

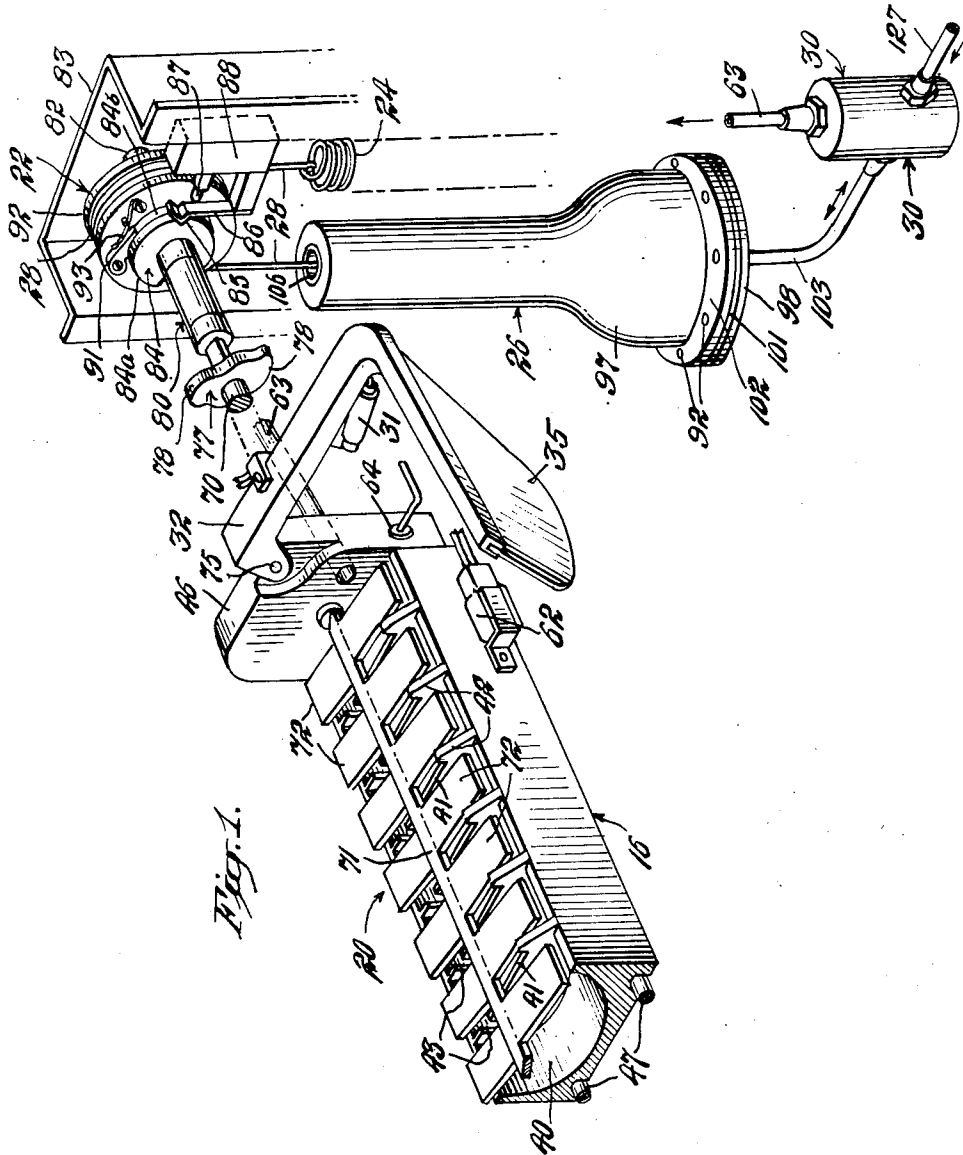
July 16, 1957

R. D. BARTON
AUTOMATIC ICE MAKER

2,799,144

Filed Sept. 30, 1953

4 Sheets-Sheet 1



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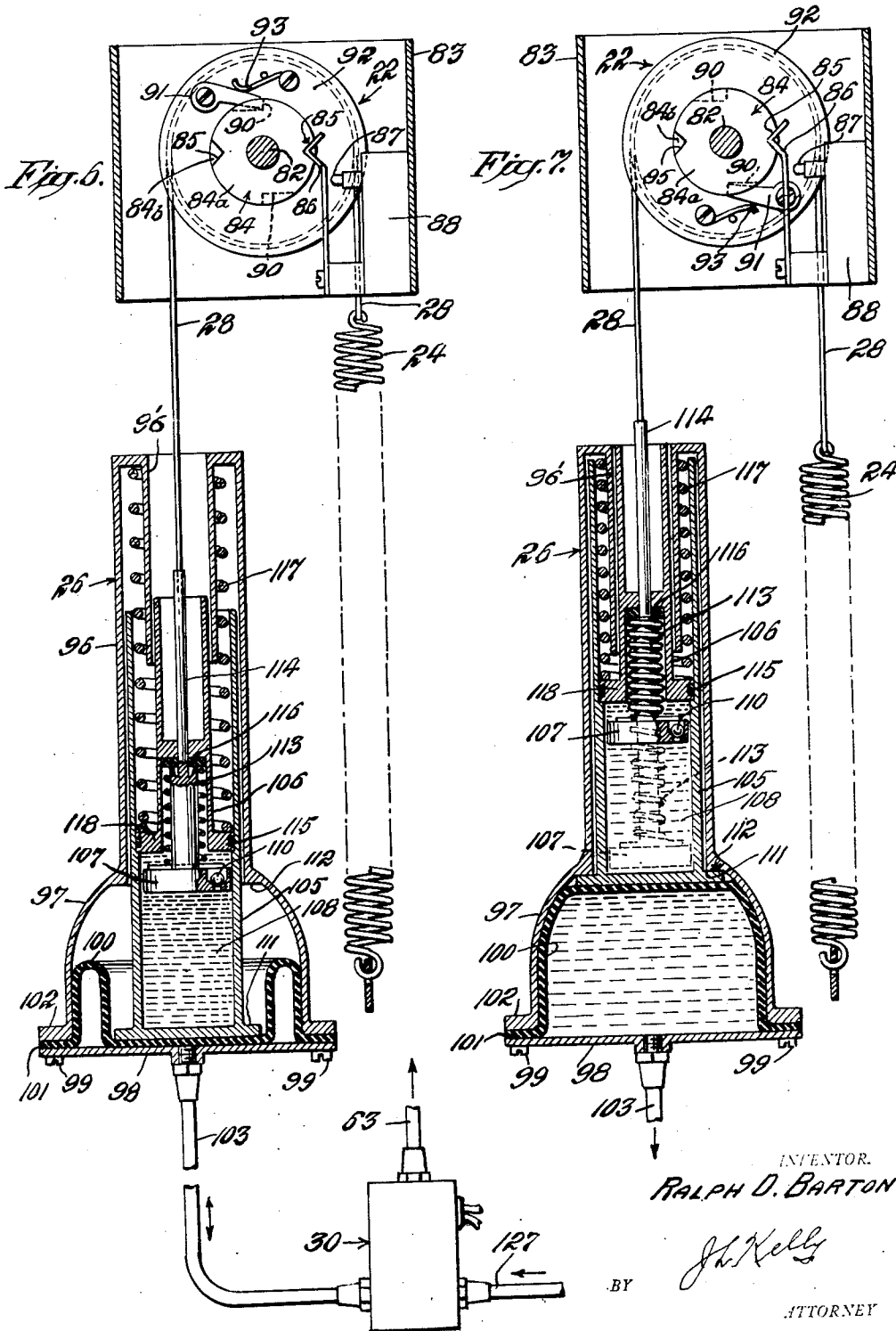
