July 18, 1939. A. C. SCHMELZER 2,166,560

FREEZING CONTAINER FOR REFRIGERATORS

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FIG. 1

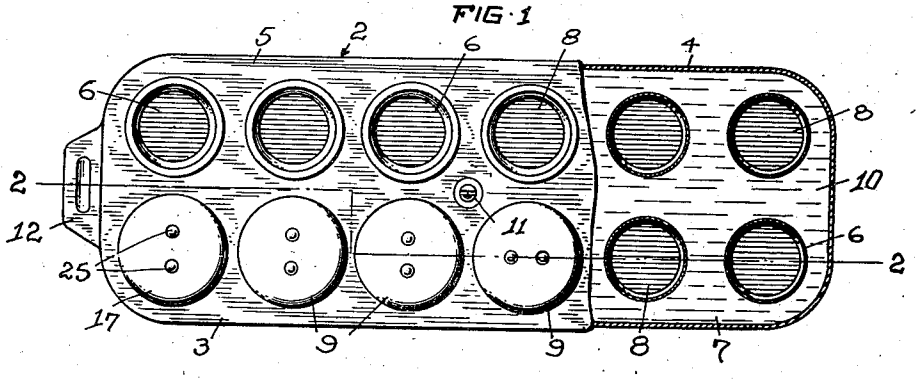


FIG. 2

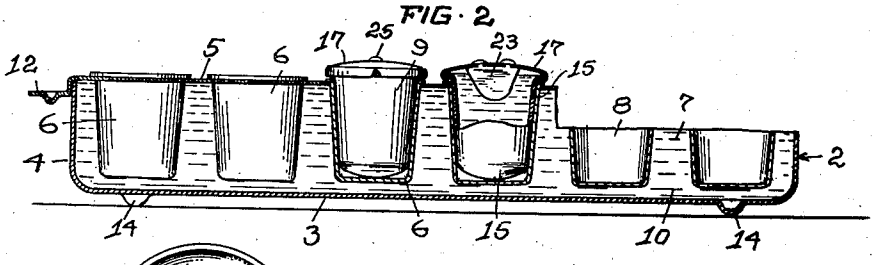


FIG. 3

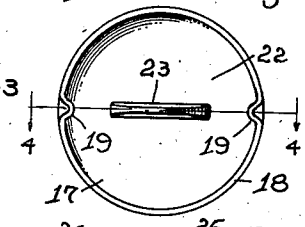


FIG. 4

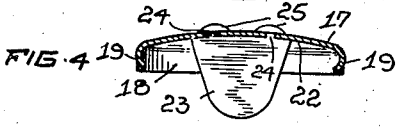


FIG. 5

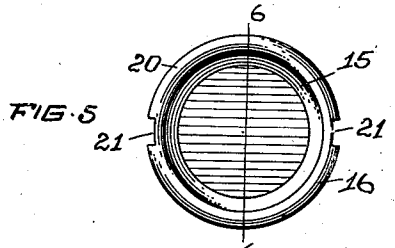


FIG. 6

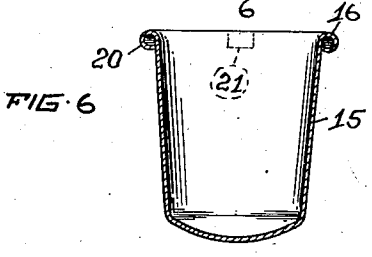
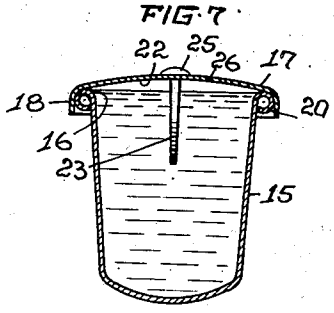


FIG. 7



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FREEZING CONTAINER FOR REFRIGERATORS

