Sept. 29, 1942. A. D. SIEDLE 2,297,371

REFRIGERATION

Filed Nov. 25, 1938 5 Sheets-Sheet 1

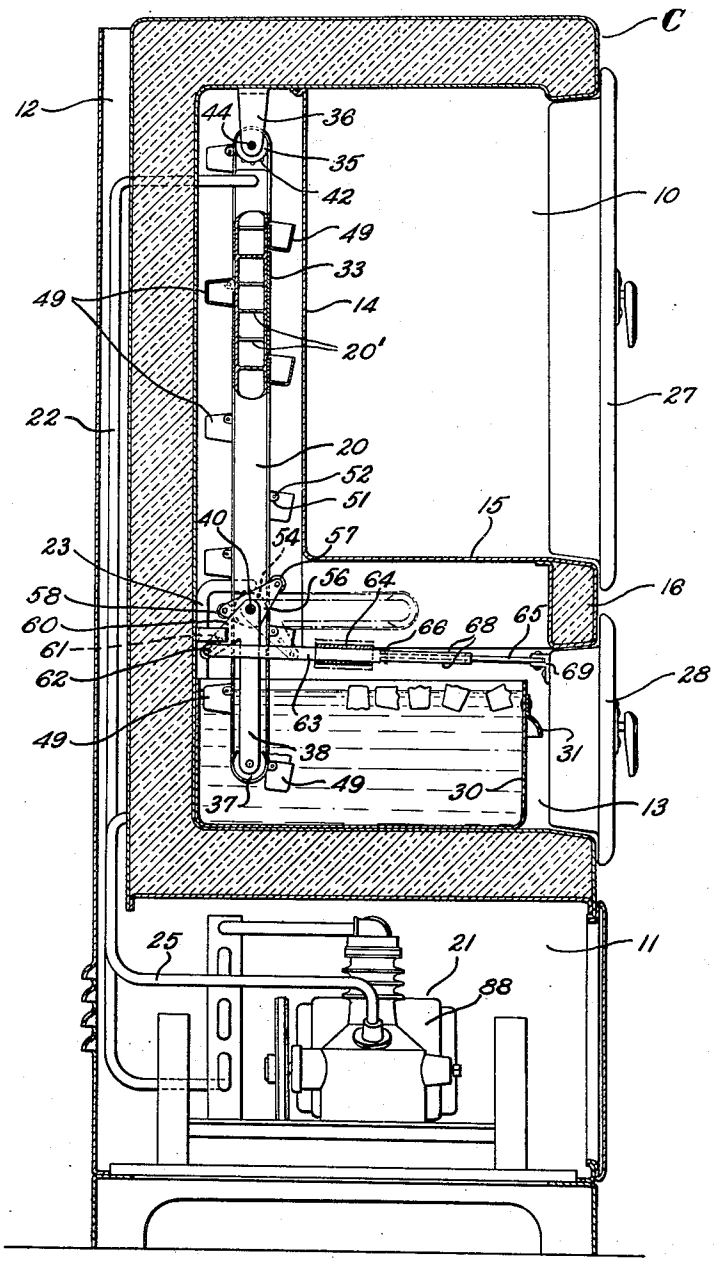


Fig. 1

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REFRIGERATION

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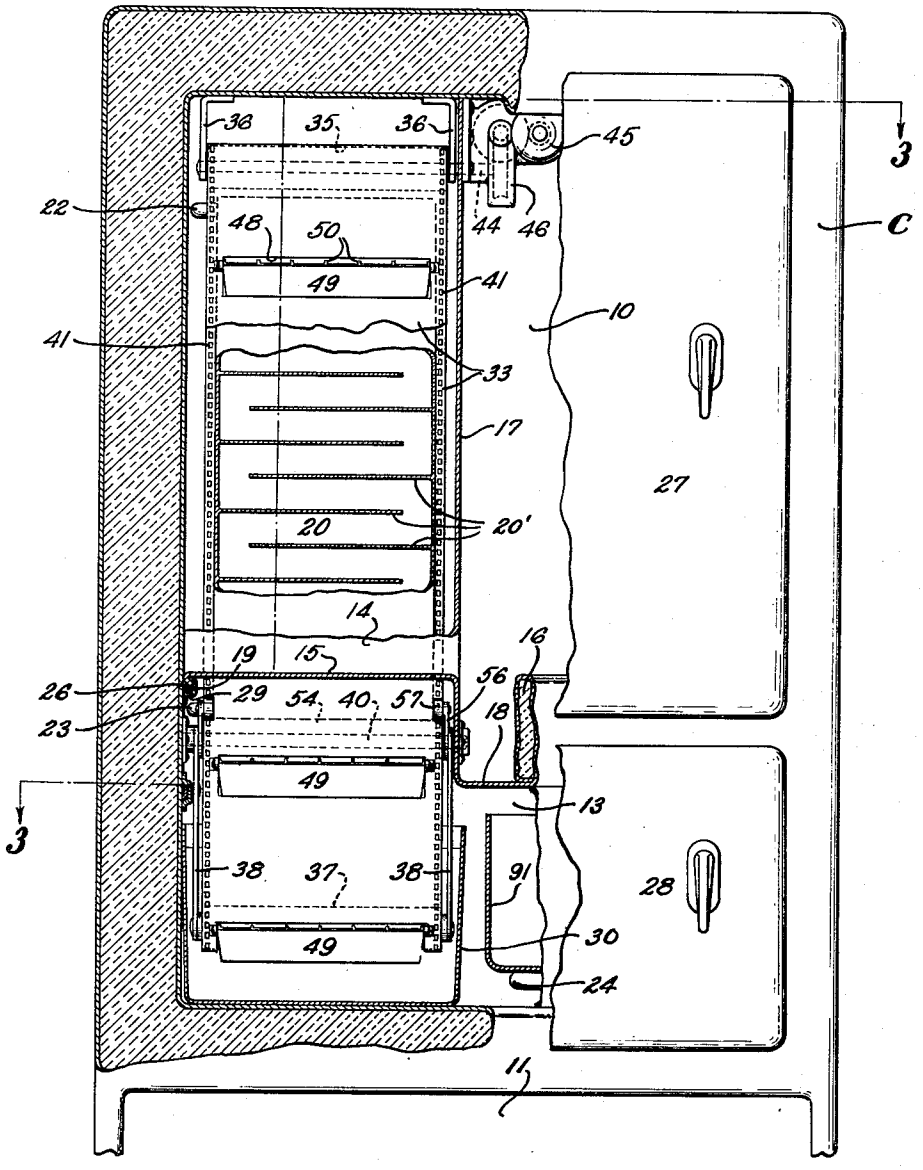