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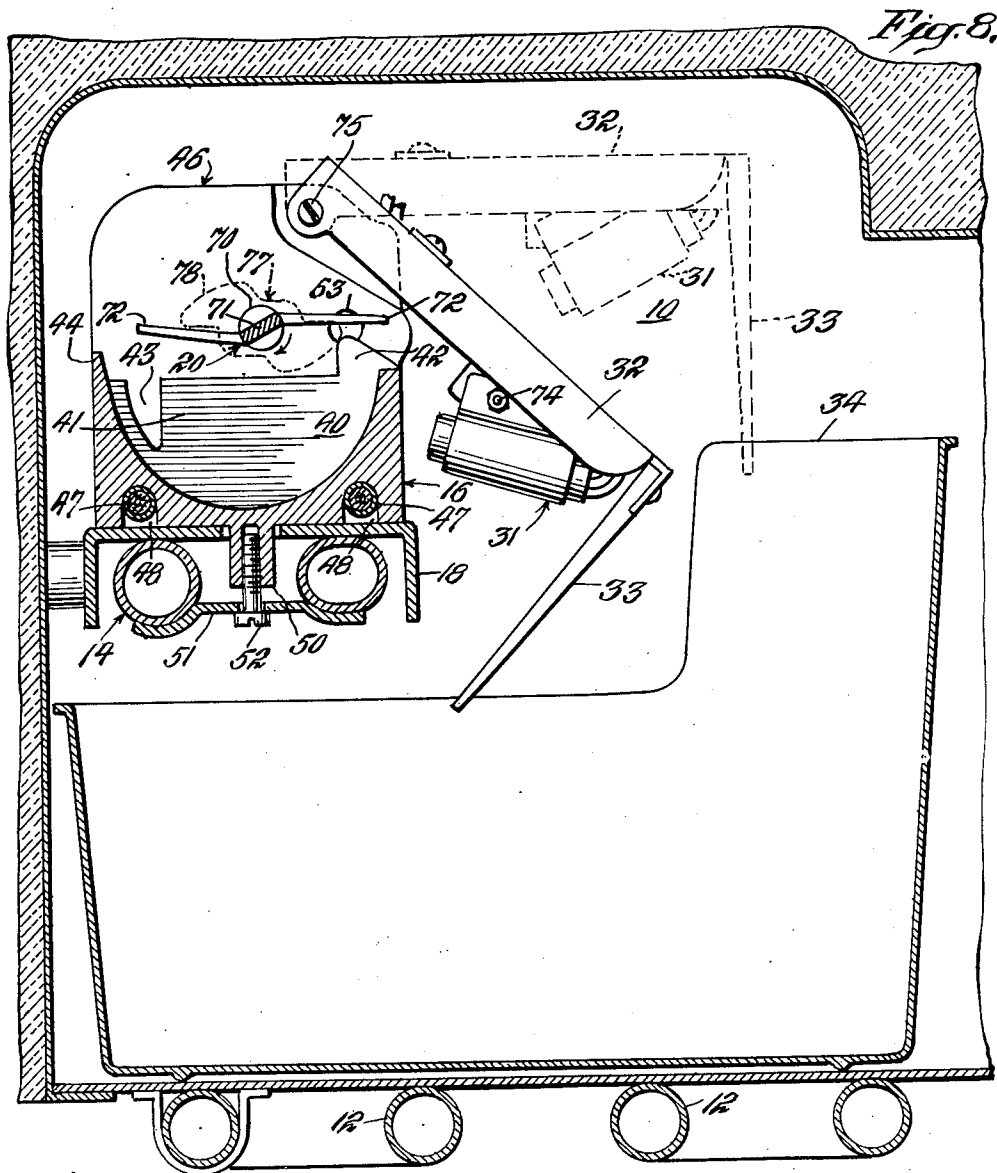
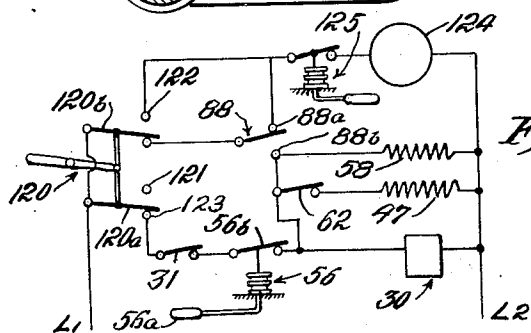
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4 Sheets-Sheet 4



