HEAT MOTOR FOR A ROTARY ICE TRAY

Fig. 1

Fig. 2

Fig. 3

Fig. 4

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HEAT MOTOR FOR A ROTARY ICE TRAY

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This invention relates to an ice making apparatus and in particular relates to an automatic ice making apparatus of the type adapted to be mounted within the usual freezing compartment of a household refrigerator or the like.

Automatic ice makers of the type adapted to be used in household refrigerators have recently found wide acceptance though their marketability has been somewhat restricted due to the fact that the ice makers which have thus far been devised have been relatively expensive to produce and have had several undesirable features which it is the object of this invention to eliminate.

This invention is more specifically directed to an apparatus operable to pivotally move an ice tray through an ice-block ejection cycle as a function of the temperature of the fluid within the molds in the ice tray.

This invention may find utility in operating a pivotal ice tray which is elongated in configuration and which has a plurality of molds spaced along the longitudinal axis thereof and facing in opposite directions and disposed in heat transfer relation with one another, though the invention should not be construed as being so limited. The type of ice tray mentioned above is adapted to function in the following manner:

Each of a plurality of upwardly facing molds are filled with water through a plug and or through a time-fill valve and are then allowed to cool until they have frozen into ice blocks. Subsequent to freezing of the water within each of the molds into ice blocks the elongated tray is rotated so that the ice molds filled with the frozen ice blocks are disposed in a downwardly facing direction and so that another plurality of upwardly facing molds are disposed in a position to receive water. Relatively warm water is then dispensed into the upwardly facing molds and the heat of the water filling the upwardly facing molds is transferred through the heat conducting walls of the ice tray to melt the surfaces of the ice blocks in the downwardly facing molds to break the bond between those ice blocks and their respective molds thus permitting the ice blocks to fall by the force of gravity into a collection tray. Subsequent to freezing of the water disposed in the upwardly facing molds the tray is again rotated to dispose those molds in a downwardly facing direction and to dispose the tray which have just been freed of their ice blocks in a position to receive water. The cycle is thus repeated.

I contemplate mounting the pivotal ice tray on a shaft journalled within a slide wall of a freezing compartment and effecting rotatable movement of the ice tray in the following manner.

Two thermal sensitive elements having power members extensible therefrom upon predetermined ambient temperature conditions therearound are disposed in coaxial alignment with one another with their power elements in opposed relation. A gear rack interconnects the outer free ends of each of the power elements and is, in turn, cooperable with a spur gear fixed to the shaft journalled within the wall of the freezing compartment upon which the pivotal ice tray is mounted. Resistor heaters are wound about each of the thermal elements to provide a means for heating the elements to effect extensible movement of their respective power members. By energizing one of the resistor heaters, the power element associated with the thermal sensitive element upon which the resistor heater is wound will move extensibly to effect longitudinal movement of the gear rack. Such movement of the gear rack will rotatably move the spur gear and accordingly effect pivotal movement of the ice tray. Subsequently, by deenergizing the resistor heater wound about the first thermal element and by energizing the resistor heater wound about the other thermal element the gear rack will be moved in an opposite direction and the ice tray will be returned to its original position.

Steps are used to limit longitudinal movement of the gear rack in either direction so that the degree of pivotal movement of the ice tray can be exactly determined. As a result, each of the thermal sensitive elements are mounted slidably in their respective supports and are generally maintained in a fixed position by means of overtravel springs which are compressible to permit slidable movement of the thermal elements within their respective supports after the movement of the gear rack has been interrupted by the gear rack stops.

A cam lever interconnects each of the thermal elements and is so arranged that it will pivotally move with respect to one of the thermal elements upon overtravel of either of the thermal elements. By placing a switch having a depressible plunger adjacent the cam lever in such a manner that the plunger is depressed upon pivotal movement of the cam lever, the switch will be actuated whenever either of the thermal sensitive elements slightly moves within its respective support. A solenoid for controlling operation of a fluid line valve may be energized through this switch so that filling of the ice tray is effected during that time interval when the plunger is depressed by the pivotal cam lever.

