

Aug. 1, 1939.

H. D. GEYER

2,168,200

ICE TRAY

Filed May 10, 1937

2 Sheets-Sheet 1

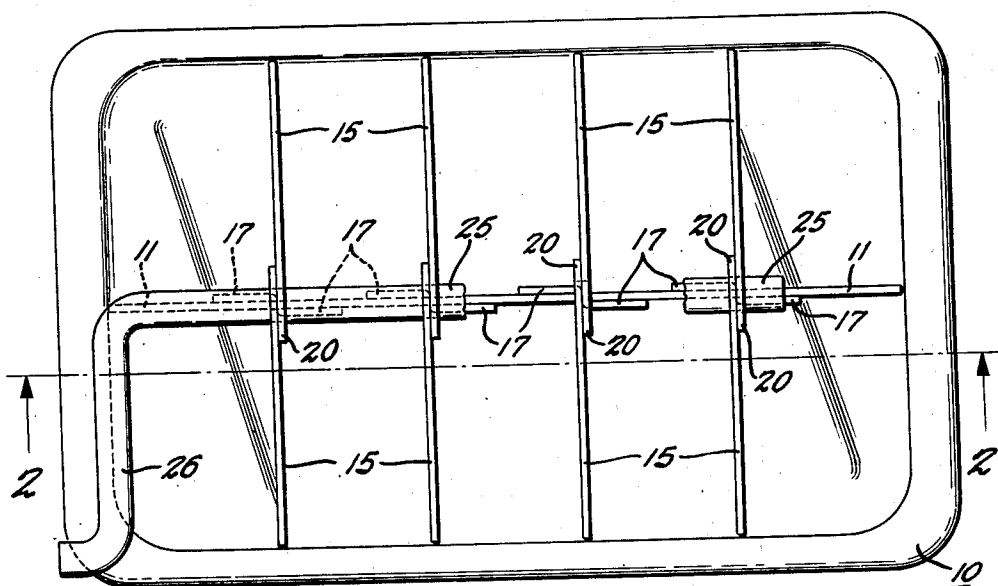


Fig. 1.

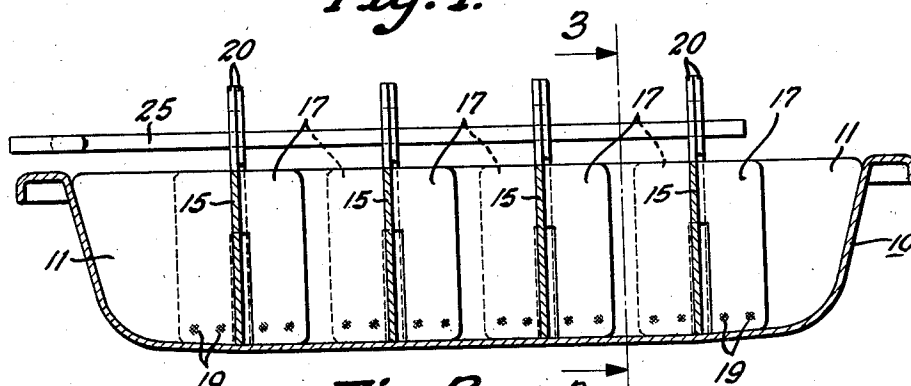


Fig. 2.

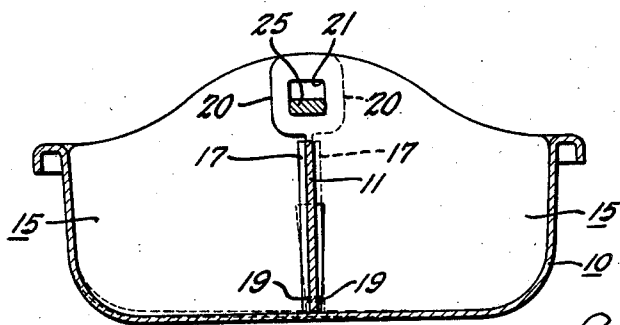


Fig. 3.

