

Oct. 10, 1944.

A. C. SHUART

2,360,286

REFRIGERATION

Filed July 10, 1942

2 Sheets-Sheet 1

Fig. 1.

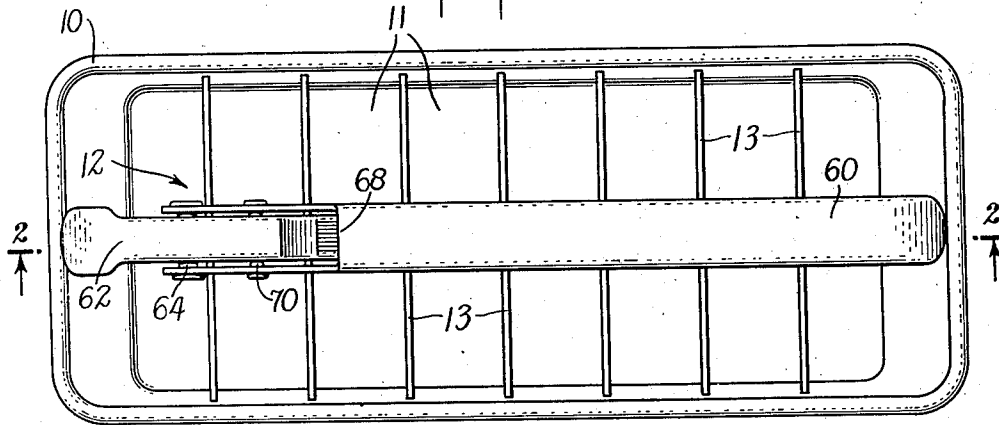


Fig. 2.

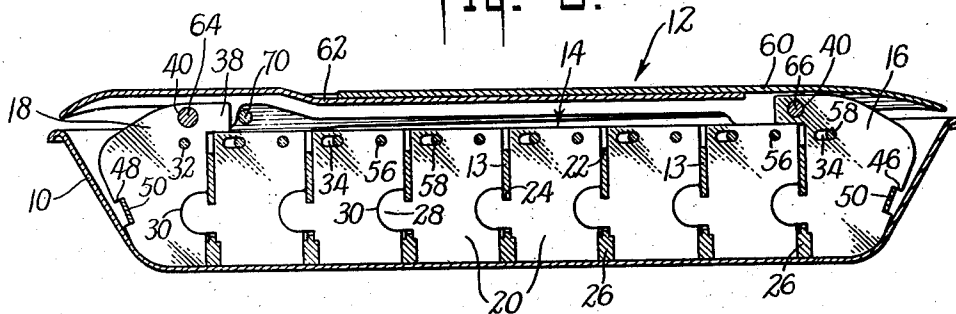


Fig. 3.

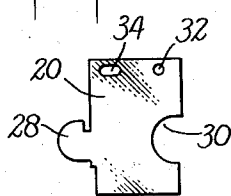


Fig. 4.

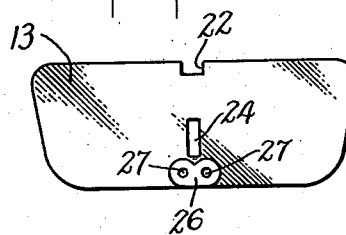
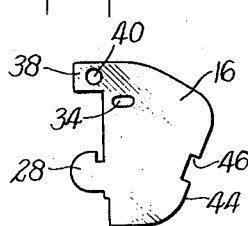


Fig. 5.