It is therefore a principle object of the present invention to provide a new and improved mechanism for effecting pivotal movement of an ice tray which comprises a pair of thermal sensitive elements disposed in opposing relation with one another and having a gear rack connected between their respective power members which is cooperable with a spur gear connected to the tray to effect pivotal movement thereof.

Another object of the invention resides in the provision of a means for filling an ice tray subsequent to pivotal movement thereof through a predetermined arc.

Yet another object of the invention is to provide a low cost and readily assemblable mechanism for effecting pivotal movement of an ice tray.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings, wherein:

FIG. 1 is a front elevational view of an ice making apparatus constructed in accordance with the principles of the present invention shown mounted in the wall of a freezing compartment;

FIGURE 2 is a fragmental front elevational view of the adjacent ends of two thermal sensitive elements with a cam lever interconnecting those ends and showing the relation of the cam lever with an electrical switch;

FIGURE 3 is a fragmental view which is similar in nature to FIGURE 2 but which shows the cam lever in a different position;

FIGURE 4 is a schematic wiring diagram of the embodiment of the invention illustrated in the drawings;

FIGURE 5 is an enlarged front elevational view of the mechanism for effecting pivotal movement of the ice tray;

FIGURE 6 is a fragmental view illustrating the gear rack and its association with the opposed power members of a pair of thermal sensitive elements;

FIGURE 7 is a horizontal sectional view through the side wall of the freezing compartment showing the co-
operation between the gear rack and the spur gear and the associated electrical switches; FIGURE 8 is a fragmental view of the gear rack and the associated spur gear from a different position, showing some parts in vertical section and others in side elevation and also illustrating the selector switch and its associated components; FIGURE 9 is a fragmental front elevational view showing a portion of the thermal sensitive element support in vertical section and showing the thermal sensitive element in an overtravel position; FIGURE 10 is a side elevational view of the mechanism for effecting pivotal movement of the ice tray; and FIGURE 11 is a fragmental view which is similar in nature to FIGURE 10 but which shows one of the thermal sensitive elements in an overtravel position.

Referring initially to FIGURE 1, a pivotal ice tray 10 is mounted on a shaft 11 for corotatable movement therewith while the shaft is, in turn, journalled for rotatable movement within the wall 12 of a freezing compartment 13. A filler spout 14 is also mounted within the wall 12 and terminates adjacent and above the pivotal ice tray 10 to provide a means for filling the ice tray with water to be frozen into ice blocks.

The ice tray 10 has a plurality of ice molds 15 formed therein along the longitudinal axis thereof which are defined by oppositely and angularly disposed side walls 16 and 17. End walls 18 are disposed at each end of the tray and serve, like the partition walls 19, to define the side walls of each of the respective ice molds. Another plurality of serially aligned molds is formed on the opposite side of the ice tray. Each of these molds has one wall defined by the wall 16 so that the wall 16 is common to the oppositely facing molds. The entire ice tray is constructed of aluminum or some other material which is a good heat conductor so that when relatively warm water is directed to the upwardly facing molds, when the ice tray is in the position illustrated in FIGURE 1, the heat of water filling those molds will be transferred through the heat conducting walls of the ice tray to melt the surfaces of the ice blocks in the downwardly facing molds to permit gravitational ejection of the ice blocks within the downwardly facing molds 15 into a suitable collection tray.

Referring now more particularly to FIGURE 5, a boss 20 which extends from the end wall 18 of the ice tray 10 is threadedly mounted on the shaft 11 which is journaled for rotatable movement within the wall 12 of the freezing compartment 13. A pin 21 fits into the shaft 11 to key the tray to the shaft for corotatable movement therewith. The outer end of the shaft 11 has a spur gear 22 affixed thereto, through which pivotal movement is transmitted to the ice tray 10. A gear rack 23 is disposed adjacent the spur gear 22 with its teeth in mesh with the peripheral teeth of that gear so that longitudinal movement of the gear rack will act to effect rotatable movement of the spur gear and consequent pivotal movement of the ice tray.

