

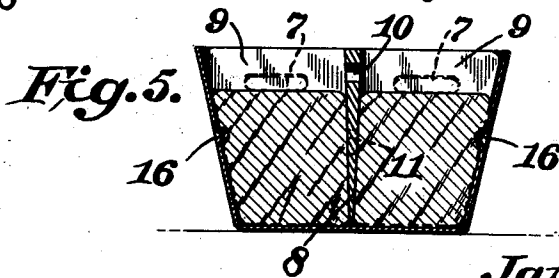
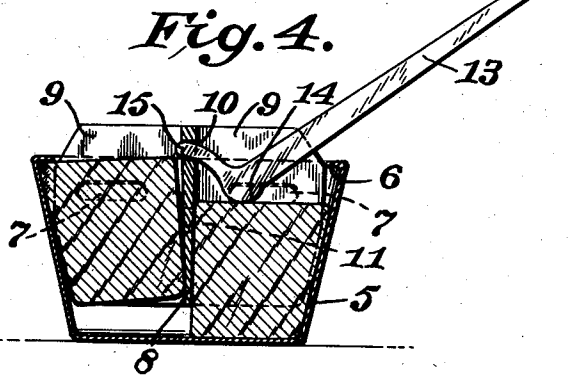
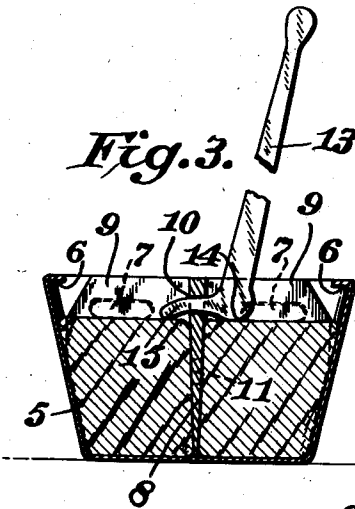
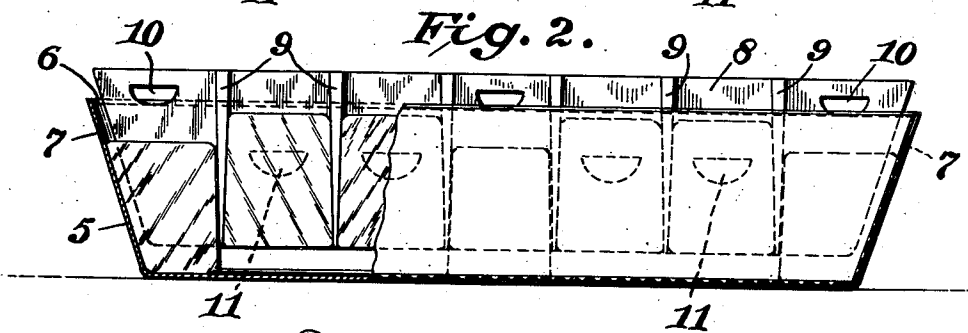
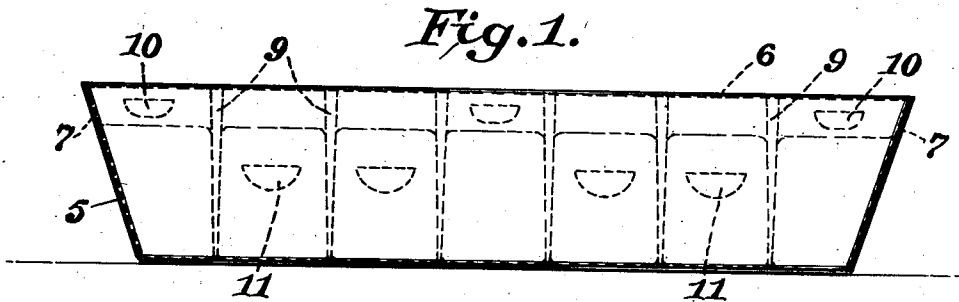
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ICE TRAY AND A METHOD OF MECHANICALLY RELEASING ICE BLOCKS

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ICE TRAY AND A METHOD OF MECHANICALLY RELEASING ICE BLOCKS

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My invention relates to ice trays for producing ice blocks and more particularly to an ice tray from which the ice blocks can be easily removed and to a method of mechanically releasing the ice blocks from the ice tray.