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2,799,144

AUTOMATIC ICE MAKER

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Application September 30, 1953, Serial No. 383,298

6 Claims. (Cl. 62—7)

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

More particularly, this invention relates to improvements in automatic ice makers like those disclosed in the copending patent applications of Sven W. E. Andersson, Serial No. 205,519, filed July 11, 1951, now Patent No. 2,717,495, and of Harry C. Shagaloff, Serial No. 325,097, filed December 10, 1952, now Patent No. 2,717,498.

Briefly, the above Andersson patent application discloses an ice maker where 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. 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.

Briefly, the above Shagaloff application discloses an automatic ice maker wherein an ice mold and an ejector mechanism are located within the low temperature or freezing compartment of a household refrigerator. The ice mold is divided into ice forming compartments, each having a generally arcuate contour so that the ejector mechanism, which is mounted above the mold, may rotate through the ice forming compartments of the mold and sweep the ice pieces therefrom. The ice pieces are thawed free of the mold by an electric heating element that is embedded in the bottom of the mold. 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 on the ejector mechanism 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 is held in storage. All somewhat similar to that disclosed in the above Andersson application.

With the Shagaloff disclosure, power for operating the ejector and control mechanisms is provided by a geared electric motor. This motor is of the type that will stall while energized when the ejector mechanism contacts the ice frozen solidly in the mold, without burning out or otherwise harming the motor. The electric motor is energized by a thermostat, the sensing bulb of which is placed in thermal contact with the ice mold in a manner as to be controlled by the ice cube that is last to freeze in the mold. The electric motor and the

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measuring vessel for supplying a measured quantity of water to the ice mold are located on the rear exterior wall of the refrigerator. The measuring vessel is of an expandable diaphragm type wherein, when an inlet valve is open, water under line pressure flows into the vessel and expands the diaphragm. Then, when the inlet valve is closed and an outlet valve opened, the diaphragm contracts and forces the measured quantity of water to the ice mold. The disclosure of the above copending Shagaloff 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 applications.

In accordance with my invention, I utilize an ice mold and a mold thermostat generally similar to that disclosed and claimed in the above Shagaloff application. Above the mold I mount a rotatable ejector shaft that is provided with a plurality of ejector blades projecting in diametrically opposite directions from the longitudinal axis of the shaft and arranged in a manner that each time the shaft is rotated through 180°, a dried batch of ice is discharged from the top of the blades into a storage receptacle, a second batch of ice pieces is removed from the mold and brought to rest on top of the blades for drying, the mold is refilled with water, and a third batch of ice is frozen in the mold.

