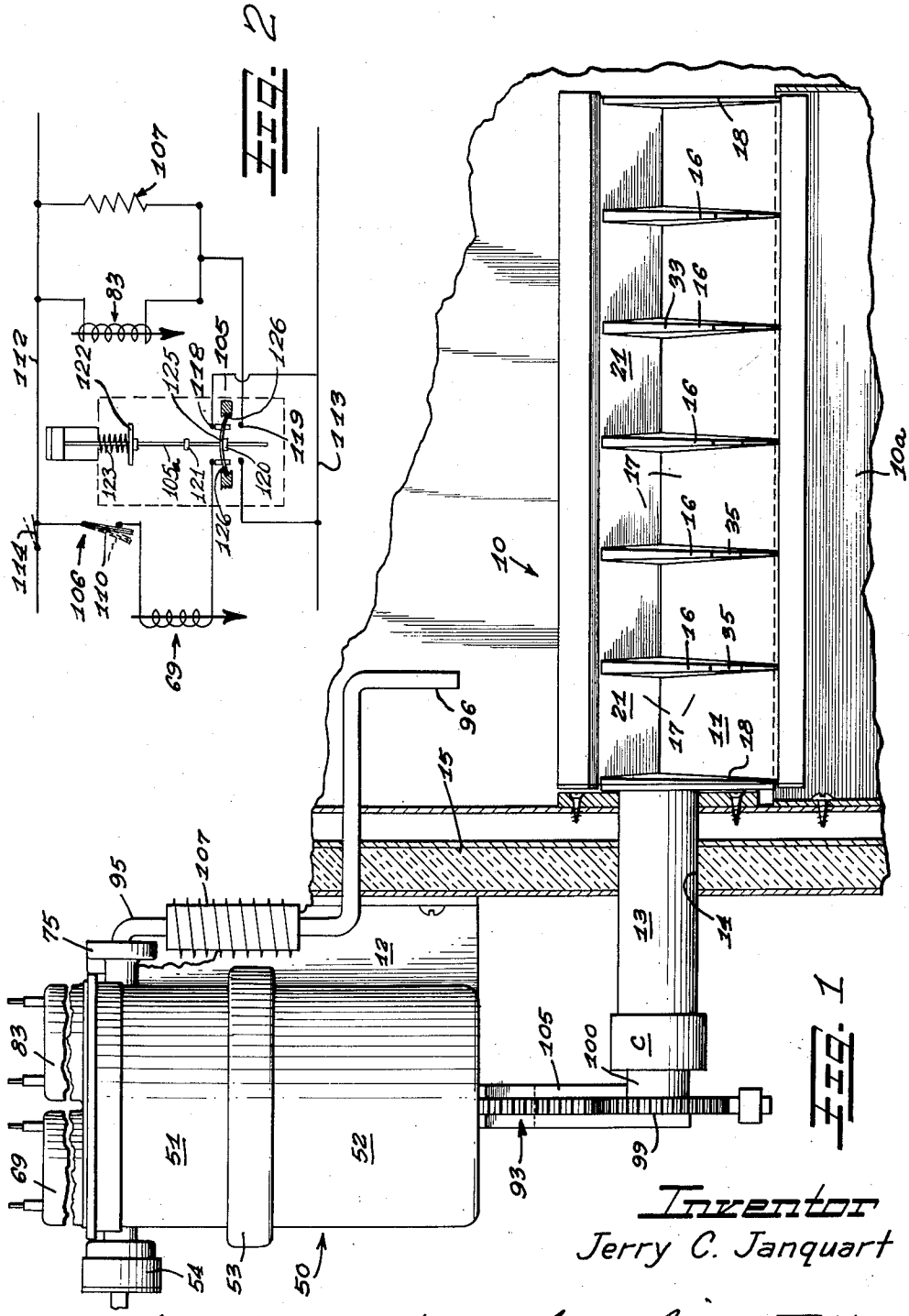
March 13, 1962 J. C. JANQUART 3,024,618

ROTATABLE ICE MOLD AND CONTROL MECHANISM THEREFOR

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ROTATABLE