May 20, 1958 V. G. SHARPE ET AL 2,835,113

COMBINED ICE BLOCK RELEASING AND STORING BUCKET

Filed Oct. 18, 1956 2 Sheets-Sheet 1

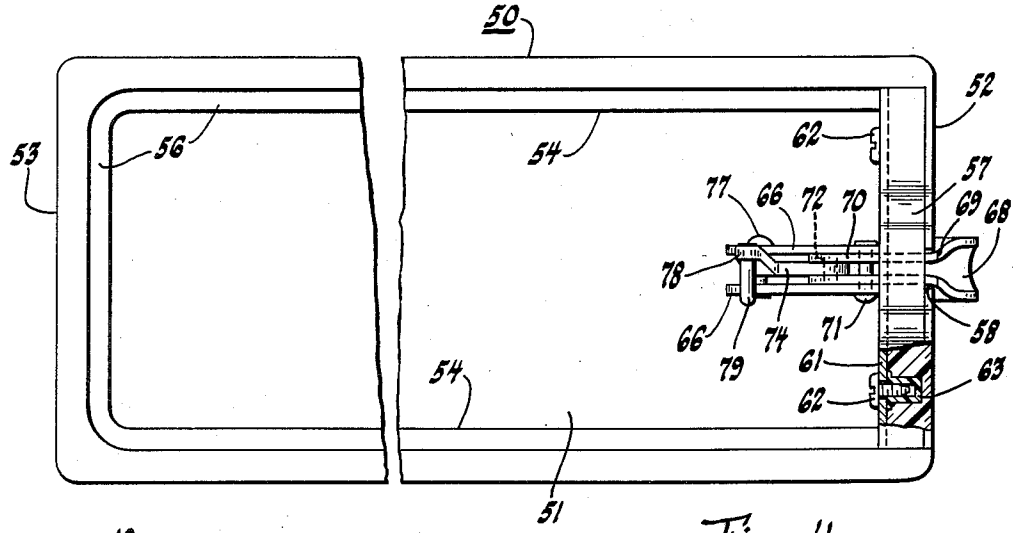


Fig. 4

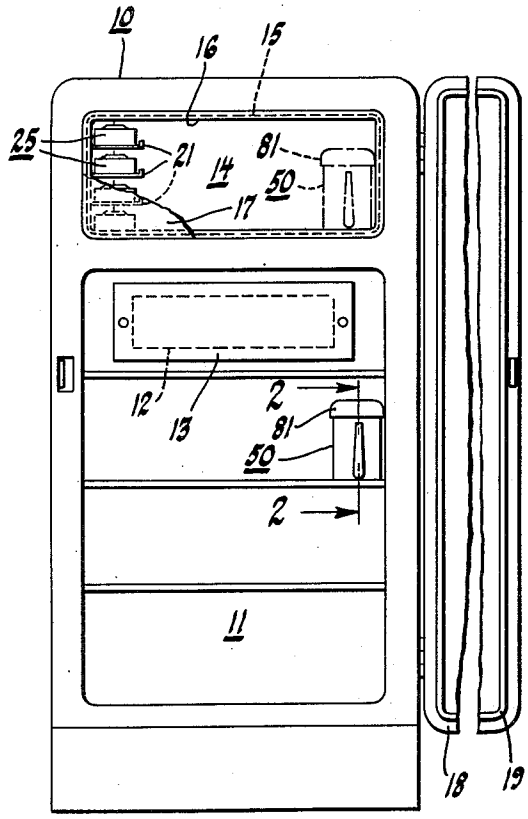


Fig. 1

