

Sept. 13, 1955

C. E. PLOEGER

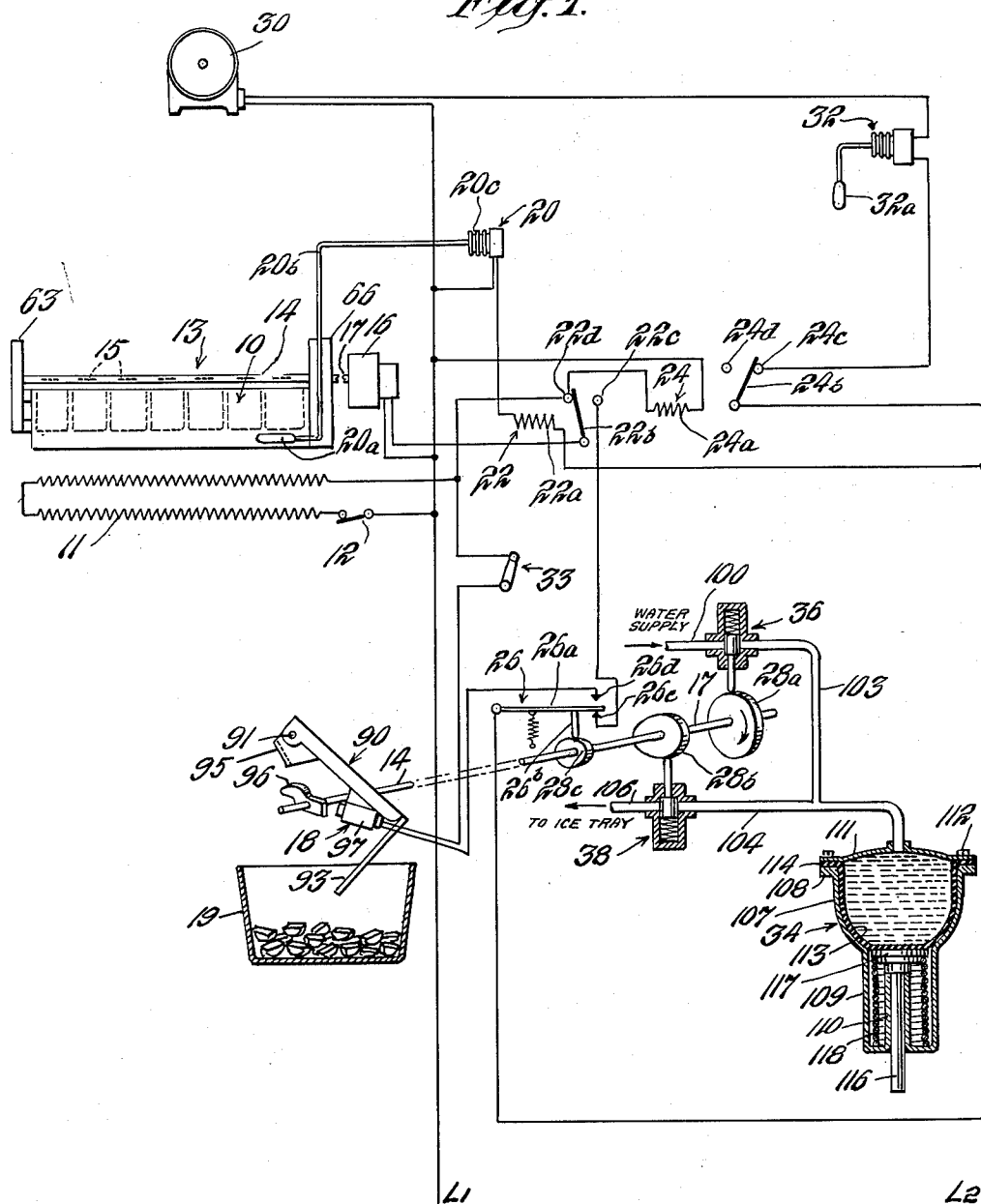
2,717,500

ICE MAKER

Filed Dec. 10, 1952

4 Sheets-Sheet 1

Fig. 1.



