

**March 11, 1941.**

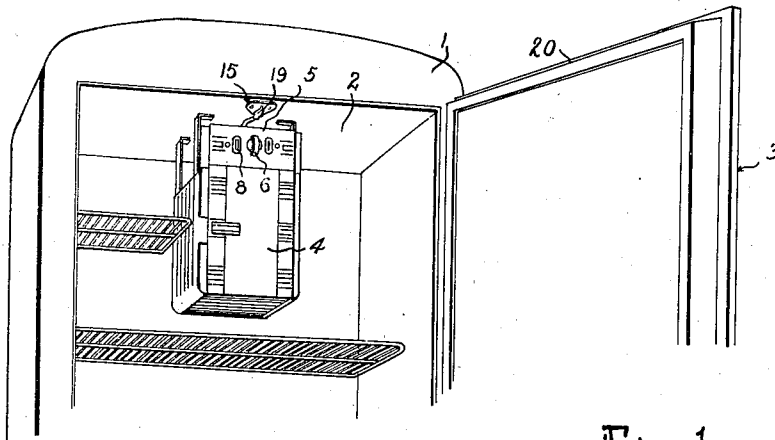
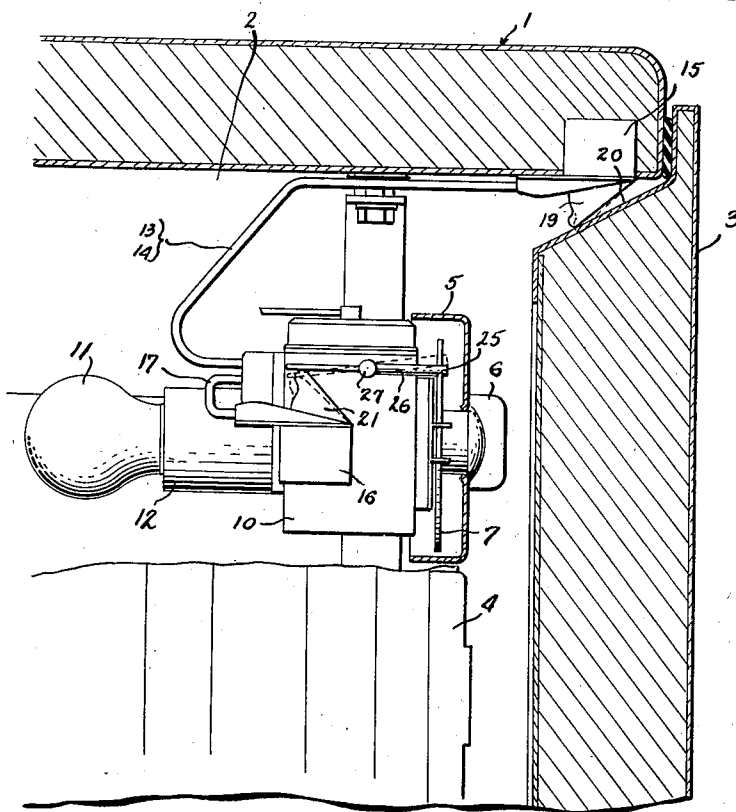
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**2,234,474**

## REFRIGERATION

Filed April 5, 1938

2 Sheets-Sheet 1



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REFRIGERATION

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2 Sheets-Sheet 2

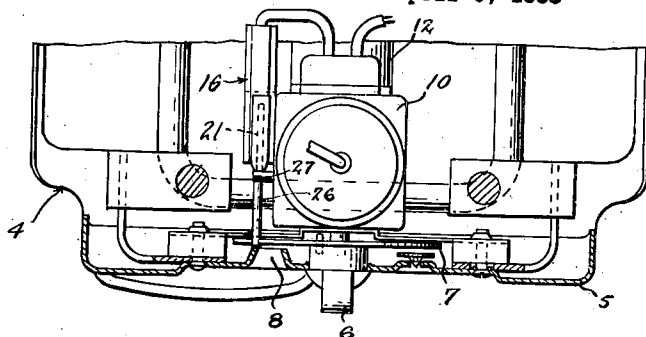


Fig. 3.

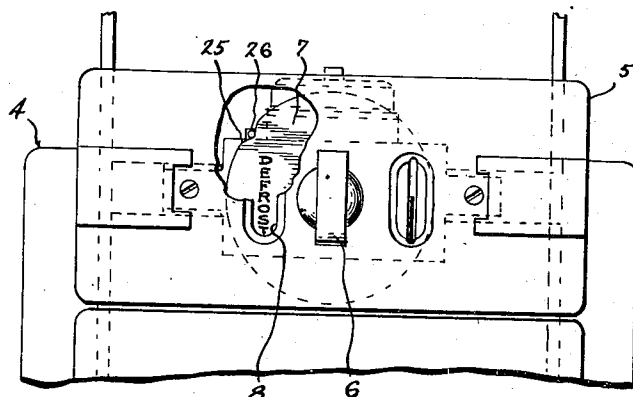


Fig. 4.