It is a generally recognized disadvantage of most ice trays that they make removal of the ice frozen therein, extremely difficult. This is due to the strong adherence between the ice and the sides of the tray and grid.

It is an object of my invention to provide an ice tray and a grid for producing ice blocks, and an improved arrangement for mechanically releasing the ice blocks from the ice tray and the grid without thawing the frozen bonds between the ice blocks and the ice tray and the grid.

Another object of my invention is to provide an ice tray having a grid co-operating therewith to form a plurality of ice block compartments and an improved method of mechanically releasing the ice blocks disposed in the compartments from the ice tray and the grid without thawing the frozen bonds between the ice blocks and their compartment walls.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

A preferred embodiment of the invention is illustrated in the accompanying drawing in which:

Fig. 1 is a side elevation.

Fig. 2 is a side elevation partly in section with the grid displaced upwardly.

Fig. 3 is a transverse sectional view of Fig. 1.

Fig. 4 is a transverse sectional view of Fig. 2.

Fig. 5 is a transverse sectional view of a modification.

Referring to the drawing, I have shown a freezing or ice tray 5 which is preferably of generally oblong shape having outwardly sloping sides. The upper edge of the long sides of the tray are inwardly turned to form a downwardly facing internal flange or shoulder 6 constituting an abutment. To limit the water level within the tray at a point below the top edge of the tray, the sides of the tray may have one or more openings 7 therein at the desired point.

Within the tray and co-operating therewith to form a plurality of adjacent pairs of ice block compartments is a removable grid made up of a longitudinal upright plate or partition 8 and transverse partitions 9 rigidly carried thereby.

The partition 8 is disposed centrally of the tray and extends the length of the tray, and the partitions 9 extend to the sides of the tray. It is to be noted that the partitions 8 and 9 are tapered in vertical cross-section so that the faces diverge upwardly from a thin part at the bottom of the tray to a thick part above the water level. The central partition 8 has a plurality of apertures 10 and 11 therethrough which provide shoulders or abutments on the grid to facilitate mechanical release of the ice blocks or cubes from their compartment walls without thawing the frozen bonds between the ice blocks and their compartment walls. It will be understood that the abutments provided by the apertures 10 may be made in any suitable manner, as by forming the grid in any convenient manner. The apertures 10 are above the water level established by openings 7 in the tray and provide downwardly facing shoulders or abutments on the grid, while the apertures 11 are below the water level and provide upwardly facing shoulders or abutments on the grid. These apertures 10 and 11 are so arranged that one only opens into each ice compartment. Preferably the upper apertures 10 are at the ends of the partition 8.

To withdraw the grid from the tray and to mechanically release the ice blocks from their compartment walls a separately formed lever is provided. This lever has a handle portion 13 at one end and is preferably rounded at the other end as shown at 14 to bear upon the ice. Projecting laterally from the lever near the end 14 is a pin 15 of a size to enter apertures 10.

In the use of this apparatus, the tray with the grid in place is filled to its maximum level with water, and is then subjected to a freezing temperature. It will be apparent that through the apertures 11 a strip of ice will be formed connecting the ice blocks or cubes on opposite sides of the center partition, and the upper surface of the ice will be below the apertures 10 which provide the abutments or stops for the lever. To elevate the grid the projecting pin 15 which constitutes a force-transmitting portion of the lever is inserted in one of the apertures 10 and the end 14 of the lever is then brought to bear against the ice by giving the handle or force-multiplying portion of the lever a downward turning movement. Continued downward movement of the lever will rock the lever upon the ice as a fulcrum and cause the grid to be lifted upwardly away from the tray bottom. Obviously, the particular cube upon which the lever bears will remain downwardly in the tray, but the other cubes

will be carried upwardly with the grid due to the adherence between the ice and grid and due also to the connecting strip of ice through apertures 11 which provide portions of the cubes engaging the upwardly facing shoulders formed by the lower semicircular walls of the apertures.

Those cubes which are being lifted with the grid will soon be brought against the under shoulder 6 of the inturned upper edge of the tray and will become arrested thereby. As the grid is moved upwardly still further it will become broken from these ice cubes due to the fact that the shoulder 6 holds the ice cubes against upward movement. Fig. 4 shows the ice cube upon which the lever bears as still in its initial position while the opposite ice cube has been broken loose both from the tray and grid in the described manner.