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4 Sheets-Sheet 2

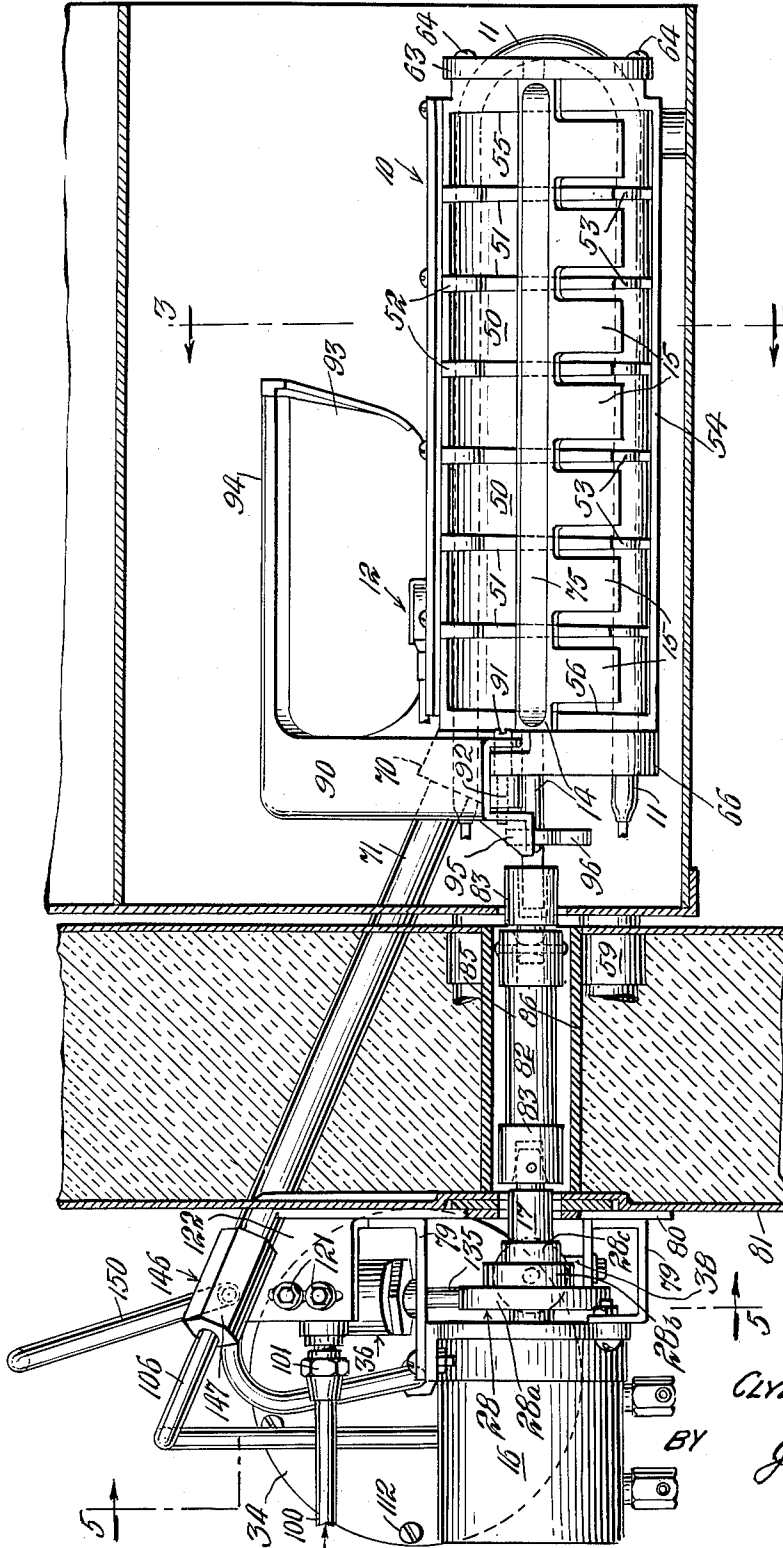


Fig. 2.

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4 Sheets-Sheet 3

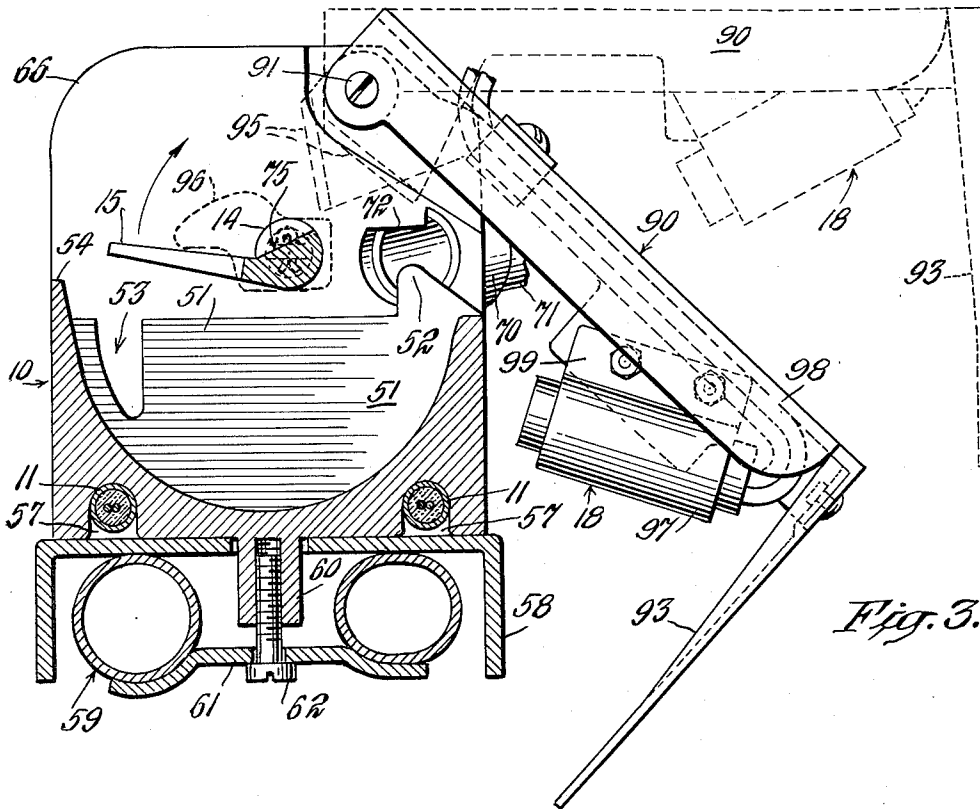


Fig. 3.

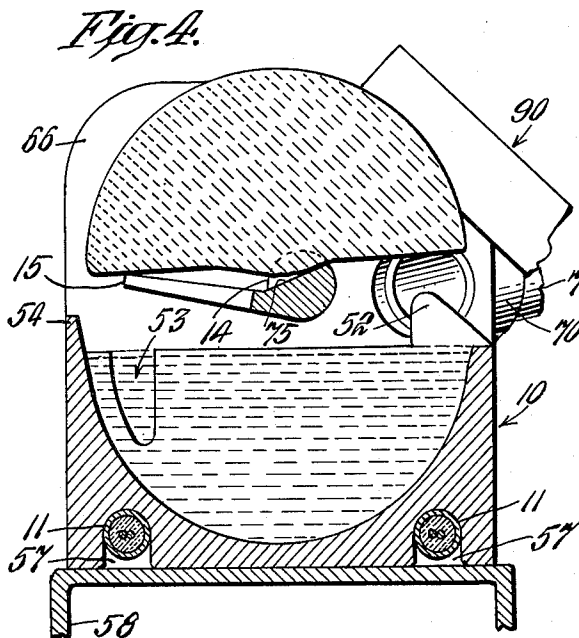


Fig. 4.