Power for rotating the ejector shaft is provided by a reciprocating hydraulic motor which also measures and delivers a quantity of water to the mold. Water from a house line is supplied to the hydraulic motor by a three-way solenoid valve that is energized responsive to the freezing of the water in the mold and arranged in a manner in one position of the valve, water flows under pressure from the house line to the hydraulic motor and in a second position of the valve, water flows from the hydraulic motor to the ice mold. The position of the valve is shifted each time the ejector shaft is rotated through 180°.

The hydraulic motor contains a piston assembly that is reciprocated in one direction by the water flowing thereto from the solenoid valve and in the opposite direction by a compression spring contained therein and which spring is compressed by movement of the piston in said one direction. A dash pot plunger is contained within the piston assembly for reciprocation relative thereto within an oil bath contained in said piston. A flexible cable is connected at one end to the dash pot plunger and at its opposite end to a tension spring located externally of the hydraulic motor. A ratchet and pulley mechanism is mounted on the rear of the ejector shaft and an intermediate portion of the flexible cable, between the dash pot plunger and the tension spring, is wrapped around the pulley of said mechanism.

The arrangement is such that each time a batch of ice is frozen in the mold the solenoid valve is energized by the mold thermostat whereupon water flows under pressure from the house line to the hydraulic motor. As the water flows into the cylinder of the hydraulic motor, the piston assembly is reciprocated in one direction, thereby compressing the compression spring and relieving the tension on the tension spring. The tension spring rotates the ratchet and pulley mechanism and the ejector mechanism in a clockwise direction until this mechanism is stalled by contact of one set of ejector blades with the ice still frozen in the mold. The water entering the hydraulic motor continues to move the piston assembly until the power stroke is completed; the dash pot plunger remaining stationary in the oil bath. Then, when the ice is thawed free of the mold by the mold heater, the tension spring resumes rotation of the ratchet and pulley mechanism and attached ejector mechanism whereupon the ice cubes are ejected from the mold and brought to

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rest in an upside down position on top of the ejector blades for drying; the previously dried batch having in the meantime been discharged into the storage receptacle.

As the ejector mechanism completes the 180° of rotation, the solenoid valve is shifted, whereupon the piston assembly is returned to its original position by the compression spring, the measured quantity of water is forced from the hydraulic motor through the solenoid valve to the ice mold, the dash pot plunger is returned with the piston assembly to its original position, and, through the flexible cable, the pulley is rotated counterclockwise through 180° and the tension spring is tensioned or cocked for the next ejector cycle; the ejector shaft remaining stationary during the counterclockwise rotation of the pulley.

During the above 180° of rotation of the ejector mechanism, a feeler vane, carrying a mercury switch, is raised and lowered relative to the ice in the storage receptacle in a manner that when an optimum amount of ice has been discharged into the storage receptacle, return movement of the vane is blocked by the ice and the mercury switch is held open. The mercury switch is contained in the ice maker circuit so that, when this switch is held open by the accumulation of the desired amount of ice in the storage receptacle, the ice maker stands idle with a batch of ice pieces held on the ejector mechanism for discharge to storage and a second batch of ice pieces frozen in the mold and ready to be ejected therefrom.

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 an explanatory perspective of my improved ice maker;

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

Fig. 3 is a rear elevation of the ice mold with parts in section and other parts broken away;

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

Fig. 5 is a horizontal section through the rear portion of the ice mold;

Fig. 6 is a rear elevation of the water measuring cylinder and power mechanism, showing parts in transverse vertical section;

Fig. 7 is a rear elevation and transverse vertical section similar to Fig. 6, with certain parts in different positions of operation;

Fig. 8 is a transverse vertical section through the ice maker and parts of the refrigerator; and,

Fig. 9 is a wiring diagram showing the controls for the ice maker.

General arrangement

Referring to Figs. 1, 2 and 8, I have incorporated my ice maker in a freezing compartment 10 of a household refrigerator. This refrigerator may be of a conventional type wherein the freezing compartment extends across the upper portion of the cabinet and a food storage compartment, maintained at a temperature above freezing, is located below the freezing compartment. Only so much of the refrigerator as is necessary for a complete understanding of the invention is shown in the drawing. The freezing compartment 10 is cooled by a freezing coil 12 and the ice maker is cooled by a separate coil 14. The coils 12 and 14 may be connected in series or in parallel in a suitable refrigerating circuit, not shown.

