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 the ice blocks are released 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 eliminates the necessity of a housewife or hostess frequently leaving the dining room and making trips to the refrigerator in the kitchen 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 therefor for invertedly receiving a freezing device of the tray and grid type including a lever 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.

Still further objects of our invention is to provide a molded one-piece non-metallic structure which receives a unitary tray and 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 frozen 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 desirable member 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 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 lifting the bottom of tray 26 upwardly loose from a support or shell 21 when a freezing device 25 is to be removed from chamber 16 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 vertical in 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 bond 45 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. 2,119,079 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 continuation of 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 the rear 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 end of wall 41 is notched out as at 33 which is slid into notch 33 at the front end 23 of device 25 and is secured to the flange 34 on the bracket welded to tray 26 by the pin or rivet 47 which is slipped into notch 33 at the front end 23 of device 25 and is secured to the flange 34 on the bracket welded to tray 26 by the pin or rivet 47. Since the walls 41, 42 and 43 are all movably interlocked together and the grid structure is fixed 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 lever mechanism for acting upon any selected one 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 elements 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 sectional 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 polysioxyane 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 at 64 to fit up and 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 interengaged with the other end or corner 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 link means 74 (see Figure 4) and carries a pin or stud 79 which is adapted to fit in slot 44 in acting 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 storage compartment 14 of cabinet 10, any selected one of the unitary freezing devices 33 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 59 with rim 31 on the 26 resting on the supporting ledges or shoulders 56 and pin 35 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 59 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 the abutment of rim 31 on tray 26 with portions of element 59 to hold the device 25 in 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 upwardly within elongated channel 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 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 ice block compartment 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 mixer and serving bar or to a dinner table where 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 containing 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 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 high hold-over feature and to also prevent the ice blocks from absorbing odors from foods stored in chamber 11 we provide a detachable dish 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 an 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 use the ice blocks therefrom.

From the foregoing it should be apparent that what 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 convenience 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 lightweight 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 bucket 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 receive in an inverted position a tray of a unitary freezing device having grid walls titably 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 transportable 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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