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FIG. 8

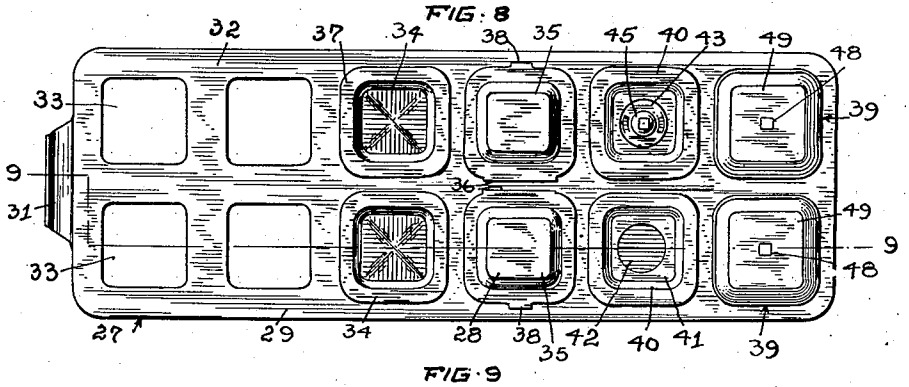


FIG. 9

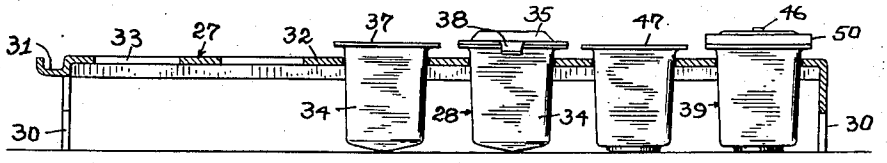


FIG. 10

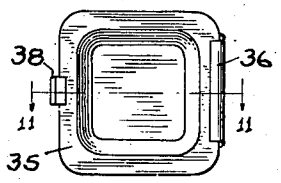


FIG. 11

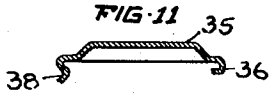


FIG. 12

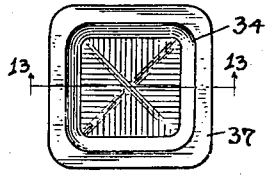


FIG. 13

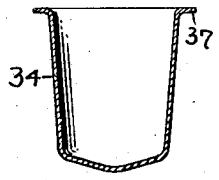


FIG. 14

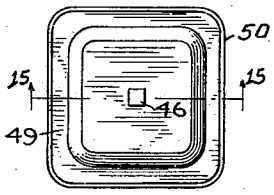


FIG. 15

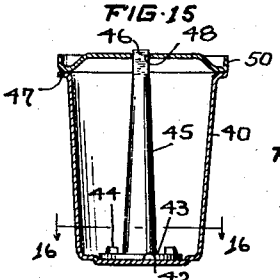


FIG. 16

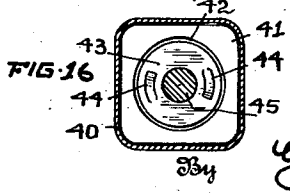


FIG. 17

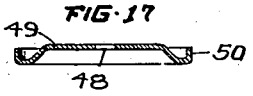


FIG. 18

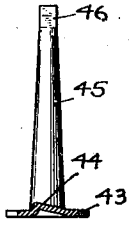
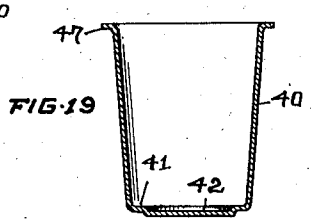


FIG. 19



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FREEZING CONTAINER FOR REFRIGERATORS