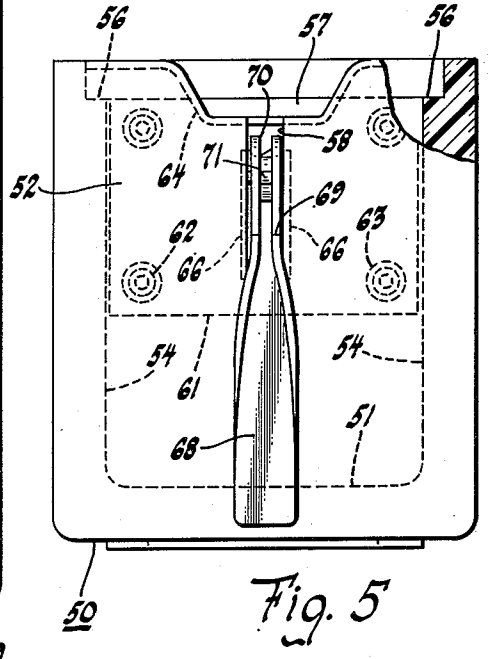


Fig. 5

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COMBINED ICE BLOCK RELEASING AND STORING BUCKET

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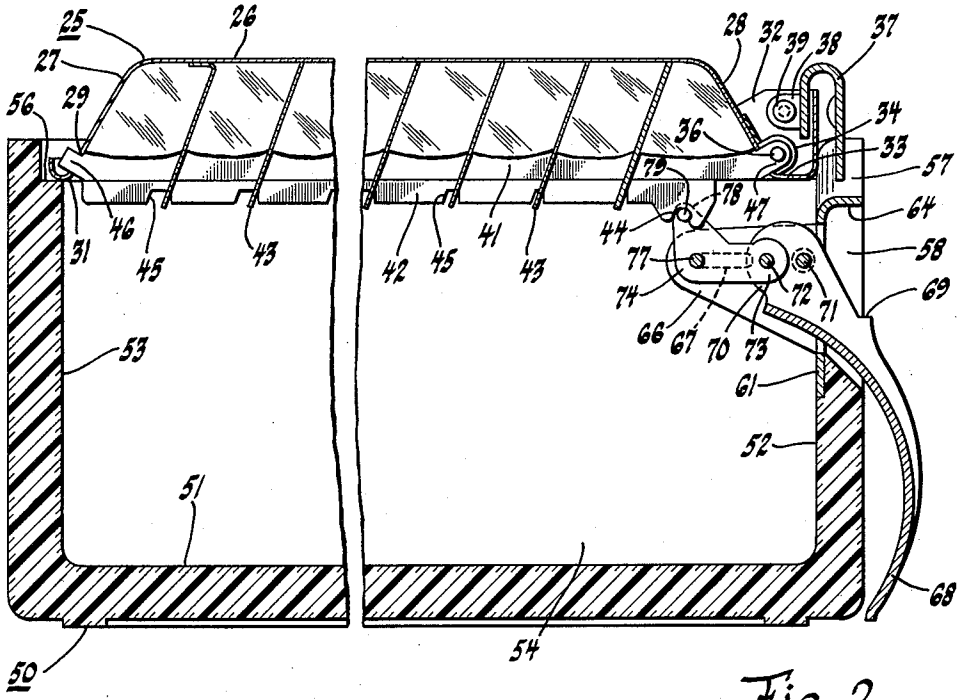