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2 Sheets-Sheet 2

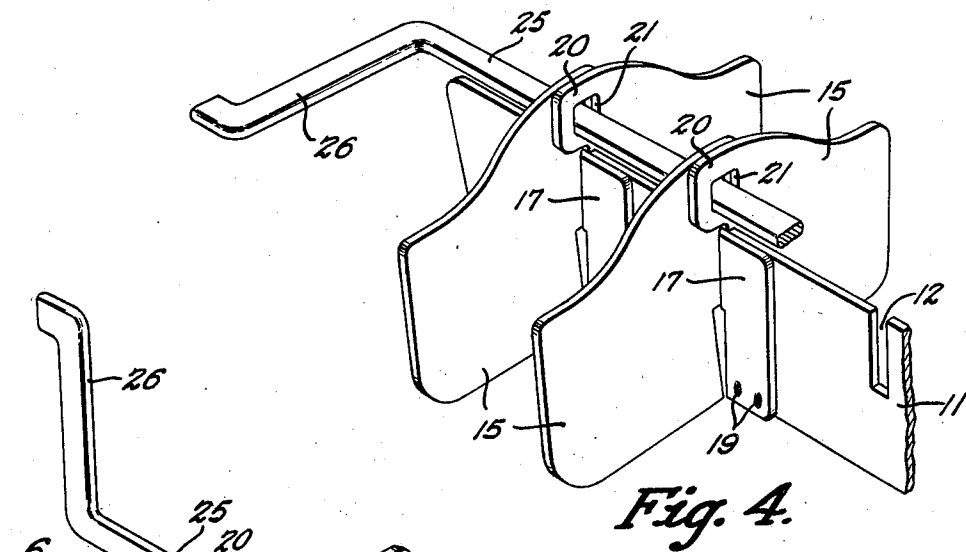


Fig. 4.

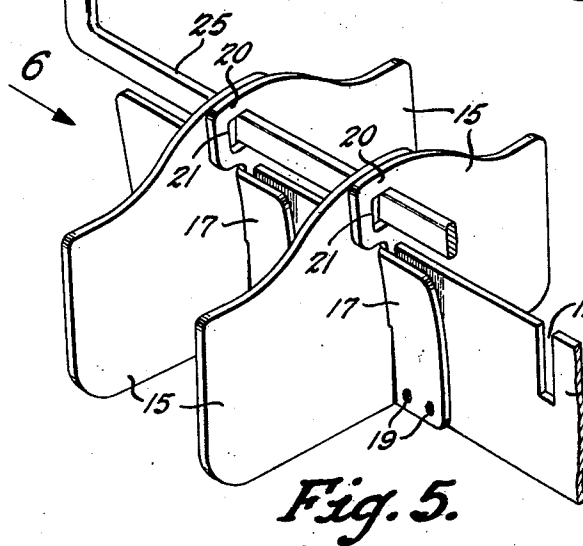


Fig. 5.

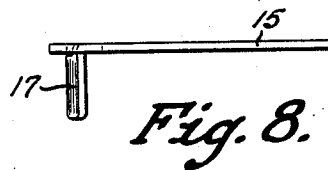


Fig. 8.

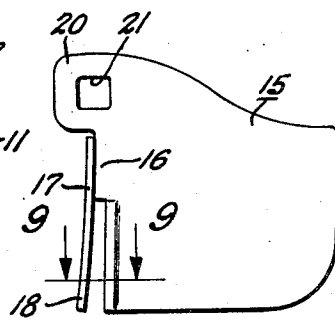


Fig. 7.

Fig. 6.

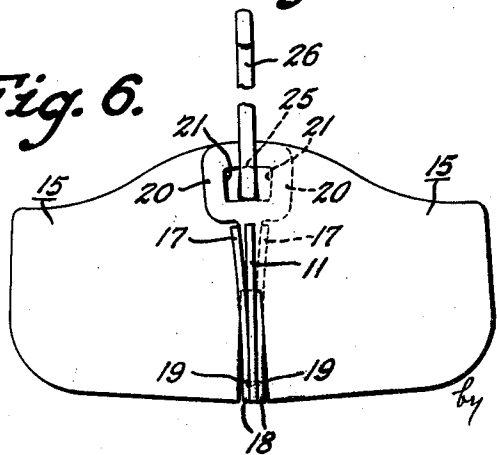


Fig. 9.