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FIG. 20

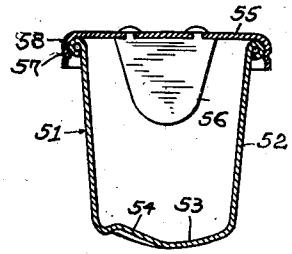


FIG. 21

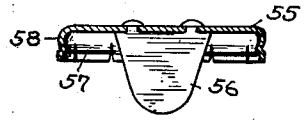


FIG. 22

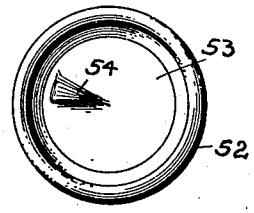


FIG. 23

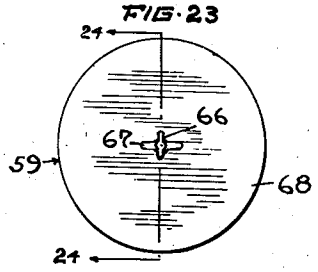


FIG. 24

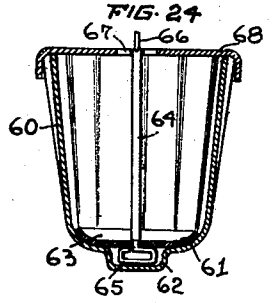


FIG. 25

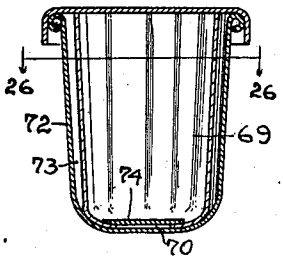
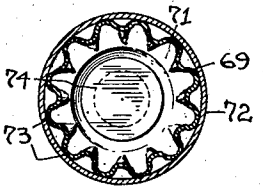


FIG. 26



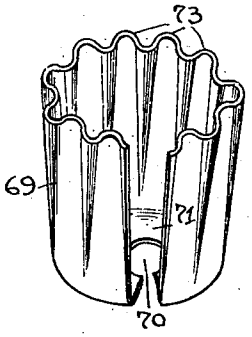


FIG. 27



FIG. 28

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Patented July 18, 1939

2,166,560

UNITED STATES PATENT OFFICE

2,166,560

FREEZING CONTAINER FOR REFRIGERATORS

Anton C. Schmelzer, Cleveland, Ohio, assignor to Mary Schmelzer, Cleveland, Ohio

Application April 1, 1937, Serial No. 134,261

13 Claims. (Cl. 62—108.5)

This invention relates to removable freezing containers used in the freezing units of electrical or mechanical refrigerators.

All common domestic refrigerators with automatic refrigeration are provided with cooling units having sharp freezing chambers for the reception of removable freezing containers or ice cube trays which usually consist of a metal tray or pan having a fixed bottom and open top, and a removable metal grid adapted to rest on the fixed bottom and to be readily inserted into and removed from said pan. In the use of these ice cube trays substantial difficulties have been experienced in removing the ice cubes from the tray, it usually being necessary to hold the tray up-side down under running warm water to release the entire batch of ice cubes and thereafter remove them one by one from the grid. This slow and messy process results in much wastage of ice cubes because ordinarily many more cubes than wanted are released from the grid. Furthermore, when previously frozen and released cubes are left in the grid which is placed back into the pan, then the cubes practically instantaneously freeze again to the pan and release of these cubes can only be effected in the previously described manner.

To overcome these difficulties it has been proposed to use rubber grids and trays, resilient metal band grids etc., however, none of the proposed constructions has been entirely satisfactory.

It is the primary object of this invention to provide a more practical and efficient ice tray embodying a plurality of individual containers individually carried by or supported upon a structure permitting individual removal of the containers, and to provide the containers with means for readily and easily removing the ice bodies therefrom.

This arrangement permits of removal of any desired number of ice bodies or blocks at any time in a single neat and efficient manner, and immediate refilling of the containers after removal of these ice bodies, and thus avoids any wastage of ice.

Another object of the invention is the provision of an ice tray embodying a plurality of individual containers, each of which includes means adapted to axially rotate an ice body formed in the container.

A further object of the invention is the provision of an ice tray embodying a plurality of individual containers, each of which includes means adapted to axially shift an ice body formed in the container for breaking the bond of the bottom and side-walls of the container with the ice body formed therein.

Still another object of the invention is the provision of an ice tray embodying a plurality of individual containers of circular cross section, each of which embodies means adapted to axially rotate an ice body formed in the container for breaking the bond of the bottom and side-walls of the container with the ice body formed therein and means adapted to axially shift the ice body during rotating operations so as to avoid formation of a new bond between the ice body and the walls of the container.