Fig. 2

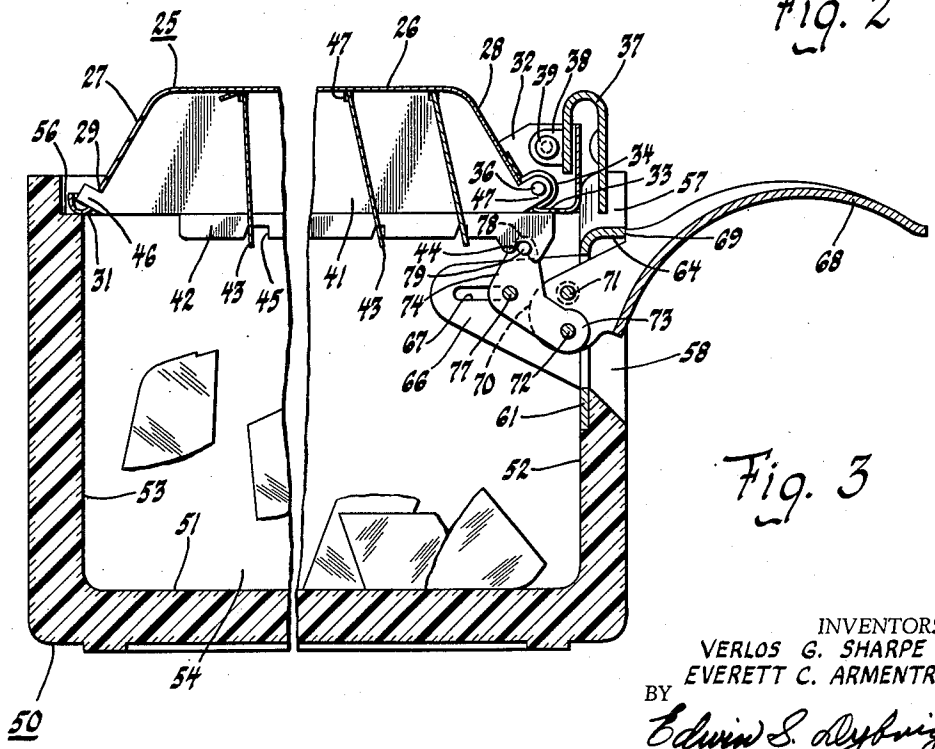


Fig. 3

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United States Patent Office 2,835,113 Patented May 20, 1958

2,835,113

COMBINED ICE BLOCK RELEASING AND STORING BUCKET

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Application October 18, 1956, Serial No. 616,849

7 Claims. (Cl. 62—106)

Our invention relates to refrigeration and particularly to a unitary portable combined ice block ejector and ice block storing bucket for use in conjunction with a refrigerator.

We are aware of various arrangements permanently mounted in a refrigerator cabinet for ejecting ice blocks from freezing devices and for storing the ejected ice blocks in the refrigerator. Such arrangements have not been entirely satisfactory because some users of refrigerators prefer an optional ice block harvesting arrangement whereby they can release ice blocks from a plurality of freezing devices within a refrigerator cabinet and/or at a kitchen sink whereupon a large quantity of released ice blocks can be placed in a serving bucket or the like which may be transported to the dinner table for dispensing ice blocks therefrom into glasses containing drinks to be chilled and which bucket may be returned to the refrigerator for storing the released unused ice blocks. The ice bucket when placed on or adjacent the dinner table elminates the necessity of a housewife or hostess frequently leaving the dining room and making trips to the refrigerator in the ktichen for more ice blocks. With this in mind we contemplate the provision of a combined or unitary portable structure which can be used in various ways in conjunction with a refrigerator cabinet to thereby satisfy the different desires of various housewives.

An object of our invention is to provide a combined portable ice bucket and ice block ejecting means whereby to increase the utility of such a means when used in conjunction with a household refrigerator cabinet.

Another object of our invention is to provide a portable ice receptacle comprising an ice storage bucket having a support thereon for receiving a freezing device including a tray containing ice and a means carried by and movable relative to the receptacle for ejecting ice from the tray into the bucket.

A further object of our invention is to provide a portable unitary ice block storage and serving receptacle or a bucket for use in conjunction with a household refrigerator cabinet having a support thereon above the storage bin or bucket thereof for invertedly receiving a freezing device of the tray and grid type including a leverage or the like mechanism carried thereon and movable relative thereto which has a part thereof adapted to engage and move the grid walls with respect to the tray for ejecting ice blocks from the device into the bucket or bin.

A still further object of our invention is to provide a molded one-piece non-metallic structure which receives a unitary tray and grid freezing device and includes means carried thereby for moving walls of the grid relative to the tray to eject ice blocks from any one of a plurality of similar freezing devices into the structure whereby it forms a light-weight portable ice block storage and dispensing unit storageable in the refrigerator and removable therefrom at will to serve ice blocks at the dinner table into glasses containing drinks to be chilled.

