Feb. 24, 1959 A. J. FREI 2,874,552

FREEZING DEVICE

Filed Nov. 12, 1957 2 Sheets-Sheet 1

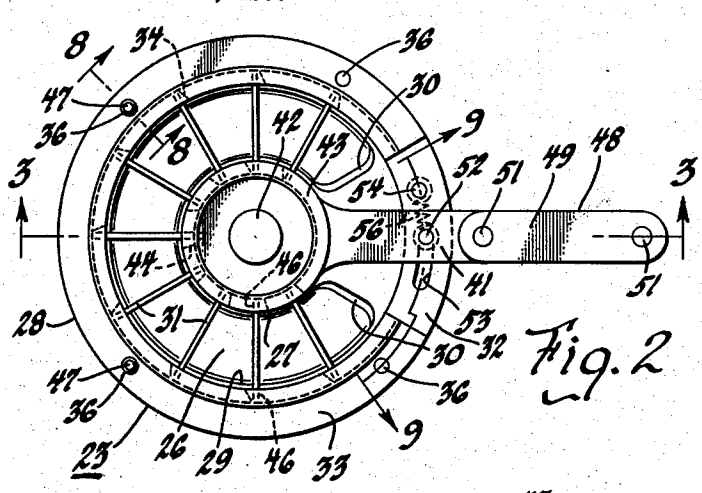


Fig. 2

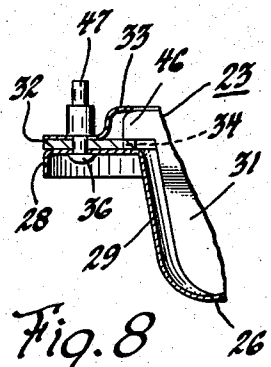


Fig. 8

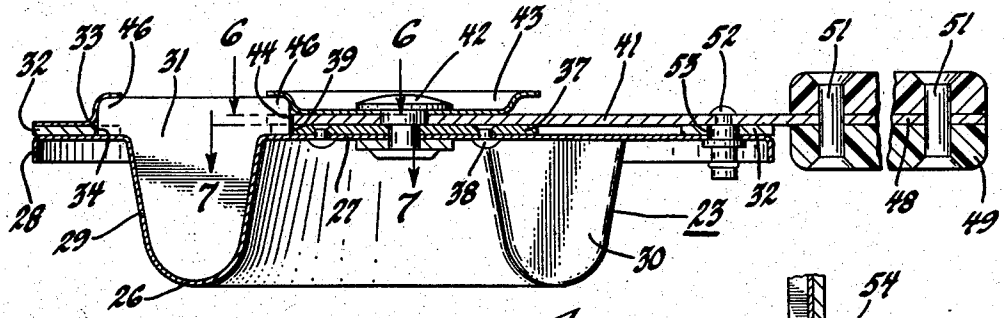


Fig. 3

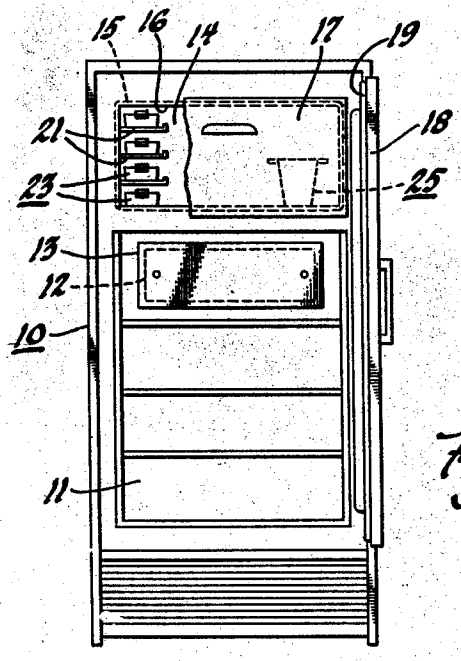


Fig. 1

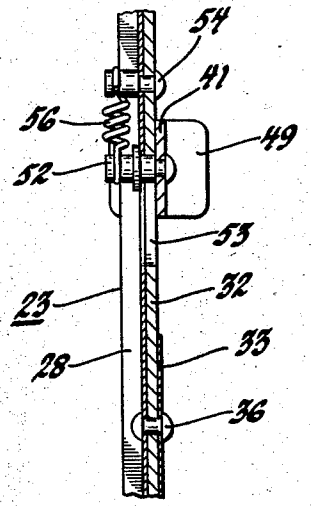


Fig. 9

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Feb. 24, 1959 A. J. FREI 2,874,552

