

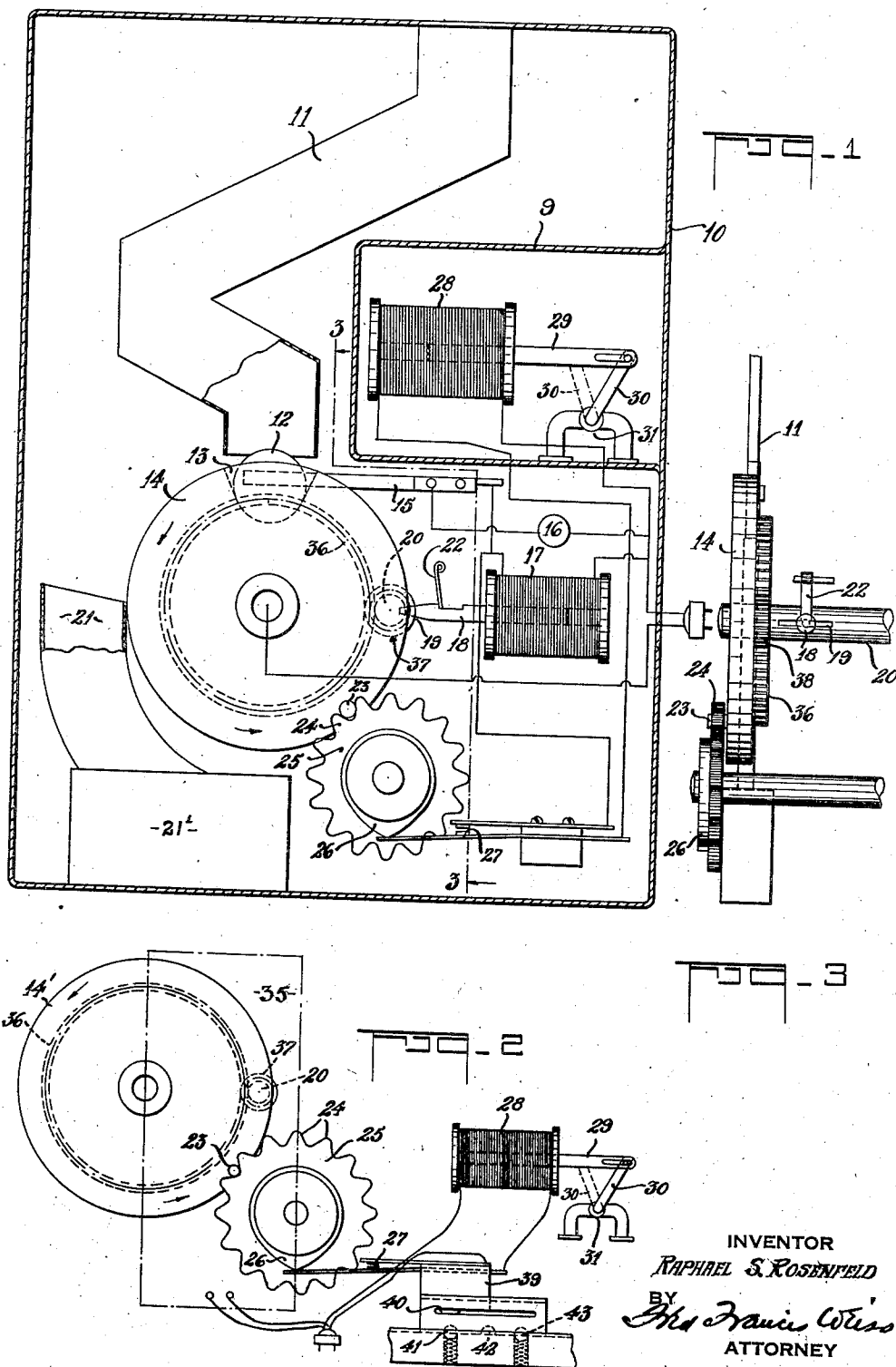
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TIMED DEFROSTING MECHANISM

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TIMED DEFROSTING MECHANISM

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This invention relates to timed defrosting mechanism for mechanical refrigerators and for other devices.