ICE MOLD AND CONTROL MECHANISM THEREFOR

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Fig. 3

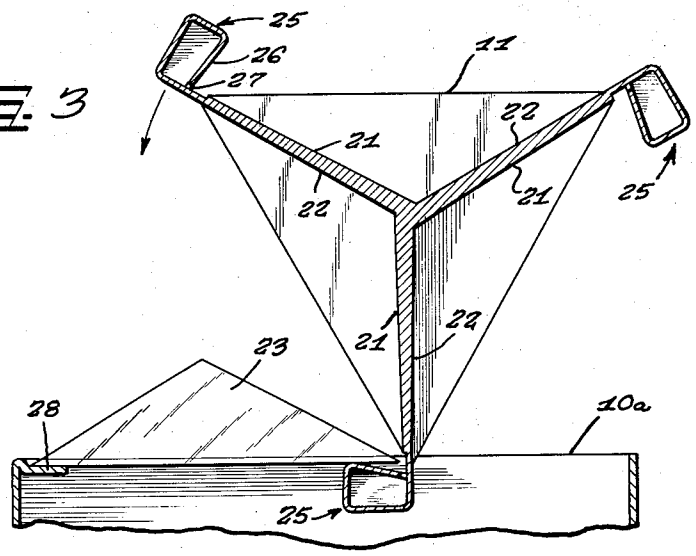
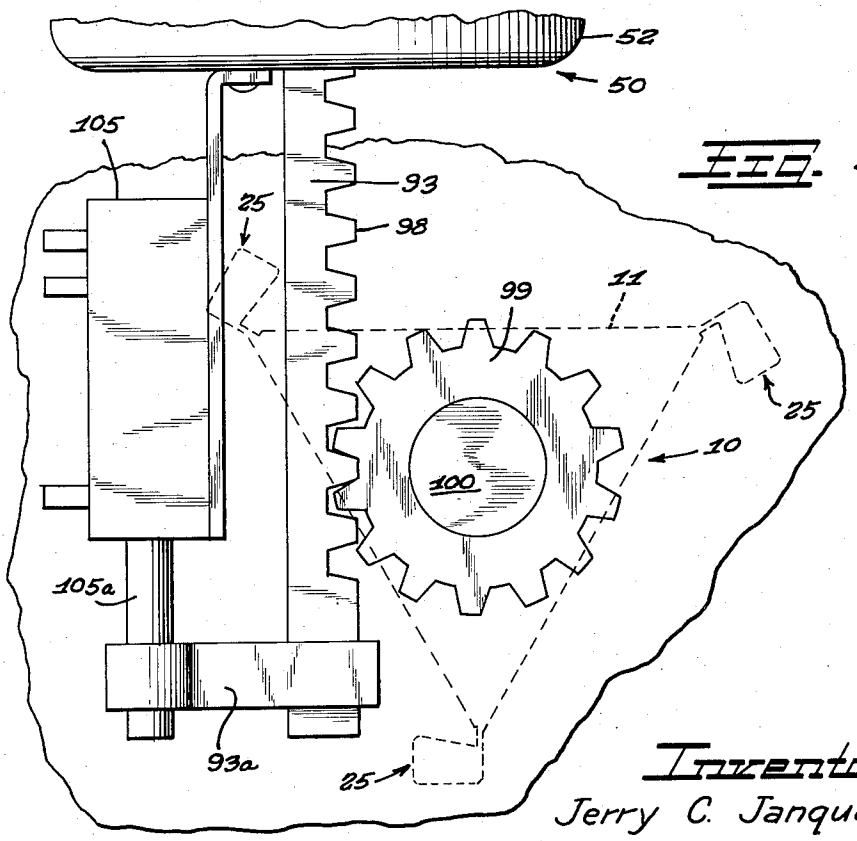