FREEZING DEVICE

Filed Nov. 12, 1957 2 Sheets-Sheet 2

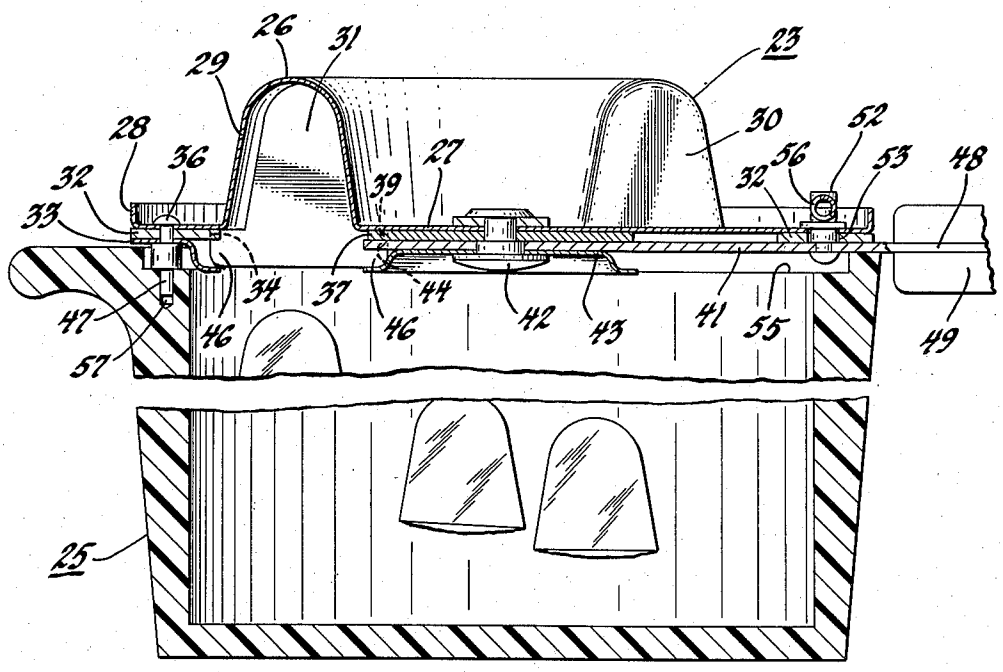


Fig. 4

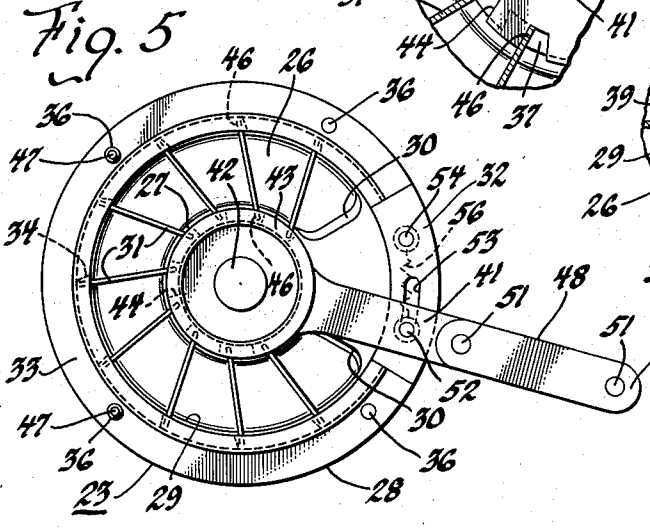


Fig. 5

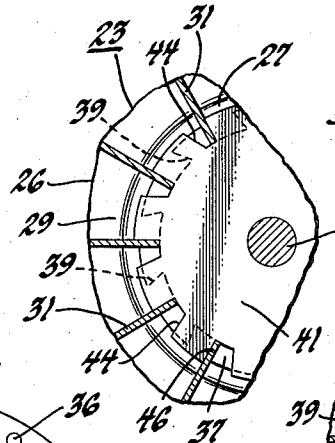


Fig. 6

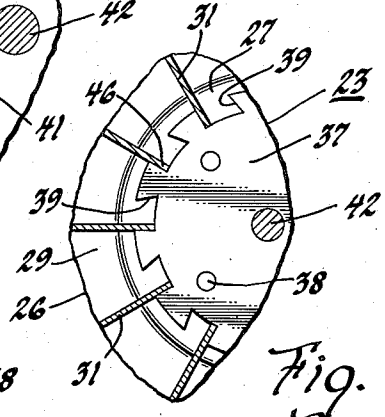


Fig. 7

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United States Patent Office 2,874,552 Patented Feb. 24, 1959

2,874,552

FREEZING DEVICE

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Application November 12, 1957, Serial No. 695,758

17 Claims. (Cl. 62—344)

The present invention relates to refrigeration and particularly to a unitary freezing device in which water is frozen into ice blocks in a refrigerator and are mechanically released from the device.

The advent of ice block freezing devices of the unitary tray and grid type which are intended to be invertedly supported upon a support of a portable ice storage and serving bucket used in conjunction with a household refrigerator cabinet when ice blocks are to be ejected from the device have, prior to the present disclosure, been of a character which include an elongated grid structure locked in a rectangularly shaped tray. Such devices have necessitated the use therewith of a special or rectangular ice block storage and serving bucket and as far as I am aware no one has made a circular unitary freezing device of this type for association with conventional portable round ice storage buckets. I therefore contemplate, for sundry reasons, the provision of a circular unitary ice block freezing device for placement in the freezing chamber of a household refrigerator cabinet and for inverted association with a circular support on a round ice bucket when removed from the refrigerator whereby ice blocks can be released from the circular device into the round ice bucket.

An object of my invention is to provide a unique circular unitary freezing device wherein ice blocks are frozen in compartments thereof and novel means for mechanically loosening or releasing the ice blocks from such a shaped device.