Briefly, the ice maker includes an ice mold 16 supported upon a shelf 18 that is cooled by the freezing coil 14. An ejector mechanism 20 is mounted above the mold and is rotated in a clockwise direction, as viewed in Fig. 8, by a ratchet and pulley mechanism 22, which mechanism is rotated in a clockwise direction by a tension spring 24 and in a counterclockwise direction by a combined hydraulic motor and water measuring device 26. A flexible cable 28 is wrapped around the pulley of the

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ratchet and pulley mechanism 22 and is connected at one end to the spring 24 and at its other end the hydraulic motor 26. A solenoid valve 30 controls the flow of water from a source of supply to the hydraulic motor and from there to the ice mold. A stop switch 31 is adjustably mounted on an arm 32 that is pivotally mounted on the rear of the ice mold, and a vane 33 projects from the arm into an ice receptacle 34 located in the freezing compartment 10 below the ice mold to receive ice therefrom.

Ice mold

Referring now to Figs. 1 to 5, inclusive, the ice mold 16 comprises an aluminum die casting divided into a plurality of ice forming compartments 40 by transverse partitions 41. The ice forming compartments are generally semi-circular in transverse vertical section, and the partitions are tapered horizontally from the right to the left side thereof as viewed in Figs. 2 and 5. The partitions have substantially no taper in the vertical direction. The partitions are each provided with an upstanding projection 42 on the right side and with a weir or notch 43 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 44 along the left side thereof, and the end walls 45 and 46a slant outward from right to left as viewed from the front in Figs. 2 and 5. An electric mold heater 47, in the form of a hairpin coil, is located in slots 48 in the bottom of the mold at each side thereof. The mold rests on the refrigerated shelf 18 that is cooled by the refrigerating coil 14 that also is in the form of a hairpin. As shown in Fig. 8, 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 in Fig. 8, the mold is provided with a plurality of bosses 50 projecting from the bottom thereof through openings in the refrigerated shelf. A clamp 51, held in place by a plurality of screws 52 threaded into the bosses 50, clamp the mold to the shelf and the shelf to the refrigerating coil. A mounting plate 53 made of thermal insulating material is attached to the front end of the mold by a plurality of screws, not shown.

The rear ice forming compartment of the mold is closed by a combined closure member and mounting plate 46 that is formed of plastic or other thermal and electrical insulating material. A copper heat transfer plug 55 is imbedded in the plastic closure member 46, with the front surface thereof in contact with water in the rear compartment of the mold. The plastic closure member and the copper plug each have an opening or well extending transversely therethrough to receive the bulb or temperature sensing element 56a of a mold thermostat 56, which bulb is placed in good thermal contact with the copper insert. A compartment 57 is provided in the rear of the plastic closure member 46 and has located therein a thermostat reset heater 58, which also is in thermal contact with the copper insert. The compartment 57 is closed by an insulating plate 59 that is held in position by a plurality of screws 60 threaded into the rear of the ice mold casting, which screws hold the plastic closure member in place on the rear of the mold to close the rear ice forming compartment. A sealing gasket 61 is located between the rear of the ice mold casting and the front of the plastic closure member. The plastic closure member 46 is provided with a downwardly and inwardly inclined opening therethrough for the reception of a water tube 63 that leads from the solenoid valve 30 to the ice mold. A rubber grommet 64 closes the transverse opening in plastic closure member 46. A high temperature cut-out switch 62 for the mold heating element

47 is clamped in thermal contact with one side of the mold casting.

The water freezes in the mold substantially in the manner described in the above Shagaloff application. That is, as the freezing progresses, cubes 1, 2, 3, 4, 5 and 6, from the front toward the rear of the mold, will freeze more or less uniformly with a small quantity of unfrozen water in the upper center portion of each of the cubes, because heat is being absorbed by conduction through the metal bottom and both adjoining metal partitions of the mold, and by convections through the air above the mold. But cube No. 7, the rearmost cube, progresses with a slightly larger quantity of unfrozen water near the copper insert, because here heat is being conducted primarily through the bottom and only one metal partition of the mold and through the air above the mold; the end wall 46a being made of plastic which is a poor heat conductor. This forces cube No. 7 to be the last to freeze. When the first six cubes are fully frozen, the freezing of No. 7 will have proceeded a little further, but there will still be some unfrozen water near the inner face of the copper insert 55, thereby keeping the copper insert and the thermostat bulb 56a in the neighborhood of 32° F. The refrigerated shelf 18, however, may be much colder. Also, the ambient temperature around the outside of the plastic closure member 46 may be very low, say 0° F., since the whole ice mold assembly is in the freezing compartment of the refrigerator, but the high heat conductivity of the copper insert makes the temperature of the sensing bulb 56a follow the temperature of the unfrozen water in the rear compartment of the mold because the bulb is insulated from the refrigerated shelf and from the low ambient by the plastic closure member. Thus, the last water of the last cube to freeze must have been frozen before the thermostat bulb 56a can reach, say 25° F. This permits 25° F. to be a safe temperature for instigating a release cycle under all conditions of operation while making sure that all of the cubes are completely frozen. It has been found that when using a reasonable size heater, say a 300 watt heater, as the heating element 47 to effect loosening of the cubes from the mold the insulating effect of the plastic closure member 46 may prevent the thermostat bulb 56a from resetting the thermostat 56 by the time the cubes are loosened. Therefore, some heat is supplied directly to the copper insert 55 and from there to the thermostat bulb during a release cycle by the thermostat reset heater 58. The reset heater may be replaced by a heat exchange member of high heat conductivity placed between the mold heater 47 and the thermostat bulb 56a.