The forces created by the action of the lever 13 between the aperture 10 in the end of the grid and the upper surface of the ice block upon which the curved end 14 of the lever fulcrums cause the grid to be lifted in an inclined position which brings the ice block carried by the grid adjacent the aperture 10 therein into engagement with the shoulder 6 prior to engagement between the adjacent pair of ice blocks disposed on opposite sides of the longitudinal partition 8 of the grid and the shoulders 6. Upon further elevation of the grid this ice block is broken loose from the grid and the adjacent pair of ice blocks is brought into engagement with the shoulders 6. Still further elevation of the grid causes this pair of ice blocks to be broken loose from the grid and the next adjacent pair of ice blocks to be brought into engagement with the shoulders 6. Thus, the adjacent pairs of ice blocks are broken loose from the grid successively from one end of the grid toward the other end thereof or in a predetermined order.

To entirely remove the ice cubes, the grid is first taken completely out of the tray, this being facilitated by the tapered formation of the grid partitions. The individual ice cubes may then be easily removed by slightly bowing the upper edge of the tray outwardly to pass the cubes free of the inturned upper edge of the tray. The removal of the grid permits the cubes to come closer together and this may be sufficient to provide clearance for removal of the ice cubes past the inturned tray edge. The ice cube upon which the lever acted may be easily broken loose by a slight blow as with the lever.

While it will ordinarily be sufficient to insert the lever in a single one of the apertures 10 to accomplish removal of the grid, it may be found desirable to apply it first in an aperture at one end of the grid and then to an aperture at the other end of the grid, thus giving each end of the grid an upward movement. An advantage of the present arrangement is that an enormous mechanical advantage is obtained due to the short distance between the fulcrum point of the lever and the pin 15 which applies force to the grid. Furthermore, by having the lever bear upon an ice cube there is no tendency to distort the tray as there would be if the lever fulcrumed upon the upper edge of the tray.

In Fig. 5 I have shown a modification of my invention in which the long sides of the tray have inwardly depressed portions 16 constituting abutments below the water level in the tray to engage with and arrest upward movement of the ice cubes, instead of the inturned upper edge shown in the other figures.

It will be understood that the invention is not

limited to the use of a grid of which the partitions are of tapered shape in vertical cross-section, and also that it is not essential to the invention that the shoulder of the tray be spaced above the ice the proportionate distance shown but that this spacing may be varied at will. Fig. 5, for example, shows the tray shoulder formed by an indentation projecting into the ice.

While I have shown a particular embodiment of my invention, I do not desire my invention to be limited to the particular construction or method shown and described, and I intend in the appended claims to cover all modifications within the spirit and scope of my invention.

What is claimed is:

1. In combination with an ice tray, a grid therein removable from the tray and comprising a centrally disposed longitudinal partition and lateral partitions projecting therefrom, said partition and partitions having upwardly diverging side faces to facilitate removal from the contained ice, said longitudinal partition being apertured below the water line to form ice strips which connect ice blocks to be lifted with the grid, said ice strips carrying the connected ice blocks upwardly with the removable grid in opposition to the tendency of the sloping sides of the grid to become free of the ice.

2. In combination with an ice tray, a grid therein removable from the tray and comprising longitudinal and transverse partitions for subdividing the contained ice, said partitions being tapered in vertical cross-section to facilitate withdrawal from the contained ice, and manually operable means adapted to exert a force between said grid and the upper surface of the ice within said tray for elevating said grid, said grid presenting upwardly facing shoulders with which ice cubes to be lifted with the grid engage, the shoulders being arranged to carry the ice cubes engaged thereby upwardly with the removable grid in opposition to the tendency of the sloping sides to become free from those cubes as the grid is elevated.

3. In combination with an ice tray, a removable upstanding plate therein dividing the contained ice, said plate having a downwardly facing shoulder above the water line, and a lever having a portion to engage under said shoulder and an immediately adjacent surface for bearing upon the ice to form a fulcrum for the lever.

4. In combination with an ice tray, a removable upstanding plate therein dividing the contained ice, said plate having an aperture therein above the water line, and a lever having a handle portion at one end and a laterally projecting pin at the other end to engage within said aperture, the end of said lever from which the pin projects having an under surface lower than the pin to bear upon the ice immediately adjacent said aperture and provide a fulcrum for the lever inwardly of the tray edge.