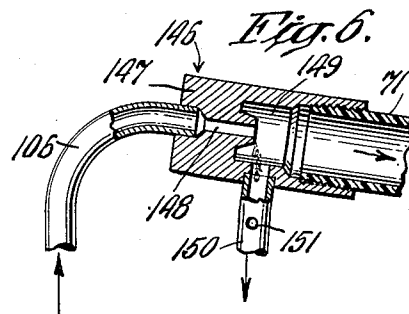


Fig. 6.

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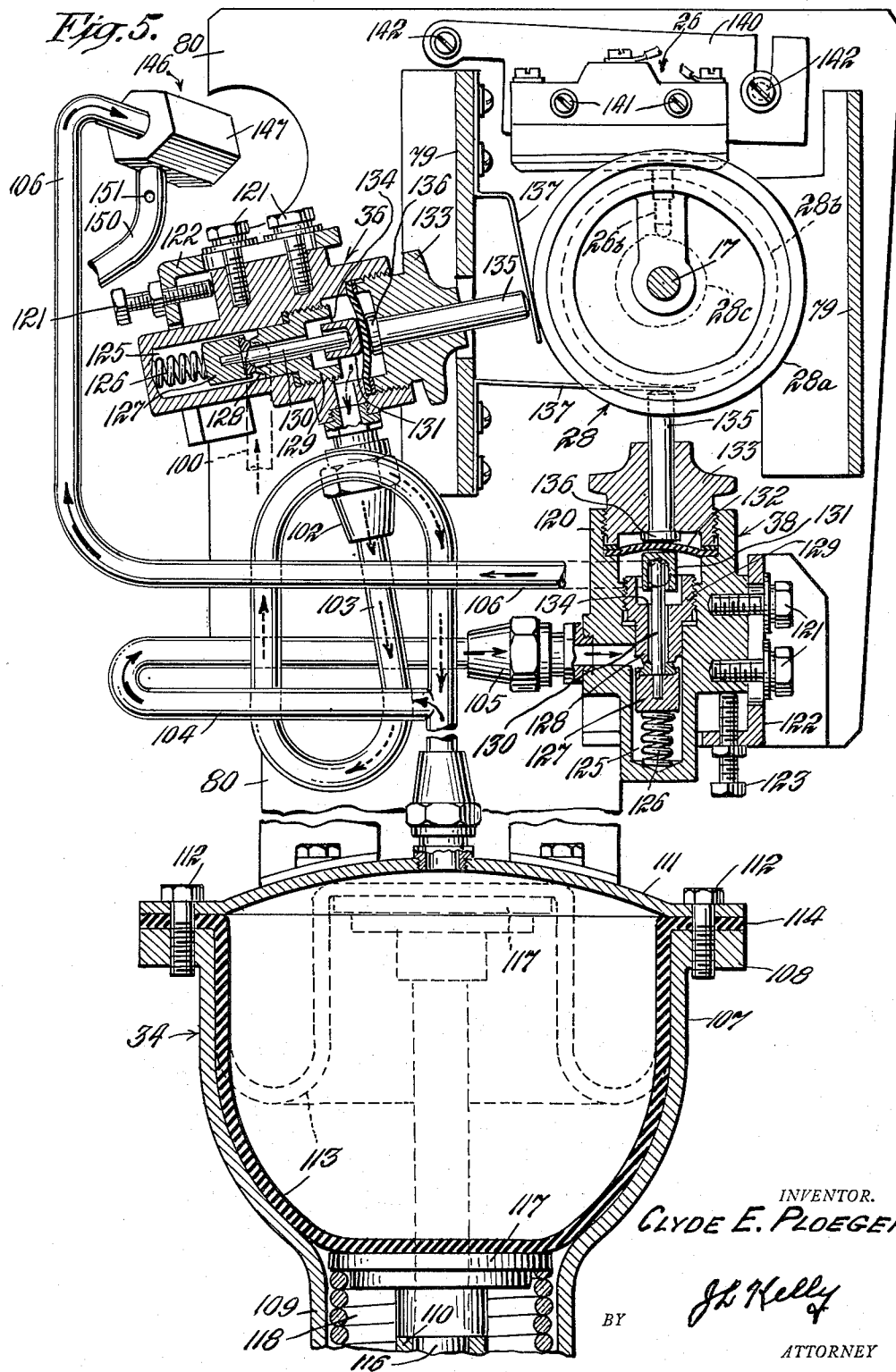
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ICE MAKER

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Application December 10, 1952, Serial No. 325,085

13 Claims. (Cl. 62—7)

This invention relates to automatic making, harvesting, drying, and storing of ice pieces, generally called ice cubes.

This invention relates particularly to an ice maker like that disclosed and claimed in the copending patent application of Sven W. E. Andersson, Serial No. 205,519, filed January 11, 1951.

Briefly, the above copending Andersson application discloses an ice maker wherein an ice mold is divided into ice forming compartments, each having a generally arcuate contour so that pieces of ice may be readily turned or swept from the mold by relative turning movement between the mold and the ice pieces. The ice removing action is automatic, as is the filling of the mold, freezing, and loosening of the ice pieces. The ice pieces are detained for thorough drying before discharge to storage. The automatic operation is stopped short of discharge of ice to storage, and remains suspended during the time that a desired quantity of ice pieces is held in storage. In the specific structure disclosed in the above Andersson application, power for operating the ice release and the control mechanisms is provided by a hydraulic motor which also measures and delivers a quantity of water to the ice mold for freezing. The disclosure of the above copending Andersson application may be considered a part of this instant application and may be referred to for a detailed description of parts thereof that are common to the two patent applications.