Ejector mechanism

The ejector mechanism 20 includes a shaft 70 mounted for rotation at its front end in the front mounting plate 53 and at its rear end in rear closure member 46. The shaft 70 is formed with a rectangular portion 71 throughout the portion of its length above the ice mold compartments and a plurality of blades or fingers 72, one pair for each ice mold compartment, project in opposite directions from and at an angle with the rectangular portion of the shaft. In order that the ice may be turned out of the mold compartments and come to rest on top of the ejector, the shaft 70 is located off center relative to the longitudinal axis of the mold. Also, in the production of ice pieces in molds of the character described, the water in freezing from the sides and bottom toward the top center of the mold compartments produces ice pieces with a tip or bulge projecting upward from the center of the top surface thereof. To accommodate these upwardly projecting bulges and, so that the ice pieces may come to rest in an inverted position on the fingers 72, each of the fingers is placed at an angle to the plane of the rectangular portion of the shaft, as shown in Fig. 4.

Stop switch

Referring to Figs. 1 and 8, the stop switch 31 is a mercury switch that is adjustably mounted by a screw 74 on the arm 32, and the arm is pivotally mounted by a screw 75 on the right upper corner of the rear closure member 46. The arm 32 has a plane surface 76 formed thereon, which surface is contacted and rotated by a pair of cam lobes 78, 78, formed on a cam member 77 mounted on the rear of the ejector shaft 70. The cam lobes 78 are so shaped that each time the ejector shaft rotates through 180° one of the lobes contacts the surface 76 and raises the arm 32 to a substantially horizontal position thereby opening the circuit through the mercury switch 31. Then the lobe 78 leaves the surface 76 which permits the arm 32 to fall by gravity to its normal position shown in full lines in Fig. 8, provided the ice receptacle 34 is not filled with ice pieces. Should the receptacle 34 be filled with ice, the vane 33 will contact the ice and hold the arm in an elevated position thereby holding the circuit through the mercury switch open, as will be described in more detail hereinafter.

Ratchet and pulley mechanism

The ejector shaft 70 is extended, preferably by a universal coupling 80, through an insulated rear wall 81 of the refrigerator, and it is connected to a pulley shaft 82. The universal coupling 80 may be of any desired construction and need not be described in detail. As shown in Figs. 1 and 2, the pulley shaft 82 is mounted for rotation in a bracket member 83 secured to the rear exterior wall of the refrigerator. A double-flanged wheel 84 is rigidly attached to shaft 82 for rotation therewith. Two V-notches 85, 85 are located in the front flange 84a of the wheel 84, 180° apart, for the purpose of engaging the free end of a leaf spring 86. This spring is attached to the pulley mechanism bracket 83 and is used to hold the ejector shaft 70 in its normal position against counterclockwise rotation, as shown in Fig. 1, and also to actuate the switch plunger 87 of a micro switch 88 to close its contacts when the free end of the spring is out of the notch and riding on the front flange of wheel 84. Two square notches 90, 90, spaced 180° apart are formed on the rear flange 84b of wheel 84. The notches 90, 90 are engaged by a pawl 91, which is pivotally attached to a free wheeling pulley 92 mounted for rotation on the shaft 82. A spring 93 presses the pawl 91 against the rear flange 84b of wheel 84. During an ice release operation as the pulley 92 is rotated by the spring 24 through the cable 28 in a clockwise direction, as viewed in Figs. 6 and 7, the pawl 91 engages one of the square notches 90, to rotate the ejector assembly 180°. However, the double-flanged wheel 84 and the ejector shaft 70 remain stationary as the pulley 92 is rotated in opposite direction back to its normal position by the action of the hydraulic cylinder 26 at the end of the ejecting cycle.

Hydraulic motor and water measuring device

The operating or driving mechanism for rotating the free wheeling pulley 92 in a counterclockwise direction and for cocking or tensioning the spring 24, which spring rotates the free wheeling pulley in a clockwise direction, is of a hydraulic type that is operated by city water and is indicated generally by reference numeral 26. This mechanism also measures and delivers a given quantity of water to the ice mold for freezing. Referring now to Figs. 1, 6 and 7, the hydraulic motor 26 includes an upper cylindrical portion 96 and a lower substantially hemispherical portion 97, which lower portion constitutes the measuring vessel for water to be delivered to the ice mold. A cylindrical sleeve or guide 96' is formed in the upper part of the cylinder 96 and the hemisphere 97 is closed by a plate 98 secured thereto by screws 99. A flexible rubber diaphragm 100 is fitted within the hemisphere and is secured therein by a peripheral flange portion 101 located between the flange 102 of the hemisphere

and the marginal edge of the closure plate 98. A conduit 193 is connected at one end to the closure plate 98 and at its opposite end to the three-way solenoid valve 30.

