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C. S. GRIMSHAW
AUTOMATIC DEFROST ACTUATOR

2,624,180

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Fig. 1.

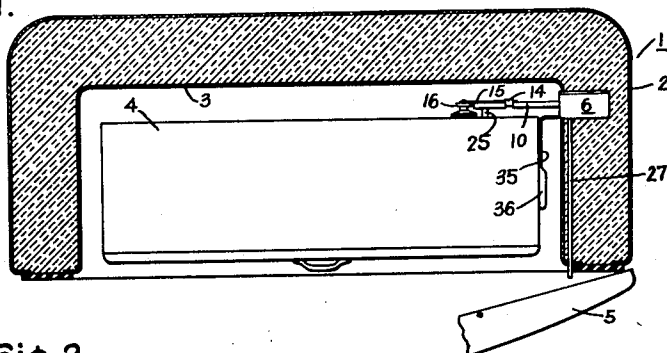


Fig. 2.

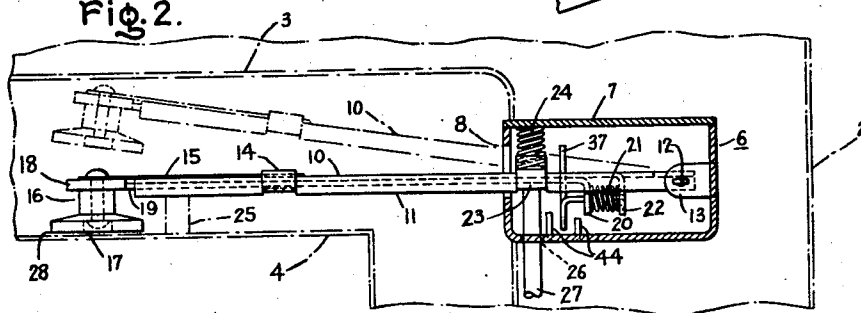


Fig. 3.

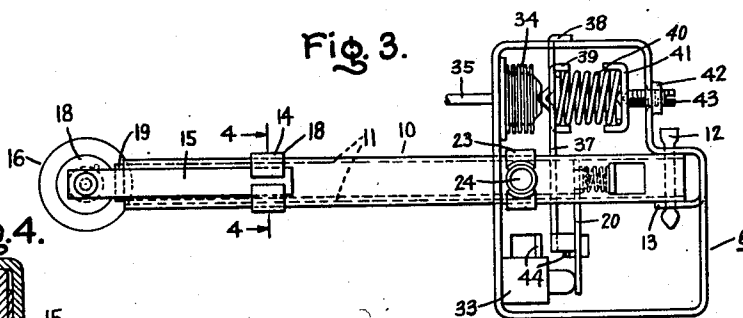


Fig. 4.

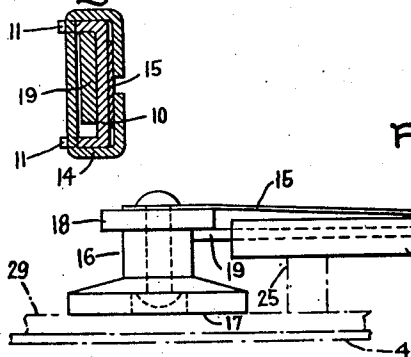


Fig. 5.

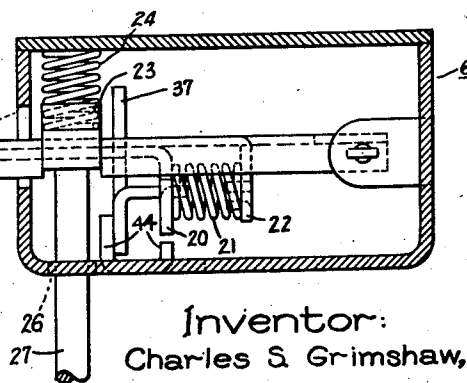
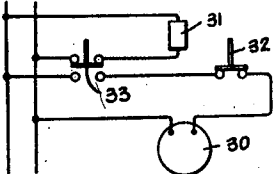


Fig. 6.