In carrying out the foregoing object it is a more specific object of our invention to provide a portable unitary

ice block ejecting, receiving and storing structure of insulating material which can be handled and carried from one locality to another without rapidly chilling a person's hands and causing the skin of the hands to stick or adhere to the structure.

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 multiple chambered household refrigerator cabinet with the main door open and a part of an auxiliary freezing chamber door broken away showing water freezing devices located therein and illustrating a covered portable unitary structure of the present invention disposed in the unfrozen food storage compartment of the refrigerator;

Figure 2 is an enlarged sectional view taken on the line 2—2 of Figure 1 showing the cover on the portable unitary structure removed therefrom and having a freezing device containing ice blocks invertedly supported thereon;

Figure 3 is similar to Figure 2 and shows grid walls in a tray of the freezing device moved relative to the tray for ejecting ice blocks from the device into the portable structure;

Figure 4 is a top view of the portable unitary structure shown in Figures 2 and 3 with the freezing device removed therefrom; and

Figure 5 is an end view of the portable structure shown in Figure 4.

Referring to the drawings, for illustrating the invention, we show in Figure 1 thereof a refrigerating apparatus including an insulated household refrigerator cabinet **10** of the multiple chamber type in conjunction with which the portable unitary structure of our invention is to be used. Cabinet **10** is provided with a lower unfrozen food storage chamber **11** which is cooled to a temperature of from, for example, 37° F. to 43° F., by a plate-like sheet metal evaporator **12** of a refrigerating system associated with the cabinet and located behind a protecting and concealing cover or baffle **13**. Cabinet **10** is also provided with an upper or fozen food storage chamber **14** which is cooled to a temperature well below 32° F. for freezing foods and/or for freezing water in freezing devices, 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 a freezing temperature by an evaporator **15**, of the refrigerating system associated with cabinet **10**, which evaporator 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**. A 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 conventional in the art. Another insulated main door structure **18**, hingedly mounted on cabinet **10** for horizontal swinging movement relative thereto, extends across the front of both chambers **11** and **14** and is provided with a resilient gasket **19** for sealingly engaging the front side of cabinet **10**. A plurality of vertically spaced apart shelves **21** are secured, in any suitable or desirable manner, directly to an upright side wall of liner **16** of chamber **14** so as to be in metal-to-metal contact therewith and consequently with evaporator **15**. Each shelf **21** is adapted to support, in an upright position, a unitary freezing device generally represented by the reference numeral **25** in Figure 1 and shown more clearly in Figures 2 and 3 of the drawings.

Each of the unitary freezing devices **25** include an elongated sheet metal pan or tray **26** provided with a bottom, outwardly inclined sides and upwardly and out-