Reference is also made to the copending companion patent application of Harry C. Shagaloff, Serial No. 325,097, filed concurrently herewith and presently identified as P. S. 2121, which Shagaloff application discloses and claims an automatic ice maker having certain parts in common with the instant ice maker.

Objects of this invention are to provide an electric motor for operating the ice release mechanism in an ice maker of the type disclosed in the above Andersson application wherein: the motor is energized responsive to the freezing of water into ice in the ice mold; the motor is deenergized and an electric heater for thawing the ice free of the mold is energized responsive to a predetermined rotation of the ice release mechanism; the motor is again energized and completes an ice release cycle responsive to the thawing of the ice free of the mold, then the motor and the electric heater are deenergized; wherein a means for supplying a measured quantity of water to the ice mold includes a measuring vessel having an inlet and an outlet valve connected thereto, which valves are operated by the electric motor in a manner that the inlet valve is open and water from a source of supply flows to the measuring vessel during the time the electric heater is thawing a batch of ice pieces free of the mold, then the inlet valve is closed and the outlet valve opened by the electric motor as the ice is ejected from the mold and remains open during the next freezing cycle; and wherein a storage receptacle is provided for receiving ice pieces from the release mechanism, and which storage receptacle has a stop switch associated therewith in a manner that

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the ice maker is stopped and remains idle upon the accumulation of a given amount of ice in the storage receptacle.

The invention, together with its objects and advantages, is set forth in more technical detail in the following description and accompanying drawings, wherein:

Fig. 1 is a schematic illustration of the ice maker and a wiring diagram of the controls therefor;

Fig. 2 is a top plan of the ice maker showing parts of the refrigerator in section;

Fig. 3 is a transverse vertical section of the ice mold taken on line 3—3 of Fig. 2;

Fig. 4 is a transverse vertical section through the ice mold and showing the ice resting on the ejector for drying;

Fig. 5 is a rear elevation of the ice maker showing the water valves in vertical section and taken substantially on line 5—5 of Fig. 2; and

Fig. 6 is a detail vertical section of parts of the water conduits.

General description

In Fig. 1 there is schematically shown an ice maker in accordance with my invention and a wiring diagram therefor, wherein L_1 and L_2 are the two sides of a 115 volt A. C. supply circuit. 10 represents an ice mold with a built-in heater 11 and a high temperature limit switch 12. An ejector mechanism is generally illustrated at 13 and includes an ejector shaft 14 having a plurality of blades 15 mounted thereon and connected to a geared electric motor 16. A line voltage stop switch 18 is connected in the motor and heater circuits. 20 is a mold thermostat having a bulb 20a in thermal contact with the ice mold and a capillary tube 20b leading from the bulb to the bellows 20c. 22 is a relay, energized and deenergized by the thermostat 20, and having a coil 22a, a switch 22b and terminals 22c and 22d. 24 is a second relay having a coil 24a, a switch 24b and terminals 24c and 24d, which latter terminal is dead. 26 is a micro switch having a blade 26a, a plunger 26b and terminals 26c and 26d. The plunger 26b is operated by a cam portion 27c of a composite cam 28 that is mounted on the shaft 17 of the motor 16. 30 is a motor-compressor unit for operating the refrigerating system, not shown, and 32 is a box thermostat having a bulb 32a within the refrigerator for controlling the operation of the motor-compressor unit. A manually operated switch for deenergizing the ice maker at will without interfering with the operation of the motor-compressor unit is shown at 33. 34 is a measuring vessel for supplying water to the ice mold and is connected to a water supply by an inlet valve 36, and by an outlet valve 38 to the ice mold 10. The inlet and outlet valves are operated by cam portions 28a and 28b, respectively, of the composite cam 28.

Ice mold

Referring now to Figs. 2, 3 and 4, the ice mold 10 comprises an aluminum die casting divided into a plurality of ice forming compartments 50 by transverse partitions 51. The ice forming compartments are generally semicircular in transverse section, and the partitions are tapered horizontally from the right to the left side thereof as viewed in Fig. 2. The partitions have substantially no taper in the vertical direction. The partitions are each provided with an upstanding projection 52 on the right side and with a weir or notch 53 in the left side thereof. The outer surface of each of the weirs is of the same general curvature as the inner surface of the ice mold compartments, and the inner surface of the weirs is substantially vertical. The mold is provided with an upstanding edge 54 along the left side thereof, and the end walls 55 and 56 slant outward from right to left as viewed from the front

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in Fig. 2. The mold heater 11 is in the form of a hairpin coil and is located in slots 57 in the bottom of the mold at each side thereof.

The mold rests on a refrigerated shelf 58 (Fig. 3) that is cooled by a refrigerating coil 59 also in the form of a hairpin. As shown, the refrigerating coil is formed out of round on one side for good thermal contact with the undersurface of the refrigerated shelf and for downward flow of refrigerant from the inlet to the outlet end of such coil. The refrigerating coil is connected to a suitable refrigerating machine, not shown. As shown, the mold is provided with a plurality of bosses 60 projecting from the bottom thereof which pass through openings in the refrigerated shelf, and which clamp the mold to the shelf and the shelf to the refrigerating coil by means of a clamp 61, held in place by a plurality of screws 62 threaded into the bosses 60. A mounting plate 63 (Fig. 2) made of thermal insulating material is attached to the front end of the mold by a plurality of screws 64. A second mounting plate 66 made of thermal insulating material is attached to the rear of the mold by suitable screws, not shown. The sensing bulb 20a of the mold thermostat 20 and the high limit switch 12 for the mold heater 11 are clamped on one side of the mold and are insulated from the ambient by suitable insulation, not shown. The rear mounting plate 66 is provided with a boss 70 having a downwardly and inwardly inclined opening therethrough for the reception of a water tube 71, and, as shown, the mounting plate is provided with an abutment 72 (Fig. 3) for locating the water tube.