A three-legged support 25 is secured to the outer surface of the freezing compartment wall 12 and has spaced outwardly extending legs 26 and 27 formed integrally therewith which have coaxially aligned apertures 28 and 29, respectively, formed therein. Bearings 30 and 31 are fitted within the apertures 28 and 29, respectively, and are adapted to slidably receive the cylindrical casings 32 of a pair of opposed and axially aligned thermal sensitive elements 33 and 34.

Each of the thermal sensitive elements 33 and 34 is of a type which is well known in the art, including a heat sensing portion 36 for containing a fusible thermally expandable material, a guide portion 37, and a power member 38 which is slidably disposed within the guide portion 37 and which is extensible from the thermal sensitive element upon fusion and expansion of the material within the heat sensing portion 36 thereof.

In order to facilitate an explanation of this device the power member which is guided within the thermal sensitive element 34 is indicated as member 38 while the power member associated with the thermal sensitive element 33 is indicated as member 39. A radially enlarged collar 40 is formed about each of the thermal sensitive elements which acts as a stop, limiting movement of the thermal sensitive elements in a manner which will hereinafter become more fully apparent.

Each of the thermal sensitive elements has a collar 41 fitted on the outermost end of the guide portion 37 thereof against which are disposed arms 43 and 44 for reasons which will hereinafter become apparent. The arms are biased into engagement with the collars 41 by means of overtravel springs 45 and 46 (associated with the elements 33 and 34, respectively) and these springs abut at their opposite end portions, the outturned flanges of the bearings 30 and 31. The overtravel springs 45 and 46 thus serve not only to urge the arms 43 and 44 into engagement with the collars 41 but also serve to bias the thermal sensitive elements 33 and 34 so that the radially enlarged portions 40 thereof are disposed in engagement with the outer surfaces of the outwardly extending legs 26 and 27.

The outer end portions of the power members 38 and 39 are connected to the gear rack 23 or, if so desired, may be formed integrally therewith so that the power members and the gear rack move with one another.

Heater coils 48 and 49 are wound about the heat sensing portions 36 of the thermal sensitive elements 33 and 34, respectively, and provide a means for heating the elements to effect extensible movement of their respective power members.

Thus, assuming that the various parts are disposed in the position illustrated in FIGURE 5, energization of the heater coil 48 will act to heat the material within the thermal sensing portion 36 thereof to effect extensible movement of the power member 39. Extensible movement of the power member 39 will move the gear rack 23 (as shown in FIGURES 5 and 6) downwardly to thereby rotate the spur gear 22 in a counterclockwise direction (as shown in FIGURE 8) while simultaneously acting to retractably move the power member 38 within the thermal sensing unit 34. Thereafter, by deenergizing the heater coil 48 and energizing the heater coil 49 the power members and the gear rack will be returned to the position illustrated in FIGURE 5 and the spur gear 22 will move in a clockwise direction (as shown in FIGURE 8) to its initial position.

Referring now more particularly to FIGURE 4, the heater coils 48 and 49 are energizable through a selector switch 50 and a line switch 51 from a power source indicated at 52.

The selector switch 50 and its associated components are more clearly shown in FIGURE 8. The selector switch 50 is mounted on an outturned leg 54 which is formed integrally with the support 25 and which extends outwardly therefrom intermediate the legs 26 and 27. The switch 50 has a depressible plunger 55 which extends entirely therethrough and which is shown as protruding from the lower surface thereof. Upon depressional movement of the plunger 55 from the position illustrated in FIGURE 8, the plunger will then be moved to a point in which it extends exteriorly of the upper surface of the switch. When the position illustrated in FIGURE 8 the movable contact of the switch will be disposed in the position illustrated in FIGURE 4 so that closure of the line switch 51 will effect energization of the heater coil 48.

The arms 43 and 44 are so bent that the arm 44 which is connected to the guide portion of the thermal sensitive element 34 is disposed adjacent the upper surface of the switch 50 while the arm 43 connected with the guide por-
tion of the element 33 extends and is disposed adjacent the lower surface of the switch 50. The arm 43 is ported as at 57 to permit the extension of the arm 44 there-
through.

It will be observed, in view of the foregoing, that when the element 33 begins to move against the opposing biasing force of the overtravel spring 45, the arm 43 will con-
tact the depressive plungers 55 and shift the movable contact within the switch 50 from the position illustrated in FIGURE 8 to a position operable to effect energization of the heater coil 49. Thus, the selector switch will be actuated whenever one of the thermal sensitive elements moves "overtravel."