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UNITED STATES PATENT OFFICE

2,624,180

AUTOMATIC DEFROST ACTUATOR

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17 Claims. (Cl. 62-4)

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My invention relates to refrigerators and pertains more particularly to automatic defrosting means for refrigerators.

The primary object of my invention is to provide in a refrigerator means for controlling a refrigerator defrosting operation in accordance with the formation of frost therein.

Another object of my invention is to provide in a refrigerator including an evaporator, an improved arrangement for initiating a refrigerator defrosting operation when frost in excess of a predetermined thickness is formed on the evaporator.

Still another object of my invention is to provide in a refrigerator including an evaporator an improved arrangement effective upon detection of an excessive thickness of frost on the evaporator for releasing actuating means to initiate a defrosting operation and effective in response to a predetermined maximum temperature of the evaporator when defrosting thereof is completed for restoring the released actuating means to thereby stop the defrosting operation and return the operation of the refrigerator to normal.

Further objects and advantages of my invention will become apparent as the following description proceeds and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

In carrying out the objects of my invention, I provide a refrigerator including an evaporator, evaporator heating means, a compressor motor and a door. A switch is provided and set for maintaining the circuit of the compressor motor closed and a circuit controlling the evaporator heating means open. Opening and closing of the refrigerator door causes an arm to be moved, respectively, into and out of an operative position a predetermined distance from the evaporator. A button yieldably carried by the arm is arranged to be moved to a predetermined proximity to the evaporator when the arm is operatively positioned and to be moved away from the evaporator when the arm is moved out of the operative position. The button normally restrains an actuator which is mounted slidably on the arm and biased for actuating the switch to open and close the circuits of the compressor motor and evaporator heating means, respectively. When during the operative positioning of the arm the thickness of the frost formed on the evaporator prevents the movement of the button to the predetermined proximity thereto,

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the button is displaced relative to the arm whereby the actuator is released to actuate the switch and thereby initiate a defrosting operation. Means responsive to the temperature of the evaporator is effective at a predetermined maximum temperature of the evaporator for restoring the actuator to its restrained state and thereby resetting the switch.

For a better understanding of my invention, reference may be had to the accompanying drawing in which Fig. 1 is a sectional view of a refrigerator cabinet provided with the device of my invention; Fig. 2 is a plan view of the device of my invention; Fig. 3 is a rear and inverted elevational view of the device of my invention; Fig. 4 is a sectional view taken along the line 4-4 in Fig. 3; Fig. 5 is a plan view of the device illustrating the manner in which the actuator is released; and Fig. 6 is a wiring diagram of the circuits controlled by the switch.

Referring to the drawing, I have shown in Fig. 1 a refrigerator cabinet including an outer wall 2, an inner wall or liner 3, an evaporator 4 and a door 5 suitably hinged to the right-side wall of the cabinet. Provided in the right-side wall of the cabinet and adjacent the rear wall is a housing 6. The housing 6 is disposed between the outer wall 2 and the inner wall 3 and is suitably secured to the latter. The housing 6 is formed with an open rear side and provided for covering the rear side is a cover plate 7.

As better seen in Fig. 2, the housing 6 is provided in the left-side wall thereof with an elongated aperture 8. Extending through the aperture 8 is an arm 10 which is formed as a channel with forwardly extending side edges 11. At its extreme right-side end the arm 10 is pivotally connected to the housing 6 by means of a pin 12 extending between a portion of the housing and a tab 13 bent inward from the right-side wall thereof.

