Aug. 8, 1939. J. H. MINER 2,168,739

ICE TRAY

Filed June 10, 1936

Fig. 1.

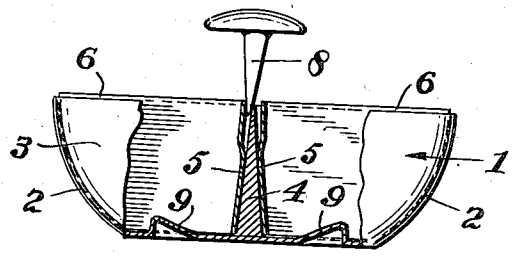


Fig. 2.

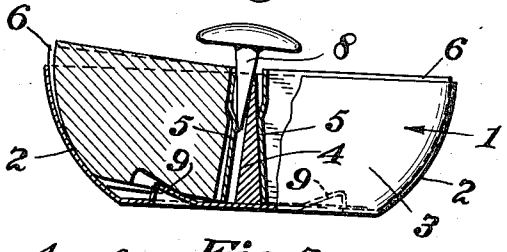


Fig. 3.

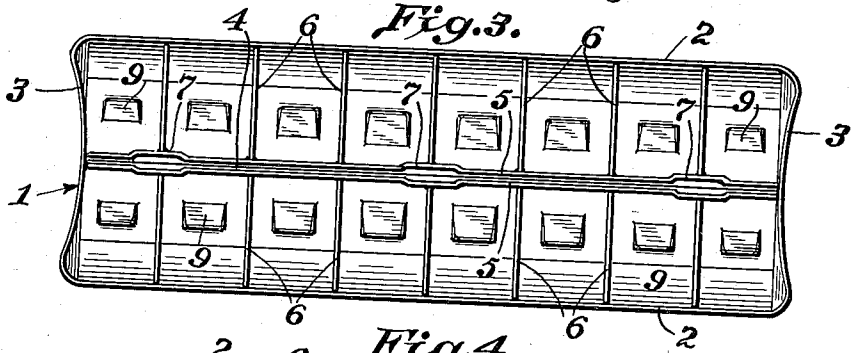
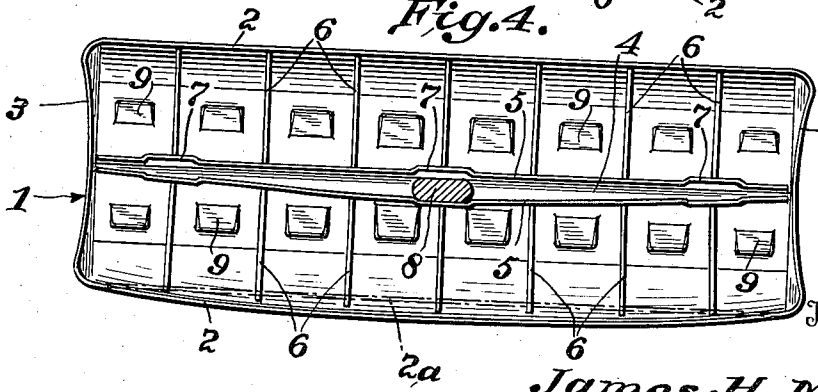


Fig. 4.



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Patented Aug. 8, 1939 2,168,739

UNITED STATES PATENT OFFICE

2,168,739

ICE TRAY

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Application June 10, 1936, Serial No. 84,579

11 Claims. (Cl. 62—108.5)

The invention relates to ice trays for refrigerators and concerns the features and combination and arrangement of parts hereinafter described and pointed out in the claims.

In the drawing

Figure 1 is an end view of a tray embodying the invention with the tray in normal condition.

Fig. 2 is a view similar to Figure 1 with the tray in a condition after it has been subjected to an operation to loosen the ice blocks.

Fig. 3 is a plan view of the tray in normal condition.

Fig. 4 is a plan view of the tray in the condition assumed by it when an operation has been performed to loosen the ice blocks on one side.

In the drawing, the tray indicated at 1 is formed of resilient material of preferably polished steel having sides and end and bottom walls. The side walls 2 are inclined, or curved, outwardly and upwardly, and the end walls 3 are re-entrant, being curved inwardly in respect to the body of the tray.

Extending longitudinally of the tray, and suitably fixed, or welded, to the bottom thereof is a partition 4 of substantially the same depth as the tray. This partition in cross section tapers upwardly from the bottom and it affords a member of substantial rigidity. The ends of the tray may be left free from the ends of the substantially rigid bar, or partition member, 4. On each side of the rigid longitudinal partition member is located a grid, each composed of a longitudinally extending bar 5 set up on edge, and of a depth substantially the same or preferably slightly greater than the depth of the tray. Each of these longitudinally extending plates, or bars, 5 has projecting laterally therefrom a series of fins, or partition members, 6 united to the bars and spaced apart to form ice compartments between them. In practice it may be desirable to make the fins tapering from the bar and from the bottom upward. This upward taper enables the fin to exert a lifting pressure upon the ice block with which it contacts when the tray is operated. The end ice pockets in the tray are formed between the end walls of the tray and the adjacent fins. Each of the longitudinally extending plates or bars of the grids is provided with a recess, or recesses, indicated at 7, so that when the grid is in place there will be a space between this offset portion of the grid bar and the longitudinally extending, substantially rigid partition member 4, these spaces being adapted to receive a wedge member indicated at 8, which, when pressed downwardly between the offset portion of the grid bar and the rigid partition wall 4, will exert pressure on the grid in a direction from the center line of the tray towards the lateral side thereof. This pressure will tend to move the grid bar laterally of the tray, and consequently the ice blocks will be pressed laterally in respect to the tray, and this will tend to elevate the ice blocks slightly after having broken them away from frozen connection with the tray bottom and sides because of two factors, the first being the upwardly and outwardly inclined sides of the tray, which plays a part in this elevating action, and second, because of the presence at the bottom of the tray of upwardly and outwardly inclined faces 9 of projections extending up into the tray from the bottom thereof, and sloping upwardly towards the sides. These upwardly and outwardly inclined faces have had the ice blocks formed about them, and hence as the ice block is pressed laterally with sufficient force, it will ride up on the inclined face of the projection and add to the elevating effect above described.

