Dec. 19, 1939. A. LENNING 2,183,750

ICE TRAY

Filed March 12, 1936

Fig. 1.

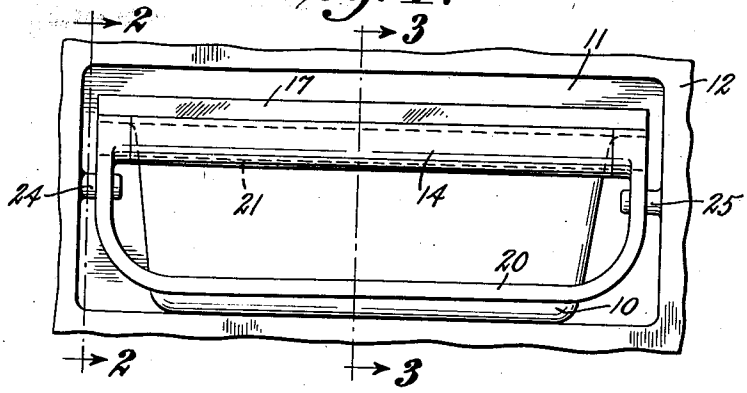



Fig. 2.

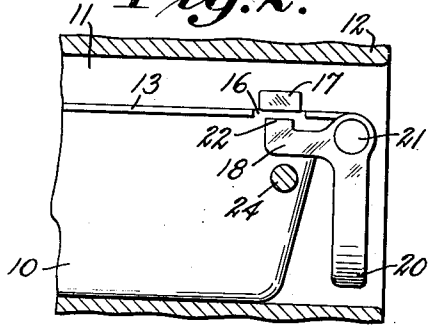



Fig. 3.

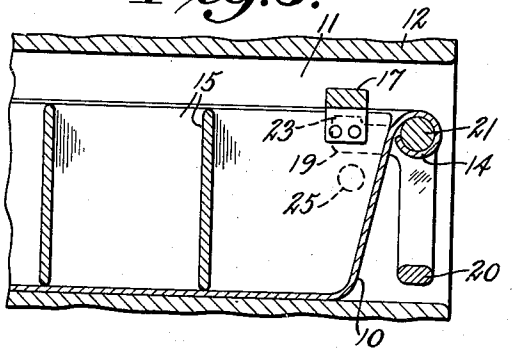
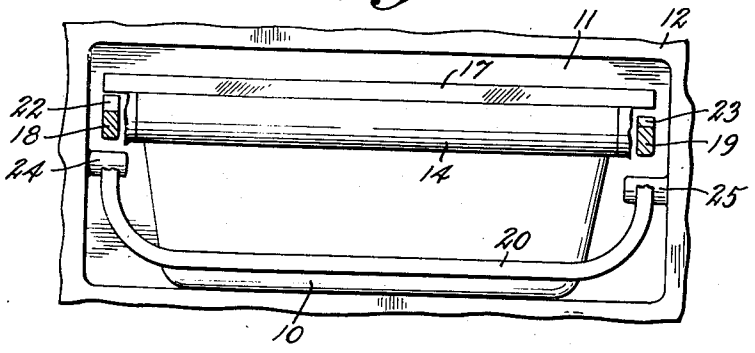



Fig. 4.




INVENTOR,
Alvar Lenning

BY

Dr. L. Hedlund
his ATTORNEY.

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# UNITED STATES PATENT OFFICE

2,183,750

## ICE TRAY

Alvar Lenning, Stockholm, Sweden, assignor, by mesne assignments, to Servel, Inc., New York, N. Y., a corporation of Delaware

Application March 12, 1936, Serial No. 68,466
In Germany March 14, 1935

17 Claims. (Cl. 62—108.5)

My invention relates to ice trays for refrigerators and it is an object of the invention to provide a simple and effective device to facilitate removal of an ice tray from a cooling element and also removal of ice cubes from the tray as will appear from the following description and the accompanying drawing forming part of this specification and of which:

Fig. 1 is a front elevation of a freezing element and ice tray embodying the invention;

Fig. 2 is a fragmentary section taken on line 2—2 in Fig. 1;

Fig. 3 is a fragmentary section taken on line 3—3 in Fig. 1; and

Fig. 4 is a view similar to Fig. 1 and illustrating a modification of the invention.