Fig. 2

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REFRIGERATION

Filed Nov. 25, 1938 5 Sheets-Sheet 3

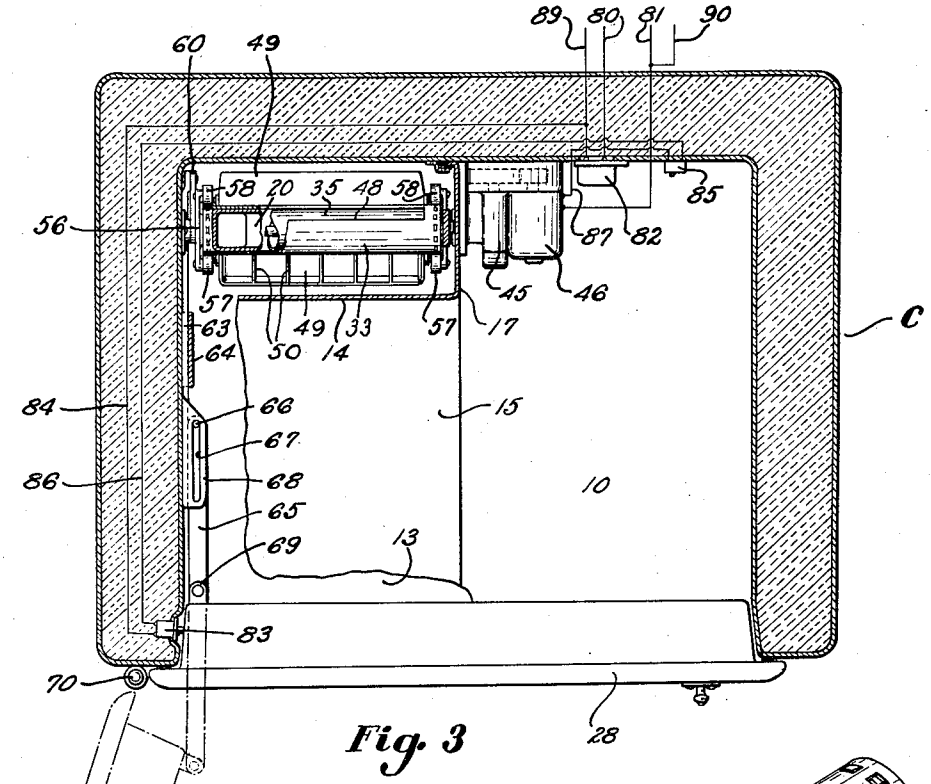


Fig. 3

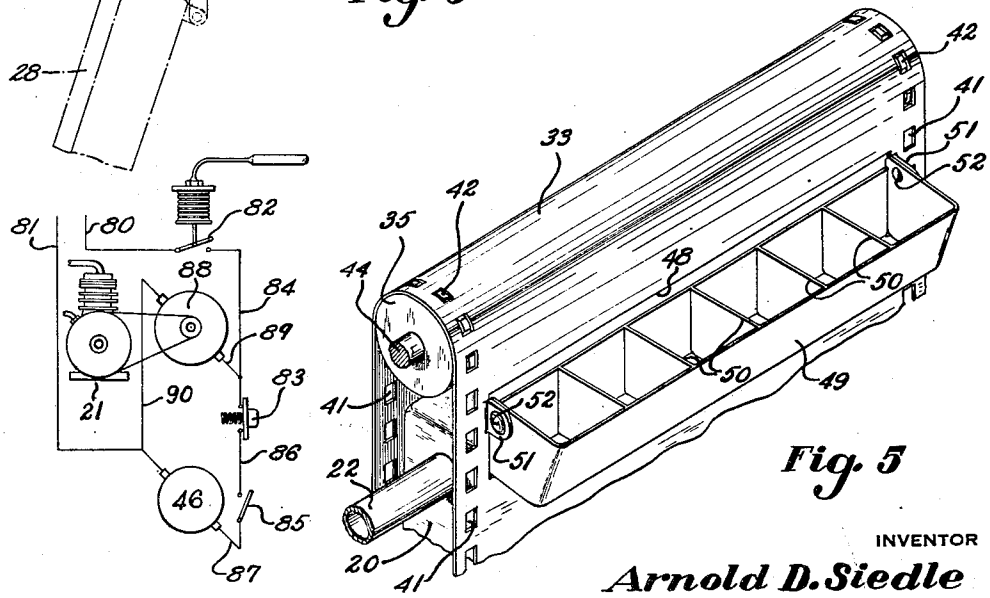


Fig. 5

Fig. 4

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REFRIGERATION

Filed Nov. 25, 1938 5 Sheets-Sheet 4

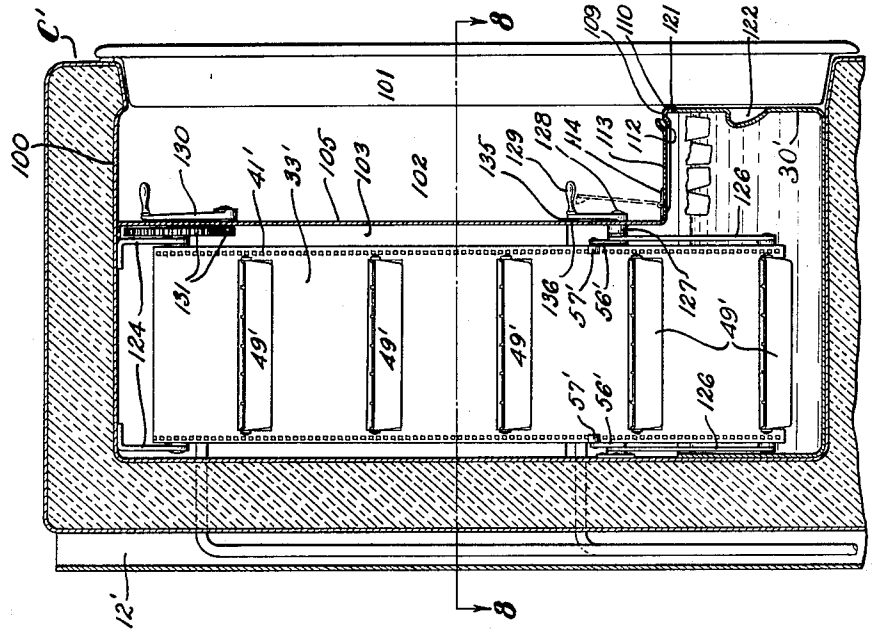


Fig. 7

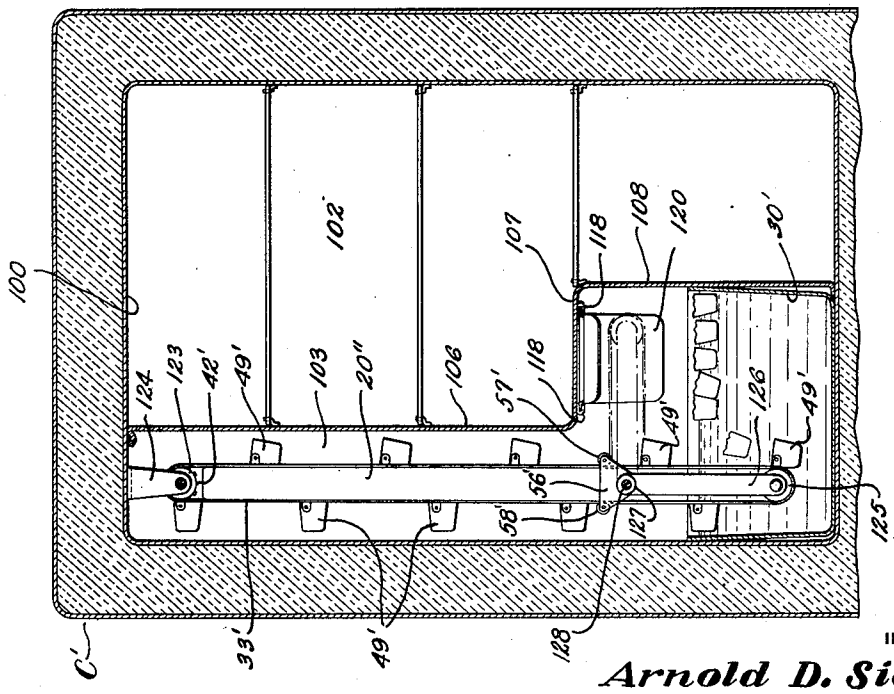


Fig. 6

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REFRIGERATION

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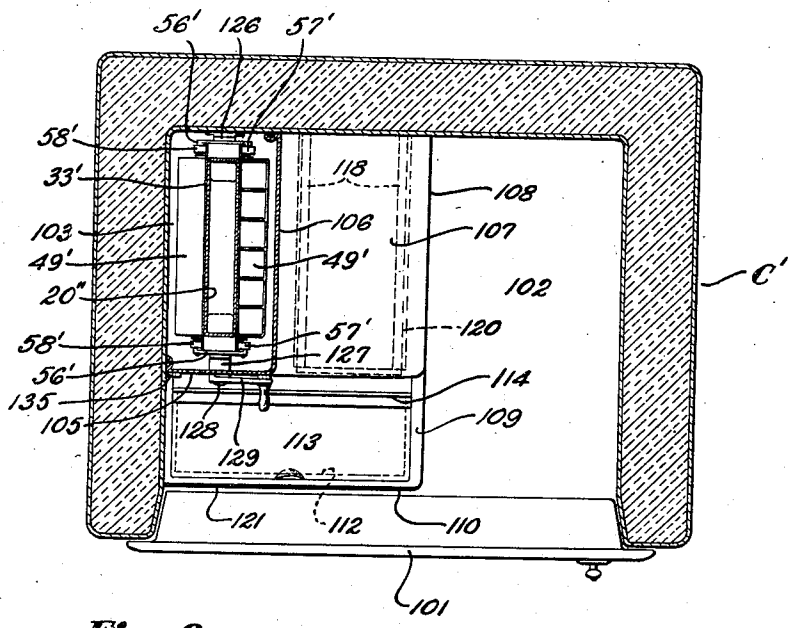


Fig. 8

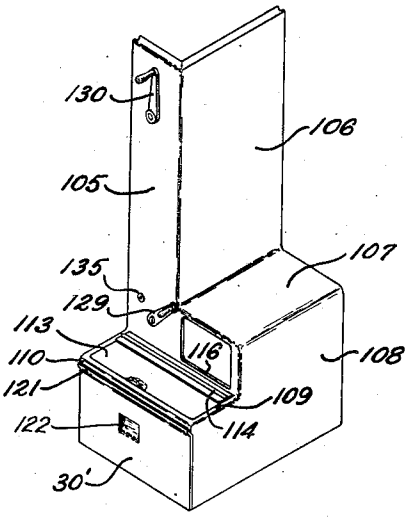


Fig. 9

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UNITED STATES PATENT OFFICE

2,297,371

REFRIGERATION

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Application November 25, 1938, Serial No. 242,209

26 Claims. (Cl. 62—105)

This invention relates to the art of refrigeration.

Previous refrigerating systems had the disadvantage that the humidity within the food storage compartment is carried to excessively low values by reason of the low temperature at which it is necessary to operate the evaporator in order to produce ice. The arrangement of the evaporator in the cabinet results in the effective elimination of a space much greater than the actual volume of the evaporator. Moreover, previous refrigerating systems had no means insuring continuous production of ice for the reason that it was necessary to remove previously formed ice from the refrigerator trays in order that the trays could be re-filled with fresh water for the production of another crop of ice, and no effective means were provided for storage of ice once it was formed except in the ice-forming trays. Numerous devices have been proposed previously for freeing the ice cubes from the mould in which they are formed without subjecting