The invention has for its object the provision of means for automatically rendering the defrosting mechanism effective under predetermined conditions and for specified periods of time. In other words, this phase of the invention depends upon time and/or volume control.

A further object includes the provision of time-duration mechanism for controlling a predetermined flow of the operating medium, such as gas or electricity, to an attached refrigerator or other unit and has, therefore, to do with supply control.

It is a further purpose of my invention to provide, in my time control and supply control defrosting mechanism, a construction that is driven either by the operating medium or by a synchronous motor or clock which, in one form, depends on a coin or a number of coins of predetermined denominations for initiating and continuing its operation. The time-duration feature of my improved defrosting mechanism is, therefore, capable of including a prepayment plan whereby a specified portion of the operating coin is applied towards the purchase price or the rental of the refrigerator or other unit. Moreover, my defrosting mechanism may be constructed as a unit and operated from a synchronous motor without embracing the coin control features. In either case I provide an electrically operated supply control for regulating the operating medium to the refrigerator or other unit.

I also provide a coin releasing electrically controlled lock device for limiting the rotation of the disk (or its equivalent) of the time-duration device.

Other objects will appear hereinafter and I attain these objects by a construction illustrated in the accompanying drawing, in which

Figure 1 is a rear elevational view of my coin operated timed defrosting mechanism;

Fig. 2 is a view similar to that of Fig. 1 but is without the coin control features and the locking mechanism; and

Fig. 3 is viewed on line 3-3 of Fig. 1 looking in the direction of the arrows.

Similar reference characters refer to like parts throughout the several views.

In the construction shown in Figure 1 I have illustrated a form of defrosting mechanism which is driven by a synchronous motor such as a clock and depends upon a coin of predetermined value for its starting operation. This coin closes an

electric circuit whereby the motor is placed in operation and the time-duration device, which may be in the form of a disk, is set in motion. The motion is so controlled, in a preferred form, that the disk rotates once in a given period as twenty-four hours and accordingly affords a time-duration element. The time-duration element puts in operation a switch controlling device which opens a normally closed electric circuit and thereby closes a valve for cutting off the flow of gas to a refrigerator (not shown) to which the device is applied. The device herein shown is designed to be applied to refrigerators of the gas operated type. Obviously the gas controlling valve may be replaced by an electric control device for electrically operated refrigerators without departing from the spirit and scope of my invention.

Referring now to the drawing, in Figure 1 the defrosting switch and associated parts are enclosed in a casing 10 which is provided with a coin shoot 11 for receiving a coin 12, or a number of coins, of predetermined value. The coin is dropped by gravity into a pocket 13 of the time-duration device or disk 14. Adjacent to the disk is a spring contact finger 15 with which the coin engages and closes the circuit between the end of the finger 15 and the disk 14 thereby energizing the synchronous motor or the clock circuit 16. When the coil of solenoid 17 is energized it withdraws the lock pin 18 from slot 19 in the shaft 20 which is driven by the synchronous motor. Disk 14 is thus rotated at a given rate in the direction of the arrows and the spring wiper finger 15 engages the disk 14 during its time of rotation after coin 12 is moved beyond the contact finger 15. Soon thereafter it is dropped into a coin shoot 21 and attached coin box 21'. As the disk returns to its initial position another coin must be supplied to keep it in operation. If, however, no coin is present or supplied the circuit will be broken and solenoid 17 de-energized so that lock plunger 18 again locks shaft 20 and the mechanism is stopped. A spring 22 maintains the plunger in locked position when the coil is not energized.

Disk 14 is provided with a pin 23 which successively engages, with each rotation, teeth 24 of the star wheel 25, advancing the same a fraction of a turn depending upon the number of teeth on the star wheel. The star wheel is also provided with a cam 26. Adjacent to the star wheel is a switch 27 for operating the solenoid 28 when the switch is closed. When the solenoid 28 is energized plunger 29 is moved so as to swing the

valve lever 30 from its full line or closed position to its dotted line position, thus opening the valve which is diagrammatically represented at 31. Gas now flows through proper channels into the refrigerating device not shown. Normally the valve is open for the operation of the gas refrigerating device. When, however, the cam reaches a point of contact with the extended arm of switch 27 as shown in Figs. 1 and 2 the circuit is opened and the valve 31 is moved into closed position thereby cutting off the supply of the gas and permitting defrosting to take place during the time that switch 27 is open.