An ice tray 10 is of a desired size to be received in a freezing chamber 11 of a refrigerator cooling element 12. The tray 10 may be formed of sheet aluminum or other suitable metal, and has a plain stiffening flange 13 around its upper edge except at the front end of the tray where the flange is looped completely around to form a sleeve 14 extending across the upper front edge of the tray. The tray 10 is provided with any suitable type of grid or tray partition member 15 which is removably contained in the tray for forming a plurality of ice pieces.

The flange at the upper edge of the tray is notched on each side of the tray adjacent the front end thereof as at 16 in Fig. 2. The grid 15 is provided wtih a cross-bar 17 adjacent its forward end, and the ends of the cross-bar 17 extend slightly beyond the sides of the tray 10 and overlie the notches 16. By exerting an upward force on the cross-bar 17, the grid 15 and the ice cubes frozen therein may be broken loose from the tray 10 in a block, and thereafter removed from the grid. For this purpose the grid 15, although here illustrated as an ordinary rigid metal grid, may be of any desired structure permitting easy removal of the cubes therefrom, such as reenforced soft rubber grid or resilient metal structure.

For the purpose of exerting an upward force on the crossbar 17, I provide two bell-crank levers pivoted on the tray and operable to engage the cross-bar 17. These bell-cranks have short arms 18 and 19, one on each side of the tray, and long arms formed by legs of a generally U-shaped handle 20. The handle 20 and arms 18 and 19 are integrally formed and pivoted on a rod 21 extending through the sleeve 14 on the front edge of the tray 10. The handle 20 may be journaled on the ends of the rod 21, or the rod may be journaled in the sleeves 14, or both. The weight distribution is such that the handle 20 depends downwardly in front of the tray and the arms 18 and 19 extend horizontally along each side of the tray. The arms 18 and 19 have upward projections 22 and 23 adapted to be moved through the notches 16 and into engagement with the ends of the cross-bar 17 on the grid to exert a force for breaking a bond between the ice cubes and the tray. It will now be understood that this is accomplished by pressing the handle 20 toward the tray.

The cooling element 12 is provided with bosses or other suitable projections 24 and 25 which project respectively beneath the bell-crank arms 18 and 19 when the tray 10 is located in freezing compartment 11 as in Fig. 1. It will now be understood that by pulling the handle 20 away from the tray 10, the arms 18 and 19 will be brought to bear upon the projections 24 and 25 and thereby exert a force for breaking a bond between the bottom of the tray 10 and that part of the cooling element 12 on which it rests.

Referring to Fig. 4, the cooling element projection 25 may be located slightly lower than the projection 24, so that, upon pulling the handle 20, the arm 18 will exert a force on the projection 24 before the arm 19 contacts the projection 25. This preliminary force, being exerted at only one corner of the tray 10 tends to warp the tray and thereby initiate breaking of the bond with what has been referred to as peeling action. In order to obtain this warping or peeling action in removal of the grid 15 from the tray, the projection 22 on the arm 18 may be made slightly longer than the projection 23 on the arm 19, so that the projection 22 engages one end of the grid cross-bar 17 very slightly in advance of engagement of the projection 23 with the other end of the cross-bar 17. The slight movement of the cross-bar 17 before both ends thereof are engaged, tends to twist that portion of the grid 15 to which the cross-bar 17 is attached and thereby initiate breaking of the bond at one point, which breaking is then gradually continued over a greater area upon continued pressure on the handle 20.

It will be understood that various changes and modifications may be made within the scope of the invention as indicated in the following claims.

What is claimed is:

1. In combination with an ice tray having a removable grid, an improved force multiplying device for breaking the grid loose from the tray and including a bell-crank lever pivoted on the tray, with the short arm adapted to engage the grid and operable to exert a removing force substantially perpendicular to the force exerted on the long arm.

2. In combination with an ice tray having a removable grid and a freezing element adapted to receive the tray, projections on said grid and said element, and a lever pivoted on said tray and normally held by gravity in a position intermediate the projections on said grid and element,

respectively, whereby removing forces between the tray and said element and between the tray and the grid may be exerted by moving said lever in opposite directions.

3. In combination with an ice tray having a removable grid, a pair of levers on said tray operable to engage said grid at opposite sides of said tray, and a handle for the tray connecting said levers and operable to operate the levers to exert a removing force on said grid substantially perpendicular to the force exerted on the handle.