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UNITED STATES PATENT OFFICE

2,168,200

ICE TRAY

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Application May 10, 1937, Serial No. 141,610

6 Claims. (Cl. 62-108.5)

This invention relates to freezing trays especially such as are adapted for use in mechanical refrigerators for household use.

An object of this invention is to provide a freezing tray having a metallic grid whose partition walls are relatively movable by spring action after the ice is frozen, whereby to automatically loosen or free the ice blocks from said grid without the necessity of melting the ice loose.

A further more specific object is to provide a grid having spring-pressed cross partitions and means for cocking said partitions into their normal freezing position until after the ice is frozen, and spring-release means for then permitting said partitions to automatically return to an ice-ejecting position to facilitate the removal of the ice blocks.

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 embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 is a plan view of the freezing tray with the parts in freezing position. A portion of the actuating bar is broken away to show the underlying grid structure.

Fig. 2 is a section taken on line 2-2 of Fig. 1.

Fig. 3 is a section taken on line 3-3 of Fig. 2.

Fig. 4 is a perspective view of a portion of the grid alone, the parts being shown in freezing position.

Fig. 5 is similar to Fig. 4 but the parts are shown in the ice-ejecting position.

Fig. 6 is an end view of Fig. 5.

Fig. 7 is a detail view of a cross partition element in its non-distorted shape.

Fig. 8 is a plan view of Fig. 7.

Fig. 9 is a section on line 9-9 of Fig. 7.

Similar reference characters refer to similar parts throughout the several views.

10 designates the container pan which may be of any suitable design, but preferably is a slightly flexible sheet metal pan shaped as shown and made according to my copending application S. N. 88,559 filed July 2, 1936. Such a container pan may be freed from its solidly frozen contents simply by setting same upon a flat surface and pressing down on its two diagonally opposed corners to slightly warp or twist the pan, thus causing it to peel from the ice mass.

The removable grid forms the chief subject matter of this application. This grid comprises a main longitudinal metal plate 11 having a series of spaced vertical slots 12 therein each extending

a substantial distance down from the top edge of plate 11 at its points of intersection with the cross partitions. Each cross partition comprises two separate metal elements 15 shaped as shown in Figs. 7 and 8. Each element 15 has a neck portion 16 which extends loosely thru a slot 12 in the main plate 11 and a distortable spring flange 17 turned at right angles to the plane of the cross partition and arranged to lie on the opposite side of main plate 11 from the main portion of element 15. These spring flanges 17 have a normal curved or inclined shape, as shown in Fig. 7, so that when the lower portions 18 thereof are spot-welded or otherwise fixed to the lower edge of plate 11 at points 19, the cross partition elements 15 will normally be held tilted at a substantial angle to plate 11 as illustrated in Fig. 6. This is called the normal or "ice-ejecting position" of the cross partitions 15.

The means for forcing cross partitions 15 against the urge of the spring flanges 17 to their non-tilted or "freezing position" shown in Fig. 3 will now be described. Each cross element 15 has an integral projection 20 overlying the main plate 11 and a square aperture 21 therein. When elements 15 are in their tilted position apertures 21 are non-aligned, that is offset laterally from each other as shown in Fig. 6, however these apertures 21 mutually overlap a distance equal to the narrow width of the rectangular section of the actuating bar 25 which is threaded thru the apertures 21 of all the cross elements 15. Now when the bar 25 is rotated in either direction thru a 90 degree angle from its vertical position it will cam all the apertures 21 into direct alignment, which of course means that cross elements 15 will be forced to rock to their non-tilted position of Figs. 3 and 4. This rocking action strongly tensions all the spring flanges 17 since it distorts them from their normal curved or angular position clearly shown in Fig. 6 to face to face contact with plate 11 as shown in Fig. 3. During such rocking of cross elements 15 their neck portions 16 slide freely thru the slots 12 in main plate 11. The actuating bar 25 has a hand crank 26 at one end thereof by means of which bar 25 may be rotated by hand in either direction. If desired, the hand crank 26 may be fixed to bar 25 at its central portion instead of at one end thereof, since it will obviously not interfere with the removal of the ice blocks when in its raised or vertical position.