wardly inclined ends 27 and 28 (see Figures 2 and 3). The rear end 27 of tray 26 is provided with an opening 29 adjacent a top rim 31 rolled or provided around the tray and having an apron-like depending portion 32 at the front end 28. Front end 28 of tray 26 is notched out as at 33 which notch extends through rim 31 to a short distance therebelow. A metal bracket is welded to the front end 28 of tray 26. Spaced apart and outwardly extending flanges 34 on this bracket are provided with an opening adapted to receive a pin 36. A U-shaped cam handle 37 has projecting legs 38 secured by rivets 39 to the sides of apron portion 32 of rim 31 and this handle serves as a lever for prying the bottom of tray 26 upwardly loose from a support or shelf 21 when a freezing device 25 is to be removed from chamber 14 as is common in the art. A movable walled grid is locked in tray 26 against detachment therefrom and the grid together with the tray form one of the plurality of unitary freezing devices 25. The grid structure in device 25 includes a two-part metal longitudinal wall or partition and a plurality of spaced apart metal walls extending transversely of the longitudinal partition for dividing the interior of tray 26 into rows of ice block forming compartments in which water is frozen into separated ice blocks. The longitudinal partition of the grid comprises a lower wall 41 and an upper actuating wall or member 42 disposed in vertical alignment therewith and adapted to be moved or shifted therealong. The plurality of longitudinal spaced-apart metal cross walls 43 are substantially inflexible or rigid and are loosely attached to the lower wall 41 of the partition at their bottom edges and to the actuating wall member 42 adjacent their upper edges. Cross walls 43 are normally disposed in an acute inclined angular plane with respect to the vertical and are mounted in such a manner that they may be swung or tilted relative to tray 26 and to the lower wall 41 of the longitudinal partition toward the vertical. Walls 43 are adapted to be tilted into a substantially vertical plane when the actuating member 42 is moved lengthwise along wall 41. It will be noted that the actuating wall member 42 is provided with a slot 44 at the front of a device 25 and this slot is for a purpose to be described hereinafter. By virtue of the normal inclined freezing position of cross walls 43 the ice block compartments are, in one vertical cross sectional contour or area therethrough, of a parallelogram shape and when the walls 43 are tilted toward the vertical, to break bonds between walls of the compartments and ice blocks therein, these compartments are enlarged in a direction intermediate the walls 43. This feature is old in the art being fully described in the Donald H. Reeves Patent No. 2,219,079 dated October 22, 1940, and it contributes to the successful operation of the grid to eject ice blocks from a tray in which the grid is locked.

Cross or transverse walls 43 each have an elongated key hole shaped opening (not shown) therein through which the walls 41 and 42 of the longitudinal partition extend. This opening is so shaped as to permit insertion of the lower wall 41 and the upper wall or member 42 one after the other during assembly of parts of the grid structure. The method of assembling the grid parts is now well known to those skilled in the art and a description thereof is not therefore necessary herein. Lower wall 41 has a series of notches 47 cut in its bottom edge to loosely receive a short web portion at the bottom of cross walls 43. The upper edge of actuating wall or member 42 has notches 45 of varying width cut therein and suitably spaced apart to receive continuous or web portions at the top of cross walls 43. The one edge of the varying width notches 45 engages the cross or transverse walls 43 progressively one after the other in succession from the front to the rear of a freezing device 25, when member 42 is shifted relative to wall 41, to tilt the walls 43 toward the vertical and to also enlarge the ice block compartments to eject or release ice blocks therefrom. Lower wall 41 of the longitudinal partition of the grid is provided with a projection 46 at the rear end of device 25 which fits in the closed walled opening 29 of tray end wall 27. The other or forward end of wall 41 is provided with a punctured ear 47 which is slid into notch 33 at the front end 28 of device 25 and is secured to the flange 34 on the bracket welded to tray 26 by the pin or rivet 36. Since the walls 41, 42 and 43 are all movably interlocked together and the grid structure is locked in tray 26 against removal or detachment therefrom by the projection 46 and ear 47 a unitary freezing device is formed which is devoid of a leverage mechanism or the like.

