March 22, 1938. R. S. AHRENS 2,112,205

METHOD AND APPARATUS FOR CONTROLLING CIRCULATION IN REFRIGERATORS

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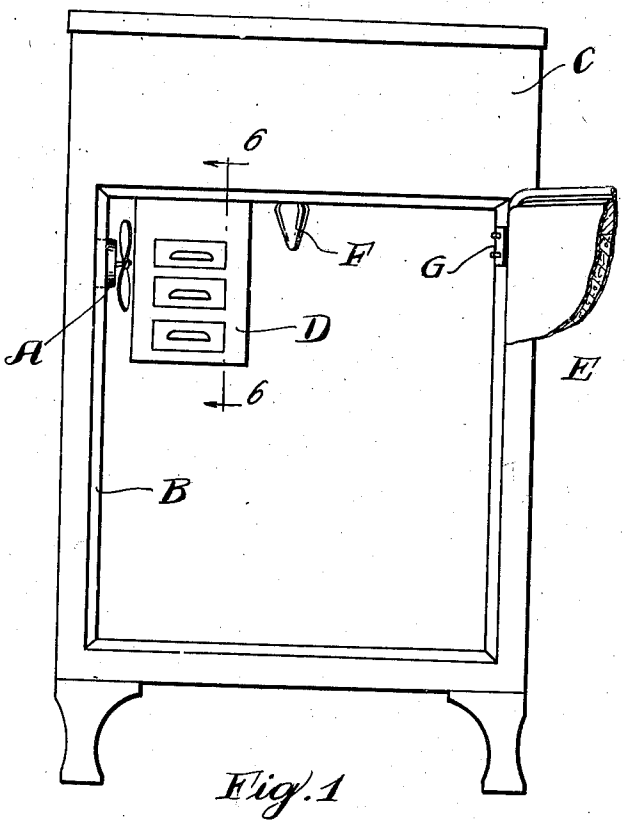


Fig. 1

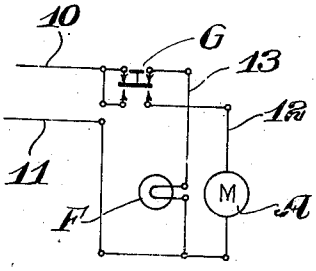


Fig. 2

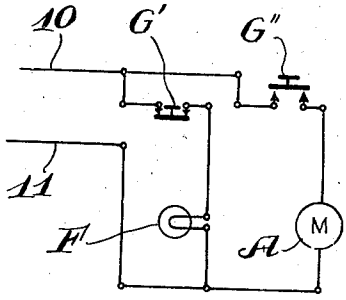


Fig. 3

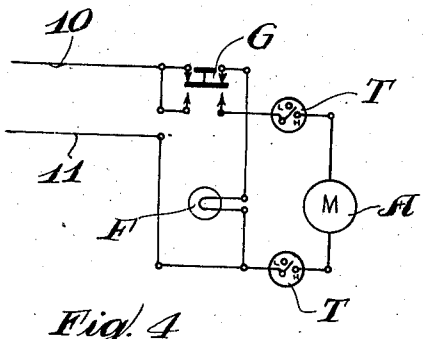


Fig. 4

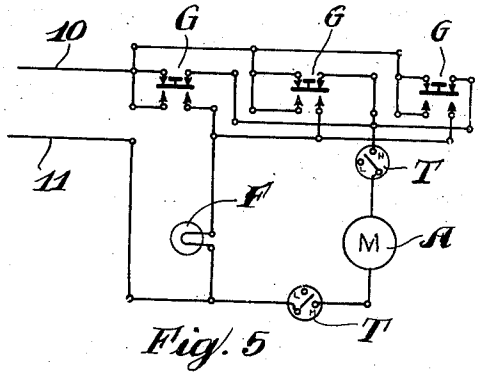


Fig. 5

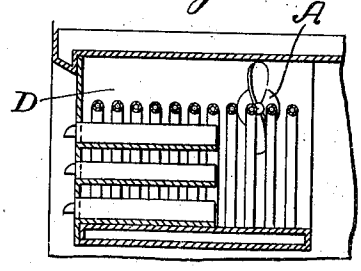


Fig. 6

Inventor

Robert S. Ahrens

By Howard Pieper

Attorney

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METHOD AND APPARATUS FOR CONTROLLING CIRCULATION IN REFRIGERATORS

Robert S. Ahrens, St. Paul, Minn., assignor to Seeger Refrigerator Company, St. Paul, Minn., a corporation of Minnesota

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3 Claims. (Cl. 62—102)

This is a method and apparatus for controlling the circulation in refrigerators. It includes the air circulating fan which is positioned adjacent the refrigerating unit or low side of the same in a refrigerator. It also includes the electric light means for illuminating the inside of the refrigerator and the method is well adapted to commercial as well as household refrigerators.

The method further includes thermostatic switch means for controlling the operation of the air circulating fan within the refrigeration compartment of the refrigerator so that the fan may be turned on or off in order to maintain an even temperature throughout the entire refrigeration compartment of the refrigerator. Several of these thermostatic switch means may be positioned at different locations within the refrigerating compartment, thus the refrigerating compartment may be maintained at a comparatively equal or predetermined temperature when the refrigerator is closed.

Further the invention includes switch means controlled by the doors or by the opening of the refrigerator so that when the refrigerator is opened, the air circulating fan adjacent the refrigerating unit will be stopped, thereby preventing waste of refrigeration to the outer atmosphere. This means may include the turning on of electric illuminating means within the refrigeration compartment simultaneously with the turning off of the air circulating fan. Further, when the refrigerator is closed, the air circulating fan is turned on and the illuminating means is simultaneously turned off. By this method and means, the temperature may be more perfectly regulated within a refrigerator.

