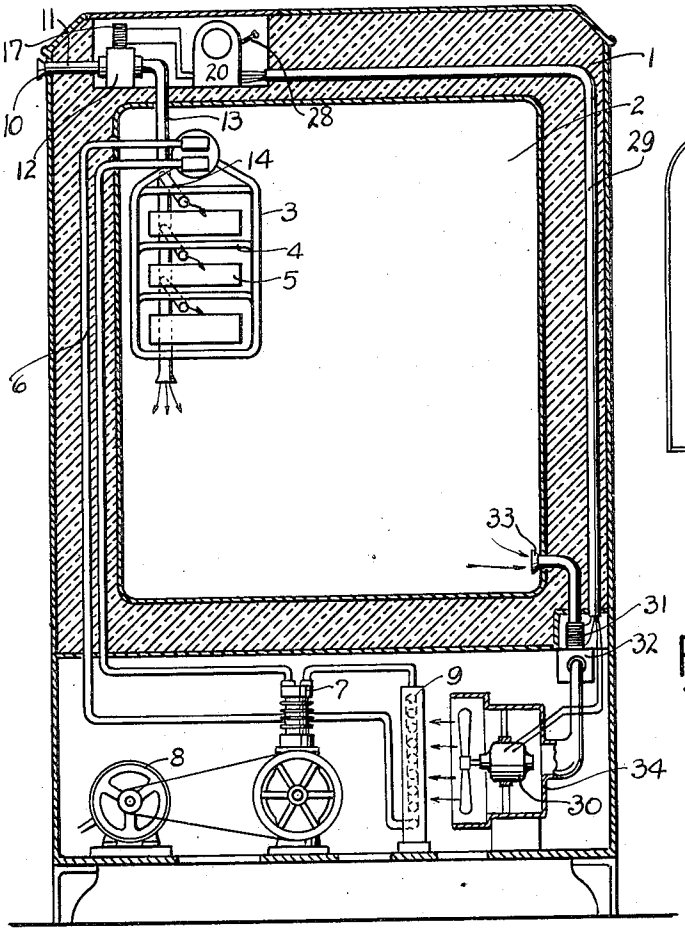


Fig. 1.

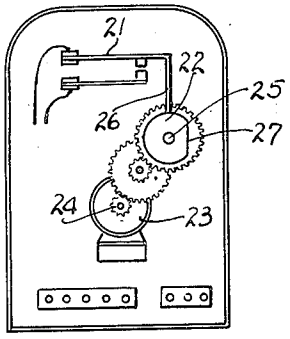


Fig. 3.

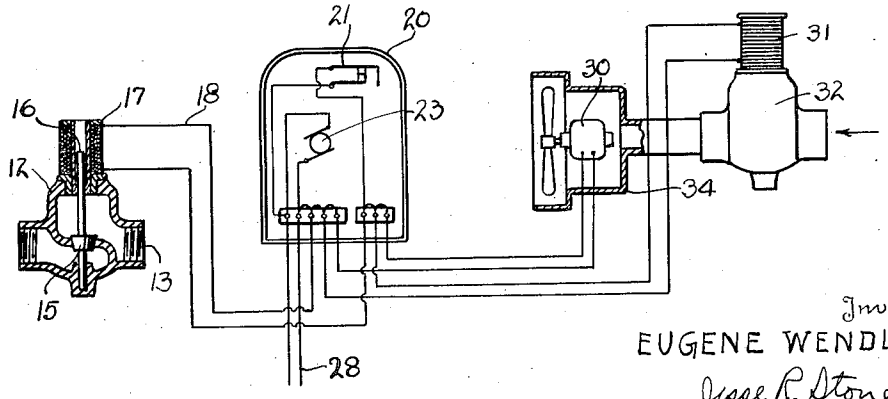


Fig. 2.

Inventor
EUGENE WENDLER.
Jesse R. Stone
&
Lester B. Clark
Attorneys

By

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REFRIGERATOR VENTILATING DEVICE

Eugene Wendler, Houston, Tex.

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4 Claims. (Cl. 98—51)

My invention relates to equipment whereby an electric or other mechanically operated refrigerator may be ventilated.

In the modern refrigerator the interior of the same is sealed and heat insulated in such manner that fresh air can not gain entrance to the interior except at occasional intervals when the door is opened. As a result, vapors from the foods or other articles within the refrigerator are absorbed in other foods within the interior of the refrigerator and the contamination of the food in this manner renders it distasteful. It is even found that the ice cubes forming in the ice chambers are flavored with the vapors from the food in the interior of the box.

It is an object of my invention to provide means for removing the vapors from the interior of the box and replacing the air from the box with fresh air from the outside at periodic intervals. I desire to remove the air from the interior of the box at frequent intervals so that the vapors will not contaminate the foods therein.

I contemplate the provision of a simple and economical device arranged to remove the air content of the refrigerator and to draw in fresh air at predetermined intervals in a uniform automatic manner.

The invention resides in the particular arrangement of the apparatus whereby the above objects are accomplished.

In the drawing herewith, Fig. 1 is a central vertical section through a mechanical refrigerator embodying my invention.

Fig. 2 is a diagrammatic view illustrating the operation of my device.

Fig. 3 is an elevation, somewhat diagrammatically, showing the manner in which the circuit is closed to operate the device for changing the air.