the mould to hot water which results in an appreciable loss of useful heat, but these devices all rely upon principles of mechanical leverage which are difficult to operate, complex, and not infrequently shatter the ice cubes which they are supposed to free from the walls of the confining mould. With these devices the entire tray must be removed from the refrigerating compartment and all the cubes must be released from the mould even though only a single cube may be desired.

Accordingly, it is an object of this invention to provide a refrigerating system which will overcome the above noted disadvantages of previous refrigerators.

According to the present invention there is provided a mechanism which will effectively produce ice continuously and will continuously and automatically project ice blocks into a storage receptacle from which they may be removed whenever desired and in any desired number by the simple process of lifting them from the storage receptacle.

It is a further object of the invention to provide a refrigerating system of the above identified character in which the food storage compartment temperatures are maintained at safe values without lowering the humidity of the air within the storage compartment to values sufficiently low to cause undesirable drying of foodstuffs stored therein.

It is a further object of the invention to provide a refrigerating system including a mechanism which automatically and continuously produces ice and cools a food storage compartment in which the parts are arranged within the cabinet in such manner that the evaporator occupies a minimum of otherwise useful space within the insulated walls of the cabinet.

It is a further object of the invention to provide a refrigerating system in which provision is made for substantially continuous production, release, storage and harvesting of ice blocks therefrom.