The arm 10, as shown in Figs. 1 and 2, extends from the housing 6 and behind the rear wall of the evaporator 4. Carried on the portion of the arm 10 which extends behind the evaporator is a clip 14. The clip 14, as best seen in Figs. 3 and 4, is adapted to secure to the rear side of the arm 10 one end of a leaf spring 15. The other end of the leaf spring extends beyond the left-side end of the arm 10 and carries a member or button 16. The button 16 is formed with a face 17 and a collar 18. As also seen in Figs. 2, 3 and 4, the clip 14 assists in retaining an actuator or bar 19 between the forwardly extending edges 11 of the arm 10. The actuator 19 is arranged for longi-

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tudinal sliding movement along the arm 10 and one end thereof extends into the housing 6 through the aperture 8. The end of the actuator 19 extending into the housing 6 is formed with a forwardly extending projection 20. A compression spring 21 resiliently connects the projection 20 on the actuator 19 with a similar projection 22 bent forward from the arm 10. This arrangement is such that the actuator 19 is biased outwardly from the housing 6, or to the left in Figs. 2 and 3. Normally, however, the leaf spring 15 tends to remain in full engagement along its length with the rear side of the arm 10. This causes the button 16 to be so positioned relative to the end of the arm 10 that the leftward movement of the actuator 19 is restrained by engagement of the left-side end thereof with the collar 18 formed on the button, in the manner shown in Fig. 2.

Carried on the arm 10 just inward of the left-side wall of the housing 6 is another clip 23 which is formed on the rear side of the arm 10 to provide a spring seat. Provided in the spring seat between the arm 10 and the cover plate 7 is a compression spring 24. The compression spring 24 is stronger than the leaf spring 15, for a purpose which will be seen hereinafter, and is adapted to bias the arm 10 forwardly for engagement with a stop 25 secured to the rear wall of the evaporator 4.

Cooperating with the front side of the clip 23 and extending through an aperture 26 in the front wall of the housing 6 is a push rod 27. The push rod 27 extends through the side wall of the cabinet 1, in the manner shown in Fig. 1, and cooperates at its forward end with the door 5. When the door 5 is closed, the spring 24 is compressed by the push rod 27 and the arm 10 is held away from the stop 25, in the position indicated by dot and dash lines in Fig. 2.

When the door 5 is closed and the arm 10 is held away from the stop 25, the arm is inoperatively positioned, that is, the face 17 of the button 16 is held away from the evaporator 4 and out of engagement with frost formed thereon.

When the door is opened, the push rod 27 permits the spring 24 to be effective for causing the arm 10 to engage the stop 25. When engaged with the stop 25, in the manner shown in full lines in Fig. 2, the arm 10 is operatively positioned a predetermined distance from the rear wall of the evaporator 4. Operative positioning of the arm 10 is effective for moving the face 17 of the button 16 toward a position a predetermined proximity to the rear wall of the evaporator 4. In Fig. 2 the rear wall of the evaporator 4 is shown as having no frost formed thereon and the face 17 of the button 16 is shown as being positioned a predetermined proximity to the rear wall of the evaporator. This predetermined proximity or spacing is indicated by 28 in Fig. 2 and corresponds to a predetermined frost thickness.

In Fig. 5, 29 indicates frost formed on the rear wall of the evaporator 4 in excess of the predetermined thickness thereof. When the door is opened and this condition exists, the face 17 of the button 16 engages the frost and is thereby prevented from being moved to the position of predetermined proximity to the rear wall of the evaporator. However, as pointed out above, the compression spring 24 is stronger than the leaf spring 15. Therefore, the arm 10 continues on to its operative position in which it engages the stop 25. As a result, the leaf spring 15 yields and the button 16 is displaced or moved relative to

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the end of the arm 10. When this displacement is sufficient, the actuator 19 is released from its restraining engagement with the collar 18 on the button 16, and is thereby permitted to move to the left in Fig. 5 under the influence of the spring 21.