Fig. 4



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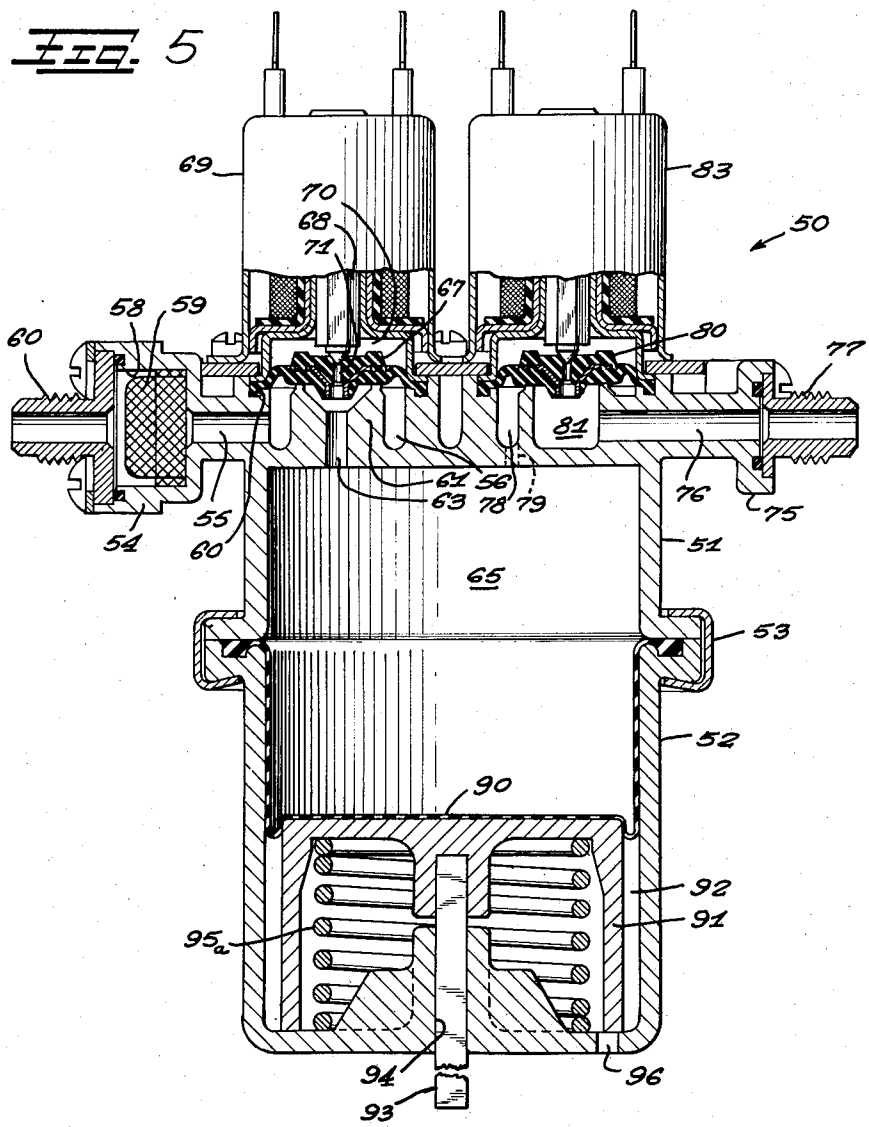
By Hill, Sherman, Meroni, Gross & Simpson Attys

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ROTATABLE ICE MOLD AND CONTROL MECHANISM THEREFOR

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Fig. 5



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3,024,618

ROTATABLE ICE MOLD AND CONTROL MECHANISM THEREFOR

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Filed Jan. 29, 1959, Ser. No. 789,898
3 Claims. (Cl. 62—135)

This invention relates to automatic ice makers and more particularly relates to an improved control means for operating a self-releasing rotatable ice mold.

This invention is directed particularly to a control means for a self-releasing ice mold of the type described and claimed in the copending application for patent of Carl C. Bauerlein for a "Self-Releasing Ice Mold," Serial No. 740,898, now Patent No. 2,939,298, which has been assigned to the assignee hereof. Generally, the particular type of ice mold to which this application is directed is rotatable about a horizontal axis and has multiple ice molds formed therein in heat transfer relationship with respect to one another and facing outwardly from the axis of rotation of the molds, so that frozen ice cubes in one set of molds will be released from the ice mold into a collection tray by the heat of water filling another set of molds. In the copending application hereinbefore referred to the ice mold is shown as comprising an automatic ice making device having three molds defined by radial walls spaced 120° apart and having a plurality of spaced partitions therein dividing the molds into a plurality of individual cube molds for freezing the ice in the form of prisms, each mold being formed so as to diverge outwardly from the radial axis thereof and so arranged that the heat of water filling an upwardly facing mold will effect the release of the ice pieces in a downwardly facing mold by heat transfer through the common walls thereof.

Applicant's invention is centered about a slug valve which is operable to dispense a measured amount of water through the ice tray at predetermined intervals and which is also operable to rotatably move the rotary mold to effect the ejection of cubes from the mold into a suitable container and to present an empty ice mold beneath the mold filler spout at predetermined intervals.

The slug valve which forms a part of the present invention comprises generally a valve body having a flexible diaphragm extending thereacross and having an inlet to and an outlet from the chamber which are formed on one side of the diaphragm for admitting and dispensing from the slug valve a measured quantity of water to be used in filling the ice mold. Fluid pressure operated solenoid controlled diaphragm valves are associated with the inlet and the outlet from the slug valve to control the passage of fluid into and out of the valve. Upon energization of the inlet solenoid, pressurized water enters the slug valve to move the diaphgram downwardly against the biasing froce of a spring member to thereby simultaneously move a mechanical transducer or motion translation rod associated with the diaphragm and extending exteriorly of the valve body downwardly also.