More specifically, it is an object of this invention to provide a refrigeration construction having a cabinet which includes an endless conveyor structure passing around an evaporator element and dipping into a body of water in a receptacle whereby ice moulds carried on the conveyor progressively scoop up a quantity of water from the water receptacle, pass over the evaporator to freeze ice blocks in the moulds and return to the water receptacle whereby the previously formed ice blocks are loosened from the moulds to float to the surface of the water and a fresh body of water is taken up by the moulds. This construction is automatically connected to operate in conjunction with the control mechanism for the refrigerating mechanism per se and is enclosed within the refrigerator cabinet in such manner that it is in heat transfer relationship with the storage compartment thereof but hermetically sealed therefrom.

Other and more specific objects and advantages of the invention will become apparent as the description proceeds when taken in connection with the accompanying drawings, in which:

Figure 1 represents a side sectional elevational view of a refrigerating mechanism embodying the present invention;

Figure 2 is a partial front sectional elevational view of the mechanism illustrated in Figure 1;

Figure 3 is a sectional plan view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a diagrammatic wiring layout showing the control of the instant invention;

Figure 5 is an enlarged scale detail view of a conveyor device;

Figure 6 is a front sectional elevational view of the refrigerating device illustrating a modified form of the invention;

Figure 7 is a sectional side elevational view of the form of the invention shown in Figure 6.

Figure 8 is a sectional top plan view taken substantially along the line 8—8 of Figure 7;

Figure 9 is a perspective view illustrating an interior cabinet structure which houses certain refrigerating elements.

Referring now to Figures 1 to 5 in detail, there is disclosed a cabinet C provided with a plurality of insulated walls to form a refrigerating chamber. A mechanism compartment 11 is suitably formed in the lower portion of the cabinet beneath the refrigerating chamber and communicates with an air flue 12 which extends upwardly along the rear wall of the cabinet C. The refrigerating chamber includes an ice-making and low temperature storage compartment 13 and a food storage compartment 10. The compartments 10 and 13 are separated by a wall structure comprising a partition 14 which extends to the top portion of the compartment 10 parallel to the rear wall on the left side thereof, as viewed in Figure 2, to a point spaced above the bottom of the refrigerating chamber where it joins a horizontally extending partition 15 which terminates in an insulated panel and door stop 16 extending across the entire front of the cabinet C. It will be noted that the panel 14 extends laterally from the left-hand side wall of the cabinet C, as viewed in Figure 2, to substantially the central portion thereof where it joins a rearwardly extending panel 17 which terminates at the rear wall of the cabinet. One edge of the panel 15 terminates in contact with the left-hand side wall of the cabinet C, as viewed in Figure 2, and the other end thereof turns downwardly to join a second horizontal panel 18 which extends the full depth of the refrigerator from the rear wall thereof to the front where it joins the bottom portion of the insulated cabinet element 16. The panel 17 also extends downwardly to join the rear portion of the panel 18, therefore the compartments 10 and 13 are defined by the various panel elements 14, 15, 17 and 18 which may be made integrally, if desired, or of separate sections suitably secured together. The panels, 14, 15, 17 and 18 are hermetically sealed in any suitable manner at their junction points with the top, side and rear walls of the cabinet C and with their points of connection to the cabinet element 16.

As illustrated, the joints between the various panels or partitions and the inner walls of the cabinet are made by forming a channel 19 on the edges of panels which receive a sealing gasket, preferably a rubber strip, 26 which may be attached to the cabinet wall, the channel or both. If the panel is called upon to carry any weight other than its own weight, for example the panels 15 and 18, the joint is supported by a suitable bracket 29 carried by the cabinet wall.

The compartments 10 and 13 are closed by suitable insulated cabinet doors 27 and 28, respectively. The cabinet element 16 forms a part of the frame of each of these doors and cooperates, as described above, with various panel elements to define the compartments included in the refrigerating chamber.

An elongated, wide, shallow depth evaporator 20 is mounted centrally of that portion of the freezing compartment 13 defined by the panels 14 and 17 at the rear end left-hand walls of the cabinet C. The evaporator 20 extends from a point spaced from the top wall of the cabinet C to a point between the level of the horizontal panels 15 and 18. Liquid refrigerant is supplied to the evaporator 20 from any suitable form of refrigerating mechanism, which is illustrated generally at 21 in the mechanism compartment 11. The evaporator 20 may be of any desired construction; for example, it may consist of a pipe coil sandwiched between flat plates, or, as illustrated, it may consist of a box-like casing provided with staggered horizontal baffles 20' over which the evaporating refrigerant liquid flows.

As illustrated, the refrigerating mechanism is of the well-known compression type and is connected to supply liquid refrigerant to the top portion of the evaporator 20 through a conduit 22 which extends upwardly through the cooling air flue 12. A conduit element 23 connects the bottom portion of the evaporator 20 to a fast-freezing evaporator coil 24 which is positioned in the bottom portion of the compartment 13 directly beneath the lower horizontal panel element 18. A suitable suction return conduit 25 connects the evaporator element 24 to the refrigerating mechanism 21.

Though a compression refrigerating system has been illustrated herein, it is to be understood that any suitable form of refrigerating mechanism may be utilized in practicing the instant invention as the particular refrigerating mechanism utilized is not an essential part thereof. Moreover, any desired means may be utilized in order to distribute the refrigerating effect between the various evaporator elements in accordance with any predetermined schedule of such distribution.

An elongated ice and water receptacle 30 is positioned in the bottom portion of the compartment 13 directly beneath the horizontal panel 15. The receptacle 30 extends to the rear portion of the compartment 13 directly beneath the evaporator 20 forwardly thereof to a point spaced slightly rearwardly of the door 28 whereby the handle 31 of the receptacle 30 may conveniently be grasped when the door 28 is in open position. The width of the receptacle 30 is slightly greater than the width of the evaporator 20 and of the vertically extending portion of the compartment 13 for a purpose to be explained more fully hereinafter.

A suitable endless belt 33, which may be of any desired material, for example, rubber, canvas, webbing, flexible stainless steel and the like, is trained around the evaporator 20. The upper portion of the belt extends around a drive spindle 35 which is suitably supported from the top portion of the cabinet C by spaced brackets 36. The bottom portion of the belt 33 is trained around a pulley 37 which is suitably carried at its end by a pair of spaced supporting arms 38 which are pivotally mounted on a spindle 40 which is mounted on the left hand side wall of the cabinet C, as viewed in Figure 2, and on the panel 17.