In accordance with our invention we, in addition to utilizing but a single means or leverage mechanism for acting upon any selected ones of the several similar or companion freezing devices 25, provide a unitary portable structure by mounting the single mechanism on an ice block storage bucket. The mechanism is, in the present disclosure, mounted on a combined freezing device receiving an ice bucket element generally represented by the reference numeral 50. This element 50 has an open top, is substantially rectangular in shape and is preferably molded from a non-metallic material to provide a rigid lightweight bucket. The bucket element or structure 50 may be formed in one piece by any suitable material such as polystyrene in a mold of the desired shape. Walls of bucket structure 50 may be formed of a rigid or semi-rigid foam which is coated with an impervious layer or shell, as depicted by the cross sectioning thereof in the drawings, of a suitable synthetic resin preferably wherein the shell is suitably bonded to the foam. The walls of bucket 50 may, for example, be a polystyrene foam or a polyisocyanate type foam such as a reaction product of an alkyd resin and a polyisocyanate. Other synthetic resin type foams well known in the art and having the desirable insulating properties may be used. Element or bucket 50 includes a bottom 51, a front wall 52, a rear wall 53 and side walls 54. The top portion of walls 53 and 54 is shouldered at 56 and this shoulder provides a positioning means and support for invertedly receiving and supporting a freezing device 25 with the tray rim 31 thereof resting on the shoulder 56. Front wall 52 of bucket element 50 is recessed centrally thereof as at 57 (see Figures 2 and 5) and a slot 58 extends downwardly in wall 52 below or beyond the recess 57. A metal plate 61 is secured to the inside surface of front wall 52 of bucket element 50 by screws 62 which are threaded into inserts 63 secured in any suitable or desirable manner in wall 52 (see Figures 4 and 5). Plate 61 is flanged as at 64 to fit upon and extend over substantially the width of the top edge of wall 52. Plate 61 is provided with a pair of integral lateral spaced apart projections 66 extremely inwardly of the bucket element or structure 50 from the front wall 52 thereof and these projections form a mounting means on the portable structure for a leverage mechanism or force multiplying means. Each of the projections 66 has an elongated opening 67 therein and aligned with one another. A lever 68, provided with a stop 69, has its one or forked end 70 extended through slot 58 and is pivotally mounted upon bucket structure 50 by a pin 71 secured to the projections 66 on plate 61. This end 70 of lever 68 carries a pin 72 spaced from and rotatable throughout an arc about pin 71. One end or corner 73 of a substantially triangularly shaped link means 74 is mounted on pin 72 intermediate the forks on end 70 of lever 68. Another end or corner 76 of the link means 74 carries pin 77 which is adapted to be moved back and forth within the elongated opening 67 in the projections 64. The third or upper end or corner 78 of link 74 is bent or offset from the rest of the link (see Figure 4) and carries a round metal pin or stud 79 adapted to fit in slot 44 in actuating member 42 of a freezing device 25 when the device is placed or posi-

tioned on the shoulder or support **56** on bucket structure **50**.

The unitary portably combined ice ejector and bucket structure **50** may be stored in the refrigerator cabinet **10** or on a kitchen ledge when it is empty and not being used. After water has been hard-frozen into separated ice blocks in the upright freezing device **25**, on shelves **21** within the frozen food or freezing chamber **14** of cabinet **10**, any selected one of the unitary freezing devices together with the grid and ice blocks therein is removed from a shelf **21**, rotated into an inverted position and placed upside down on bucket element **50** with rim **31** on tray **26** resting on the supporting ledges or shoulders **56** and with the sides of rim **31** substantially abutting against the abutments above the shoulders. It is to be understood that at the time the device **25** is placed on structure **50** this portable unitary bucket **50** can be located in the freezing compartment **14** of cabinet **10** or it may if desired be supported on a kitchen work ledge. When a device **25** is so received by element **50** the slot **44** in actuating wall member **42** of the grid within tray **26** of the device receives and fits over the pin or stud **79** to removably interlock the member **42** with link **74** of the leverage mechanism (see Figure 2). The support on and abutment of portions of rim **31** on tray **26** with portions of element **50** serve to hold the tray of an inverted device **25** stationary. In order to now release or eject ice blocks from the device **25** on element **50** the handle of lever **68** is grasped by a hand of an operator and pulled outwardly and swung upwardly relative to bucket **50** until stop **69** on lever **68** engages the upper part of plate **51**. The forked end **70** of lever **68** rotates about the fixed pivot or pin **71** and offset pin **72** or movable pivot swings or rotates counter-clockwise in an arc around the axis of pin **71**. This moves the end **73** of link **74** downwardly and pulls the movable pin **77** horizontally within elongated openings **67** and consequently moves stud **79** toward the front wall **52** of the bucket element **50**. The member **42** is thereby shifted forwardly along grid wall **41** to cause edge portions of the notches **45** therein to progressively engage and tilt the grid cross walls **43** one after the other in succession toward the vertical. Tilting of walls **43** relative to one another, to grid wall **41** and to tray **26** breaks bonds therebetween and ice blocks in the freezing device **25** while enlarging the ice block compartments whereupon ice blocks are released or ejected from the inverted tray **26** and these blocks fall into the storage bucket of the unitary portable structure **50** (see Figure 3). This operation can be performed while structure **50** is located in the freezing chamber **14** of cabinet **10** or it can be performed with the portable structure **50** located at the kitchen sink. It should be understood that one or more of the freezing devices **25** may be operated upon one after the other in accordance with the quantity of ice blocks desired to be released into bucket structure **50** without distorting a tray **26** of a device **25** and while the tray remains stationary on the structure **50**. The freezing device or devices from which ice blocks have been ejected while invertedly supported by structure **50** are removed therefrom, refilled with water and replaced in an upright position within freezing chamber **14** of the refrigerator cabinet **10** and this filling operation causes grid walls **43** to return to their normal inclined freezing position in tray **26** as depicted in Figure 2. The lightweight portable structure **50**, containing separated ice blocks ejected from one or more of the devices **25**, can now be carried from the refrigerator cabinet or from the kitchen sink to a cocktail mixing and serving bar or to a dinner table whereat ice blocks can be harvested or dispensed from the bucket structure **50** at will. The portability of structure **50** renders it capable of being returned to the refrigerator cabinet **10** and stored in chamber **14** or in chamber **11** thereof in order to maintain unused ice blocks or ice blocks remaining in the portable bucket