The motion translation rod is associated with an electrical switch in such a manner that initial downward movement of the rod acts to close a holding circuit to the inlet solenoid to permit the continuous passage of fluid into the main fluid chamber in the slug valve during downward movement of the motion translation rod. As the rod moves to the end of its downward stroke, a movable contact within the switch is snapped out of engagement with one stationary contact and into engagement with a second stationary contact to open the energizing circuit to the inlet solenoid and to simultaneously close an energizing circuit to the outlet solenoid to thereby

effect closure of the inlet port and substantially simultaneous opening of the outlet port. Upon opening of the outlet port the spring member within the slug valve body acts to move the diaphragm within the main fluid chamber upwardly to force water out of the outlet and into an empty ice mold. When the motion translation rod approaches the upper end of its stroke, the various movable electrical contacts within the switch are returned to their normal position to await the beginning of another cycle and both the inlet and outlet ports remain in their normal closed position.

The ice mold is mounted on a rotatable shaft which is journaled in a suitable support and which has radial gear teeth on one end thereof which are cooperable with ratchet teeth on the motion translation rod so that the ice mold will be moved rotatably through a given angular displacement upon downward movement of the motion translation rod.

It will be understood that the electrical switch operated by movement of the motion translation rod is so adjusted, with respect to the rotatable ice mold, that the outlet solenoid is not opened until the motion translation rod has nearly completed its downward stroke so that water will not be directed to the tray until an empty mold has rotated to a position beneath the filler spout associated with the outlet from the slug valve.

Accordingly, it is a principal object of the present invention to provide a novel, simple, and inexpensive means for rotating the rotatable ice tray at preselected intervals, and for providing a means for directing water at preselected intervals to the ice tray to fill the individual molds therein.

More specifically, an important aspect of the invention resides in the provision of a motion translation member which is responsive to movements of the diaphragm in the slug valve which is operable to coact with a shaft affixed to the rotatable ice tray to effect rotational movement of the ice tray at preselected intervals.

Yet another object of the present invention is to provide a simple yet positively acting electrical switch means coupled with the motion translation linkage associated with the slug valve diaphragm to control the energization of the inlet and outlet solenoid coils of the slug valve.

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

FIGURE 1 is a side elevational view of an ice making mechanism constructed in accordance with the principles of the present invention;

FIGURE 2 is a circuit diagram of the electrical control system for the ice maker illustrated in FIGURE 1;

FIGURE 3 is a vertical sectional view of the rotatable ice mold illustrated in FIGURE 1 with the storage basket associated therewith;

FIGURE 4 is a fragmental end view of the rotatable ice mold which forms a part of the present invention illustrating the interconnection between the motion translation rod of the slug valve and the rotary ice mold; and

FIGURE 5 is a vertical sectional view through the slug valve which forms a part of the present invention.

In the embodiment of the invention illustrated in the drawings a freezing receptacle or ice tray **10** is shown as being generally triangular in cross-section and as having three ice molds **11** spaced 120° apart, and as being rotatably mounted about the center axis thereof on a drive shaft **13** which is rotatably journaled in an aperture **14** in the side wall **15** of a refrigerating compartment, such as the freezer compartment of a refrigerator or the like.

The molds **11** are partitioned to provide a series of individual prism-like molds by partitions or dividers **16**

extending thereacross between radial walls 17 and extending from the center axis of the receptacle and connected between end walls 18. Each radial wall 17 has an advance face 21 facing in the direction of rotation of the mold, which is shown as being generally parallel to a radial line extending from the center axis of the receptacle. Each wall 17 also has a retreating face 22 facing oppositely from the direction of rotation of the mold and extending at an angle with respect to a radial line extending through the center of the receptacle and inclined from the center of the receptacle toward the face 21 to provide a tapered wall and a release face tilted with respect to the vertical, to facilitate the release of ice prisms 23 from the molds, as the surfaces of faces 21 and 22 are heated by relatively warm water filling an upwardly facing mold 11.

As shown most clearly in FIGURE 3, drip retainers 25 are provided to collect the drops of water running off the melting surfaces of the ice prisms as the ice prisms are released by the heat of the water filling an upwardly facing mold 11, and to return the water to the mold when the mold has been rotated to a filling position. The solidified or frozen water in the drip retainer will be melted and return to the mold when the mold has been rotated to the filling position and the ice has been thawed by the heat of water filling the mold. Each drip retainer 25 has an inwardly turned wall 26 which is notched as indicated at 27, to accommodate the drops of water flowing from the individual ice prisms to drip into the chamber defined by inturned wall 26.