The outer edges of the belt 33 are provided with perforations 41 which cooperate with projecting teeth 42 on the end portions of the rolls 35 and 37. The roll 35 is provided with a projecting shaft 44 which extends through the panel 17 into the compartment 10 where it joins a gear box 45. The gearing in the box 45 may be of any desired construction which will provide for a high reduction ratio between the drive roll 35 and an electrical motor 46 which is mounted within the compartment 10 and suitably connected to drive the gearing within the gear box 45. Though the motor and gearing 45 and 46 are illustrated as being positioned within the compartment 10, they may, if desired, be positioned within the rear flue 12 and connected to the drive roll 35 through suitable gearing and shafting extending to the rear insulated wall of the cabinet C.

The belt 33 is provided with a plurality of

spaced elongated cut-out portions 48 which are adapted to receive suitable ice moulds 49. The ice moulds 49 are provided interiorly thereof with a plurality of dividing partitions 50 whereby the same are adapted to form a plurality of individual ice blocks. The ice moulds 49 are pivotally attached to the belt 33 at the side edges of the openings 48 by means of small ears 51 which extend outwardly from the belt 33 and receive pivot rivets 52 carried by the moulds 49.

The shape of the moulds 49 is such that the rear wall thereof rests against the wall of the evaporator 20 as shown in Figure 5, as the mould is moving upwardly of the evaporator. After the mould passes around the roll 35 it pivots about the rivets 52 and brings the open face thereof into contact with the uncut-out leading portion of the belt 33 whereby the face portions of the ice blocks are then brought into intimate thermal contact with the rear wall of the evaporator 20.

A guide roll 54 is pivotally mounted upon the pivoted arms 38 and coaxially with the pivot 40 thereof, whereby the roll 54 extends between the flights of the belt 33 directly beneath the bottom portion of the evaporator 20.

Small triangular plate elements 56 are rigidly carried by the spindle 40 on each side edge of the belt 33. Small wheels 57 which run on the perforated edge portions of the belt 33 are carried in the ends of the plates 56 which extend forwardly of the belt 33 and are positioned slightly above the top portion of the roll 54. The other ends of the plates 56 carry small wheels 58 which run upon the perforated edge portions of the downward flight of the belt 33 and are positioned directly rearwardly of the roll 54.

The left hand arm 38, as viewed in Figure 2, is provided with an angularly projecting operating extension 60 which is provided with an elongated slot 61 in its end portion. The slot 61 receives a small pin 62 which is rigidly mounted in the end portion of a connecting rod 63. The connecting rod 63 is slidably mounted in a suitable guide plate 64 which is rigidly attached to the left hand side wall of the compartment 13, as viewed in Figure 3. The forwardly projecting end of the connecting rod 63 is pivotally connected to an actuating arm 65 by means of a pivot pin 66. The pin 66 projects outwardly beyond its point of connection to the connecting rod 63 and rides in elongated slots 67 which are formed in a pair of guide plates 68 which project outwardly from the left hand side wall of the cabinet C, as viewed in Figure 3, above and below the actuating arm 65. The free end of the actuating arm 65 is pivotally connected by means of a pivot lug 69 to the corner of the door 28 adjacent the hinge 70 thereof whereby movement of the door 28 to open position swings the follower roll 37 of the belt 33 upwardly into the dotted line position shown in Figure 1 whereby the receptacle 30 may be removed from the compartment 13 without interference from the belt mechanism. The rolls 57 and 58 maintain the belt 33 in proper position with relation to the evaporator 20 and the rolls 35, 37 and 54 when it is in the dotted line position.

Electrical energy is supplied to the apparatus from a pair of electrical conductors 80 and 81. The conductor 80 connects to a suitable thermostatic switch 82 which will be positioned within the compartment 10 to be responsive to temperature conditions prevailing therein. The terminal of the switch 82 is connected to one terminal of a door switch 83 by means of a wire 84. The other terminal of the door switch 83 is connected to a manual switch 85 by means of a wire 86, and the manual switch is connected to the drive motor 46 for the conveyor 33 by means of a wire 87. The other terminal of the motor 46 connects directly to the wire 81. The drive motor 88 for the compressing mechanism 21 is connected to the wire 84 by means of a wire 89 and to the wire 81 by means of a wire 90. The door switch 83 is positioned in a recess of the cabinet C, as indicated in Figure 3, in position to be operated to open-circuit position when the door 28 is moved to open position whereby movement of the belt 33 is discontinued and the bottom portion of the belt is swung upwardly out of the water contained in the receptacle 30 whenever the door 28 is opened.

A suitable container 91 is mounted within the compartment 13 beneath the panel 18 and rests upon the fast-freezing evaporator 24 whereby desserts and similar material may be frozen within the receptacle 91 or foodstuffs requiring exceptionally low temperature storage may be maintained in fresh condition by placing them in the receptacle 91. If desired, the receptacle 91 may be replaced with a small cabinet structure having shelves therein upon which dessert freezing trays or foodstuffs may be rested for low temperature refrigeration.

Access may be had to the fast-freezing chamber without permitting loss of refrigerating effect from the food storage compartment 10 simply by opening the door 28.

The operation of this form of the invention is as follows: The receptacle 30 is removed from the apparatus and filled with water substantially to the level shown in Figure 1. When the door 28 is closed, the switch 83 is moved to closed position and the motors 46 and 88 will be energized provided the thermostatic mechanism 82 is also responding to a call for refrigeration and the manual switch 85 is in closed circuit position. It should be noted, however, that the compressor motor 88 is not affected by the position of the switches 83 and 85. Assuming that the motors 88 and 46 are now energized, refrigeration will be produced and the belt 33 will be driven in a counterclockwise direction, as viewed in Figure 1. As the belt 33 travels about the evaporator 20, the ice moulds 49 will pass downwardly into the receptacle 30 and will become filled with water as they pass upwardly therethrough enroute to the top portion of the evaporator 20. The water picked up by the moulds 49 is frozen therein as these moulds travel upwardly across the surface of the evaporator 20. The cut-out portions 48 of the belt permit the rear vertical walls of the moulds 49 to ride directly upon the evaporator 20, thereby insuring direct heat transfer therebetween.

The water within the ice moulds 49 will be frozen by the time these moulds reach the top portion of the evaporator 20 after which they will pass around the drive roll 35, will pivot through an arc of substantially 90° about their pivot 52, and will then rest against the base of the downward flight of the belt 33, as shown in Figure 1. When the moulds 49 reach the bottom portion of their path, they will again pivot through an arc of 90° in order to face upwardly in the upward flight of the conveyor belt 33. When the previously formed ice blocks within the moulds 49 become immersed in the water in the tank 30 on the downward flight thereof, they are melted loose from the walls of the moulds and

float freely therefrom immediately the conveyor begins its upward flight. Blocks of ice so frozen then float to the surface of the water within the tank 30 where they remain until removed therefrom for ultimate consumption.