A still further object of the invention is the provision of an ice tray embodying a plurality of individual cone-shaped covered containers, each of which includes means secured to the cover member adapted to effect axial rotation of the ice body formed in the container and means in the walls of said container adapted to effect axial shifting of the ice body, when the ice body is rotated by the means on the cover of the container.

In addition, the invention has other marked improvements and superiorities which radically distinguish it from presently known structures. These improvements or superior characteristics embodying certain novel features of construction are clearly set forth in the appended claims, and a preferred form of embodiment of the invention is hereinafter shown with reference to the accompanying drawings, forming part of the specification.

In the drawings:

Fig. 1 is a plan view partly broken away, showing an ice tray according to the invention embodying a plurality of individual containers for ice bodies of conical shape.

Fig. 2 is a longitudinal sectional view on line 2—2 of Fig. 1.

Fig. 3 is a bottom view of a cover member for the individual containers of the ice tray shown in Fig. 1.

Fig. 4 is a sectional view through the cover shown in Fig. 3, the section being taken on line 4—4 of Fig. 3.

Fig. 5 is a plan view of one of the individual containers of the ice tray; and

Fig. 6 is a sectional view through the container shown in Fig. 5, the section being taken on line 6—6 of Fig. 5.

Fig. 7 is a sectional view through one of the containers of the ice tray when filled with liquid and closed with its cover member;

Fig. 8 is a plan view of a somewhat modified

ice tray embodying a stand mounting a plurality of individual containers of substantially rectangular cross section.

Fig. 9 is a cross sectional view through the ice tray shown in Fig. 8, the section being taken on line 9—9 of Fig. 8.

Fig. 10 is a bottom view of the cover member of one of the individual containers shown in Figs. 8 and 9.

Fig. 11 is a sectional view through the cover member shown in Fig. 10, the section being taken on line 11—11 of Fig. 10.

Fig. 12 is a plan view of one of the individual containers shown in Figs. 8 and 9; and

Fig. 13 is a sectional view through the container shown in Fig. 12, the section being taken on line 13—13 of Fig. 12.

Fig. 14 is a plan view of another somewhat modified container and its cover; and

Fig. 15 is a sectional view through the container shown in Fig. 14, the section being taken on line 15—15 of Fig. 14.

Fig. 16 is a cross sectional view through the container shown in Figs. 14 and 15, the section being taken on line 16—16 of Fig. 15.

Figs. 17 through 19 show the disassembled parts of the container shown in Figs. 14 and 15, thus

Fig. 17 shows a sectional view through the cover member;

Fig. 18 a side view, partly in section of the rotatable stem and cam member; and

Fig. 19 a sectional view through the body of the container.

Fig. 20 is a sectional view through an individual ice container of cone-shaped form embodying a key member for rotating an ice body formed in said container and cam means for axially shifting the ice body when rotated.

Fig. 21 is a sectional view through the cover member of the container shown in Fig. 20; and

Fig. 22 a plan view of the container body of said container.

Figs. 23 and 24 show plan and sectional views of an individual container adapted to freeze ice cream therein, the container being provided with means for readily removing the frozen ice cream body from the container.

Fig. 25 is a sectional view through an individual container for an ice tray embodying inset means arranged in the container for molding ice cream therein.

Fig. 26 is a cross sectional view on line 26—26 of Fig. 25.

Fig. 27 is a perspective view of a split molding inset such as used in the individual container assembly shown in Fig. 25; and

Fig. 28 is a perspective view of the bottom plate for the split molding inset shown in Fig. 26.

Referring more particularly to Figs. 1 through 7 of the drawings, there is shown an ice cube or ice body tray which may be generally designated with reference numeral 2. This tray, preferably formed of metal such as aluminum, includes a supporting structure 3 of conventional size consisting of a pan or tray 4 having its top tightly sealed by a plate 5, which plate is suitably apertured at regular intervals for the reception of flanged cups 6 sealed and securely fastened to said plate in any suitable manner as for example by welding. The supporting structure 3 forms a fully closed chamber 7 of substantial rectangular cross section having extended thereinto a plurality of cup-shaped recesses 8 adapted to snugly engage individual freezing containers 9 sleeved into said recesses 8 for supporting and heat exchanging contact with the walls of said recesses.