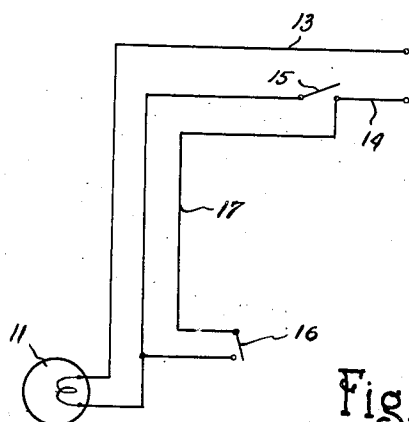


Fig. 5.

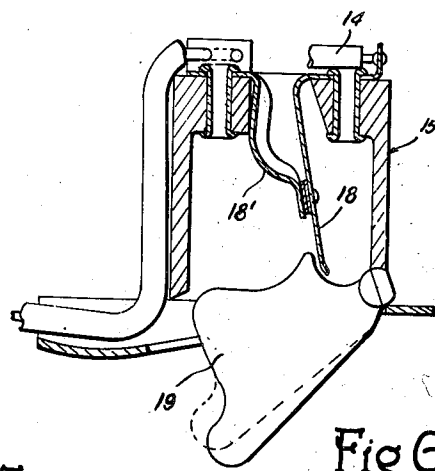


Fig. 6.

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## UNITED STATES PATENT OFFICE

2,234,474

## REFRIGERATION

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Application April 5, 1938, Serial No. 200,172

5 Claims. (Cl. 62—1)

In refrigerators where refrigerant is evaporated to absorb heat, frost collects particularly on those portions of the evaporator which define or form, either in whole or in part, a sharp freezing chamber where the temperature is below freezing. From time to time this frost should be removed by placing the refrigerating mechanism in an inoperative condition so that the frost will melt and run off in the form of water. The defrosting action may be accomplished by manually operable means or by means automatically controlled to cause defrosting at certain intervals.

This invention relates to improvements in a refrigerator for accelerating defrosting, to the end that the time required for defrosting is shortened. Some refrigerators are equipped with electric lighting means so that when the door is opened an electric lamp is energized, and the lamp is arranged to be deenergized when the door is closed. In accordance with this invention such a light may be used, and it is preferably arranged in proximity to the evaporator. The circuit for this light is arranged so that it may be controlled not only by the door but by the refrigerator control mechanism so that when the control is set for defrosting, the circuit to the light is established and remains established. The heat generated by the light accelerates defrosting action. Thus a single light source may be used for illuminating the interior of a refrigerator when the door is opened, for which purpose the circuit for the light is controlled by the door, and for accelerating the defrosting action, for which purpose the circuit is determined by the position of the control means. As shown herein the control means is of the manually operable type, although so far as this invention is concerned it may be automatic.

In the accompanying drawings:

Fig. 1 is a general view looking into a refrigerator and illustrating an evaporator.

Fig. 2 is an enlarged cross sectional view taken through the refrigerator and illustrating the location of the electric lamp.

Fig. 3 is a partial plan view of a portion of the evaporator showing some parts in section.

Fig. 4 is a partial front elevational view with a portion of the cover plate cut away.

Fig. 5 is a diagrammatic view of the wiring arrangement for the electric lamp.

Fig. 6 is a detail sectional view taken through a control switch.

In Fig. 1 the body of a refrigerator is illustrated at 1 having a refrigerated compartment

2 which may be opened and closed by a door 3. Inside the compartment is an evaporator 4, and the upper part of the evaporator is shown as having a panel 5 with a handle 6 which can be turned to operate the controls.

This handle may be journaled in the panel as shown in Fig. 2, and attached to the handle may be a dial 7 which may take the form of a disc. Suitable indicia may be placed on the disc so that the same may be exposed through a sight opening 8. This control may regulate the different degrees of coldness produced, and, as illustrated in Fig. 4, the word "defrost" is visible through the sight opening. The evaporator may define a sharp freezing chamber which may be opened and closed by a door on the front of the evaporator just below the panel 5. Suitable mechanism for the control which may include a thermostat, an electric switch, and the like, is generally illustrated at a housing 10.

Mounted just above the evaporator and to the rear of the panel 5 and the housing 10 is an electric bulb or lamp 11 in a socket 12. The lamp serves as an electrical heating element. The wiring for the lamp is illustrated in Fig. 5. One electrical conductor 13 leads to the lamp 11 and the other conductor 14 is provided with a switch 15. In parallel with the switch 15 is a switch 16 in a conductor 17. One switch, such as the switch 15, may be mounted so as to be controlled by the door. The structure may be a simple one comprising a spring arm 18 arranged to make contact with an arm 19 with the contact arranged to be broken by a pivoted operator 19 which lies so as to be engaged by a portion 20 of the door. When the door is closed the operator 19 is moved to the dotted line position shown in Fig. 6, and the switch is opened. The switch 16 may be the same kind of a switch having an operator 21. It will be noted that both switches are normally open. The conductors 13 and 14 may be united in a duplex wire or cable, as illustrated in Fig. 2, and the two parts of the conductor 17 may be similarly arranged.