The drip retainers 25 also cooperate with an inwardly extending refreeze ledge 28, extending inwardly from the upper wall of a storage basket 10*a* (which is also connected to the sidewall 15), to support the ice prisms during freezing of the water in an upwardly facing mold and to accommodate the surface of the prisms to dry by freezing as the water in an upwardly facing ice mold freezes, prior to the discharge of the prism into the storage basket 10*a*. As the water freezes in an upwardly facing mold 11 and the receptacle is subsequently rotated to bring an empty mold into position to be filled with water, the ice prisms 23 will be released from the drip retainers 25 to fall into the storage basket 10*a*. In this manner, since each of the ice prisms 23 is thoroughly dry before dropping into the storage basket 10*a*, the tendency for individual ice prisms or cubes to stick together in a common storage basket is substantially eliminated.

As shown most clearly in FIGURE 1, the end walls 18 are tapered outwardly from the center of the mold and are also tapered from the top to the bottom of the mold. The partitions or dividers 16, spaced between the end walls 18, are also tapered in two directions to provide individual ice prism molds tapering outwardly from the base to the outer edges of the molds, to facilitate the release of the ice prisms by gravity when one of the molds is in a release position and an upwardly facing mold 11 is being filled with water to melt the surfaces of the frozen ice prisms 23 extending along the faces 21 and 22 of the walls 17 and along the dividers 16.

As again shown most clearly in FIGURE 1, each divider 16 has an outer triangular face 33, the base of which is adjacent the outer end of the face 21 of the wall 17, the apex of which is at the lower end of the face 22 of the wall 17, when said face is extending in a generally vertical direction.

The opposite side walls of each divider 16 also taper inwardly from the center of the mold as they extend along the divider 16, the taper of which is the same as the taper of the inner faces 30 and 31 of the respective end walls 18 of the ice tray.

All of the walls of the individual molds thus taper inwardly and downwardly when the mold is in an ice release position, to provide ice prism molds diverging outwardly and downwardly to readily release the frozen ice prisms upon breaking of the bond between the walls of the individual molds and the ice prisms by the melting of the ice prisms along the walls of the molds.

The dividers 16 have notches 35 recessed in the outer faces 33 thereof. These notches are herein illustrated as being V-shaped and accommodate the flow of water from one compartment to the other during filling of the molds. After freezing of the water in the molds, the frozen portions of the ice prisms extending through the notches 35 serve to connect the ice prisms together as a composite mass. As the ice prisms are released by thawing by filling of the upwardly facing molds with water, the composite mass will slide downwardly along the downwardly facing mold and the surfaces of the notches will act as cams engaging the connecting pieces between the ice prisms, to cam the ice prisms away from the surfaces 22 and to thereby aid in the ejection of the ice prisms from their molds.

Referring now more particularly to the means for filling the rotatable ice tray, a slug valve 50 is mounted on sidewall 15 by a bracket 12 and is shown as being a two-part structure comprising an upper and a lower section 51 and 52, respectively, which are sealed together by means of an annular ring 53 which is C-shaped in cross-section. A boss 54 is formed integrally with the upper section 51 and has an inlet passage 55 formed therein which is communicable with an annular inlet chamber 56 formed in the upper end of the upper section 51. The inlet passage 55 has a radially enlarged portion 58 formed within the boss 54 which is adapted to encompass a filter screen 59 placed therein to filter water flowing into the inlet passage 55 from a similar passage formed within a connecting nipple 60 which is attached to the hollow boss 54. An upstanding boss 61 is formed at the upper end of the upper section 55 centrally of the annular fluid inlet chamber 56, and has an inlet port 63 leading therethrough to communicate fluid from the fluid inlet chamber 56 to the main fluid chamber 65 within the slug valve 50. An annular groove 66 is formed about the annular fluid inlet chamber 56 and serves as a seat for an annular peripheral depending lip 67*a* of a fluid pressure actuated diaphragm valve 67. The diaphragm valve 67 is cooperable with the port 63 to control fluid flow therethrough from the annular fluid inlet chamber 56 in a manner which is now well known in the art, and is electrically manner which is now well known in the art, and is electrically controlled by the movement of an armature 68 which forms a composite part of an inlet solenoid 69.

Generally, the operation of the fluid pressure actuated solenoid control diaphragm valve may be described as follows: Upon energization of the inlet solenoid 69 the armature 68 is moved upwardly with respect to the diaphragm valve 67 and fluid within a chamber 70 formed above the diaphragm 67 is permitted to flow through the central aperture 71 in the diaphragm 67 faster than fluid can flow from the annular inlet chamber 56 to the chamber 70 through a bleed passage 71*a* due to the differential area of the passages 71 and 71*a*. Thus, since fluid flows out of the chamber 70 to the port 63 faster than fluid flows to chamber 70 from the chamber 56, a differential fluid force is created across the diaphragm and the pressure of the fluid within chamber 56 tends to raise the diaphragm off of the seat defining the port 63 so that fluid is directly communicated tothe port 63 from the fluid inlet chamber 56.