The refrigeration produced by the evaporator 20 and also to some extent by the evaporator 24 lowers the temperature of the various panels 14, 15, 17 and 18 to such an extent that the compartment 10 is refrigerated thereby. As a result of this, the compartment 10 is supplied with an enormous refrigerating area, but one which does not operate at excessively low temperatures whereby the temperature within the compartment 10 is maintained at values safe for food storage without, however, materially drying the air contained within the compartment. This insures efficient and proper refrigeration of foodstuffs stored in the compartment 10 without drying the same with all its attendant disadvantages and waste. Due to the enormous area for refrigerating the compartment 10, the temperature of the panels may operate as high as 40° without permitting the temperature within the compartment 10 to exceed safe values.

As long as the door 28 is in closed position, the switch 83 is in closed circuit position and the motor 46 continues to drive the endless belt 33 whereby there is a continuous cycle of ice-freezing, melting free, storage, replenishment of freezing water, and further freezing. If, for any reason, the supply of ice tends to become excessive, the operator has only to open circuit the switch 85 to de-energize the motor 46 and prevent further production of ice even though refrigeration will continue to be produced for maintaining the temperature in the compartment 10 and in the chamber 91.

Whenever the door 28 is moved to open position, in order to obtain access either to the contents of the vessel 30 or to those of the vessel 91, the switch 83 is moved to open-circuit position and the linkage inter-connecting the door and the bracket 38 actuates the bracket 38 through an arc of 90°, as illustrated in Figure 1, to throw the lower end of the conveyor belt and its supporting mechanism upwardly into the top portion of the compartment 13 beneath the panel 15 whereby the receptacle 30 may be slid outwardly of the compartment 13 without interference from the conveyor and ice-freezing mechanism.

Referring now to Figures 6 to 9, inclusive, there is disclosed a modified form of the invention. Certain portions of this apparatus are identical with portions of the apparatus previously described and are given the same reference characters primed. In this form of the invention there is provided an insulated cabinet C' including a refrigerating compartment 100 which is closed by an insulated door 101. A cooling air flue 12' extends upwardly along the rear wall of the cabinet C' similarly to the flue 12 previously described. The refrigerating compartment 100 is divided into a storage compartment 102 and a low temperature storage and ice-freezing compartment 103 by an interior cabinet construction.

The interior cabinet construction, which is illustrated in Figure 9, comprises a vertically extending narrow front panel 105 which joins with a shorter rearwardly extending side panel 106. The bottom portion of the panel 106 merges into a horizontally extending panel 107 which in turn terminates in a vertical stepped side panel 108. The panel 105 is L-shaped with the leg of the L extending laterally of the vertical portion thereof and joining the front edge portions of the panels 108 and 107. The bottom portion of the panel 105 joins a horizontally extending step panel 109 which also joins the horizontal stepped edge portion of the panel 108. The panel 109 is joined to a vertically extending front panel 110 which is also joined to the front edge portion of the side panel 108.

The panel construction may be made in any desired manner and is inserted in the refrigerating compartment 100 in the manner illustrated in Figures 6 to 8. As illustrated in these figures, the edge portions of the panels 105, 109 and 110 are hermetically sealed in any suitable manner to the left hand side wall, as viewed in Figure 8, of the cabinet C'. If desired, the previously described joint construction 19, 26 and 29 may be applied here. The bottom edge of the panel 108 is suitably sealed to the bottom wall of the compartment 100 and the rear edges of the panels 106, 107 and 108 are suitably sealed to the rear wall of the cabinet C' whereby the panel elements 105 to 110, inclusive, form the defining boundaries of the compartments 102 and 103 which are hermetically sealed each from the other.

The panel 109 is provided with an opening 112 which is closed by a suitable closure panel 113 which is hingedly mounted at 114, as illustrated in Figure 7. That portion of the panel 105 which extends laterally beneath the panel 107 is provided with an opening 116 for purposes to be described hereinafter. The panel 110 actually constitutes little more than a downwardly and inwardly projecting flange around the front edges of the panel 108 and the left hand side wall of the cabinet C'.

The panel 107 is provided with a pair of spaced channel shaped guideways 118 which are adapted to receive a fast-freezing receptacle 120. The receptacle 120 is adapted to be inserted through the opening 116 into the guides 118 and is provided with any suitable closure or front panel to seal the edges of the openings 116.

A receptacle 30' is mounted in the bottom portion of the compartment 103 and extends from the panel 108 to the left-hand side wall of the cabinet C'. The front portion of the receptacle 30' is provided with a surrounding flange 121 which abuts the edges of the panel 110 to seal the opening therein. The receptacle 30' is also provided with a gripping recess 122 to grasp the same to remove it from the compartment 103.

The vertically extending portion of the compartment 103 houses an evaporator 20' which is identical with the evaporator 20 previously described. This form of the invention may also be provided with a refrigerating mechanism identical with that previously described except that the evaporator 24 is omitted.

A belt 33' provided with ice moulds 49' is mounted within the compartment 103 and around the evaporator 20''. The top portion of the belt 33' passes over a roller 123 which is supported by brackets 124 suitably secured to the top wall of the cabinet C'. The bottom portion of the belt passes around a roll 125 which is pivotally carried by spaced brackets 126. The brackets 126 are rigidly attached to a shaft 128 which is pivotally mounted in bosses 127 in the left-hand side wall of the cabinet C' and in the panel 105. The shaft 128 projects outwardly beyond the front face of the panel 105 and receives a suitable crank handle 129 on the projecting end thereof, whereby rotation of the crank 129

swings the bottom portion of the belt 33' and its supporting and guide mechanism upwardly out of the path of movement of the receptacle 30'. The belt 33' is also provided with guide plates and guide rollers 56', 57' and 58', respectively, which are similar to the elements 56, 57 and 58 previously described. In this instance, however, the plates 56' are rigidly carried by the pivot bosses 127.

The roller 123 is provided with teeth 42' on the opposite ends thereof which receive spaced perforations 41' in the edges of the belt 33'. The roller 123 is driven by a crank 130 which is mounted in the top portion of the panel 105 and drives a gearing 131 positioned within the compartment 103 and connected to the roll 123 whereby rotation of the crank 130 drives the belt 33' through the compartment 103.