As seen in Fig. 6, there is included in the refrigerating system of the refrigerator a compressor motor 30 and an evaporator heating means 31. The heating means may be an electrical heater or any other means by which heat can be directed to the evaporator 4. In addition to the usual switch 32 included in the circuit of the compressor motor 30 for controlling the operation of the system there is provided another switch 33. The switch 33 is also included in a circuit provided for controlling the evaporator heating means 31. The switch 33 is contained in the housing 6 and normally is set for maintaining the compressor motor circuit closed and for maintaining the evaporator heating means circuit open. A pendant portion of the projection 20 formed off the inner end of the actuator 19 is adapted to cooperate with and actuate the switch 33 when the actuator 19 is released by the displacement or movement of the button 16 relative to the arm 10. Actuation of the switch 33 initiates a defrosting operation by opening the compressor motor circuit and thereby stopping the compressor motor 30 to stop the refrigeration process and by closing the circuit controlling the evaporator heating means 31 to heat the evaporator. It is to be understood that the heating means 31 is used to hasten defrosting of the evaporator and that defrosting could be effected, although somewhat more slowly, in an arrangement in which the device of the present invention controls only a compressor motor and in which no heating means is provided.

As seen in Fig. 3, there is provided in the housing 6 a bellows 34. The bellows 34 is connected by a tube 35, in the manner seen in Fig. 1, with a bulb 36. The bulb 36 contains an amount of volatile fluid and is placed in heat exchange relationship with the evaporator 4. Defrosting of the evaporator 4 causes the temperature of the evaporator to increase. This causes the fluid in the bulb 36 to expand whereby the bellows 34 is extended. Commonly cooperating with the bellows 34 and the projection 20 formed off the actuator 19 is a bar 37 which is pivotally connected as at 38 to the bottom wall of the housing 6. When the bellows 34 is extended, the bar 37 is actuated to the right in Fig. 3. When the evaporator 4 reaches a predetermined maximum temperature extension of the bellows 34 resultant actuation of the bar 37 is sufficient for restoring the actuator 19. When the actuator 19 is restored, the leaf spring 15 again positions the button 16 relative to the arm 10 so that the actuator is restrained by engagement with the collar 18 formed on the button. Also, restoration and restraint of the actuator 19 is effective for resetting the switch 33 whereby the motor circuit is closed and the evaporator heating means circuit is opened. Thus, the defrosting operation is stopped and the operation of the refrigerator is returned to normal.

As seen in Fig. 3, the bar 37 is formed to include a spring seat 39. Situated in the spring seat 39 is a compression spring 40. Fitted on the other end of the spring 40 is a spring cap 41. Cooperating with the spring cap 41 and threaded in a stationary nut 42 secured to the housing 6 is an adjusting screw 43. With this arrangement it is possible by turning the adjusting

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screw 43 to adjust the bellows 34 for determining the evaporator temperature at which the bellows will be effective for restoring the actuator 19 and thereby stopping the defrosting operation.

As best seen in Figs. 3 and 5, the lower end of the bar 37 is disposed between a pair of projections 44 bent inward from the front wall of the housing 6. This arrangement limits the movements of the bar 37. During normal operation of the refrigerator, the temperature of the evaporator 4 is much lower than the defrosting temperature and there is a tendency for the spring 40 to cause the bar 37 to collapse and damage the bellows 34. Also, during shipment and transportation of the refrigerator, the temperature of the evaporator 4 might be higher than the defrost temperature. With this condition, there is a tendency for the bellows to become damaged by overextending. It will be seen that the projections 44, by limiting the movements of the bar 37, are effective for preventing damage to the bellows 34 from either excessive contraction or overextension thereof.

While I have shown and described a specific embodiment of my invention, I do not desire my invention to be limited to the particular construction shown and described and I intend by the appended claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letter Patent of the United States is:

1. In a refrigerator including an evaporator, evaporator defrosting means and means for controlling said evaporator defrosting means comprising; an arm, means for moving said arm to an operative position a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is in its operative position, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, and means operated by movement of said member relative to said arm for initiating operation of said evaporator defrosting means.

2. In a refrigerator including an evaporator, evaporator defrosting means and means for controlling said evaporator defrosting means comprising; an arm, means for moving said arm to an operative position a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, and means operated by the release of said actuator for initiating operation of said evaporator defrosting means.

3. In a refrigerator including an evaporator, evaporator defrosting means and means for controlling said evaporator defrosting means comprising; an arm, means for moving said arm to an operative position a predetermined distance from said evaporator, a member yieldably car-

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ried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, means operated by the release of said actuator for initiating operation of said evaporator defrosting means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator to thereby stop defrosting of said evaporator.