In Fig. 2 I have shown a simplified form of construction which is operated by a synchronous motor or electric clock 35. Said motor or clock drives shaft 20 as in the construction shown in Fig. 1 and thereby places into rotation the disk 14' of the time-duration device. This disk, as also the one shown in Fig. 1, is provided with teeth 36 which mesh with teeth 37 of pinion 38 on shaft 20. Since the mechanism is operated directly from the electric clock or synchronous motor disk 14' is not dependent upon coin release or the electric lock devices for governing the operation of the time-duration device. Solenoid 28 is energized when switch 27 is closed and when so energized the gas supply valve 31 is opened as before.

By referring to Fig. 2 it is apparent that the time during which the defrosting switch is held in open position may be varied by varying the length of time that the longer contact finger of switch 27 engages with cam 26. One way of doing this is by adjustably positioning the switch so as to vary the extension of the wiper finger in the path of the cam. This may be done by mounting the switch on a block 39 which may be moved by means of a handle 40 from the position shown to where the block engages a spring pressed ball 41 to hold it in its present position. If the switch on block 39 is now moved so that the recess 42 engages ball 43 the contact finger of switch 27 will also be moved so that the wiping arc of cam 26 is shortened. The time that the switch is open is, therefore, shorter whereby the period of defrosting is varied.

In the forms discussed above I have shown a gas control valve for regulating the flow of the operating medium to the refrigerator or other unit. Obviously the gas control device may be replaced by a device for controlling the electric current without departing from the spirit and scope of my invention. Such a device may be used to supply current to an electric refrigerator, or to other electrically operated implements such as electric washer, ironer, and other appliances.

In Figure 1 I have shown a casing 9 which encloses the gas valve and solenoid for safety. Having now defined my invention what I claim as new and useful is:

1. In a defrosting mechanism, the combination of a disk rotatably mounted, of driving means for rotating said disk, means for locking said driving means against operation, a supply

control valve, means for operating said valve, and a switch for controlling said operating means.

2. In a defrosting mechanism, the combination of a disk rotatably mounted, means for rotating said disk, a valve for controlling the flow of an operating medium, a solenoid for controlling said valve, a switch for controlling said solenoid, a cam for opening said switch to thereby deenergize said solenoid and close the valve, and means controlled by said rotating disk for timing the defrosting periods.

3. In a defrosting mechanism, a time-duration device including a rotatively mounted disc, means for rotating said disc, a switch control wheel adjacent said disc, means on said disc for repeatedly advancing said wheel in the same direction, a switch normally closed, and a cam on said wheel for holding open the switch a given period of time.

4. In a defrosting mechanism, a time-duration device including a rotatively mounted disc and means for rotating said disc, a star wheel adjacent said disc, said wheel having a succession of teeth, means on said disc for engaging successive teeth on the star wheel with each rotation of the disc, a refrigerator power supply control device, means for operating said device, and a switch for controlling said operating means.

5. In a defrosting mechanism, the combination of a time-duration device including a disc and means for rotating said disc at a fixed rate of speed, a star wheel adjacent said disc, means on said disc for engaging the teeth of said star wheel and for rotatively advancing the same, a refrigerator power supply control device, means for controlling said refrigerator power supply control device, a switch for rendering operative said refrigerator power supply control device, said switch normally being closed, and means on said star wheel for opening said switch at a predetermined time and for a given period.

6. In a defrosting mechanism of the type described, comprising a means for operating a time duration device a predetermined period of time, the combination of a time-duration device and a refrigerator power supply control device for controlling the flow of a refrigerator operating medium, means electrically energized for maintaining said refrigerator power supply control device open, and means including a switch actuated by said time-duration device for periodically deenergizing said electrically energized means and thereby closing the refrigerator power supply control device.

7. In a defrosting mechanism, a time-duration device including a rotatively mounted disc and means for rotating said disc, a wheel adjacent said disc, said wheel having a succession of teeth and a hub, a pin on said disc for engaging successive teeth on said wheel, a refrigerator power supply control valve, means for operating said valve, a switch normally closed for controlling the operation of said valve, and a cam on said hub for opening the switch.

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