My invention further includes electric circuit means wherein an electrically operated air circulating fan is included in the circuit which may also include electric light means as well as thermostatic controlling means for the operation of the air circulating fan, together with switch means which may simultaneously operate the turning off of the air circulating fan and turning on of the electric lights, or vice versa, thus providing a very practical and desirable means of economizing the refrigeration of a refrigerator when the same is open, and controlling the illuminating means as well as providing thermostatic control means for the refrigerator when it is closed.

The drawing illustrates one form of refrigerator, showing how my method of controlling the circulation of the refrigerator may be carried out in the diagrammatic illustration in Figure 1.

Figure 2 diagrammatically illustrates an electric circuit used in my method of controlling the circulation of air and the illuminating means in a refrigerator in one form.

Figure 3 diagrammatically illustrates an electric circuit showing another form of control for refrigerators.

Figure 4 diagrammatically illustrates an electric circuit showing another form of controlling circuit means for the refrigerator.

Figure 5 diagrammatically illustrates an electric circuit showing another form of circuit means for controlling the circulation and lighting within a refrigerator compartment.

Figure 6 is a section on the line 6—6 of Figure 1.

The invention includes the method of controlling the circulation of air and the lighting within a refrigerator which consists in placing an electrically operated air fan A within the refrigeration compartment B of the refrigerator C. The refrigerator may be of any form. While the one illustrated is only diagrammatic of a household type of refrigerator, it is apparent in considering the invention that the method will apply equally to a commercial refrigerator of any design and construction.

Within the refrigerator C is provided the refrigerating unit D and the air circulating fan A is positioned adjacent this refrigerating unit so as to circulate air over the same when the refrigerator is closed.

The method includes the means of turning off the fan A when the door E, only a portion of which is shown, or any one of the doors, it being obvious that several doors may be supplied, are opened, so that the air circulation within the refrigerator will stop when the refrigerator is opened. Thus the cooled air within the refrigerator is not forced out into the outer atmosphere as would be the case if the air circulating fan A continued to operate when the refrigerator was open.

The refrigerator C is ordinarily provided with electric light means F positioned in the refrigerating compartment and the light F and fan A are controlled by the door switches G.

The switches G may be in the form illustrated diagrammatically in Figure 2 having a double action so as to simultaneously turn the motor A off and the light means F on when the door E is opened, and to turn the motor A on and simultaneously turn the light means F off when the door E is closed. The electric circuit in Figure 2 illustrates the electric wires 10 and 11 lead-

ing from a source of electrical current, the wire 10 leading to both sides of the switch G. The wire 11 extends to the electric light means F and to one side of the motor fan A. In this circuit the motor A is connected by the wire 12 to the switch G and one side of the light circuit is connected by the wire 13 to the switch G.

In Figure 3 I have diagrammatically illustrated an electric circuit leading from a source of electrical current wherein electric switches G' and G'' are illustrated. In this circuit the switch G' controls the lighting means separately from the circuit to the electric fan motor A. The fan motor circuit is controlled by the switch G''. Each of the switches G' and G'' may be located to be operated when the refrigerator C is opened to control the lighting means and the air circulating means.

In Figure 4 I have illustrated an electric circuit showing a source of electrical current through the wires 10 and 11. In this circuit the light means F and the fan A are controlled by the double switch G to operate the same simultaneously turning the light means off when the fan means is turned on when the refrigerator is closed, and vice versa. In this circuit I have also illustrated a thermostatic control means T which is placed within the refrigeration compartment and is adapted to control the starting and stopping of the motor fan A when the refrigerator is closed to regulate the temperature within the refrigerator or maintain it at a predetermined point. Figure 5 illustrates an electric circuit of a similar character to Figures 2 and 4, showing the thermostatic controls T in the circuit, the fan motor A, the lighting means F, and several switches G which may be supplied for the different openings leading into the refrigerator compartment of the refrigerator.

I have defined my method of controlling circulation and lighting means within a refrigerator and the apparatus employed to carry out my method. The illustrations of the drawing are only diagrammatic and suggestive of a way and means of carrying out the method. It is obvious that these may be varied to completely control the refrigeration in the manner hereinbefore defined within a refrigerator, whether it is of a commercial type or household refrigerator. It is also apparent that certain variations and additions or changes may be made from those set forth within the scope of the following claims to those who are skilled in the respective arts of refrigeration and lighting means, as well as thermostatic controls, all of which when within the scope of the following claims form a part of my invention.

I claim:

1. The method of cooling a refrigerator having a cooling compartment in said refrigerator, a cooling unit near one wall of the compartment at the top of the same, and a fan arranged on a substantially horizontal axis between the cooling unit and the said one wall, said method consisting in blowing air through the cooling unit in a horizontal direction and across the top of the refrigerator compartment cooling the top portion of the refrigerator compartment prior to the cooling of the bottom of the refrigerator compartment.

2. The method of cooling a refrigerator having a cooling compartment, a cooling unit near one wall of the compartment and at the top of the same, and an air forcing means, the method consisting in blowing air into contact with the cooling unit, and beyond said cooling unit along the top of the refrigerator compartment, filling the top portion of the compartment with cooled air prior to the filling of the lower portion of the compartment with cooled air.

3. A refrigerator including a refrigerator compartment, a cooling unit positioned adjacent one wall of said compartment at the top of the compartment, a fan disposed between said one wall and said cooling unit and positioned to force air into intimate contact with said cooling unit and past said unit across the top of the refrigerator compartment, thereby filling with cooled air and cooling the top portion of the compartment.

ROBERT S. AHRENS.