A brine solution 10 in chamber 7 filled there into through a plugged opening 11 in plate 5 facilitates proper heat exchange between the freezing containers 9 and the supporting structure 3, and a flange 12 at the front end of plate 5 permits of proper handling of the tray, which preferably rests on bulged out leg portions 14.

The flanged cups 6 and the individual freezing containers 9 are conically shaped to insure proper heat exchange contact of their side walls with each other and to facilitate axial movements of the ice bodies formed therein, as will be later described. Each of the freezing containers 9 consists of a cup-shaped body portion 15, the upper edge 16 of which is beaded, and a flanged cover member 17, the peripheral flange 18 of which snugly fits the beaded edge 16 of the body 15. Cover member 17 can readily be interlocked with the body 15 by means of curved inwardly extending struck up portions 19 in the flange 18, which portions tightly engage the lower curved face of the bead 20 when cover member 17 is placed upon the body with its portions 19 in alignment with cut out portions 21 in the bead 20 and then rotated to secure cover member 17 and body 15 to each other. The cover member 17 carries in its central, bulged out area 22 a downwardly extended, wedge-shaped key member 23, decreasing in width and cross section from the top to its bottom, which key member is rigidly secured to said area by fingers 24 extended through the cover and set up on the outside thereof to form rivet heads 25. Key members 23 extend a substantial distance into the cup-shaped bodies 15 of the freezing containers 9 in order to securely interlock with ice bodies frozen in the containers and effect rotation and therewith loosening of the ice core, when the cover 17 is rotated with respect to the body 15 of the freezing container 9.

With the form of device described above any desired number of freezing containers 9 can be taken from the supporting structure 3 and either be stored in the ice box or the ice body can be removed by gripping the body 15 of the container 9 and rotating the cover member 17 and therewith the ice body until the struck up portions 19 are aligned with the cut out portions 21 in body 15 and permit free simultaneous removal of the cover 17 and the ice body interengaged therewith.

The central area 22 of the cover member 17 is slightly upwardly curved or may be upwardly offset to provide sufficient space 26 for expansion of the liquid when changing from a liquid condition to a frozen condition.

In the modification disclosed in Figures 8 through 19, Sheet 2 of the drawings, the supporting structure 27 for the freezing containers 28 consists of a substantial rectangular open frame 29 supported on legs 30. This frame is provided with an end lip 31 to facilitate removal of the tray from the chamber of a freezing unit, and the top surface 32 of the frame is formed with a plurality of symmetrically arranged rectangular apertures 33 formed to receive the individual freezing containers 28 all of which have substantially rectangular cross section and oppositely inclined side walls for facilitating removal of ice bodies formed therein. The freezing containers 28 each embody a flanged body portion 34 and a cover member 35, engaged by means of a hook-like downward extension 36 with the flange 37 of the body portion and yieldingly clamped to

the opposite edge of the flange 37 by means of a yielding tongue 38, to permit of safe handling of the liquid filled freezing container prior to its support in the frame 29.

The tray structure shown in Figs. 8 and 9 includes a group of freezing containers 39, adapted to semiautomatically release ice bodies frozen in these containers. Each of these containers embodies a substantially rectangularly cross sectioned cup member 40 with a flat bottom 41 which is centrally recessed to form a circular seat 42 for a rotatable cam disc 43. This disc has symmetrically arranged thereon cam means 44 which are preferably formed by struck up portions of the disc and furthermore has upwardly extended from its central portion a cone-shaped extension rod 45, the upper squared end 46 of which extends beyond the upper edge 47 of the cup member 40 to and through a square opening 48 in cover 49 of the container 39. Consequently, when cover 49 is rotated, extension rod 45 and therewith cam disc 43 are rotated so that the cams 44 will shift an ice body in container 39 upwardly and effect breaking of the bond between the walls of cup member 40 and the ice body or cube formed therein.