Conversely, when the inlet solenoid 69 is deenergized, the armature 68 is moved by a spring (not shown) into engagement with the wall portion of the diaphragm 67 defining the central passageway 71 so that the fluid entering chamber 70 through bleed passage 71*a* builds up a pressure sufficient to move the diaphragm 67 downwardly into engagement with the wall portion of the boss 61 defining the inlet port 63. A fluid force differential across the diaphragm 67 is created due to the fact that the bleed passage 71*a* in the diaphragm 67 is located

in the periphery thereof where the fluid inlet pressure is greatest. Obviously, when the diaphragm **67** is in an open position with respect to the port **63** fluid pressure on the undersurface of the diaphragm is greater adjacent the periphery of the diaphragm than it is centrally of the diaphragm where a vortex and partial vacuum is formed by fluid flowing through the port **63**. Thus, the total fluid force within the chamber **70** tending to move the diaphragm downwardly is greater than the opposing fluid force tending to move the diaphragm upwardly so that the diaphragm is seated on the wall portion of the boss **61** defining the port **63** to thereby entirely close off all fluid communication between the inlet chamber **56** and the port **63**.

It will also be noted that an outlet boss **75** is formed integrally with the upper section **51** of the slug valve **50** and that an outlet passage **76** is formed therein which is communicable with a similar passage in a connecting nipple **77** connected to the boss **75**. An annular outlet chamber **78** which is similar in nature to the annular inlet chamber **56** hereinbefore described, is formed within the upper section of the slug valve **50** and is communicable through a passage **79** with the main fluid chamber **65** of the slug valve **50**. A fluid pressure actuated solenoid controlled diaphragm valve **80** is associated with the annular outlet chamber **78** and the outlet port **81** to control fluid flow therebetween and is controlled by the actuation of an outlet solenoid **83** which is similar in nature and function to the inlet solenoid **69** hereinbefore described in detail.

A resilient membrane or diaphragm **90** is peripherally sealed to the body of the slug valve **50** intermediate the upper and lower sections **51** and **52**, respectively, and is moved to the position illustrated in FIGURE 5 by the pressure of fluid entering the chamber **65** through the port **63**. A reciprocably movable piston **91** is positioned within a spring chamber **92** of the slug valve **50** and has a motion translation rod **93** connected therewith which is extensible from the slug valve body **50** through a central aperture **94** in the lower section **52**. A compression spring **95***a* is also positioned within the spring chamber **92** intermediate the bottom wall of the lower section and the piston **91** and serves to oppose the fluid pressure within the chamber **65** and urge the piston **91** and consequently the diaphragm **90** to move upwardly within the slug valve body. It will further be noted that a vent port **96** is formed within the lower section of the slug valve **50** to vent the spring chamber **92** to the atmosphere to prevent a fluid pressure buildup within the spring chamber **92**.

Referring now more particularly to FIGURE 1, it will be noted that an outlet tube **95** is connected to the outlet nipple **77** and terminates in a filler spout **96** overhanging the ice tray **10** for filling the same.

Assuming that the outlet valve **80** is closed with respect to the fluid outlet port **81** within the slug valve **50**, energization of the inlet solenoid **69** will cause the inlet diaphragm valve **67** to become unseated from its respective port to permit the free flow of fluid from the inlet passage **55** to the main fluid chamber **65**. The increasing force of pressurized fluid entering the chamber **65** through the port **63** will tend to act against and overcome the opposing biasing force of spring member **95***a* and to thereby move the membrane **90** and the piston **91** downwardly within the lower section **52** until the diaphragm and piston have been bottomed in the position illustrated in FIGURE 5. Thereafter, upon closure of the inlet diaphragm valve **67** and upon energization of the outlet solenoid **83**, the outlet diaphragm valve **80** will become unseated from its respective port and the biasing force of spring member **95***a* will urge the piston **91**, and consequently the membrane **90**, upwardly within the slug valve **50** to decrease the volumetric capacity of the main fluid chamber **65** and thereby force fluid within chamber **65** to the outlet passage **76** within the outlet boss **75**, and thence to the ice tray through the tube **95** and filler spout **96**. Thus, the volumetric capacity of the main fluid chamber **65** will determine the amount of fluid directed to the ice cube tray **10**.