In carrying out the foregoing object it is another object of my invention to construct a unitary circular ice block freezing device with a leverage mechanism for loosening or releasing ice blocks from compartments thereof which extends outwardly beyond the periphery of the device to also serve as a carrying means therefor whereby a skillet-like structure, that is easily held in an upright position while filling the device with water and is readily handled during the act of removing the device from a refrigerator and invertedly placing same on a round ice bucket, is provided.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a front view of a household refrigerator cabinet showing a round portable ice block storage and transfer bucket and freezing devices of the present invention located in the freezing compartment thereof;

Figure 2 is a top plan view of a unitary circular freezing device constructed in accordance with the present invention;

Figure 3 is an enlarged sectional view of the freezing device disclosed in Figure 2 and is taken on the line 3—3 thereof;

Figure 4 is a sectional view of the unitary freezing device supported on a support of a round ice bucket

showing ice blocks removed from the device into the bucket;

Figure 5 is a top view of the unitary freezing device similar to Figure 1 with walls in the device moved to an ice block releasing position;

Figure 6 is an enlarged fragmentary sectional view taken on the line 6—6 of Figure 3 showing notches in a leverage means of the freezing device;

Figure 7 is a view similar to Figure 6 taken on the line 7—7 of Figure 3 showing notches in a wall retaining disk of the device;

Figure 8 is an enlarged fragmentary sectional view taken on the line 8—8 of Figure 2 showing a stud on the freezing device for locating same on a portable round ice bucket; and

Figure 9 is an enlarged fragmentary sectional view taken on the line 9—9 of Figure 2 showing a spring return means for the lever of the freezing device.