Ejector mechanism

The ejector mechanism 13 includes the shaft 14 mounted for clockwise rotation at its front end in the front mounting plate 63 and at its rear end in the rear mounting plate 66. The shaft has a flat portion 75 on the upper part thereof, and is provided with a plurality of ejector blades 15, one for each ice mold compartment, at one side thereof. As shown in Figs. 3 and 4, the ejector shaft is mounted off center relative to the longitudinal axis of the mold and the blades 15 are at an angle to the flat portion 75 of the shaft. The electric motor 16, for driving the ejector shaft 14, is mounted by a pair of brackets 79 (Fig. 2) on a mounting plate 80 on the rear wall 81 of the refrigerator, and is connected to the rear of the ejector shaft by a universal connecting member 82. This electric motor is geared down from 3400 R. P. M. to approximately 2 R. P. M. The connecting member 82 is provided with a notched universal coupling 83 at each end thereof to receive the end of the motor shaft at one end and of the ejector shaft at the other end. The middle portion 85 of the connector member is made of a phenolic cloth laminate or other suitable thermal and electrical insulating material. A spool 86 made of suitable thermal insulating material encircles the connecting member and forms a guide therefor and a protecting shield for the insulation located between the rear wall members of the refrigerator.

Stop switch

The stop mechanism 18 comprises a channel member 90 that is generally L-shaped in plan (Fig. 2) and is connected by a pivot pin 91 to the upper right side of the rear mounting plate 66 of the mold. An insulating spacer 92 is provided on the pivot pin between the rear of the mounting plate and the rear inner portion of the channel member. A vane 93 made of a thermal and electrical insulating material is attached to the longitudinal portion 94 of the channel member and projects downwardly therefrom (Fig. 3). The channel member is provided with a rearwardly extending arm 95 that is adapted to be contacted by a cam member 96 mounted upon a reduced portion of the ejector shaft

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14 and held in position thereon by a cotter key, not shown. The cam 96 is so shaped that upon rotation of the ejector shaft the cam contacts the rearwardly extending arm 95 of the channel member and gradually raises the channel member to a substantially horizontal position as shown in broken lines in Fig. 3. Then the cam leaves the arm and permits the channel member to fall by gravity to its normal position shown in full lines. A mercury switch 97 is mounted on the transverse portion 98 of the channel member by an adjustable bracket 99 in a manner that when the channel member is in the full drawn position shown in Fig. 3 the circuit through the mercury switch 97 is closed, whereas when the channel member is in the broken line position the circuit is open.

Mold filling device

Referring to Figs. 1 and 5, the structure for filling the ice mold 10 with a measured quantity of water includes the measuring vessel 34 connected to a suitable supply of water by a conduit 100 having the inlet valve 36 therein. The valve 36 has an inlet connection 101 leading from the source of supply and an outlet connection 102 including a conduit 103 leading to the measuring vessel 34. The conduit 103 has a T-connection and a conduit 104 leading to the outlet valve 38, which outlet valve has an inlet connection 105 leading thereto and an outlet connection having a conduit 106 leading therefrom to the ice mold 10. The measuring vessel 34 is attached to the mounting plate 80 and is formed of an aluminum casting having an upper portion 107 of generally hemispherical shape with an outwardly projecting flange 108 at the upper end thereof, and a lower portion 109 of cylindrical shape having a sleeve or guide member 110 projecting upwardly from the lower portion thereof into the bottom of the hemispherical portion. A cover plate 111 made of copper or other suitable material is attached to the open end of the measuring vessel by a plurality of set screws 112, several of which screws hold the measuring vessel on the mounting plate 80. A flexible rubber diaphragm 113 is fitted within the hemispherical portion of the measuring vessel and is secured therein by a peripheral flange portion 114 located between the flange 108 of the measuring vessel and the marginal edge of the closure member 111. A piston, having a stem 116 slidably mounted in the sleeve 110 and a head 117 which contacts the undersurface of the flexible diaphragm, is located in the lower portion of the measuring vessel. A compression spring 118 is located between the undersurface of the piston head and the lower inner surface of the cylindrical portion of the measuring vessel.

The inlet and outlet valves 36 and 38 are substantially identical, therefore, a detailed description of one of such valves will suffice. Each of these valves includes a body member 120 adjustably mounted by screws 121 upon a bracket 122, which bracket is in turn mounted upon the mounting plate 80. An adjusting screw 123 is provided for locating the valve relative to the cam 28a. The valve body member 120 has a well portion 125 adapted to receive a compression spring 126 for urging the valve head 127 into engagement with the valve seat 128. The valve seat is located on one end of a plug member 129 that is screw-threaded into the valve body. A valve stem 130 reciprocates within the plug member 129 and has a cap or spacer 131 on the upper portion thereof, which spacer contacts a flexible diaphragm 132 held in position by a plug 133 that is screw-threaded into the upper portion of the valve body. An annular channel 134 is provided in the plug member 129 for flow of water from the inlet to the outlet when the valve is open. A reciprocating shaft 135 having a head 136 on the lower portion thereof is mounted in a bore of the valve plug 133, and the opposite end of the shaft lies

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adjacent a cam surface 28a on the cam 28. A cam follower 137 made of a suitable wear-resistant material is located between the end of the valve shaft 135 and the cam surface 28a. A second cam surface 28b on cam 28 operates the valve shaft 135 of the outlet valve 38. The cam surfaces 28a, 28b and 28c form integral parts of the cam 28 and are shaped in the manner shown in Figs. 2 and 5. The cam surface 28a operates the shaft of the inlet valve 36; the cam surface 28b operates the shaft of the outlet valve 38; and the cam surface 28c operates the plunger of the micro switch 26.