It will be noted from an inspection of Figures 6 and 8 that the receptacle 120 is in the path of movement of the belt 33' and its lower supporting mechanism when the same is moved upwardly out of the path of movement of the receptacle 30' wherefore it is necessary to remove the receptacle 120 before actuating the crank 129 to swing the belt upwardly into the dotted line position of Figure 6. This could be eliminated simply by raising the level of the panel 107 though that would decrease the useful space within the compartment 102.

The handle 129 is adapted to cooperate with a fixed perforated latch plug 135 to hold the lower end of the conveyor in the dotted line position of Figure 6. For this purpose, the free end of the handle is provided with a manually retractable latch pin 136 which is adapted to be received in the central opening of the latch plug 135 when released. The latch pin 136 will be actuated by the manual grip portion of the crank 129 in a manner well known.

The operation of this form of the invention is as follows: Refrigeration is produced as before within the evaporator 20' though the control circuit for this form of the invention comprises only the drive motor for the compressor and the box-temperature responsive thermostatic mechanism. Whenever the operator of the machine desires ice, he has only to open the door 101 and to lift the plate 113 to obtain access to ice stored within the receptacle 30'. After the ice has been removed therefrom, the operator will turn the crank 130 to pass a new set of the ice moulds 49' through the receptacle 30' to re-fill the same and to position them adjacent the evaporator 20' for further production of ice. If a large quantity of ice is desired, the operator has only to actuate the crank 30' a few times during the course of a day in order to store a very large quantity of ice blocks within the receptacle 30' which may be used as needed.

This form of the invention also possesses the advantages enumerated in connection with the form of the invention disclosed in connection with Figures 1 to 5 with respect to maintenance of proper temperature and humidity conditions within the food storage compartment 102.

The present invention provides a highly convenient arrangement whereby continuous production and automatic storage of ice cubes is provided while simultaneously providing for low temperature fast-freezing and for high temperature high humidity food storage in a single refrigerator cabinet.

Additionally, the present invention makes the most economical use of the space within the refrigerator cabinet. For example, in the form of the invention disclosed in Figures 1 to 5, a convenient space for tall bottles and similar receptacles is provided on the right-hand side of the panel 17 above the panel 18, and in Figures 6 to 9 a similar storage space is provided to the right of the panel 108 without interfering in any fashion with the normal shelf arrangement in the upper portion of the food storage compartment 102.

While the invention has been illustrated and described in considerable detail it is not to be limited thereto as various changes may be made in the form, arrangement and construction of parts without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, means for conveying ice molds in a path of movement in heat transfer relationship with said cooling unit, means for removing ice blocks from said molds and replenishing the same with water to be frozen, a door for said cabinet, and means operated by said door for discontinuing the movement of said ice molds and the operation of said ice block removing and water replenishing means.

2. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, means for conveying ice molds in a path of movement in heat transfer relationship with said cooling unit, means for removing ice blocks from said molds and replenishing the same with water to be frozen, box temperature responstive control means for regulating the operation of said refrigerating mechanism, a door for said cabinet, and means operated by said door for discontinuing the movement of said ice molds and the operation of said ice block removing and water replenishing means.

3. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, a water receptacle in said cabinet, means for conveying ice molds in a path of movement in heat transfer relationship with said cooling unit and into and out of said receptacle for removing ice blocks from said molds and replenishing the same with water to be frozen, and manually operable means for removing said conveying means and said ice moulds from said receptacle.

4. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, means for conveying ice molds in a path of movement in heat transfer relationship with said cooling unit, means for removing ice blocks from said molds and replenishing the same with water to be frozen, manually operable means for driving said molds in their path of movement in heat exchange relationship with said cooling unit, and manually operable means for rendering said ice block removing and water replenishing means inoperative.

5. Refrigerating apparatus comprising an evaporator, an endless belt having a plurality of spaced cut-out portions trained around said evaporator and arranged with one flight of said belt passing closely adjacent one face of said evaporator, means for driving said belt, ice molds pivotally mounted on said belt in position to pass through the cut-out portions therein whereby they may ride upon said evaporator, and a recep-

tacle for water through which said endless belt and ice molds travel in their path of movement around said evaporator.

6. Refrigerator apparatus comprising an evaporator, an endless belt having a plurality of spaced cut-out portions trained around said evaporator and arranged with one flight of said belt passing closely adjacent one face of said evaporator, means for driving said belt, the molds pivotally mounted on said belt in position to pass through the cut-out portions therein whereby they may ride upon said evaporator, a receptacle for water through which said endless belt and ice molds travel in their path of movement around said evaporator, and means operable to remove said belt and its associated ice molds out of said water receptacle in order that the same may be readily removed from operative association therewith.

7. Refrigerating apparatus comprising an insulated cabinet, an evaporator positioned therein, apparatus for continuously producing ice by heat exchange with said evaporator, means for harvesting and storing ice produced by said apparatus and a heat conducting panel structure within said cabinet in heat transfer relationship with said evaporator and hermetically sealed to said cabinet to provide two chambers therein, said ice-producing apparatus, said ice harvesting and storing means and said evaporator being housed in one of said chambers and the other of said chambers forming a storage chamber which is refrigerated by said panel structure.

8. Refrigerating apparatus comprising an insulated cabinet, an evaporator positioned therein, apparatus for continuously producing ice by heat exchange with said evaporator, and a heat conducting panel structure within said cabinet in heat transfer relationship with said evaporator and hermetically sealed to said cabinet to provide two chambers therein, said ice-making mechanism and said evaporator being housed in one of said chambers and the other of said chambers forming a storage chamber which is refrigerated by said panel structure, said evaporator extending vertically along the rear wall of said cabinet.

9. Refrigerating apparatus comprising an insulated cabinet, an evaporator positioned therein, apparatus for continuously producing ice by heat exchange with said evaporator, and a heat conducting panel structure within said cabinet in heat transfer relationship with said evaporator and hermetically sealed to said cabinet to provide two chambers therein, said ice-making mechanism and said evaporator being housed in one of said chambers and the other of said chambers forming a storage chamber which is refrigerated by said panel structure, said evaporator extending vertically along the side wall of said cabinet.

10. Refrigerating apparatus comprising an insulated cabinet, a panel construction within said cabinet dividing the same into two compartments which are in heat transfer relationship with each other, door means for each of said compartments, motor driven means for moving ice moulds in a continuous path of movement in heat transfer relationship with an evaporator in one of said compartments, a receptacle in the lower portion of said one compartment through which the moulds pass, and means interconnected with the door to the compartment housing said evaporator operable to discontinue movement of said ice moulds in their path of movement around said evaporator and to remove the same from said receptacle when said door is moved to open position.