Referring now especially to FIGURES 1 and 4, it will be noted that the motion translation rod **93** has a gear rack **98** formed along one longitudinal edge thereof which is positioned in mesh with the peripheral gear teeth on a pinion gear **99** which, in turn, is affixed to an input power shaft **100**. The input power shaft **100** is, in turn, connected to the output power shaft **13** which is connected to the ice tray **10** through a one-way drive clutch C so that reciprocable movement of the motion translation rod **93** will effect rotatable movement of the ice tray **10** in a clockwise direction as viewed in FIGURE 4. The one-way clutch interconnecting the input shaft **100** with the output shaft **13** is arranged to corotatably move the shaft **13** with the shaft **100** when the input power shaft **100** is rotated in a counter-clockwise direction, as viewed in FIGURE 4, but is so arranged that clockwise rotatable movement of the shaft **100** will not vary the rotated position of the shaft **13** or the ice tray **10** connected therewith. It will also be noted that in this particular embodiment of the invention, the gear teeth on the pinion gear **99** are so associated with the gear rack **98** that the output shaft **13**, and the ice tray **10** will be rotated exactly 120° by one complete downward stroke of the motion translation rod **93**.

A switch **105** is mounted on the lower section **52** of valve **50** which is cooperable with and actuated by reciprocation of the motion translation rod **93** to control energization of the electrical circuit of the ice making apparatus, through a link **93***a* associated with plunger **105***a* of switch **105**.

It will further be noted that a simple water heater resistance coil **107** is wound about the pipe **95** exteriorly of the refrigerating compartment for reasons which will hereinafter become more fully apparent.

The circuit diagram of the control is illustrated in FIGURE 2 and includes generally inlet and outlet solenoid coils **69** and **83**, respectively, a mold thermostatic switch **106**, multi-purpose switch **105**, and the resistor heater **107**. It will be noted that the diagrammatic representation of the circuit in FIGURE 2 shows the various components of the switch **105** as being directly connected to the piston **91** while, in fact, the connection is indirect through members **93**, **93***a*, and **105***a*, but this representation has been made to facilitate a complete understanding of the electrical circuit. The armatures for controlling operation of the fluid pressure operated diaphragm valves are normally biased into engagement with their respective valves by spring means or the like but are arranged to be retractably moved therefrom by energization of their respective actuating solenoids **69** and **83**.

The solenoid **69** is initially energized through the movable contact **110** of the thermostatic switch **106** and the movable contact **111** of the multi-purpose switch **105** from the power supply conductors **112** and **113** when a line switch **114** is closed. It will be understood that the mold thermostat **106** is disposed within the ice tray **10** in heat transfer relation with the walls of the molds therein so that when relatively warm water is put in any of the molds the switch will be effective to open an energizing circuit. The mold thermostat should be so arranged that it will not close an energizing circuit to the solenoid **69** until the water within the ice tray **10** is completely frozen. Thus, if it be assumed that the switches **106** and **105** are in the position illustrated in full lines in FIGURE 2, the inlet diaphragm valve **67** will be opened by fluid pressure in the matter hereinbefore described and fluid will begin to pour into the main fluid chamber **65** through the inlet port **63** to initiate downward movement of the piston **91** and the motion translation rod **93** connected therewith.

Downward movement of the motion translation rod **93** will move the plunger **105***a* axially downwardly as shown in FIGURE 2. The plunger **105***a* has a plurality of stops **120**, **121**, and **122** affixed thereon which are axially spaced from one another along the plunger **105***a*.

A spring steel snap acting movable contact member **125** has its opposite end portions received within suitable notches **126** in the body of multi-purpose switch **105** and may be selectively positioned in engagement with either or stationary contacts **118** or **119**. The plunger **105***a* extends through the snap acting contact member **125** and has stops **120** and **121** affixed thereon on opposite sides of the contact **125** to effect movement of the contact into or out of engagement with stationary contacts **118** or **119**.

Accordingly, assuming that the various parts of the electrical control mechanism are in the position illustrated in FIGURE 2, the inlet port **63** will be opened and the outlet port **79** will be closed so that water will begin to flow into the chamber **65** to initiate downward movement of the piston **91** and the motion translation rod **93** connected therewith. Continuous downward movement of the piston **91** and the rod **93** will act to continuously move the plunger **105***a* downwardly (as shown in FIGURE 2) but the contact **125** will remain in the position illustrated in FIGURE 2 to effect energization of the solenoid **69** until the piston **91** and rod **93** have nearly completed their downward stroke. At such time the stop **121** will be moved into engagement with the contact **125** to snap the contact **125** out of engagement with stationary contacts **118** and into engagement with stationary contacts **119** to thereby effect deenergization of the inlet solenoid **69** and substantially simultaneous energization of the outlet solenoid **83** and the resistor heater **107**.