4. In combination with an ice tray and a freezing element adapted to receive the tray, projections on said element, a pair of levers on said tray operable to engage said projections at opposite sides of the tray, and a handle for the tray connecting said levers and operable to operate the levers to exert a force between the tray and projections substantially perpendicular to the force exerted on the handle.

5. In combination with an ice tray having a removable grid, a pair of levers on the tray operable to engage the grid at different points, and constructed and arranged so that one of said levers engages the grid in advance of the other lever, and means for operating said levers together.

6. In combination with an ice tray having a removable grid, a handle pivoted on said tray and constructed and arranged to exert removing force on said grid at first one point and then simultaneously at two points.

7. In combination with an ice tray and freezing element therefor, a handle pivoted on said tray and constructed and arranged to exert a removing force between the tray and freezing element at first one point and then simultaneously at two points.

8. In combination with an ice tray having a removable grid, an improved leverage device for breaking the tray loose from a cooling element and breaking the grid loose from the tray and consisting of a bell crank lever pivoted on said tray so that the weight of one arm holds the other arm in direct operative relation with both said grid and a part associated with said cooling element when the tray is placed in the cooling element.

9. In combination with an ice tray having a removable grid, an improved leverage device for breaking the tray loose from a cooling element and breaking the grid loose from the tray and consisting of a bell crank lever pivoted on each side of said tray, and a U-shaped tray handle forming one arm of each lever and holding the other arms thereof by gravity in operative relation with both said grid and a part associated with said cooling element when the tray is placed in the cooling element.

10. In combination with an ice tray having a removable grid, a lever pivoted on said tray, said lever having a first portion depending below said pivot point to provide a handle and being movable by a susbtantially horizontal tangential force to cause another and lighter portion of said lever at an angle to said first portion to exert a vertical removing force on said grid.

11. In combination with an ice tray and refrigerated shelf support therefor, an improved leverage device for breaking the tray loose from the shelf and consisting of a bell crank lever pivoted on said tray and having a long arm depending from the pivot point, the center of gravity of said bell crank normally being vertically beneath the pivot point, and said long arm being operable by a substantially horizontal tangential force.

12. In combination with an ice tray having a removable grid, an improved leverage device for both breaking the tray loose from a support and breaking the grid loose from the tray and consisting of a bell crank lever pivoted on said tray, said lever having a longer arm depending below the pivot point to hold a shorter arm in operative position, said depending arm being operable in opposite directions by a substantially horizontal tangential force.

13. In combination with an ice tray member having a removable grid member, a lever pivoted on one of said members and having a first portion depending downward below said pivot point on the outside of a wall of said tray member to provide a handle, and said downward depending portion of said lever being angularly movable upwardly in a plane transverse to said wall to cause another portion of said lever at an angle to said first portion to exert removing force on said grid member with respect to said tray member.

14. In combination with an ice tray and freezing element therefor, a lever pivoted on said tray and having a first portion adapted to engage a surface associated with the freezing element to exert a removing force between the tray and freezing element, said lever having a second heavier portion fixed with respect to said first portion and depending freely beneath the pivot point with the center of gravity of said lever being vertically beneath the pivot point to normally hold the latter in operative position, and said second heavier portion forming a handle and being operable by a substantially horizontal tangential force.

15. In ice freezing apparatus, the combination of a tray member having a bottom, end walls and longitudinal side walls, a grid member removably fitting into said tray member, and means normally attached to one of said members and cooperating with the other of said members at an end of said tray member at only one region thereof offset with respect to the medial longitudinal and transverse axes of said tray member to break the ice bond and loosen said grid member from said tray member.

16. In ice freezing apparatus, the combination of a tray member having a bottom, end walls and longitudinal side walls, a grid member removably fitting into said tray member, and a lever pivotally attached to one of said members and cooperating with the other of said members at an end of said tray member at only one region thereof offset with respect to the medial longitudinal and transverse axes of said tray member to break the ice bond and loosen said grid member from said tray member.

17. In ice freezing apparatus, the combination of a tray, a grid removably fitting into said tray, and a lever pivoted on said tray and cooperating with said grid at a region offset with respect to the medial longitudinal and transverse axes of said tray to produce the total separating force effective to break the ice bond to loosen said grid from said tray.

ALVAR LENNING.