Aug. 13, 1935. W. H. KLYCE, JR 2,011,289

ICE CUBE TRAY

Filed Sept. 28, 1931

Fig. 1

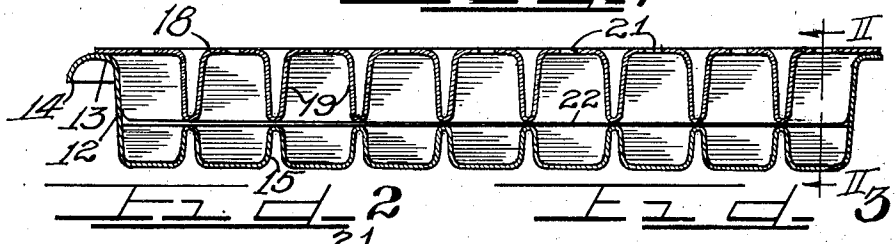


Fig. 2

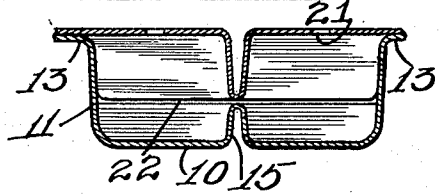


Fig. 3

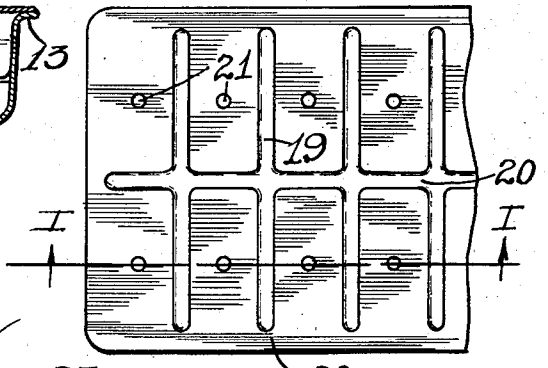


Fig. 4

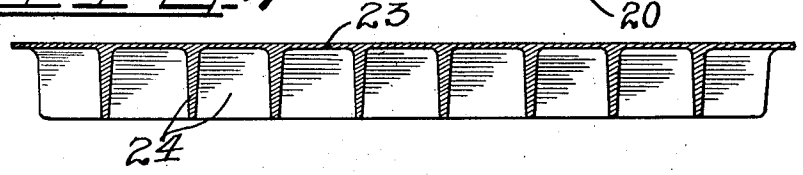
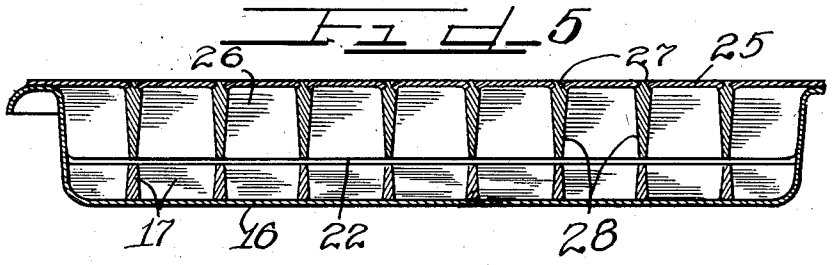


Fig. 5



Inventor
William H. Klyce Jr.
By Charles W. Hills
Atty.

Patented Aug. 13, 1935 2,011,289

UNITED STATES PATENT OFFICE

2,011,289

ICE CUBE TRAY

William H. Klyce, Jr., Detroit, Mich.

Application September 28, 1931, Serial No. 565,575

14 Claims. (Cl. 62—108.5)

This invention relates to an improved ice tray for domestic refrigerators where it is desired to produce individual pieces of ice in shapes convenient for domestic use.

Heretofore ice trays have been provided with removable grids which produce ice cubes that are difficult to remove from the tray and grid even if flooded with water with the resulting waste due to melting and the loss of the unused portion of a tray full if only a few cubes are desired at the time they are removed. It has also been proposed to use a flexible or elastic material for the grid and/or tray to facilitate the removal of cubes, but elastic material such as rubber greatly prolongs the freezing time because of its insulating effect. It is accordingly an object of this invention to provide an improved ice tray and partitions therefor from which the ice blocks can readily be removed and which will facilitate filling with water and the removal of individual pieces of ice, as well as accelerate the freezing of the ice by substantially surrounding each compartment with metal in contact with or immediately adjacent to conductive material exposed to the low temperature of the freezer compartment.

It is a further object of this invention to provide slightly spaced upper and lower grids for an ice tray wherein the slight spacing provides for ready filling of each compartment yet when the water is frozen in these spaces the resulting thin sheet of ice will be readily frangible to permit removal of individual ice cubes or blocks, while the unused pieces will remain in position so that the upper grid can be returned to place and the tray be replaced in the refrigerator.