As shown clearly in FIGURES 6 and 7, the gear rack 23 has an elongated boss 60 protruding from the base thereof which is slidably received within a complementary channel in the leg 54. The gear rack also has a pair of ears 61 extending from the opposite sides thereof which are received within channel grooves 62. Thus, when the power element 38 moves extensively from the thermal sensitive element 34 the gear rack will be slidably moved within the complementary grooves in the leg 54 until the ears 61 abut the terminal walls defining the ends of the channel grooves 62. Thereafter, since the power mem-
ber 38 cannot move further extensively from the thermal sensitive element 34, the element 34 will move in over-
travel against the opposing biasing force of the spring 46 to effect actuation of the selector switch 50 in the manner which has hereinbefore been described and to effect con-
sequent deenergization of the heater coil 49 and sub-
stantially simultaneous energization of the heater coil 48.

As shown diagrammatically in FIGURE 5, a solenoid actuated shut-off valve 70 is disposed in a fluid line for controlling fluid flow through the filler spout 14 to the ice tray 10. Opening of the shut-off valve is effected by means of energization of a solenoid coil associated therewith. The solenoid coil is illustrated diagrammatically in FIGURE 4 and is indicated at 71.

Energization of the solenoid coil 71 is controlled through a movable contact within a switch 73, which con-
tact, as diagrammatically illustrated in FIGURE 4, is normally biased by a spring to an open circuit position. As shown in FIGURE 7 the line switch 51 is secured to the leg 54 and the switch 73 is, in turn, mounted on the switch 51.

FIGURES 2 and 3 illustrate the means devised to effect actuation of the switch 73 and only fragmentarily illustrate the coaxing parts in order to clarify the drawing.

A cam lever 75 has one end thereof secured to the arm 43 while the opposite end thereof, which comprises an inclined cam surface 76 (bent at an angle with respect to the remainder of the lever) is slidably disposed within an elongated slot 77 formed in the arm 44. The switch 73 is disposed (as indicated in FIGURES 2, 3 and 7) adjacent the lever 75 so that pivotal movement of the lever will effect axial movement of the plungers 78 which, in turn, is operably connected with the movable contact of the switch to open and close the energizing circuit to the solenoid coil 71. Thus, whenever the thermal sensi-
tive element 33 is moved and consequently the arms 43 and 44, move relatively away from one another as from the position illustrated in FIGURE 2 to the position illustrated in FIGURE 3, the lever 75 will be pivoted in a clockwise direction about its point of connection with the arm 43 by engagement of the portion of the arm 44 defining the slot 77 with the cam surface 76 to effect retraction movement of the plungers 78 and consequently closure of the movable contact within the switch 73 thereby oper-
erating the solenoid coil 71 and effecting filling of the upwardly facing molds within the ice tray 10. Such relative movements of the thermal sensitive elements away from one another will be affected whenever one of the thermal sensitive elements moves in overtravel.

Finally, energization of the entire ice making apparatus is effected through the line switch 51 which, in turn, is actuated as a function of the temperature of fluid within the upwardly facing molds in the ice tray 10. Once again to FIGURE 5, an elongated cylinder 80 is disposed within the ice tray 10 along the pivotal axis thereof and is adapted to contain a fluid which is ex-
pansible upon cooling. The interior of the cylinder 80 is in open communication with a central bore 81 in the boss 20 and that bore is, in turn, closed by a flexible annular diaphragm 83. The diaphragm 83 is secured within the hollow interior of the boss 20 by engagement with the outer end of the shaft 11. It will be noted that the shaft 11 is also relieved as at 84 to permit flexure of the dia-
aphragm 83.

A motion translation rod 85 abuts the diaphragm 83 and is disposed within an axial bore formed in the shaft 11 and the spur gear 22 and terminates at a point adja-
cent the plunger 87 of the electrical switch 51. The plunger 87 is, of course, operably linked with the move-
able contact of the switch (which is shown in FIGURE 4) so that depressional movement of the plunger 87 will act to close the electrical circuit therethrough. It will be noted at this juncture that the switch 73 and the cam lever 75 have been deleted from the illustration of the appa-
ratus in FIGURE 5 in order to clarify that drawing.