Referring to the drawings, for illustrating the invention, I show in Figure 1 thereof a refrigerating apparatus including an insulated household refrigerator cabinet **10** of the multiple chamber type in conjunction with which a round portable ice bucket is used and is adapted to invertedly receive and support my improved freezing devices located in the refrigerator. Cabinet **10** is provided with a lower unfrozen food storage chamber **11** which is cooled to a temperature of from, for example, 37° to 43° F. by a plate-like sheet metal evaporator **12** of a closed refrigerating system associated with the cabinet. Evaporator **12** is secured to and spaced from the rear wall of chamber **11** in any suitable manner behind a concealing cover or baffle **13**. Cabinet **10** is also provided with an upper or frozen food storage chamber **14** which is cooled to a temperature well below 30° F. for freezing foods and/or for freezing water in freezing device structures removably disposed in chamber **14** into ice blocks for table use in chilling salads or the like and drinks in glasses. Chamber **14** is cooled to the below freezing temperature by another evaporator **15** of the refrigerating system associated with cabinet **10**. Evaporator **15** is in the form of a conduit coiled or wrapped around the outside of and secured to a metal can-like member **16** forming the liner of chamber **14**. An auxiliary or inner door **17**, shown broken away in Figure 1, is hingedly mounted at the front of chamber **14** to provide a closure for the access opening thereof as is now conventional in the art. Another or larger insulated main door structure **18**, hingedly mounted on cabinet **10** for horizontal swinging movement relative thereto, normally extends across the front of both chambers **11** and **14** and is provided with a resilient gasket **19** for sealingly engaging the front face of the refrigerator cabinet. A plurality of vertically spaced apart shelves **21** are secured, in any suitable or desirable manner, to an upright side wall of liner **16** within chamber **14** so as to be in metal-to-metal contact therewith and consequently with evaporator **15**. Each shelf **21** is adapted to receive and support, in an upright position, a unitary circular freezing device generally represented by the reference numeral **23** in Figure 1 and shown more clearly in other figures of the drawings. A substantially round portable ice storage, transferring or serving bucket generally indicated at **25** in Figure 1 may be contained in chamber **14** or if desired in chamber **11** for use in receiving ice blocks ejected from any of the freezing devices **23** while invertedly supported on the bucket when the bucket is within the refrigerator cabinet or outside same.

Each of the unitary freezing devices **23** includes or comprises a stamped sheet metal circular pan or tray **26** having a raised central portion **27**, inwardly of a downturned rim **28** therearound, providing inclined side walls **29** of an open-topped chamber of arcuate shape in configuration and having a curved bottom wall (see Figures