4. In a refrigerator including an evaporator, evaporator heating means, a compressor, and circuits controlling said evaporator heating means and said compressor, means for controlling defrosting of said evaporator comprising; switching means normally set for maintaining said evaporator heating means and compressor motor circuits open and closed, respectively, an arm, means for moving said arm to an operative position a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased for actuating said switching means to close and open said circuits of said evaporator heating means and said compressor motor, respectively, and thereby initiating a defrosting operation, said actuator normally engaging said member and being thereby restrained from actuation of said switching means, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator to thereby actuate said switching means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator whereby said switching means is reset and defrosting of said evaporator is stopped.

5. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, means dependent on movement of said door for operatively positioning said arm a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, and means operated by movement of said member relative to said arm for initiating operation of said evaporator defrosting means.

6. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means

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comprising; an arm, a push rod associated with said door, means including said push rod for operatively positioning said arm a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, and means operated by movement of said member relative to said arm for initiating operation of said evaporator defrosting means.

7. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, a push rod associated with said door, said push rod being actuated by movement of said door to closed position for inoperatively positioning said arm, said push rod being biased to move said arm to an operative position a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned away from said evaporator when said arm is inoperatively positioned, said member being positioned a predetermined proximity to said evaporator when said arm is in its operative position, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, and means operated by movement of said member relative to said arm for initiating operation of said evaporator defrosting means.

8. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, means dependent on movement of said door for operatively positioning said arm a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, and means operated by the release of said actuator for initiating operation of said evaporator defrosting means.

9. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, a push rod associated with said door, means including said push rod for operatively positioning said arm a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move

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relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, and means operated by the release of said actuator for initiating operation of said evaporator defrosting means.

10. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, a push rod associated with said door, said push rod being actuated by movement of said door to closed position for inoperatively positioning said arm, said push rod being biased to move said arm to an operative position a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned away from said evaporator when said arm is inoperatively positioned, said member being positioned a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, and means operated by the release of said actuator for initiating operation of said evaporator defrosting means.

11. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, means dependent on movement of said door for operatively positioning said arm a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, means operated by the release of said actuator for initiating operation of said evaporator defrosting means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator to thereby stop defrosting of said evaporator.

12. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, a push rod associated with said door, means including said push rod for operatively positioning said arm a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement

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relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, means operated by the release of said actuator for initiating operation of said evaporator defrosting means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator to thereby stop defrosting of said evaporator.

13. In a refrigerator including an evaporator, evaporator defrosting means and a door, means for controlling said evaporator defrosting means comprising; an arm, a push rod associated with said door, said push rod being actuated by movement of said door to closed position for inoperatively positioning said arm, said push rod being biased to move said arm to an operative position a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned away from said evaporator when said arm is inoperatively positioned, said member being positioned a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased against and restrained by said member, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator, means operated by the release of said actuator for initiating operation of said evaporator defrosting means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator to thereby stop defrosting of said evaporator.

14. In a refrigerator including an evaporator, evaporator heating means, a compressor, circuits controlling said evaporator heating means and said compressor and a door, means for controlling defrosting of said evaporator comprising; switching means normally set for maintaining said evaporator heating means and compressor motor circuits open and closed, respectively, an arm, means dependent upon movement of said door for operatively positioning said arm a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased for actuating said switching means to close and open said circuits of said evaporator heating means and said compressor motor, respectively, and thereby initiating a defrosting operation, said actuator normally engaging said member and being thereby restrained from actuation of said switching means, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective

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for releasing said actuator to thereby actuate said switching means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator whereby said switching means is reset and defrosting of said evaporator is stopped.