Assuming that the various parts of the ice tray rotat-

ing mechanism are initially in the positions illustrated in FIGURES 1, 2, 4, 5, 6 and 8 and that the upwardly facing molds within the ice tray are filled with water to be frozen into ice blocks the operation of the mechanism may be described as follows:

Upon cooling of the fluid within the cylinder 80 the fluid will expand to force the diaphragm 83 outwardly and to consequently slidably move the rod 85 within the axial bore in the shaft 11 to depressively move the plunger 87 in switch 51 and effect closure of the movable contact therein to thereby energize the resistor heater 48.

When the resistor heater 48 is energized the fusible thermally expansible material within the element 33 will be heated and consequently expand to extensively move the power member 39 therefrom. Extensible movement of power member 39 will act to retractably move the power member 38 within its respective thermal sensitive element and to longitudinally and downwardly move the gear rack 23. Such downward movement of the gear rack 23 will act to rotatably move the spur gear 22 in a counterclockwise direction (as viewed in FIGURE 8) to rotate the ice molds illustrated in FIGURE 1 to an up-
wardly facing direction preparatory to filling thereby.

When the stops 61 abut the end walls of the channel grooves 62 further longitudinal movement of the gear rack 23 will be prevented so that the thermal sensitive element 33 will be forced to slidably move within the bearing 30 against the opposing biasing force of the over-
travel spring 45.

When the thermal sensitive element 33 thus moves in overtravel, the relative distance between the opposed ends of the two thermal sensitive elements will be lengthened so that the cam lever will be pivoted from the position illustrated in FIGURE 2 to the position illustrated in FIGURE 3 and the plunger 78 in switch 73 will thereby be depressed to energize the solenoid coil 71 and effect filling of the ice tray 10.

Also, during this interval when the thermal sensitive element 33 is moving in overtravel the arm 43 will engage the end of the plunger 55 extending exteriorly of the lower surface of the switch 50 to move the movable contact within that switch from the position illustrated in FIGURE 4 to a position to effect subsequent energization of the heater coil 49. The heater coil 49 will thus be energized almost simultaneously with deenergization of the heater coil 48.

Upon energization of heater coil 49 the power member 38 will begin to move extensively to effect retractable movement of the power member 39 and consequent return
upward movement of the gear rack 23. Such return upward movement of the gear rack 23 will, of course, act to rotatably move the spur gear 22 and consequently the ice tray in a clockwise direction (as viewed in FIGURE 8).

It will be understood that upon deenergization of the heater coil 48 the fusible thermally expansible material within the element 33 will be permitted to cool so that the element will be returned to its normal position illustrated in FIGURE 5 by overtravel spring 45. Such return movement of the element 33 will of course act to decrease the distance between the mating opposed ends of the thermal sensitive elements so that the cam lever 75 will return from the position illustrated in FIGURE 3 to the position illustrated in FIGURE 4 to effect consequent deenergization of the solenoid 71 and to thereby shut-off fluid flow to the ice tray 10.

Subsequently the heat of water filling the upwardly facing molds within the ice tray will be transmitted to the fluid within the cylinder 80 through the heat conducting walls of the ice tray and the diaphragm 83, rod 85, and the plunger 87 will be returned to the position illustrated in FIGURE 5 so that the movable contact within switch 51 will be disposed in the open circuit position thereby preventing further cycling of the apparatus until the heat transmitted from the upwardly facing molds in the ice tray has frozen into ice blocks.

Each of FIGURES 9 and 11 clearly illustrates the position of thermal element 34 and its associated components when that element is moving in overtravel in order to clarify the operation of the device.

It will be understood that this embodiment of the invention has been used for illustrative purposes only and that various modifications and variations of the present invention may be effected without departing from the spirit and scope of the novel concepts thereof.