2 and 3). The open-topped chamber may extend entirely around the axial center of tray **26** but as herein disclosed, preferably for better release of ice blocks, terminates in inclined end walls **30** so as to be substantially C-shaped in planular appearance (see Figures 2 and 5). A plurality of substantially inflexible walls **31** are directed laterally at different angles from the axis or axial center of circular tray **26** across the open top arcuate shaped chamber in spaced apart upright relationship and divide the interior thereof into a curved row of compartments in which water is to be frozen into separated ice blocks. In order to provide a unitary freezing device the walls **31** are locked to a device **23** against detachment therefrom and are so anchored in the tray **26** thereof as to be movable relative thereto angularly within the chamber. A flat ring **32**, beneath a substantially C-shaped retainer **33**, is provided along its inner edge with spaced apart wall receiving notches **34**. A plurality of studs or rivets **36** are employed to secure the ring **32** and retainer **33** to tray **26**. A disk **37**, secured to tray **26** at the axis or axial center thereof by a plurality of smaller rivets **38**, is provided with a series of spaced apart wall receiving notches **39** about its periphery (see Figure 7.) A manually operable leverage means or force multiplying mechanism in the form of a lever **41** is pivotally mounted to the raised portion **27** of tray **26** at the axis or axial center thereof by a large pin or rivet **42** which also secures a cuplike retainer **43** over the lever **41**. A circular edge portion of lever **41** about rivet **42** is also provided with a series of spaced apart wall engaging notches **44** therein (see Figure 6). The opposed notches **34** and **39—44** receive upper ear portions **46** provided on the walls **31** and the retainers **33** and **43** overlap the top of ears **46** to lock the plurality of walls **31** to a freezing device **23** against detachment therefrom in spaced apart upright relationship within the arcuate chamber in tray **26**. This method of locking the walls **31** within tray **26** loosely anchors them therein for movement relative thereto as will be hereinafter described. It is to be noted that at least two of the rivets **36** are provided with upstanding pin-like or peg-like portions or projections **47** (see Figure 8) for a purpose to be presently described. The lever **41** of the manually operable means or mechanism is provided with an end portion **48** extending outwardly from its mounted portion, pivoted at **42**, beyond the peripheral rim **28** of tray **26** and has handle means **49** secured thereto by rivets **51**. The handle end of lever **41** serves as a carrying means for a unitary freezing device **23**, in skillet-like fashion, during the act of filling tray **26** with water and while placing a water filled device on a freezing shelf **21** and also upon removing the device therefrom and from the refrigerator cabinet. A stud **52** riveted to lever **41**, intermediate its handle end **48** and its portion mounted at **42**, projects through aligned elongated openings **53** provided in tray **26** and ring **32** adjacent the rim **28** of the tray. Another stud **54** is riveted to tray **26** in spaced relationship to an end of opening or slot **53** and a lever return spring **56** has its ends secured to the studs **52** and **54** respectively (see Figure 9). The walls **31** are maintained in a normal ice block forming position as disclosed in Figure 2 of the drawings and are adapted to be moved or shifted therefrom angularly into the position shown in Figure 5 of the drawings by the manually actuated lever **41**. For example lever **41** is rotated about its pivotal mounting **42** relative to tray **26** so that an edge of notches **44** thereon engage the inner ears **46** of walls **31** to move or angularly shift the plurality of walls within the arcuate shaped chamber of tray **26** of a unitary device **23** for loosening ice blocks from their compartments. It being understood that the opposed notches **34** and **39** provided in ring **32** and disk **37** respectively are so shaped as to permit such angular movement of the walls **31**. It is also to be understood that the notches **44** in lever **41** are cut to be progressively wider than one another around the edge thereof bounding its pivotal mounting **42** so as to engage the ears **46** on walls **31** one after another in succession during a rotary movement of the lever. This breaks up the force required to move the walls **31** into increments and renders the ice block releasing operation easily performable.

While my circular unitary freezing devices **23** may be used along in a more or less conventional manner in conjunction with a refrigerator to freeze water therein into ice blocks and to release ice blocks therefrom they are particularly adapted to be used in combination with a portable round ice bucket to be stored in the refrigerator or to be employed at a point remote from the refrigerator. Thus the round ice bucket **25** is provided with a circular shouldered recess **55** at the top thereof (see Figure 4) which together with the top of the bucket forms a support for receiving and supporting a unitary freezing device **23**. This support **55** is provided with a pair of spaced bores or apertures **57** which receive the projections **47** on the two rivets **36** for holding a device **23** in a stationary inverted supported position on the round bucket **25** against movement relative thereto during operation or rotation of lever **41**. It is to be understood that a unitary freezing device **23** may be invertedly supported on the round bucket **25** for the release of ice blocks therefrom into the bucket while the bucket **25** is located in the freezing chamber **14** of cabinet **10** and/or when the bucket is removed from the refrigerator cabinet and located at an ice block serving point remote thereto.