In operation, starting with the grid in its normal or non-tensioned condition (shown in Figs. 5 and 6), the actuating bar 15 is rotated thru 90

degrees by the hand crank 26. This aligns all the apertures 21 and thereby forces all the cross elements 15 to rock to their non-tilted position (shown in Figs. 3 and 4) and thereby strongly tensions all the spring flanges 17. The narrow flat surfaces of bar 25 will then lie pressed tightly against the vertical edges of apertures 21 and hence elements 15 will be retained in their tensioned position after the operator releases hand crank 26. The grid then stands "cocked" in its freezing position (see Figs. 3 and 4). The grid may be thus cocked either before or after it is set within pan 10, and also either before or after pan 10 is filled with water to the desired level.

After the ice is solidly frozen, the pan 10 is first removed from its frozen contents by flexing the pan by pressing down on two diagonally opposed corners thereof as above described, or by any of various other suitable and presently known methods. The operator then merely flips the hand crank 26 to its vertical position, that is to say he uncocks the spring mechanism with little effort. As soon as bar 25 releases its pressure against the apertures 21, the spring flanges 17 are then free except for the ice bond to tilt or rock cross elements 15 to the ice-ejecting position of Figs. 5 and 6. The tension of spring flanges 17 is made sufficiently strong to overcome the binding resistance of the ice bond and hence to automatically rock cross elements 15 to the position of Fig. 5 and thereby loosen or entirely eject the ice blocks from the grid. It will be noted that when the spring flanges 17 return to their normal angular position shown in Fig. 5, each flange 17 will urge its contacting ice block laterally outwardly from its two contacting metal partitions 15. In other words there is a substantial relative movement between each flange 17 and the two metal partitions 15 adjacent thereto.

In some cases the binding resistance of the ice bond may be so strong due to very cold temperatures that the above-described automatic operation of the grid will not occur immediately upon uncocking same. In such cases the operator simply uncocks the grid and lets it stand for a few moments at room temperature, whereupon the above-described automatic ejection will take place without any further attention from the operator.

Preferably the metal parts 11, 15, and 25 are made from stainless steel. It is essential that the spring flanges 17 be made of some resilient metal with good spring qualities.

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

What is claimed is as follows:

1. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a main longitudinal metal plate and a series of metal cross partitions associated with said plate

to form ice block compartments, said cross partitions each having a spring flange pressing against said plate and normally projecting therefrom, retaining means for holding said spring flanges deflected toward said plate during freezing of the ice contents, and means for releasing said retaining means after the ice is frozen to permit said flanges to return to their normal projecting position and thereby aid in ejecting the ice from the grid.

2. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a main longitudinal metal plate and a series of metal cross partitions movably attached to said plate to form ice block compartments, spring means for urging said cross partitions to an ice-ejecting position, retaining means for holding said cross partitions in their freezing position against the urge of said spring means, and means for releasing said retaining means after the ice is frozen.

3. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a main longitudinal metal plate and a series of metal cross partitions movably attached to said plate, spring means for normally urging said cross partitions to an ice-ejecting position, and manual means for cocking said cross partitions in their deflected freezing position and for releasing same.

4. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a series of relatively movable metal partitions forming ice block compartments, spring means for normally urging said partitions to an ice-ejecting position, and manual means operable to deflect said spring means and retain said partitions in their deflected freezing position and operable to release said partitions after the ice is frozen.

5. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a series of relatively movable partitions forming ice block compartments, spring means for moving some of said partitions relative to other partitions, and means for tensioning said spring means and holding said partitions in their freezing position and for releasing said spring means after the ice is frozen.

6. In a freezing tray, a container pan, a removable grid for said pan, said grid comprising: a main longitudinal partition forming a relatively stationary backbone for said grid, a series of pairs of relatively tiltable lateral fins carried by and projecting laterally from opposite sides of said main partition and forming therewith two rows of ice block compartments, each lateral fin forming a dividing partition on only one side of said main partition, and means for forcing the two lateral fins of each pair to tilt relative to each other and relative to said main wall to facilitate the removal of the frozen ice contents.

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