The dial or disc 7 is provided with a recess or notch 25, and a rocker arm 26 pivoted as at 27 is arranged to engage the periphery of the disc and to engage the operator 21.

Normally, when the machine is in operation, the rocker arm 26 will engage the periphery of the disc, and the notch 25 will be disaligned from the rocker arm and this holds the rocker arm in the dotted line position of Fig. 2, depresses the operator 21, and opens the switch 16. When the

door is closed the switch 15 is opened. When the door is opened the switch 15 closes. Therefore, the interior of the compartment is illuminated any time the door is opened, but the light goes off when the door is closed. When the control is shifted to the defrosting position, as indicated in the present construction by the alignment of the word "defrost" with the sight opening 8, the notch 25 comes into alignment with the rocker arm and the natural spring tendency of the switch 16 causes the switch to close. Therefore, the circuit for the lamp remains closed through the conductors 13 and 17 and switch 16. When the door 3 is closed the lamp circuit is unbroken and the heat generated by the lamp accelerates the defrosting action, thus reducing the time required. The heat so generated is concentrated in proximity to the evaporator, and the defrosting may be caused while the temperature of the contents in the compartment is not raised to a point as high as otherwise might be required.

The control for the evaporator to condition it for defrosting purposes may be of the type which completely discontinues operation, or it may be of the type which sets up a condition where the device operates at temperatures above freezing. Thus the evaporator would defrost, but all of the refrigeration is not lost. This is what is meant in the appended claims which call for means for conditioning the evaporator for defrosting.

We claim:

1. In a refrigerator, the combination of a compartment to be refrigerated, a door for the compartment, a cooling unit in the compartment subject to being frosted in use, an electric lamp in proximity to the cooling unit, a circuit for the lamp, means for closing the circuit upon the opening of the door and for opening the circuit upon the closing of the door, a manually operable control device shiftable to one position where the cooling unit is operable and to another position where the cooling unit defrosts, and switch means having an operable connection with the control device and operable when the said control device is shifted to the said other position for closing the circuit for the lamp independently of the opening and closing of the circuit by the closing and opening of the door whereby the lamp remains energized and the heat therefrom accelerates defrosting.

2. In a refrigerator, the combination of a compartment to be refrigerated, a door therefor, a cooling unit in the compartment subject to being frosted in use, an electric lamp in proximity to the cooling unit, a circuit for the lamp including a switch arranged to close upon the opening of the door and to open upon the closing of the door, another switch connected in parallel with the first mentioned switch, a manually operable control device shiftable to one position where the cooling unit is operable and to another position where the cooling unit defrosts, and means operably connecting the second named switch and the control device for opening the second

named switch when the control device is shifted to the said one position whereby the energization of the electric lamp is controlled entirely by the door, and for closing the second named switch when the control device is moved to said other position, whereby the electric lamp remains energized independently of the closing and opening of the door, and the heat therefrom accelerates defrosting.

3. In a refrigerator, the combination of a cooling unit subject to being frosted in use, an electric lamp in proximity to the cooling unit, a circuit for the lamp, a switch in the circuit, a control device operable to condition the cooling unit for defrosting purposes, said control device including a rotary element, a rocker member operably associated with the switch and arranged to ride upon the surface of the said rotary element as it turns in the operation of the control device, said rotary element having a notch therein for the reception of the rocker element when the control device is moved to defrosting position for the closing of said switch and the energization of the lamp so that the heat therefrom accelerates defrosting.

4. In a refrigerator, the combination of a cooling unit subject to being frosted in use, an electric lamp in proximity to the cooling unit, a circuit for the lamp, a switch in the circuit, a control device operable to condition the cooling unit for defrosting purposes, said control device including a rotary element, a rocker member operably associated with the switch and arranged to ride upon the surface of said rotary element as it turns in the operation of the control device, said rotary element having a notch therein for the reception of the rocker element when the control device is moved to defrosting position for the closing of said switch and the energization of the lamp so that the heat therefrom accelerates defrosting, said cooling unit being disposed in a compartment and said compartment having a door, and another switch in the circuit for the lamp connected in parallel with the first mentioned switch and operable by the opening and closing of the door of the compartment.

5. In a refrigerator, the combination of a cooling unit subject to being frosted in use, an electric lamp in proximity to the cooling unit, a circuit for the lamp, a switch in the circuit, a control device operable to condition the cooling unit for defrosting purposes, said control device including a shiftable element, a movable member operably associated with the switch and with said shiftable element, said shiftable element having an irregular formation thereon for cooperation with the movable member when the control device is moved to defrosting position for the moving of said movable member and the closing of the switch thereby for the energization of the lamp so that the heat therefrom accelerates defrosting.

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