Assume that the portable round bucket **25** is disposed in the chamber **14** of refrigerator cabinet **10**, as shown in Figure 1 of the drawings, that water in an upright supported unitary freezing device **23** on a shelf or ledge **21** in this chamber is hard-frozen into separated ice blocks and that it is now desired to harvest some ice blocks. Door **18** of cabinet **10** and inner door **17** are opened to afford access to chamber **14**. A unitary freezing device **23** is removed from its freezing support in skillet-like fashion by the handle end of lever **41** of the device. The removed device **23**, together with ice blocks therein, is rotated into an inverted position and placed on top of bucket **25** with stud projection **47** on the two rivets **36** inserted into the bores or apertures **57** in the shoulder or recess **55** (see Figure 4) to prevent rotation of the invertedly supported freezing device **23** relative to the bucket **25**. This invertedly placing of a freezing device structure **23** on bucket **25** may be done while the bucket is disposed in chamber **14** of the refrigerator and/or when the bucket is supported on a dinner table or on a cocktail serving table located remote from the refrigerator cabinet. The handle end **48** of lever **41** of the leverage means or force multiplying mechanism is now grasped by the operator's hand, while holding bucket **25** stationary against rotation preferably by grasping a handle projection provided on the bucket, and rotated about its pivotal mounting **42** at the axis of tray **26**. One side edge of notches **44** on the round pivoted portion of lever **41** is rotated into engagement with the ice compartment walls **31** one after another in succession to rotate these walls in circular fashion whereby the walls are moved angularly within the arcuate shaped chamber of tray **26** (see Figure 5) to slide the walls **31** from ice blocks whereby a camming force is applied to the blocks for progressively loosening and mechanically releasing ice blocks from their compartments in the unitary freezing device invertedly supported on bucket **25** and the loosened ice blocks freely fall into the storage bucket (see Figure 4). The first wall **31**, adjacent an inclined end **30** of the chamber in tray **26**, moved cams end ice blocks along chamber wall **30** and ejects same from the tray and the movement of the remainder of the walls one after another ejects other of the ice blocks from the inverted tray. Circular rotation of lever **41** about the axis or center of tray **26** is limited by stud **52** carried thereon stopping against one end of elongated opening **53** in the

tray and in the ring **32** (see Figure 5). Thus when the operator releases the handle end of lever **41**, after ice blocks have been removed, return spring **56** moves the lever back to its original position as shown in Figure 2 of the drawings and consequently side edges of notches **44** on the lever shifts the walls **31** back to their normal ice block compartment forming position.

From the foregoing it should be apparent that I have provided a novel unitary ice block freezing device and a unique arrangement for releasing ice blocks from a circular freezing device. The making of a circular unitary freezing device for inverted association with a round ice storage and serving bucket renders the provision of a special shaped ice bucket unnecessary and permits easy handling of the freezing device in skillet-like fashion. My novel freezing device element and its intended use with a round ice block storage and serving bucket affords a competitor in the art with an arrangement which differs from, has an altogether distinct sales appeal and an appearance unlike arrangements of other competitors. While I have provided a new freezing device element I have also provided a novel combination thereof with a round portable ice bucket either when the bucket is within a refrigerator cabinet and/or when it is located exteriorly thereof.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted as may come within the scope of the claims which follow.

What is claimed is as follows:

1. A unitary freezing device comprising, a circular tray having an arcuate shaped open top chamber about the axial center thereof, a plurality of substantially inflexible walls directed laterally from said tray center across the chamber in spaced apart upright relationship, said walls dividing the interior of said chamber into a curved row of compartments in which water is to be frozen into ice blocks, said walls being locked to said device against detachment therefrom and anchored in the tray for movement relative thereto, and a manually operable mechanism on said device having portions thereof engageable with said walls for moving them within said chamber about their anchorage to loosen ice blocks from said compartments.

2. A device as defined by claim 1 wherein a stop means on the tray thereof is engageable by a part of the mechanism and limits movement of the walls.

3. A device as defined by claim 1 wherein the portions of the mechanism are engageable with the walls one after another to move them in succession around the arcuate shaped chamber for progressively loosening ice blocks from their compartments.

4. A unitary freezing device comprising, a circular tray having an arcuate shaped open top chamber about the axial center thereof, a plurality of substantially inflexible walls directed laterally from said tray center across the chamber in spaced apart upright relationship, said walls dividing the interior of said chamber into a curved row of compartments in which water is to be frozen into ice blocks, said walls being locked to said device against detachment therefrom and anchored in the tray for movement relative thereto, leverage means pivotally mounted upon said device for rotation with respect thereto in a horizontal plane paralleling said tray, and said leverage means having portions thereof directly engageable with said walls for moving them within said chamber about their anchorage to loosen ice blocks from said compartments.

5. A device as defined by claim 4 wherein a stop on the tray is engageable by the leverage means and limits rotation thereof and consequently movement of the walls.

6. A device as defined by claim 4 wherein the portions of the leverage means engage and move the walls one after another in succession.