in a low-temperature zone until ice blocks are again to be dispensed therefrom. This portability of bucket **50** increases the utility thereof when used in conjunction with a household refrigerator cabinet by providing optional storage of same and ice blocks remaining therein. For example, if a housewife does not wish to store the bucket **50** and ice blocks within freezing chamber **14**, as shown by dot-dash lines in Figure 1 of the drawings because of its occupying too much frozen food storage space, bucket **50** and its ice block content can be stored in the food chamber **11** as shown by full lines in Figure 1. We have found that ice blocks remaining in bucket structure **50** and stored in unfrozen food chamber **11** can be held over in a substantially dry frozen state for 36 hours or more. In order to obtain this long hold-over feature and to also prevent the ice blocks from absorbing odors from foods stored in chamber **11** we provide a detachable dished cover **81** (see Figure 1), preferably of molded plastic material, for the portable structure **50**. This cover **81** fits snugly over the open top of bucket structure **50** and at least its one end depends in overlapping relationship to recess **57** and the upper part of slot **58** in the end of structure **50** to substantially close or seal the interior of the bucket. Cover **81** may be readily removed or detached from bucket structure **50** when it is desired to harvest ice blocks therefrom.

From the foregoing it should be apparent that we have provided a single force multiplying mechanism which receives any selected one of the plurality of freezing devices and that we have in addition, by mounting this mechanism on a portable unitary structure, provided a combined contrivance for specific uses in conjunction with a refrigerator cabinet. The portable unitary structure of our disclosure is of special design to increase the utility thereof and to provide optional storage of same to meet different desires or demands of various housewives. The portable unitary ice bucket structure is compact, of low manufacturing cost and its light-weight permits transportation thereof from one locality to another with ease. By constructing walls of the ice bucket of rigid non-metallic material these walls do not, particularly when ice blocks are contained in the bucket, tend to frost and cause the skin of a person's hand to stick thereto during portaging thereof. Also by making the portable structure into a substantially box-like shape as distinguished from round ice buckets it provides for the storage of a maximum number of ice blocks in a food compartment of a refrigerating cabinet without wasting any substantial amount of food storage space therein.