5. In combination with an ice tray, a removable grid therein comprising longitudinal and transverse interconnected partitions for subdividing the contained ice into cubes, said grid having openings above the water, a lever having a projecting pin portion to engage within one of said openings and a portion to engage with a cube immediately adjacent the opening, said grid having other openings below the water level to form ice strips connecting cubes other than those upon which said lever fulcrums.

6. In combination with an ice tray, a grid therein removable from the tray and comprising a lon-

5 longitudinal partition disposed centrally of the tray and side partitions projecting laterally from the central partition to form ice compartments, the central partition having apertures above the water line to receive a tool for removing the grid and below the water line to form connecting ice strips through the partition, said apertures being so disposed that one aperture only opens into each ice compartment.

10 7. In combination with an ice tray, a grid therein comprising a longitudinal partition disposed centrally of the tray and transverse partitions carried by the central partition to form ice compartments, said partition and partitions being tapered in vertical cross-section to facilitate withdrawal of the grid upwardly away from the ice, said central partition having apertures above and below the water line so disposed that one aperture only opens into each ice compartment, a lever having a projecting pin portion to engage within an aperture above the water level, and having a portion to bear upon the ice cube immediately adjacent that aperture, the apertures below the water level forming ice strips connecting ice cubes and serving to carry the connected ice cubes upwardly with the grid in opposition to the tendency of the sloping sides of the partitions to free the ice as the grid is elevated by said lever.

30 8. In combination, an ice tray having the upper edges of an opposite pair of side walls inwardly turned, and a removable partition within the tray extending in the direction of said side walls, said partition having means to engage with and lift the ice upwardly against said edges on upward movement of the partition.

35 9. An ice tray for refrigerators having an opening in its wall to determine the height of the water therein, a partition member removably mounted in the tray, and a lever fulcruming on the ice and engaging the partition above the water line to dislodge said partition from the tray and the ice from the partition, substantially as described.

40 10. An ice tray having a shoulder or flange extending inwardly from the upper part of its wall, a partition removably mounted in the tray, means for lifting the partition, and causing the ice to tilt about its point of engagement with the shoulder or flange, substantially as described.

50 11. An ice tray having a partition movably mounted therein and provided with means for engaging and lifting the ice, said tray having fulcrum means on the inner side of its side walls about which the ice may tilt upwardly and outwardly relative to the center of the tray, and means removably engaging said partition for lifting the same with the portion of the ice contacting therewith, substantially as described.

12. An ice tray having a partition movably mounted therein and provided with means for engaging and lifting the ice, said tray having fulcrum means on the inner side of its side walls about which the ice may tilt upwardly and outwardly relative to the center of the tray, and means co-operating with said partition for lifting the same with the portion of the ice contacting therewith, substantially as described.

10 13. In combination with an ice tray, a partition movably mounted in said tray, means adapted to lift said partition for mechanically releasing the ice from said tray, and means including an abutment carried by said tray and adapted to engage the ice for mechanically releasing the ice from said partition.

15 14. The combination with an ice tray and a grid therefor including a longitudinal element and a transverse element rigidly connected thereto of a lever having a force-multiplying portion and a force-transmitting portion, a stop positioned near the top of said grid to cooperate with said lever when said lever is fulcrumed on an ice block in the tray to release the grid from the tray and to cause the force from said lever to break a frozen bond between the ice block and the grid.

20 15. The combination with an ice tray and a grid therefor including a longitudinal element and a transverse element rigid therewith of a lever having a force-multiplying portion and a force-transmitting portion, a stop positioned near the top of said grid to receive a force from said lever directed away from the bottom of said tray when said lever is fulcrumed on an ice block in the tray and to cooperate with said lever and the ice block to move at least a portion of said grid away from said tray to mechanically release at least one ice block from the tray and grid.

25 16. A grid for an ice tray, said grid comprising partition means extending longitudinally from one end of the grid to the other, a plurality of elements rigidly carried by and extending laterally from said partition means and forming therewith walls of ice block compartments ranging along opposite sides of said partition means, and means carried by certain of said elements and providing bearing surfaces so arranged with respect to each of the spaces between the last-mentioned elements that a portion of a lever may be applied against the bearing surface associated with a selected space and another portion against a block frozen therein to release the latter from the grid.

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