For clarity of illustration, the ejector motor 16 is omitted in Fig. 5. The micro switch 26 is mounted on a bracket 140 by screws 141 and the bracket is adjustably mounted on the mounting plate 80 by screws 142. The micro switch includes the spring pressed plunger 26b which rides upon the perimeter of the cam 28c in a manner that the circuit through the terminal 26c is closed when the plunger is on the low portion of the cam and open when it is on the high portion, and the circuit through terminal 26d is open when the plunger is on the low portion of the cam and closed when it is on the high portion, as shown in Fig. 1.

The conduit 106 leading from the outlet valve 38 to the ice mold 10 includes a water diverter 146. The diverter (Fig. 6) includes a body member 147 having a restricted passageway 148 connected to the conduit 106 and an enlarged or unrestricted passageway 149. A drain conduit 150 having a vent opening 151 therein leads from the unrestricted passageway 149 to a suitable place of disposal. The water tube 71 that is made of plastic or other thermal insulating material is connected at one end to the enlarged passageway 149, and at its opposite end this tube fits into the boss 70 on the rear mounting plate 66 of the ice mold (Fig. 2). The function of the diverter 146 is to prevent the freezing of drip water in the conduit 71 leading to the ice mold. That is, when the outlet valve 38 is open, water is forced from the measuring vessel 34 through the outlet valve and conduit 106 into and through the restricted passageway 148 and from there through the tube 71 to the rear compartment of the ice mold. And when the outlet valve is closed, any water that may leak past this valve falls from the restricted passageway 148 into the drain conduit 150, without entering the tube 71. The drip water that flows into the drain conduit 150 may be disposed of in any suitable manner, not shown. The vent opening 151 in conduit 150 prevents the siphoning of water through this conduit. This specific manner of preventing the blocking of the water tube 71 by the accumulation of frozen drip water in the lower end thereof is the invention of Sven W. E. Andersson and is disclosed and claimed in his copending patent application, Serial No. 325,146, filed concurrently herewith and presently identified as P. S. 2060.

It will be noted that the ejector motor 16, the composite cam 28, the micro switch 26, the measuring vessel 34, the inlet and outlet valves 36 and 38 and the connecting conduits are all mounted as an assembly on the mounting plate 80, which mounting plate is attached to the rear wall 81 of the refrigerator, as shown in Figs. 2 and 5.

Sequence of operation

The "starting position" of the ejector shaft 14 is the position it has when water is being frozen in the mold 10, and the previous batch of ice is resting on the ejector blades 15, as shown in Fig. 4. Starting with all switches in the freezing or ice making position (Fig. 1) with the refrigerant compressor running, freezing will continue until the thermostat 20 is satisfied at a temperature of approximately 18° F.—at which time this thermostat will open the circuit to the coil 22a of the relay 22, causing the switch 22b to shift from the terminal 22d to the terminal 22c, thereby closing a circuit to the ejector

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motor 16 from L₁ and L₂ through the terminals 22c on the relay 22 and 26c on the micro switch 26. This will energize the ejector motor and cause it to rotate the ejector shaft 14 and the attached blades 15.

As the ejector shaft passes the 45° point of rotation from the starting position, the high portion of cam 28b draws away from the shaft 135 of the water outlet valve 38, whereupon the spring 126 forces the valve head 127 against the seat 128, thereby closing this valve. At approximately the 60° point of rotation of the ejector blades 15, the previously frozen and dried batch of ice cubes is discharged from the blades into the storage receptacle 19, and at about the 90° point of rotation of the ejector the high portion of cam 96 on the ejector shaft contacts the arm 95 of the channel member 90 and lifts the channel member and attached mercury switch 97 to the broken line position of Fig. 3, thereby opening the circuit through the mercury switch 97. The opening of the circuit through the mercury switch has no immediate effect on the ejector motor which continues to rotate the ejector shaft and at about the 100° point of rotation the high portion of cam 96 is removed from contact with the arm 95 of the channel 90 whereupon the channel member and attached mercury switch is free to fall by gravity to the full drawn position of Fig. 3 which closes the circuit through the mercury switch, provided the receptacle 19 is not filled with ice. Should the receptacle be filled with ice, the vane 93 will contact the ice and hold the mercury switch open. This still has no immediate effect upon the rotation of the ejector mechanism, because the ejector motor is receiving current from L₂ through the blade 26a and terminal 26c of the micro switch, through the terminal 22c and blade 22b of the relay 22, and through the motor to L₁. However, as will be described hereinafter, the holding of the mercury switch open prevents the later energization of the mold heater 11.

The ejector continues to rotate and at about the 180° point of rotation, just when the ejector blades are about to contact the ice frozen in the mold, the high portion of cam 28c contacts the plunger 26b and shifts the blade 26a of the micro switch from terminal 26c to terminal 26d. The opening of the circuit through terminal 26c on the micro switch deenergizes the ejector motor 16 and the closing of the circuit through terminal 26d energizes the mold heater 11, provided the stop vane 93 has returned to the full drawn position of Fig. 3. That is, if the receptacle 19 is not filled with ice, the mercury switch 97 will be closed and a circuit will be established from L₂ through the blade 26a and terminal 26d of the micro switch, through the mercury switch 97, and through the heater 11 and the high temperature limit switch 12 to L₁, thereby energizing the heater which begins to thaw the ice cubes free of the mold. The high temperature limit switch 12 in the heater circuit is a bimetal thermostat placed in thermal contact with the ice mold and which opens the heater circuit at about 100° F., and opens only in the event that the mold heater is energized too long due to something having gone wrong with the controls. At the same time that the blade 26a of the micro switch was shifted from terminal 26c to terminal 26d and the circuit established through the heater 11, a circuit was also established through the coil 24a of the second relay 24, whereupon the coil was energized and the switch blade 24b shifted from terminal 24c to the dead terminal 24d which opened the circuit through the compressor motor 30, causing the compressor to stand idle during the thawing of the ice cubes free of the mold.