It will now be seen that the containers 39 permit of ready release of ice bodies formed therein by mere rotation of the cover member 49, which cover member has its flange 50 preferably knurled to facilitate proper gripping of said flange by an operator. The cone-shaped form of the extension rod 45 facilitates breakage of the bond between the ice body and said rod.

In the modified form of the container 51 shown in Figs. 20 to 21, there are provided means for forcibly rotating an ice body formed in the container and means cooperating with said first means for axially shifting the ice body during rotation. Thus, the body 52 of container 51 is cone-shaped and at its bottom face 53 provided with a cam 54, and the cover member 55, having a key member 56, is axially shiftable. This arrangement permits of shifting of an ice body in body 52, when cover 55 and its key member 56 are rotated and forced upwardly by the axially shifted ice body, which ice core is shifted by the cam 54, it being understood that key member 56 tightly freezes into the ice body.

Preferably, as shown, the cover member 55 is slightly clamped to the body 52 by means of a circumferential ridge 57 in the flange 58 of said cover, however, such clamping will not interfere with the axial movement of the cover when an ice body in the body 52 is shifted by the cam 54, all as previously described.

Figs. 23 through 24 disclose a container 59 particularly adapted for freezing ice cream therein. This container embodies a cup-shaped, preferably corrugated body 60, the curved bottom wall 61 of which is centrally recessed to form a cylindrical pocket 62. Body 60 has seated on the bottom wall 61 a false bottom 63 in the form of a disc having embossed or molded therein a design. The false bottom 63 has secured to its central portion a thin rod 64 extended through bottom 63 and formed with a finger grip 65 fully seated within the pocket 62. This rod is also upwardly extended and its upper end 66 is swedged to permit of said end being interlocked with a key hole 67 centrally arranged in a flanged cover member 68 for the body 60.

If it is desired to freeze ice cream in container 59, false bottom 63 is inserted into body 60, thereafter ice cream liquid poured into the container and cover 68 sleeved over the swedged end 66 of the rod 64 and locked therewith by rotation. The container is now placed into the sharp freezing chamber of a refrigerator for freezing the ice cream. When the ice cream is to be served, cover member 68 is lifted off container 59 so that the ice cream body is lifted out of the body 60, in which operation false bottom 63 acts as support for the ice cream body. Now cover 68 is released by simple rotation and then the ice cream body is placed in upside down position upon a serving plate to effect loosening of rod 64 and false bottom 63 and to permit of removal of said rod and bottom by lifting rod and bottom upwardly on finger grip 65.

In Figs. 25 through 28 are disclosed inset means for freezing ice cream in the freezing containers previously described. These inset means embody a corrugated cup-shaped yielding split member 69 having a circular opening 70 in its rounded bottom 71. Split member 69, when inserted into the container 72, snugly engages with its ribs 73 the side and bottom walls of said container and is in proper heat exchange contact therewith. The circular opening 70 in member 69 is preferably covered by a disc 74 so that the ice cream liquid is fully contained within the inset. Such inset can readily and easily be taken out of container 72 when the ice cream liquid is frozen to a solid body, and the inset can readily be dismantled from the frozen ice cream body due to the springing action of split member 69.

Having thus described my invention:

What I claim is:

1. An ice tray for use in the freezing unit of a refrigerator comprising a supporting rack provided with a plurality of openings, individual containers adapted to be removably seated upon said rack while partly extended through the openings thereof, rotatable means seated upon each of said containers and partly extended thereinto adapted to interlock with and rotate an ice body frozen in said container, and means in each of said containers co-operating with said rotatable means and the ice body formed in said container in axially shifting the said ice body when rotated by said rotatable means.

2. An ice tray for use in the freezing unit of a refrigerator comprising a supporting rack, individual containers of cup-shaped form removably supported by said rack, a rotary cover member for each of said containers, and means secured to and downwardly extended from said cover member into the respective container adapted to be embedded in an ice body frozen in said container, said means being adapted to effect rotation of said ice body for breaking the bond between the walls of said container and said ice body when said cover member is rotated.