7. A unitary freezing device comprising, a circular tray having an arcuate shaped open top chamber about the axial center thereof, a plurality of substantially inflexible walls directed laterally from said tray center across the chamber in spaced apart upright relationship, said walls dividing the interior of said chamber into a curved row of compartments in which water is to be frozen into ice blocks, said walls being locked to said device against detachment therefrom and anchored in the tray for movement relative thereto, a lever pivotally mounted upon the device at said tray center and having a handle end extending outwardly therefrom beyond the periphery of the tray serving as a carrying means for said unitary device, said lever being rotatable about its mounting with respect to said tray by swinging its handle end in a horizontal plane paralleling the tray, and said lever having portions thereon directly engageable with said walls for moving them within said chamber about their anchorage to loosen ice blocks from said compartments.

8. A device as defined by claim 7 wherein a stop on the tray is engageable by a part of the handle end of the lever and limits rotation thereof and consequently movement of the walls.

9. A device as defined by claim 7 wherein the portions on the lever engage and move the walls one after another in succession.

10. A unitary freezing device comprising, a circular tray having its axial center portion raised and providing an arcuate shaped open top chamber therearound, a plurality of substantially inflexible walls directed laterally from the center of said tray across said chamber in spaced apart relationship, said walls dividing the interior of said chamber into a curved row of compartments in which water is to be frozen into ice blocks, said walls being locked to said device against detachment therefrom and anchored in the tray for movement relative thereto, leverage means pivotally mounted upon the device at said raised axial center portion of the tray for rotation with respect thereto, said leverage means having a handle end extending beyond the periphery of said tray serving as a carrying means for the unitary device, said leverage means being rotatable about its mounting with respect to said tray by swinging its handle end in a horizontal plane paralleling the top of said device, and said leverage means having portions thereof directly engageable with said walls for moving them within said chamber about their anchorage to loosen ice blocks from said compartments.

11. A device as defined by claim 10 wherein a stop on the tray is engageable by a part of the handle end of the leverage means and limits rotation thereof and consequently movement of the walls.

12. In combination, a round portable ice bucket provided with a circular freezing device support thereon adapted to selectively store ice blocks in a refrigerator or for transferring ice blocks therefrom to a serving point remote thereto, a unitary freezing device normally located in the refrigerator including a circular tray having an arcuate shaped open top chamber about the axial center thereof, a plurality of substantially inflexible walls directed laterally from said tray center across said chamber in spaced apart upright relationship and dividing the interior thereof into a curved row of compartments in which water is to be frozen into ice blocks, said walls being locked to said device against detachment therefrom and anchored in the tray thereof for movement relative thereto, said unitary freezing device also including a leverage means pivotally mounted upon its tray at said axial center thereof and engageable with said walls, said unitary freezing device together with ice blocks therein being removable from the refrigerator and receivable in an inverted position on said circular support of the round portable ice bucket when same is within and/or without the refrigerator, said leverage means being rotatable relative to the tray of said invertedly supported unitary freezing device for moving said walls within said chamber with respect thereto whereby to mechanically release

ice blocks from their compartments into said bucket, and means for holding the tray of said invertedly supported unitary freezing device stationary on the circular support of said round bucket against movement relative thereto during rotation of the leverage means.

13. The combination defined by claim 12 wherein the leverage means engages the walls one after another in succession to progressively release ice blocks from their compartments.

14. The combination defined by claim 12 wherein the leverage means has a handle portion extending beyond the periphery of the circular tray of the freezing device serving as a carrying means therefor.

15. A freezing device comprising, a circular tray having an arcuate shaped chamber about the axis thereof, a plurality of substantially inflexible walls directed laterally from said tray axis across the chamber in spaced apart upright relationship, said walls dividing the interior of said chamber into a curved row of ice block compartments in which water is to be frozen into separated ice blocks, and means pivotally mounted on said device for rotation about the axis of said tray engageable with said

walls to move them angularly within the arcuate shaped chamber whereby ice blocks are loosened from said compartments.

16. A device as defined by claim 15 wherein the rotatable means engages and moves the walls one after another in succession to progressively loosen ice blocks from their compartments.

17. A device as defined by claim 15 wherein a stop on the tray is engageable by the rotatable means and limits rotation thereof and consequently angular movement of the walls.

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