Just prior to the time that the 180° point of rotation, referred to above, had been reached and the ejector motor deenergized, the high portion of cam 28a will have contacted and depressed the shaft 135 of the inlet valve 36, thereby opening this valve whereupon water flows from the source of supply into the measuring chamber 34. As the water flows into the measuring

chamber the flexible diaphragm 113 is expanded to the shape shown in full lines in Figs. 1 and 5, whereupon a measured quantity of water is contained therein, and as the diaphragm expands, the piston head 117 and attached rod 116 is forced downward whereby the spring 118 is compressed. The inlet valve 36 remains open and the measured quantity of water stands in the measuring vessel during the time that the heater 11 is thawing the ice free of the mold, and for some time thereafter as pointed out hereinafter. It will be noted, in the expanded position, the diaphragm 113 conforms to the shape of the hemispherical portion 107 of the measuring vessel and of the piston head 117 so that these metal members, and not the rubber diaphragm, take the load, and an excess water pressure will not damage the diaphragm. On the other hand, the pressure of the water supply need be only high enough to expand the diaphragm 113 and compress the spring 118 to the position shown in Figs. 1 and 5 when the inlet valve 36 is in open position.

Returning now to the 180° point of rotation, assume that the receptacle 19 is filled with ice, that the vane 93 is in contact with the ice and therefore the mercury switch 97 is open. Under these conditions the shifting of the micro switch from terminal 26c to 26d does not energize the mold heater 11, neither does it energize the coil 24a of the second relay 24, so that the switch 24b remains in contact with the live terminal 24c, and the compressor motor remains energized under the influence of the thermostat 32. That is, the ice maker stops at this point and remains idle with the mold heater deenergized, the ejector motor deenergized and the compressor motor energized, until such time as ice has been removed from the receptacle and operation resumed by the closing of the circuit through the mercury switch 97.

Assuming now that the receptacle 19 is not filled with ice, the energized heater 11 continues to heat the mold, thawing the ice free thereof, and when the bulb 20b of the mold thermostat reaches a temperature of approximately 30° F.—indicating that the mold is at a slightly higher temperature and that the ice has been thawed free therefrom—the thermostat 20 energizes the coil 22a of the relay 22 which causes the blade 22b to shift back to the terminal 22d. The blade 26a of the micro switch has remained in contact with the terminal 26d during the thawing period so that the ejector motor 16 is again energized through the blade 26a and terminal 26d of the micro switch and through the blade 22b and terminal 22d of the relay 22. Thus the ejector motor resumes rotation of the ejector blades through the second 180° whereupon the ice is slowly swept from the mold and brought to rest in an upside down position on the ejector blades as shown in Fig. 4.

As the motor shaft passes the 225° point of rotation from the original starting point the high portion of the cam 28a draws away from the shaft 135 of the inlet water valve 36, whereupon the spring 126 forces the valve head 127 against the seat 128, thereby closing this valve. At approximately the 315° point of rotation of the ejector mechanism, the high portion of the cam 28b contacts and depresses the shaft 135 of the outlet valve 38, thereby opening this valve, whereupon the spring 118 in the lower portion of the measuring vessel 34 expands and through the piston head 117 forces the expanded diaphragm upward, whereby the measured quantity of water is forced from the measuring chamber through the conduit 104, the outlet valve 38, the conduit 106, the diverter 146 and the tube 71 into the rear compartment of the ice mold. The water flows from the rear to the forward compartments of the mold through the weirs 53. The outlet water valve remains open during the next freezing cycle. In Fig. 5, the direction of flow of water from the source of supply through the inlet valve to the measuring vessel is shown by broken line arrows, and the full line arrows show the direction of flow from the

measuring vessel through the outlet valve and the diverter to the ice mold.

When the ejector reaches the 360° point of rotation, that is when it is back to the starting point, the plunger 26b of the micro switch 26 is in contact with the low portion of the cam 28c whereupon the blade 26a is shifted from terminal 26d back to terminal 26c, thereby deenergizing the ejector motor 16 and the mold heater 11. The shifting of the blade 26a from the terminal 26d to terminal 26c opens the circuit to the coil 24a of the relay 24 which deenergizes this coil and causes the blade 24b to shift from the dead terminal 24d to the live terminal 24c whereupon the compressor is again energized and operates under the influence of the box thermostat 32. Thus a new freezing cycle begins with the compressor motor energized; the ejector motor and mold heater deenergized; the water inlet valve closed; the outlet valve open; the mold filled of water; and a batch of ice resting in an upside down position on the ejector blades in a sub-freezing atmosphere to be dried during the freezing cycle.

In the above description, a compression type refrigerating system is used as one means of freezing the water in the ice mold. However, other types of refrigerating systems may be used with equal facility. For example, an absorption type refrigerating system may be used for freezing the water in the mold, in which case, should it be desired that operation of such system be interrupted during the ice release periods, the heat supply to the system may be controlled by the second relay 24. That is, the fuel supply to a burner or the electric supply to an electric heating element for the refrigerant generator may be controlled by the switch 24b.