It is another object of this invention to provide an improved sanitary ice tray unit wherein an upper grid section and cover is removable without disturbing the ice blocks formed thereby in the tray, the removal of the upper grid section leaving spaces between the blocks which permit the use of ice tongs to remove the ice blocks from the tray instead of dumping the trayful into the sink or a bowl due to the difficulty of removing ice cubes from the conventional form of grid.

It is also an object of this invention to provide an improved ice tray unit of the class described wherein the ice blocks are retained in spaced relationship in the tray proper upon removal of a cover carrying depending grids or separators, so that if only a few pieces of ice are required the cover can be replaced over the remaining pieces, the empty spaces refilled if desired, and the tray unit returned to the refrigerator without wasting the unused ice.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

This invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a longitudinal section through one form of ice tray and upper grid embodying the features of this invention, the section corresponding to the line I—I in Figure 3.

Figure 2 is a cross section of the tray of Figure 1 taken on the line II—II of Figure 1.

Figure 3 is a fragmentary plan view of one end of Figure 1.

Figure 4 is a longitudinal section through a modified form of one piece die cast top grid intended for use with the tray of Figure 1.

Figure 5 is a longitudinal section of another form of top grid embodying grid members die cast or welded to a sheet metal top plate or cover.

As shown on the drawing:

The complete unit shown in Figure 1 comprises a tray 10 formed with sides 11 and ends 12 and a peripheral outwardly extending flange 13 around the upper edge of the sides and ends. This flange 13 may be extended at one end, as indicated at 14, to provide a convenient handle for withdrawing the tray from the freezer compartment. The bottom of the tray is indented lengthwise and crosswise to form low upstanding partitions or grids 15 within the tray. Since an oblong ice block would be more convenient than cubes for use in individual glassware, only one central longitudinal partition may be used instead of the more usual three rows of cubes necessarily resulting from requirements of rigidity in separate grids, but I want it understood that the single longitudinal grid it not essential to my invention.

In supplying ice trays embodying the present invention for use in existing refrigerators it may be desirable for the sake of economy to permit the customer to use his own ice trays 16, as shown in Figure 5, which are not provided with the grids 15 above mentioned. I then provide a separate grid 17 to be inserted in the tray to accomplish the results of the grid 15, and it should be clearly understood that I contemplate using either of the trays 10 or 16 with the upper grids of each embodiment of the invention shown.

The cover 18 in Figure 1 is formed as a stamping from sheet metal, depending grid members

19 being struck therein in positions corresponding to the grid in the tray 10. The top is formed to overlap somewhat on the flanges 13 of the tray both to protect the water or ice from contamination and to stiffen the grid. The peripheral flange 20 so formed outside the indentations 19 adds rigidity to the grid. If more than one longitudinal grid is used it will be necessary to vent the interior pockets so formed, to permit the water therein to stand at the same level as in the other pockets, and it may also be desirable to vent the pockets in any case, as indicated by the holes shown at 21 in Figures 1, 2, and 3.

The depending grids of the cover preferably extend almost into contact with the grids 15 struck up from the bottom of the tray 10, leaving a slight gap 22 to permit an equalizing flow of the water if the tray should be filled through one of the vent holes 21. After the water is frozen, the ice in this narrow gap will be sufficiently thin to be readily frangible so that single ice blocks can be lifted out by the use of small ice tongs, after removing the top grid, without disturbing the remaining ice blocks, which are retained in their original relationship by the bottom or tray grid 15, or 17, as the case may be, and thus do not interfere with the replacement of the top grid or cover after removing only a portion of the ice blocks.

The foregoing stamped form of top grid or cover 18 with the special tray 10 forms the preferred embodiment of this invention aside from cost. However other forms of grids have advantages aside from cost and in Figure 4 a die-cast one piece cover 23 with depending grids 24 is shown. The integral grids, as well as the mass of metal, accelerate freezing due to the good conductivity and large exposed area.

Another embodiment of this invention is shown in Figure 5 where a sheet metal cover member 25 has a central longitudinal rib 26 pressed therein and is perforated at 27 in alignment with the lateral grid strips 28 which are then cast in position, the perforations 27 being filled with the metal of the lateral grid strips 28 to anchor the latter in position.