11. Refrigerating apparatus comprising a cabinet, means within said cabinet dividing the interior thereof into two hermetically sealed compartments which are in heat transfer relationship, an evaporator in one of said compartments, a receptacle for water in the lower portion of the compartment containing said evaporator, an endless belt within the compartment mounted for movement in a path around said evaporator and through said water receptacle, a plurality of ice moulds carried by said belt, means for driving said belt, and means for swinging the lower portion of said endless belt in an arc to remove the same from within said receptacle in order to allow the receptacle to be removed from the compartment without obstruction from said belt.

12. Refrigerating apparatus comprising an elongated flat evaporator, an endless belt trained around said evaporator, a cut-out in said belt, an ice mould pivotally mounted to said belt in position to swing through said cut-out portion to contact said evaporator, means for driving said belt, and means for periodically removing ice blocks from said mould and then for replenishing the same with fresh water to be frozen.

13. Refrigerating apparatus comprising an evaporator, means for supplying refrigerant to said evaporator, an endless belt trained around said evaporator, motor means for driving said belt, ice moulds carried by said belt, means for removing ice blocks from said moulds and for replenishing the moulds with water, thermostatic control means connected to govern the operation of said belt driving means and said refrigerant supply means, manually operable means for controlling the operation of said belt driving means, and door operated means for controlling the operation of said belt driving means.

14. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, and an ice making mechanism in said freezing chamber comprising means for bringing water to be frozen into intimate heat transfer relationship with said cooling unit, means for harvesting ice from said last mentioned means, and means for storing harvested ice for subsequent use.

15. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, an ice making mechanism in said freezing chamber in good heat transfer relationship with said cooling unit, a closure element for each of said chambers, and means operated by movement of one of said closure elements to open position for

rendering said ice making mechanism inoperative.

16. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, a water receptacle in said freezing chamber, a plurality of ice moulds, and means for moving said ice moulds successively through said receptacle in heat exchange relationship with said cooling unit and back into said receptacle whereby said receptacles are filled with water, the water in said receptacles is frozen, the ice in said receptacles is melted free thereof and floats in said receptacle and said moulds are refilled with water in said receptacle.

17. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, a water receptacle in said freezing chamber, a plurality of ice moulds, means for moving said ice moulds successively through said receptacle in heat exchange relationship with said cooling unit and back into said receptacle whereby said receptacles are filled with water, the water in said receptacles is frozen, the ice in said receptacles is melted free thereof and floats in said receptacle and said moulds are refilled with water in said receptacle, a closure element arranged to provide access to said freezing chamber to allow removal of said receptacle and means operated by movement of said closure element to open position for withdrawing said ice moulds from said receptacle to allow said receptacle to be withdrawn from said chamber.

18. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, a water receptacle in said freezing chamber, a plurality of ice moulds, means for moving said ice moulds successively through said receptacle in heat exchange relationship with said cooling unit and back into said receptacle whereby said receptacles are filled with water, the water in said receptacles is frozen, the ice in said receptacles is melted free thereof and floats in said receptacle and said moulds are re-filled with water in said receptacle, a closure element arranged to provide access to said freezing chamber to allow removal of said receptacle, and means operated by movement of said closure element to open position for discontinuing operation of said moving means and for withdrawing said ice moulds from said receptacle to allow said receptacle to be withdrawn from said chamber.

19. In a refrigerating apparatus a housing, ice producing mechanism in said housing comprising a cooling unit, a water receptacle, an endless ice mould carrying belt arranged to travel in a path of movement in which said belt and ice moulds pass in heat conducting relationship with said cooling unit and pass through said receptacle, and means for removing said belt and ice moulds from said receptacle to allow said receptacle to be removed from said housing.

20. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, an ice making mechanism in said freezing chamber in good heat transfer relationship with said cooling unit, a low temperature storage compartment in said freezing chamber and a cooling unit arranged to refrigerate said low temperature storage compartment.

21. Refrigerating apparatus comprising an insulated refrigerating chamber, a cooling unit in said chamber, a receptacle in said chamber, an endless belt trained in a path passing into and out of said receptacle and in heat transfer relationship with said cooling unit, a plurality of ice moulds attached to said belt, means for driving said belt, manually operated means for governing the energization of said belt driving means, a closure for said compartment, and means for de-energizing said belt driving means when said closure is opened.

22. Refrigerating apparatus comprising an insulated cabinet, a heat conducting panel having an extensive area construction within said cabinet dividing the interior thereof into a freezing chamber and a storage chamber which are hermetically sealed from each other, a low temperature cooling unit in said freezing chamber in poor heat transfer relationship with said panel whereby said panel serves to refrigerate said storage chamber at a temperature level appreciably higher than the temperature of said cooling unit, an ice making mechanism in said freezing chamber comprising means for bringing water to be frozen into intimate heat transfer relationship with said cooling unit, means for harvesting ice from said last mentioned means, and means for storing harvested ice for subsequent use, and means responsive to the temperature of said storage chamber for controlling the operation of said cooling unit and of said ice making mechanism.

23. That method of producing ice which comprises conveying a receptacle for water through a closed path of movement, freezing the water in said receptacle to produce ice by passing the receptacle into heat exchange relation with a heat absorbing medium in a part of said path, freeing the ice from said receptacle and replenishing the receptacle with a fresh charge of water to be frozen by passing the receptacle into and out of a body of water in another part of said path of movement, and storing the ice freed from said receptacle in said body of water.

24. That method of producing and harvesting ice by a continuous process which includes the steps of passing a receptacle for water through a closed path of movement, freezing the water in said receptacle by refrigerating said receptacle in a portion of said path of movement, freeing ice from said receptacle by warming the receptacle in another portion of said path of movement and simultaneously removing the ice from said receptacle and refilling the receptacle with a fresh charge of water to be frozen.

25. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, a water receptacle in said cabinet, means for conveying ice molds in a path of movement in heat transfer relationship with said cooling unit and into and out of said receptacle for removing ice blocks from said molds and replenishing the same with water to be frozen, a door for said cabinet, and means operated by said door for discontinuing the movement of said ice moulds and for removing said conveying means and said ice molds from said receptacle.

26. Refrigerating apparatus comprising an insulated cabinet, means for producing refrigeration including a cooling unit within said cabinet, a water receptacle in said cabinet, means for conveying ice moulds in a path of movement in heat transfer relationship with said cooling unit and into and out of said receptacle for removing ice blocks from said moulds and replenishing the same with water to be frozen, box temperature responsive control means for regulating the operation of said refrigerating mechanism, a door for said cabinet, and means operated by said door for discontinuing the movement of said ice moulds and for removing said conveying means and said ice moulds from said receptacle.

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