In practice, with a quick stroke of the wedge it may be possible to entirely dislodge the ice block from the tray; that is to say, more particularly, those blocks which lie near the longitudinal center of the tray.

In the operation above described, the side walls of the tray will flex outwardly, and this action is indicated by a comparison of the full line position of the side wall in Fig. 4 with the adjacent dotted line 2a, which latter indicates the normal position of the side wall. This tray may be made of thin tempered highly polished steel, which has the advantage of freezing quicker. The rigid central bar attached to the bottom keeps the tray in proper shape from any excessive flexing. The end walls of the tray, being of resilient material and re-entrant, or curved inwardly, will under the operation above described tend to straighten out slightly and thus permit the end portions of the side walls of the tray to move outwardly from their normal positions, and thus the end ice blocks of the tray will be released. Those inclined projections 9 which are located near the longitudinal central portion of the tray may be of greater heighth than those toward the ends, and also they may be of greater extent laterally of the tray than those near the ends. These projections may be provided in any suitable way, as, for instance, by stamping them upwardly from the metal forming the bottom of the tray.

By reason of the employment of the longitudinally extending partition wall 4 of substantial size and rigidity, I am enabled to employ a tray composed of much thinner material, so that the side walls and ends spread easily when proper pressure is applied.

In operating the tray, the wedge member 9 may be used first on one side of the rigid partition to operate one of the grids, and then on the other side of the partition. In this way if only a few ice blocks are needed they can be obtained without loosening all the cubes, and by filling the empty spaces with water the entire tray may be subject to the freezing action.

The inclined projections 9 have the advantage of enabling a cube to be produced with less flare or taper than otherwise, it being desirable to have the ice cubes as near square as possible to prevent chipping.

The small recess formed in the cube from the raised portion 9 is not noticeable. There is no tendency to chip or crack the cubes, for the cubes are protected on their sides. The outward or spreading action of the tool 8 extracts the cubes without marring. The partition bar 4 gives strength to the tray. With it, lighter material can be used. Flexing is rendered easier, and a quicker freezing is accomplished.

I claim:

1. An ice tray having upwardly inclined projections fixed on its botom to contact the ice, means for dividing the ice into blocks, and means for urging the ice blocks in relation to the stationary inclined projections to ride up the inclines of said projections.

2. An ice tray having side walls flaring upwardly and outwardly and adapted to yield outwardly and restore automatically, end walls of re-entrant form, and projections from the bottom of the tray inclining upwardly and laterally to lift the ice blocks when pressure is exerted in a direction laterally and outwardly of the tray, substantially as described.

3. In combination an ice tray having a rigid partition, a grid on each side of said partition in the tray, means for forcing the grids from the partition outwardly, and projections on the bottom of the tray, having inclines for raising the ice blocks relative to the tray when urged across said projections, substantially as described.

4. An ice tray organization for refrigerators comprising a tray proper, a grid removably mounted therein, dividing the ice into cubes and projections on the bottom of the tray inclining upwardly and laterally of the tray, said tray having an upwardly and outwardly inclined side and means for moving the grid in a direction crosswise of the tray to make the cubes ride up the inclined side, said projections by their inclines causing the ice blocks to move upwardly when urged laterally, substantially as described.

5. In combination, a tray having a substantially rigid wall and an opposing upwardly and outwardly inclined yieldable wall, a grid removably mounted between said walls comprising a member lying adjacent the rigid wall and having fins or partitions extending from said member to the inclined wall and having their ends conforming to the inclined wall, and means for urging the grid away from said rigid wall towards the inclined wall, substantially as described.

6. A tray according to claim 5 in which there are projections on the bottom of the tray that incline upwardly and outwardly towards the inclined side of the tray to lift the ice blocks as they are moved towards said inclined side.

7. A tray according to claim 5 in which the inclined yieldable wall automatically restores itself to normal position.

8. A tray having a rigid wall and an opposing upwardly and outwardly inclined resilient wall, a grid within the tray comprising a member to lie adjacent the rigid wall and having fins to divide the ice into blocks, said fins extending from said member across the tray with their end edges bearing on the inclined wall, said member having a recess, or recesses, to receive a tool between it and the rigid wall for forcing the grid up the yielding wall, substantially as described.

9. An ice tray of resilient material having upwardly and outwardly inclined side walls, a rigid partition member connected with the bottom of the tray and extending longitudinally thereof, and a grid on each side of said partition with means for moving each grid laterally outward in respect to the rigid partition to free the ice blocks formed by the grid.

10. An ice tray having an upwardly and outwardly inclined side wall, projections on and stationary with its bottom wall inclining upwardly therefrom in a direction towards the upwardly extending wall of said tray, a grid member within the tray, and means for moving said grid member in a direction towards the outer wall of the tray and in relation to the stationary inclined projection on the bottom of the tray whereby in said movement the inclined projection will exert a lifting effect for freeing the ice from the tray, substantially as described.

11. In combination, a tray having upwardly and outwardly inclined side walls, projections on and stationary with the bottom wall of the tray inclining upwardly and outwardly towards the said side walls, a grid composed of sections, and means for moving said sections from the central portion of the tray outwardly towards the inclined sides and over the inclined projections, substantially as described.

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