We claim as our invention:

1. An ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a shaft connected to said ice tray along the rotational axis thereof, a mechanical transducer tangentially disposed relative to said shaft and drivingly connected therewith, power means disposed at opposite ends of said transducer, and means for alternately energizing said power means to effect longitudinal movement of said transducer and consequent rotational movement of said shaft and tray, said power means being movably mounted relative to each other in the direction of movement of said transducer.

2. In an ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a shaft connected to said ice tray along the rotational axis thereof, a mechanical transducer tangentially disposed relative to said shaft and drivingly connected therewith, power means including thermally expansible material disposed at opposite ends of said transducer, and means for alternately energizing said power means as a function of the temperature of fluid within said freezing compartment to effect longitudinal movement of said transducer and consequent rotational movement of said shaft and tray.

3. In an ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a geared shaft connected to said ice tray along the rotational axis thereof, a pair of thermal sensitive elements mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a mechanical transducer tangentially disposed relative to said shaft and drivingly connected therewith and connected at its opposite ends with said power member, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom, and means for alternately energizing said heater means to effect longitudinal movement of said gear rack and consequent rotational movement of said shaft and tray.

4. In an ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a shaft connected to said ice tray along the rotational axis thereof, a pair of thermal sensitive elements mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a mechanical transducer tangentially disposed relative to said shaft and drivingly connected therewith and connected at its opposite ends with said power member, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom, and means for alternately energizing said heater means to effect longitudinal movement of said gear rack and consequent rotational movement of said shaft and tray.

5. In an ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a shaft connected to said ice tray along the rotational axis thereof, a pair of thermal sensitive elements mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a gear rack drivingly connected with said gear shaft and connected at its opposite ends with said power members, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom, and means for alternately energizing said heater means to effect longitudinal movement of said gear rack and consequent rotational movement of said shaft and tray.

6. In an ice making apparatus comprising a support, an ice tray journaled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a geared shaft connected to said ice tray along the rotational axis thereof, a pair of coaxially aligned thermal sensitive elements slidably mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a gear rack reconnecting the free ends of said power members and drivingly engaging said geared shaft so that longitudinal movement of said rack will effect rotatable movement of said geared shaft and consequently said ice tray, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom,
abutment means formed on each of said elements, means biasing said elements toward one another to maintain said abutment means on each of said elements in engagement with said support, means limiting the amount of longitudinal movement of said gear rack, and switch means for alternately energizing said heater means operable as a function of changes in relative distance between said thermal sensitive elements.

7. In an ice making apparatus comprising a support, an ice tray journalled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a geared shaft connected to said ice tray along the rotational axis thereof, a pair of coaxially aligned thermal sensitive elements slidably mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a gear rack interconnecting the free ends of said power members and drivingly engaging said geared shaft, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom, abutment means formed on each of said elements, means biasing said elements toward one another to maintain said abutment means on each of said elements in engagement with said support, means limiting the length of travel of said gear rack, switch means for alternately energizing said heater means operable as a function of changes in relative distance between said thermal sensitive elements, and switch means operably controlling said tray filling means and actuable during those intervals whenever one of said thermal sensitive elements has slidably moved within said support to move its abutment means out of engagement therewith.

8. In an ice making apparatus comprising a support, an ice tray journalled within said support and disposed within a freezing compartment, means for filling said ice tray with fluid to be frozen into ice blocks, said ice tray being rotatable to permit gravitational ejection of ice blocks therefrom, the improvement of means for rotating said ice tray comprising a geared shaft connected to said ice tray along the rotational axis thereof, a pair of coaxially aligned thermal sensitive elements slidably mounted within said support having power members extensible therefrom upon predetermined ambient temperature conditions therearound and having their power members disposed adjacent one another, a gear rack interconnecting the free ends of said power members and drivingly engaging said geared shaft, heater means associated with each of said elements for effecting extensible movement of the respective power members therefrom, abutment means formed on each of said elements, means biasing said elements toward one another to maintain said abutment means on each of said elements in engagement with said support, means limiting the amount of longitudinal movement of said gear rack, means for alternately energizing said heater means, and switch means for controlling operation of said tray fill means actuable during those intervals when at least one of said thermal sensitive elements has slidably moved within its support to move its respective abutment means out of engagement with said support.

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