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. In combination, a combined portable ice bucket and freezing device support unit for selectively storing ice blocks in a refrigerator or for transporting ice blocks away from the refrigerator so as to dispense ice blocks from the unit at an ice block serving point remote from the refrigerator, a unitary freezing device comprising an elongated tray of a type unintended to be distorted and a grid locked therein against detachment therefrom having spaced apart substantially inflexible walls anchored in the tray for tilting movement relative thereto to loosen ice blocks frozen in compartments of the freezing device, said unitary freezing device being receivable in an inverted position on the support of said combined portable unit so as to allow loosened ice blocks to fall therefrom, mechanism separate from and independent of said freezing device carried by and transportable with said combined unit for applying force to said grid walls in a direction lengthwise of said elongated tray to tilt them whereby ice blocks are mechanically released from said freezing device into the bucket of said unit while the grid remains locked in the tray, said mechanism including

a manually operable means accessible from exteriorly of said unit and said freezing device while said unitary freezing device is supported in its inverted position on the support of said combined portable unit when same is within and/or without the refrigerator, and means on the combined portable unit for holding the tray of said inverted unitary freezing device stationary on said support against sliding movement relative thereto during the application of said force to the grid walls by said mechanism.

2. The combination defined by claim 1 wherein the walls of the grid locked in the tray of the unitary freezing device are tilted one after the other in succession to progressively release ice blocks into the combined portable unit.

3. The combination defined by claim 1 wherein a cover is placeable on the combined portable unit when a freezing device is removed therefrom for substantially closing the bucket thereof.

4. In combination, a combined portable ice bucket and freezing device support unit for selectively storing ice blocks in a refrigerator or for transporting ice blocks away from the refrigerator so as to dispense ice blocks from the unit at an ice block serving point remote from the refrigerator, a unitary freezing device comprising an elongated tray of a type unintended to be distorted and a grid locked therein against detachment therefrom having spaced apart substantially inflexible walls inclined with respect to the vertical and anchored in the tray for tilting movement relative thereto to loosen ice blocks frozen in compartments of the freezing device, said unitary freezing device being receivable in an inverted position on the support of said combined portable unit so as to allow loosened ice blocks to fall therefrom, mechanism separate from and independent of said freezing device carried by and transportable with said combined unit for applying force to said grid walls in a direction lengthwise of said elongated tray to tilt them toward the vertical whereby to enlarge said compartments and mechanically release ice blocks from said freezing device into the bucket of said unit while the grid remains locked in the tray, said mechanism including a manually operable means accessible from exteriorly of said unit and said freezing device while said unitary freezing device is supported in its inverted position on the support of said combined portable unit when same is within and/or without the refrigerator, and

means on the combined portable unit for holding the tray of said inverted unitary freezing device stationary on said support against sliding movement relative thereto during the application of said force to the grid walls by said mechanism.

5. The combination defined by claim 4 wherein the walls of the grid locked in the tray of the unitary freezing device are tilted one after the other in succession to progressively release ice blocks into the combined portable unit.

6. The combination defined by claim 4 wherein a cover is placeable on the combined portable unit when a freezing device is removed therefrom for substantially closing the bucket thereof.

7. An ice bucket and freezing device support structure for use in conjunction with a household refrigerator adapted to removably receive in an inverted position a tray of a unitary freezing device having grid walls tiltably locked therein against detachment therefrom and containing separated ice blocks in compartments thereof, said structure being constructed as a portable unit with the tray support inseparable from the ice bucket whereby to prevent relative movement therebetween, said unit being selectively insertable into a chamber of the refrigerator for storing ice blocks in the bucket therein or transportable away from the chamber for transferring ice blocks in the bucket to an ice block serving point remote from the refrigerator, a pivotally mounted force multiplying leverage mechanism separate from and independent of said unitary freezing device carried by and portable with the bucket of said unit, and the lever of said mechanism being accessible from exteriorly of said unit while the freezing device is invertedly supported on the support thereof and operable to cause tilting of said grid walls locked in the tray of said inverted freezing device for releasing ice blocks from their compartments into said bucket when the portable unit is inside the refrigerator chamber and/or outside same.

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