Without further description, it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art to which this invention appertains, and it will, of course, be understood that changes in form, proportions and minor details of construction may be resorted to without departing from the spirit of the invention and scope of the claims.

What is claimed is:

1. In an automatic ice maker, an ice mold, means for filling the mold with water to be frozen, refrigerating means for freezing the water into ice in the mold, heating means for thawing the ice free of the mold, ejecting mechanism for removing the ice from the mold, and control means for operating said filling, refrigerating, heating and ejecting means in sequence, said control means including a first electric switch operable responsive to the formation of ice in the mold for energizing the ejector mechanism, a second electric switch movable to one position by the ejector mechanism for deenergizing the ejector mechanism, for energizing the heating means and for deenergizing the refrigerating means, means operable responsive to the thawing of ice free of the mold for reenergizing the ejector mechanism, means operable responsive to movement of the ejector for operating the filling means, and said second electric switch being movable to a second position by the ejector mechanism for deenergizing the ejector mechanism and for reenergizing the refrigerating means.

2. An ice maker as set forth in claim 1 wherein said first electric switch is closed and opened responsive to low and high temperatures, respectively, of the ice mold.

3. An ice maker as set forth in claim 1 wherein said control means includes a thermostat movable to one position by the freezing of the water in the mold for energizing the ejector mechanism and movable to a second position by the thawing of the ice free of the mold for reenergizing the ejector mechanism.

4. An ice maker as set forth in claim 1 wherein said control means includes a thermostat operable responsive to the formation of ice in the mold for moving said first switch to a first position for energizing the ejector mechanism and operable responsive to the thawing of the ice

free of the mold for moving said first switch to a second position for reenergizing the ejector mechanism.

5. An automatic ice maker as set forth in claim 4 wherein the control means includes a first relay energized and deenergized by the thermostat for moving the first switch.

6. An automatic ice maker as set forth in claim 4 wherein the control means includes a first relay energized and deenergized by the thermostat, and a second relay energized and deenergized by the second switch.

7. In an automatic ice maker, an ice mold, means for filling the mold with water to be frozen, refrigerating means for freezing the water into ice in the mold, thawing means for freeing the ice from the mold, ejector mechanism movable into contact with ice in the mold for removing the ice from the mold, means on the ejector mechanism for holding ice thereon for drying wetted surfaces thereof before discharge to storage, a storage receptacle for receiving ice from the ejector mechanism, and control means for the filling, freezing, thawing, and removing means, said control means including a thermostatic switch operable responsive to the freezing of ice in the mold for energizing the ejector mechanism, a second switch operable by movement of the ejector mechanism for energizing the thawing means, and a third switch operable by the accumulation of ice in the storage receptacle for preventing the energization of the thawing means.

8. An ice maker as set forth in claim 7 wherein the third switch is opened and closed by movement of the ejector mechanism and is held open by the accumulation of a given amount of ice in the storage receptacle.

9. An ice maker as set forth in claim 8 wherein the opening of the third switch renders the filling, thawing and removing means inoperative.

10. In an automatic ice maker, an ice mold, means for filling the mold with water to be frozen, refrigerating means for freezing the water into ice in the mold, means for thawing the ice free of the mold, ejector mechanism for removing the ice from the mold, and control means for the filling, thawing and removing means, said filling means including a measuring vessel having conduits leading thereto and therefrom and valve mechanism connected between the measuring vessel, a source of supply of water and the ice mold, said valve mechanism being operable by the control means to connect the measuring vessel to the source of water during operation of the thawing means and to the ice mold during operation of the removing means, said measuring vessel being located at a level below that of the ice mold and having means therein for forcing water therefrom to the mold, and said measuring vessel being closed to the atmosphere at all times at least by water in the conduit leading therefrom.

11. An ice maker as set forth in claim 10 wherein the valve mechanism includes an inlet valve connected between the source of water and the measuring vessel and an outlet valve connected between the measuring vessel and the ice mold, and wherein the means for forcing water from the measuring vessel includes means utilizing water pressure for storing energy therein when the inlet valve is open and for dissipating the stored energy and forcing water to the ice mold when the outlet valve is open.

12. In an automatic ice maker, an ice mold, means for filling the mold with water to be frozen, refrigerating

means for freezing the water into ice in the mold, ejector mechanism movable relative to the ice mold for removing the ice from the mold, said filling means including a measuring vessel located below the ice mold and a conduit leading upwardly therefrom to the mold, said measuring vessel having a substantially hemispherical portion and a cylindrical portion, an expansible-collapsible diaphragm within said hemispherical portion adapted to be expanded by water flowing into said vessel and when expanded to conform to the shape of such hemispherical portion, a spring-pressed plunger in said cylindrical portion adapted to be loaded by the expansion of the diaphragm and to collapse the diaphragm when unloaded by flow of water from said vessel, and valve means operated by said ejector mechanism for controlling the flow of water to and from said measuring vessel, said valve means being operated by said ejector mechanism in a manner that the measuring vessel is filled with water and the diaphragm expanded during removal of ice from the mold, and the measuring vessel is empty, the diaphragm collapsed and the conduit leading upwardly to the mold filled with water during the freezing of water in the mold.

13. In an automatic ice maker, a freezing surface, means for supplying water to said surface to be frozen thereon, refrigerating means for freezing the water on said surface, heating means for thawing the ice free of said surface, a storage receptacle, means for conveying ice from the freezing surface to the storage receptacle, and control mechanism including means operative responsive to the freezing of ice on said surface for energizing said conveying means, means operated by said conveying means for deenergizing the conveying means and for energizing said heating means, means operable responsive to the thawing of the ice free of said surface for reenergizing said conveying means and means operable responsive to the accumulation of ice in said storage receptacle for rendering the heating means inoperative.

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