A tubular piston assembly 105 is fitted within the hydraulic motor and contains a guide member or second piston 106 and a dash pot plunger 107 operating in an oil-filled compartment 108. A ball check valve 110 is provided in a port in the plunger 107 to allow free upward movement of the piston relative to the plunger, and the plunger has a somewhat loose fit with the interior wall of the tubular piston 105 for retarded upward movement of the plunger relative to the piston. The tubular piston 105 is provided with a peripheral flange 111 which contacts the bottom 112 of the cylinder 96 to limit upward movement of the piston, as shown in Fig. 7. A compression spring 113 urges the plunger 107 downward through the oil in the compartment 108 and a stem 114 that passes through an opening in the second piston 106 connects the plunger 107 to one end of the flexible cable 28, the opposite end of which cable is connected to the tension spring 24. The oil within the compartment 108 is sealed therein by rubber gaskets 115 and 116. A second compression spring 117, for returning the tubular piston 105 to its lowermost position against the collapsed rubber diaphragm 100 as shown in Fig. 6, is fitted between the top of the cylinder 96 and the bottom or flange portion 118 of the second piston 106. This return spring 117 is somewhat stronger than the tension spring 24 so that it holds the tension spring in its normal extended or cocked position, shown in Fig. 6.

Controls and operation

Referring now to Fig. 9, L¹ and L² are the two sides of a 115 volt A. C. supply circuit. 120 is a double pole double throw manually operated switch, shown in the "on" position to operate the ice maker. In the "off" position the lower blade 120a will be at terminal 121, which is dead, and the upper blade 120b will be at terminal 122, which keeps the compressor motor for the refrigerating system, indicated generally by numeral 124, running under the control of a thermostat 125 located in the refrigerator. Thus, in the "off" position of switch 120, all circuits to the ice maker are broken, but the refrigerator continues to operate under the influence of the thermostat 125. Normally current is supplied to the ice maker through the terminal 123 of switch 120. If the stop switch 31 is open, indicating that the storage receptacle 34 is full of ice cubes, the ice maker stands idle. If the stop switch is closed, as shown in Fig. 9, nothing happens until the mold thermostat 56 snaps the switch 56b to the closed position, also as shown in Fig. 9, indicating that the water in the ice mold has been completely frozen.

The closing of the switch 56b energizes the solenoid valve 30, the mold heater 47 and the thermostat reset heater 58, whereupon the solenoid valve is opened and water flows from a supply conduit 127 through the valve 30 and conduit 103 into the bottom of the measuring vessel 97, Fig. 6. As the water flows into the measuring vessel under pressure, the diaphragm 100 is expanded and forces the piston assembly 105 upward, thereby compressing the spring 117 and relieving the tension on the ejector spring 24. The ejector spring now tends to contract and, through the cable 28, rotates the free-wheeling pulley 92, the wheel 84, shaft 82, shaft 70 and ejector blades 72 in a clockwise direction until the blades, that is the blades on the right side of the shaft, as viewed in Fig. 4, contact the ice still frozen in the mold, which stalls the ejector mechanism. However, water continues to flow into the measuring vessel 97 and the diaphragm 100 continues to expand, forcing the piston 105 upward until the flange 111 contacts the stop 112 which limits this upward movement. In the meantime, the plunger 107 will remain at substantially the broken line position shown in Fig. 7.

As the wheel 84 begins its above clockwise rotation,

the spring 86 will be forced from the V-notch 85 and ride upon the flange 84a, whereupon the switch plunger 87 is depressed and the micro-switch 38 is shifted from terminal 88a to terminal 88b, Fig. 9. This shifting of the micro-switch deenergizes the compressor motor 124 and establishes holding circuits through the reset heater 58, the mold heater 47 and the solenoid valve 30. The high temperature limit switch 62 shown ahead of the mold heater is a thermostatic device in thermal contact with the ice mold 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 other controls.

Returning to Figs. 6 and 7, the ejector spring 24 continues to pull on the cable 28, and to urge the ejector blades against the ice in the mold, so that as soon as the mold heater 47 has thawed the ice pieces free of the mold compartments, rotation of the free-wheeling pulley and attached ejector mechanism continues in the clockwise direction, whereupon the ice is slowly swept from the mold by the ejector blades and brought to rest in an upside-down position on top of the blades for drying, as shown in Fig. 4; the previous batch of dried ice pieces having been discharged from the top of the ejector blades into the receptacle 34 as the ejector mechanism was rotated. As the ejector mechanism is rotated clockwise by the spring 24, the dash pot plunger 107 acts as a brake as it is slowly drawn upward relative to the piston 105 from the broken line position to the full line position of Fig. 7, by the cable 28. Also, as the ejector mechanism is rotated about 90° from the starting point shown in Figs. 3 and 4 the lobe 78 on the right side of cam 77 contacts the plane surface 76 of the arm 32, raising the arm and attached mercury switch 31 to the broken line position of Fig. 8. This opens the circuit through the mercury switch 31. However, the holding circuits through the micro switch 88 are still closed so that the solenoid valve 30, the mold heater 47 and the reset heater 58 remain energized.