In the use of ice tray units embodying my invention, the tray proper, provided either with an integral lower grid or an inserted one, is filled with water and the upper grid and cover is then placed in position. The essential function of the cover is to serve as a convenient means of heat transfer from and to the grid strips, serving to both withdraw heat during the freezing period and to add heat when it is desired to remove ice cubes. The cover also serves both to protect the water from contamination during freezing and to prevent spilling of water while placing the tray in the freezer compartment. After the water is frozen the tray can be placed on some convenient surface at room temperature for a few moments, or water may be run over the top of the cover to detach the ice therefrom. Thereupon the cover and upper grid can be removed, exposing the separate cakes of ice to removal by means of ice tongs, without the necessity of dumping the ice into a bowl or sink or of handling the ice. Any unused ice remains in the tray in such a position as to permit replacing the upper grid and cover so that the vacant compartments can be refilled and the tray returned to the refrigerator.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. An ice tray unit for refrigerators comprising a tray member, a cover member, and upper and lower grid members cooperating respectively with the cover and the tray whereby upon removal of the cover together with its associated upper grid the ice blocks will remain in the separate compartments of the lower grid member permitting ready removal of a portion of the ice blocks without disturbing the arrangement of the remaining ice blocks or the handling thereof.

2. An ice tray unit for refrigerators comprising a tray member, a cover member, and upper and lower grid members cooperating respectively with the cover and the tray, said upper and lower grid members being slightly spaced apart when in their assembled position in the tray, whereby individual ice blocks will be formed which are connected by thin readily frangible sections intermediate the top and bottom surfaces of the blocks.

3. An ice tray unit for refrigerators comprising a tray member, a cover member, and upper and lower grid members cooperating respectively with the cover and the tray, said grid members being slightly spaced from each other whereby the resulting ice tray is divided into convenient blocks connected by thin sheets of ice.

4. An ice tray unit for the purpose described comprising an open tray provided with shallow dividing ridges forming a grid in the bottom thereof, a cover for said open tray, and depending grid members associated in heat transferring relationship therewith and in alignment with the grid in the bottom of the tray.

5. An ice tray unit for the purpose described comprising an open tray provided with shallow dividing ridges forming a grid in the bottom thereof, a cover for said open tray, and depending grid members associated in heat transferring relationship therewith and in alignment with the grid in the bottom of the tray, said tray and cover grid members being slightly spaced from each other to form an easily frangible ice connection between adjacent ice blocks.

6. An ice tray unit for the purpose described comprising an open tray provided with shallow dividing ridges forming a grid in the bottom thereof, a cover for said open tray, and depending dividing ridges struck therefrom in alignment with the ridges in the ice tray.

7. An ice tray unit for the purpose described comprising an open tray provided with shallow dividing ridges forming a grid in the bottom thereof, a cover for said open tray, said cover being die-cast with integral depending members forming a grid in alignment with the tray grid.

8. An ice tray unit for the purpose described comprising an open tray provided with shallow dividing ridges forming a grid in the bottom thereof, a cover for said open tray, and depending grid members applied to said cover in heat exchanging relationship thereto, and positioned in alignment with the tray grid.

9. An ice tray unit comprising a container, a cover therefor, partition means depending from the cover, and registering partition means extending upwardly from the bottom of the container and spaced from the partition means depending from the cover.

10. An ice tray unit comprising a container, a cover therefor, partition means affording downwardly diverging ice chambers depending from the cover, and partition means registering with the first partition means extending upwardly from the bottom of said container and affording upwardly diverging ice chambers.

11. An ice tray unit comprising a container, a cover therefor, partition means affording downwardly diverging ice chambers depending from the cover, and partition means registering with the first partition means extending upwardly from the bottom of said container.

12. As an article of manufacture, a cover for a refrigerator tray comprising a sheet metal stamping having transversely disposed spaced tapering depressions pressed downwardly from the top surface of the stamping, and integral therewith, said depressions being of a lesser length than the width of the sheet and being hollow to receive water when it is desired to remove the cover from the frozen mass thereunder, the ends of said depressions being tapered downwardly and inwardly as well as rounded adjacent the side edges of the stamping so as to facilitate withdrawal of the cover from the frozen mass, the cross-section of each rounded end being constantly decreasing in radius as the distance from the top surface increases.

13. As an article of manufacture, a cover for a refrigerator tray comprising a sheet metal stamping having transversely disposed spaced open topped depressions extending downwardly from the surface of the stamping, said depressions being of a lesser length than the width of the sheet and being hollow to receive water when it is desired to remove the cover from the frozen mass thereunder, the ends of said depressions being tapered downwardly and inwardly as well as rounded adjacent the side edges of the stamping so as to facilitate withdrawal of the cover from the frozen mass, the cross-section of each rounded end being constantly decreasing in radius as the distance from the top surface increases.

14. A mold for producing individual solidified blocks having in combination, a tray, a grid comprising a series of spaced narrow hollow partitions closed at their lower ends and at least one transverse intersecting partition, a top member rigidly secured to said grid and communicating with the interior of said partitions for distributing liquid therewithin, said partitions defining compartments having their outer ends and bottoms open and cooperating with one another and with the bottom and side walls of said tray to form individual molds.

WILLIAM H. KLYCE, JR.