In Fig. 1 I have shown an ordinary type of mechanical refrigerator having insulated walls 1 thereon enclosing an interior 2, which is to be cooled. In the drawing the door and the ordinary shelving within the refrigerator are omitted for purposes of clearness. It is to be understood, however, that the interior will be equipped with shelves, etc. in the usual manner. The cooling system for the refrigerator is shown somewhat diagrammatically. There is a cooling coil 3 within the box having separate partitions 4 between the coils wherein the compartments 5 for ice are arranged, said compartments being adapted ordinarily for special cooling of objects to be kept at a temperature approaching that of freezing. The cooling coils are connected by means of the pipes 6 with a circulating pump 7 operated from the motor 8. There is also a condenser 9 connected with the cooling system in the usual manner.

My ventilating system includes an inlet shown toward the upper end of the box at 10. This inlet leads by way of the pipe 11 to the valve 12. The valve tends to control the passage of air through the valve to the pipe 13 on the interior of the box. This pipe which discharges the air into the box is extended down past the cooling chambers and has its lower end open to discharge the fresh air. I may provide also a separate branch from the main pipe 13, as shown at 14, leading to each of the ice compartments.

The valve 12 is shown in more detail in Fig. 2. It connects at one end with the pipe 11 and at the other end with the pipe 13. The valve member 15 within the outer casing 12 has an upwardly extending stem 16 projecting into a solenoid 17. This stem is of iron adapted to be drawn upwardly when the solenoid is energized. Said solenoid is connected in a circuit 18, which may be included in the house circuit shown at 28.

There is a timing device in the circuit shown generally at 20. Within this timing device I include a switch 21, connected in the circuit, and adapted to be held in open position by the cam member shown at 22 in Fig. 3. There is a small motor 23, connected in the circuit, which is arranged to operate said cam 22.

With reference particularly to Fig. 3, it will be seen that the motor 23 operates a gear 24 thereon, which is connected by a train of gears to the shaft 25 upon which the cam 22 is mounted. This cam has its outer surface contacting with the arm 26 upon the switch member 21. It will be seen that the switch is ordinarily held in open position. There is a flattened side 27 upon the cam, which when rotated into position beneath the switch arm 21 will allow said arm to drop and the switch to close. The continued rotation of the cam will, however, again raise the arm to open the switch after it has remained closed a predetermined interval of time. In Fig. 1, the timing device is shown as having a cord 28, which is intended for connection in an electric light circuit. The timing device is also connected through a pipe 29 to the suction fan 30, and also to the solenoid 31 operating the valve 32, at the lower end of the box.

The valve 32 is in a suction line having its upper end 33 extended into the lower end of the compartment 2 of the refrigerator. Said line passes through a valve connected at its lower end to the housing 34 of the suction fan. It will thus

be seen that when the circuit is closed by the timing device, the valve 32 will be opened and the suction fan 30 actuated to draw a current of air from the lower end of the box so as to remove the contaminated vapors from the interior. It is to be understood that the valve 32 is identical in construction with the valve 12, as illustrated in Fig. 2, and is operated in the same manner.

The cold air removed from the box may be discharged upon the condenser 9 so as to assist in cooling the same.

With this set-up it will be understood that some timing device will be employed which will allow the circuit to be closed at periodic intervals, so as to open the valves and operate the suction fan. This device has nothing whatever to do with the refrigerating apparatus ordinarily employed in the cooling of the box. I have shown a telechrone motor for operating the timing device but I wish it understood that this is simply illustrative of any device such as a clock or other mechanism whereby the circuit, connecting the operative portions of the device may be closed at predetermined intervals of time.

When the circuit is closed the two solenoids 17 and 31 will be actuated to open the two valves in the inlet and in the outlet lines. The suction fan 30 will also be actuated to draw from the lower end of the box the air and vapors from the interior of the chamber 2. This will also allow the entrance through the inlet pipe of fresh air to the interior of the box. I contemplate employing a suction fan of such capacity to remove the air from the interior of the box rapidly so that the operation need take but a very brief interval. The circuit through the operating devices will then be broken automatically. The interior of the refrigerator will thus be supplied with fresh air which will be quickly cooled within the box and will not materially decrease the temperature of the interior of the refrigerator.

It will be noted that but one suction fan is necessary and this may be of small capacity so that the cost of operating my device will be practically negligible. I will be enabled, however, to maintain the interior of the refrigerator free from objectionable odors or vapors tending to contaminate the other foods within the interior of the refrigerator. The advantages of this will be obvious without further description.

What is claimed as new is:

1. In a refrigerator having an interior cooling chamber, an inlet pipe thereto, a valve in said inlet pipe, an outlet pipe, a valve in said outlet pipe, means to create a suction in said outlet pipe, and automatically operated means to periodically open said valves and operate said suction means.

2. A refrigerator having an interior cooling chamber, means to maintain a cool temperature in said chamber, valve controlled inlet and outlet air lines in said chamber, a suction device in one of said lines, means automatically operating to open said valves and means to simultaneously operate said suction device at predetermined intervals.

3. A refrigerator, an inlet pipe thereto adjacent its upper end, a valve in said pipe, electrically operated means to control said valve, an outlet adjacent the lower end of said refrigerator, a device for causing circulation of air through said refrigerator, electrically operated means to actuate said device, and time operated means to simultaneously close the circuit to said valve and device and cause a flow of air through said refrigerator.

4. A refrigerator having a cooling chamber, inlet and outlet air lines in said chamber, means to control the passage through said air lines, time controlled means to cause a flow of air through said lines and means to open said air control means and to operate said air flowing means to change the air in said chamber.

EUGENE WENDLER.