3. An individual freezing container for an ice tray adapted to be used in the sharp freezing chamber of a refrigerator comprising a cup-shaped container, a cover for said container rotatably seated upon, and means secured to said cover and downwardly extended therefrom into said cup-shaped container adapted to freeze into an ice body formed in said cup-shaped container.

4. An individual freezing container for an ice tray adapted to be used in the sharp freezing chamber of a refrigerator comprising a cone-shaped cup, a rotatable cover for said cup, and key-shaped means secured to said cover and downwardly extended therefrom into said cup, said means being adapted to freeze into an ice body formed in said cup and effect breakage

of the bond between said body and the walls of said cup when said cover is rotated.

5. An individual freezing container for an ice tray adapted to be used in the sharp freezing chamber of a refrigerator comprising a cone-shaped cup, cam means in the wall of said cup, a cover for said cup rotatably and axially shiftably arranged with respect thereto, and key means on said cover extending downwardly therefrom into said cup adapted to freeze into an ice body formed in said cup, said cover and key member co-operating in breaking the bond of the walls of said container with said ice body when said cover is rotated, and said cam means effecting axial shifting of said ice body when rotated by said cover and key means.

6. An individual freezing container for an ice tray as described in claim 5, wherein the key member on said cover is centrally extended from said cover, and wherein said cam means is arranged in the bottom wall of said cone-shaped cup.

7. An individual freezing container for an ice tray adapted to be used in the sharp freezing chamber of a refrigerator comprising a cup-shaped body of substantially rectangular cross section, a circular recess in the wall of said body, a cam disc rotatably seated in said recess, operating means for said cam disc extending upwardly from the central portion thereof, and means slidably and non-rotatably interengaged with said operating means for rotating same and said cam disc and effecting axial shifting of an ice body formed in said cup-shaped body.

8. In an ice tray adapted to be used in the sharp freezing chamber of a refrigerator a plurality of freezing containers having circular cross section, means in the walls of said containers adapted to effect axial shifting of ice bodies frozen in said containers, and means associated with said containers extended thereinto adapted to form key-shaped recesses in the ice bodies frozen in said containers to permit of said ice bodies being held for rotation of said ice bodies and containers with respect to each other.

9. A device for freezing ice bodies in the sharp freezing chamber of a refrigerator comprising a cup-shaped container, freely rotatable cover means for said container, and means axially aligned and cooperating with said rotatable cover means for moving an ice body frozen in said container with respect to the walls thereof, so as to forcibly break the bond between said walls and said ice body, said means being axially extended into the said ice body.

10. A device for freezing ice cores in the sharp freezing chamber of a refrigerator comprising a cup-shaped container, rotatable cover means for said container, and means in said container axially aligned therewith and cooperating with said rotatable cover means for axially shifting an ice body frozen in said container, said means in said container being axially extended into and through said ice body.

11. An ice tray for use in the freezing unit of a refrigerator comprising a supporting rack provided with a plurality of substantially rectangular openings, individual containers of rectangular cross section extended through the openings of said rack and seated thereupon, a disc-shaped cam member within each container resting upon the bottom face thereof, operating means for said cam member extending upwardly therefrom, and a rotatable cover member for each container slidably inter-engaging with said operating means for said cam member, said cam member when rotated being adapted to effect axial shifting of an ice body frozen in said container so as to break the frozen bond between the walls of the container and the ice body frozen therein.

12. An individual freezing container for an ice tray adapted to be used in the sharp freezing chamber of a refrigerator comprising a cup-shaped container, a single, axially rotatable cam member in said cup-shaped container seated upon the bottom wall thereof, and a rotatable cover member for said container coupled with said cam member for rotating same, said cam member co-operating with said cover member and an ice body frozen in said cup-shaped body in shifting said ice body axially with respect to said cup-shaped body.

13. In an ice tray adapted to be used in the sharp freezing chamber of a refrigerator a plurality of freezing containers having circular cross section, and means associated with said containers extended thereinto adapted to form key-shaped recesses in the top portions of ice bodies frozen in said containers to permit of said ice bodies being held for rotation of said ice bodies and containers with respect to each other.

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