Energization of the outlet solenoid **83** and closure of the inlet valve **67** will permit the expulsion of fluid from the chamber **65** through the outlet passage **76** by the action of spring member **95***a* into the ice tray **10**. The resistor heater **107** will act to heat the water in the outlet pipe **96** and the heat of the water flowing into the ice tray **10** will act to move the contact **110** of mold thermostat **106** to the broken line position illustrated in FIGURE 2. As the spring **95***a* acts to move the piston **91** upwardly within the chamber **65** the motion translation rod **93** will be moved upwardly also to effect upward movement of the plunger **105***a*. Contact **125** will remain in engagement with stationary contacts **119** until the piston **91**, rod **93**, and plunger **105***a* (as shown in FIGURE 2) have nearly completed their upward stroke. At such time the contact **125** will be unseated from the contacts **119** by the stop **120** and snapped into engagement with the contacts **118** to reposition the electrical control elements for a new cycle of operation.

It will further be understood that when the electrical contacts **122** and **125** have been returned to the position illustrated in FIGURE 2, a new cycle will not begin immediately since the thermal sensitive contact **110** will normally not be positioned in a closed circuit position until the water within the ice molds has had sufficient time to freeze.

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

I claim as my invention:

1. In an automatic ice making apparatus including a rotatable ice tray having a plurality of ice molds in heat transfer relation with one another spaced about the rotational axis of said ice tray, a slug valve having an inlet and an outlet and fluid pressure actuated diaphragm valves associated with said inlet and said outlet for controlling fluid flow therethrough, an outlet pipe extending from said outlet valve, electrically energizable means for controlling the fluid actuation of said diaphragm valves, a membrane extending across the interior of said slug valve having a piston disposed on one side thereof, said membrane and piston being spring biased in one direction and movable by pressurized fluid entering said valve through said inlet in an opposite direction, the improvement of means for controlling actuation of said inlet and outlet diaphragm valves and for rotating said ice tray comprising a motion translation rod connected to said piston and extensible from said slug valve, a gear rack on said motion translation rod, support means, an output power shaft connected to said ice tray and journaled in said support means, an input power shaft, a one-way drive clutch interconnecting each of said shafts, a pinion gear mounted on said input power shaft drivingly connected with said gear rack, thermostatic switch means associated with said outlet pipe in heat transfer relation with respect thereto operable to effect energization of said inlet valve, and second switch means coupled with said motion translation rod and responsive to movements thereof operable to effect the completion of an energizing circuit to said inlet solenoid in one position and to deenergize said inlet solenoid and simultaneously energize said outlet solenoid in a second position.

2. An automatic ice making apparatus comprising a rotatable ice tray, a slug valve including a housing defining a chamber having an inlet and an outlet and valve means cooperable with said inlet and outlet to control the flow of liquid therethrough, a conduit extending from and communicable with said outlet and terminating above said tray to provide a means for filling said tray, separate electrical inlet and outlet control means for controlling actuation of said valve means, a movable wall extending across said chamber within said housing of said slug valve biased in one direction by the pressure of liquid entering said valve through said inlet, means biasing said wall in an opposite direction to expel liquid from said valve through said outlet upon opening of said outlet and closure of said inlet, a support, a shaft journaled within said support and connected to said ice tray at the rotational axis thereof, a motion translation rod extending through said housing and connected to said movable wall and having a one way driving connection with said shaft so that linear rod movement effects rotary shaft movement, switch means wired in series with said inlet control means, and second switch means responsive to the position of said motion translation rod and wired in series with each of said control means to permit energization of one or the other of said control means in accordance with the position of said rod.

3. An automatic ice making apparatus comprising a support, a shaft journaled within said support, an ice tray mounted on said shaft having a plurality of ice molds spaced about the axis of rotation of said tray and shaft and arranged so that the heat of water filling an upwardly facing mold will effect ejection of ice blocks from a downwardly facing mold by heat transfer through the walls of the ice tray, a slug valve having a housing defining a chamber and having an inlet and an outlet, electrically energizable inlet and outlet valve means for controlling the flow of liquid through said inlet and outlet of said slug valve, a movable wall extending across said chamber within said slug valve biased in one direction by the pressure of liquid entering said valve through said inlet, means biasing said wall in an opposite direction to expel liquid from said valve through said outlet upon opening of said outlet and closure of said inlet, a conduit communicable with said outlet and terminating above said tray to provide a means for delivering liquid expelled from said outlet to said tray, a one way mechanical transducer interconnecting said movable wall with said shaft to translate movement of said movable wall in one direction into rotary shaft movement, switch means wired in series with said inlet valve means for controlling energization thereof, and second switch means responsive to

the position of said movable wall and wired in series with each of said valve means to permit energization of one or the other of said valve means in accordance with the position of said movable wall, wherein said switches and said electrically energizable valve means comprise the only electrical components essential to provide continuous operation of said apparatus through multiple tray filling and ice ejecting cycles.

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