15. In a refrigerator including an evaporator, evaporator heating means, a compressor, circuits controlling said evaporator heating means and said compressor and a door, means for controlling defrosting of said evaporator comprising; switching means normally set for maintaining said evaporator heating means and compressor motor circuits open and closed, respectively, an arm, a push rod associated with said door, means including said push rod for operatively positioning said arm a predetermined distance from said evaporator when said door is opened, a member yieldably carried by said arm, said member being positioned by said arm a predetermined proximity to said evaporator when said arm is operatively positioned, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased for actuating said switching means to close and open said circuits of said evaporator heating means and said compressor motor, respectively, and thereby initiating a defrosting operation, said actuator normally engaging said member and being thereby restrained from actuation of said switching means, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator to thereby actuate said switching means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator whereby said switching means is reset and defrosting of said evaporator is stopped.

16. In a refrigerator including an evaporator, evaporator heating means, a compressor, circuits controlling said evaporator heating means and said compressor and a door, means for controlling defrosting of said evaporator comprising; switching means normally set for maintaining said evaporator heating means and compressor motor circuits open and closed, respectively, an arm, a push rod associated with said door, said push rod being actuated by movement of said door to closed position for inoperatively positioning said arm, said push rod being biased to move said arm to an operative position a predetermined distance from said evaporator, a member yieldably carried by said arm, said member being positioned away from said evaporator when said arm is inoperatively positioned, said member being positioned a predetermined proximity to said evaporator when said arm is in its operative position, an actuator mounted on said arm for longitudinal movement relative thereto, said actuator being normally biased for actuating said switching means to close and open said circuits of said evaporator heating means and said compressor motor, respectively, and thereby initiating a defrosting operation, said actuator normally engaging said member and being thereby restrained from actuation of said switching means, said member being arranged to move relative to said arm when the thickness of frost formed on said evaporator prevents movement of said member to said predetermined proximity

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to said evaporator, the movement of said member relative to said arm being effective for releasing said actuator to thereby actuate said switching means, and means responsive to the temperature of said evaporator and effective at a predetermined temperature thereof for restoring said actuator whereby said switching means is reset and defrosting of said evaporator is stopped.

17. In a refrigerator including an evaporator, evaporator heating means, a compressor, circuits controlling said evaporator heating means and said compressor and a door, means for defrosting said evaporator when frost forms thereon in excess of a predetermined thickness comprising; a switch normally set for maintaining said evaporator heating means and compressor motor circuits open and closed, respectively, an arm, a push rod associated with said door, said push rod being actuated by movement of said door to closed position for inoperatively positioning said arm, a spring biasing said push rod to move said arm to an operative position a predetermined distance from said evaporator, a stop engageable by said arm for determining said operative position, a button attached to said arm by a spring, said button being positioned away from said evaporator when said arm is inoperatively positioned, said button being positioned by said arm a predetermined proximity to said evaporator corresponding to said predetermined thickness of frost when said arm is in its operative position, an actuator mounted slidably on said arm for longitudinal movement relative thereto, a spring connecting said actuator with said arm and whereby said actuator is normally biased for actuating said switch to close and open said cir-

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cuits of said evaporator heating means and said compressor motor, respectively, and thereby initiating a defrosting operation, said actuator normally engaging said button and being thereby restrained from actuation of said switch, said button being arranged to move relative to said arm when frost formed on said evaporator in excess of said predetermined thickness prevents movement of said button to said predetermined proximity to said evaporator, the movement of said button relative to said arm being effective for releasing said actuator to thereby actuate said switch, a bellows associated with said actuator, said bellows being responsive to the temperature of said evaporator and effective at a predetermined maximum temperature thereof for restoring said actuator whereby said switch is reset and defrosting of said evaporator is stopped, and adjusting means associated with said bellows for determining the temperature of said evaporator at which said actuator is restored.

CHARLES S. GRIMSHAW.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,916,315	Hoffman	July 4, 1933
1,999,191	Hirschl	Apr. 30, 1935
2,007,409	Schweitzer	July 9, 1935
2,114,768	Philipp	Apr. 19, 1938
2,123,073	Bell	July 5, 1938
2,147,867	Volpin	Feb. 21, 1939
2,421,819	Vandenberg	June 10, 1947