When the ejector mechanism has completed the 180° of rotation in the clockwise direction, the upper part of the spring 86 will have entered the second V-notch 85 in the wheel flange 84a and the micro switch 88 snaps back to the position shown in Fig. 9, with the ice maker deenergized and compressor motor energized. With the ice maker circuits open, the solenoid valve 30 shifts so that now conduit 103 is in open communication with conduit 63, and the compression spring 117 forces the piston assembly 105 downward from the position shown in Fig. 7 to that in Fig. 6, whereupon the measured quantity of water is forced from the measuring vessel 97 through conduit 103, solenoid valve 30 and conduit 63 to the ice mold. As the piston assembly 105, including the plunger 107, is forced downward, the cable 28 rotates the free-wheeling pulley 92 counterclockwise through slightly more than 180° back to the position shown in Fig. 6, with the pawl 91 in the second square notch 90, and with the ejector spring 24 tensioned or cocked for the next ejecting cycle. During this counterclockwise rotation of the free-pulley 92, the ejector mechanism is held stationary by the upper part of spring 86 within the V-notch 85.

Returning to the point in the ejecting cycle where the cam lobe 78 has lifted the arm 32 and attached mercury switch 31 to the open switch position, continued rotation of the ejector shaft and cam lobe causes the lobe to rotate free of arm, whereupon the arm is free to fall by gravity. However, should the receptacle 34 be full of ice pieces, the vane 33 will contact such ice and hold the switch 31 in the open position, so that at the beginning of the next ejecting cycle, the closing of the thermostat switch 56b, responsive to the complete freezing of the water in the mold, will not energize the ice maker because the switch 31 is open. Therefore, the ice maker stands idle until such time as some of the ice pieces are removed from the

receptacle 34 and the stop mechanism returned to its full line position of Fig. 8.

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. An ice maker comprising a mold having a generally arcuate contour, means for filling the mold with water, a freezer for congealing water in the mold, and an ejector mechanism for removing ice from the mold, said ejector mechanism including a shaft mounted for rotation above the mold and extending longitudinally thereof, a plurality of fingers mounted on said shaft on opposite sides of the longitudinal axis thereof, means for holding said fingers above the mold out of contact with water therein during the congealing of such water, and means for rotating said shaft whereby the attached fingers are moved into and out of the mold for removing ice therefrom.

2. An ice maker as set forth in claim 1 wherein the mold is divided into a plurality of ice forming compartments and the plurality of fingers includes a pair of fingers, one on each side of the longitudinal axis of the shaft for each of the mold compartments.

3. An ice maker as set forth in claim 2 which includes control means for the filling, freezing and ejecting mechanism and wherein said control means is energized responsive to the freezing of ice in the mold compartments.

4. An ice maker as set forth in claim 3 wherein said control means includes means for operating the ejector mechanism for removing ice from the mold and the filling means for refilling the mold with water each time the ejector mechanism is rotated through approximately 180° of rotation.

5. An ice maker comprising a mold, means for filling the mold with water, a freezer for congealing water in the mold, and an ejector mechanism for removing ice from the mold, said ejector mechanism including a member movable through the mold for removing ice therefrom, spring mechanism for moving said member through the mold, and power mechanism including a hydraulic

motor movable in one direction for cocking said spring mechanism and discharging a measured quantity of water to the mold, and movable in an opposite direction for tripping said spring mechanism and ejecting ice from the mold.

6. An ice maker comprising a mold, means for filling the mold with water, a freezer for congealing water in the mold, and ejector mechanism for removing ice from the mold, said ejector mechanism including a member movable through the mold for removing ice therefrom, spring mechanism for moving said member through the mold, and power mechanism for cocking said spring mechanism, said spring mechanism including a tension spring and said power mechanism including a hydraulic motor having a piston, a compression spring, a dash pot plunger within said piston and connected to said tension spring, and valve means actuated by the formation of ice in the mold for flowing water to and from the hydraulic motor, the construction and arrangement being such that water flowing to the hydraulic motor moves the piston in one direction whereby said compression spring is compressed, said tension spring is tripped and contracts under the influence of said dash pot plunger, whereas flow of water from the hydraulic motor causes movement of the piston in an opposite direction by said compression spring and cocking or tensioning of said tension spring.

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