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2 Sheets-Sheet 2

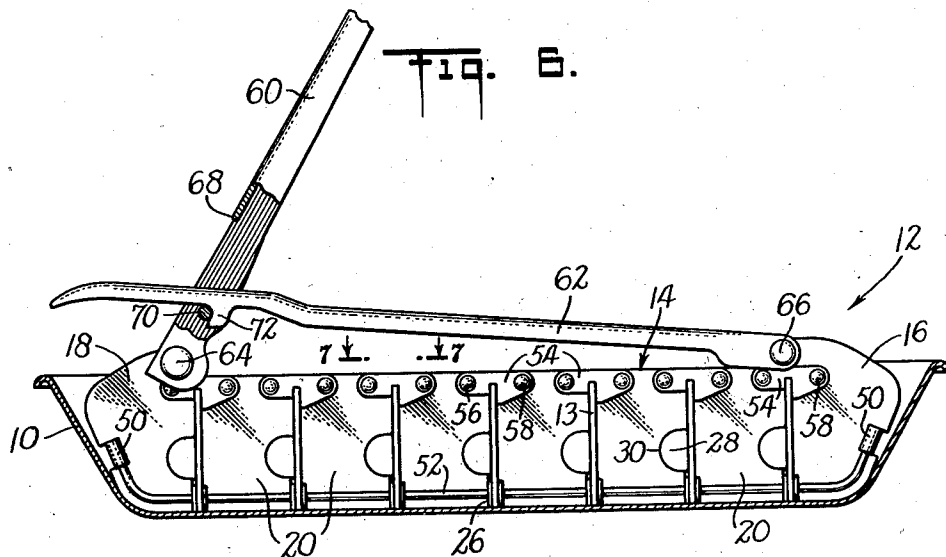


Fig. 7.

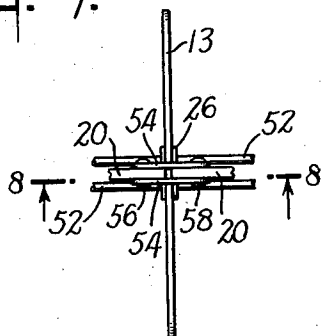


Fig. 8.

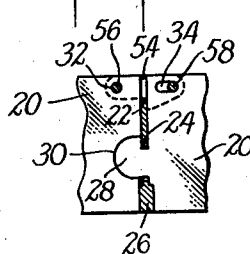
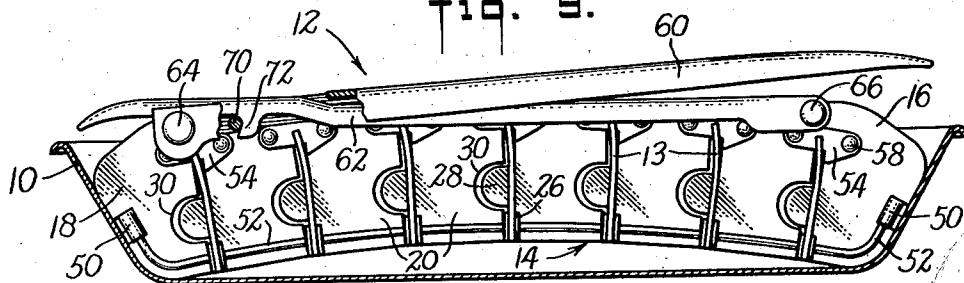


Fig. 9.



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2,360,286

REFRIGERATION

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Application July 10, 1942, Serial No. 450,399

10 Claims. (Cl. 62-108.5)

This invention relates to refrigeration and more particularly to an ice tray and grid used for freezing small blocks or cubes of ice in a domestic refrigerator.

An object of this invention is to provide, in an ice tray, an improved grid by which ice may be removed quickly and efficiently. A further object is to provide a thoroughly reliable and efficient grid for an ice tray which is mainly non-metallic and which is free of the objectionable characteristics and features normally associated with grids of this character. These and other objects will be in part obvious and in part pointed out below.

In the drawings:

Figure 1 is a top view of a grid embodying the invention in an ice tray;

Figure 2 is a vertical section taken on line 2-2 in Figure 1;

Figure 3 is an elevation of a division member forming part of the center wall of the grid;

Figure 4 is an elevation of a transverse division member forming part of the grid;

Figure 5 is an elevation of a division member forming an end of the center wall of the grid;

Figure 6 is a side elevation of the grid in a tray, with the tray and part of the handle broken away showing an operative position of the handle;

Figure 7 is a detail section taken on line 7-7 in Figure 6;

Figure 8 is a detail section taken on line 8-8 in Figure 7; and,

Figure 9 is a view like that of Figure 6 showing a different position in operation of the grid.

Referring particularly to Figure 1 of the drawings, a tray 10 has therein a grid structure indicated at 12 formed by a plurality of identical transverse division members or webs 13 and (see Figure 2) a longitudinal or center wall, indicated at 14, which is in the form of an articulated backbone or center wall. This grid divides the space within the tray into a plurality of cells 11, there being a row of these cells on each side of the center wall. At the ends of center wall 14 are end members or segments 16 and 18, and positioned between these end segments are several identical wall segments 20. Webs 13 and wall segments 16, 18, and 20 are all made of a sheet form of a transparent synthetic plastic, illustratively polystyrene, which is a soft coal derivative. These various members may be cut from sheets of the material, or they may be formed directly by extrusion.

Webs 13 are of the shape shown in Figure 4,

with a notch 22 at the top, a vertically extending slot 24 directly below the notch, and at the bottom a thickened boss portion 26 through which extend two holes 27. Wall segments 20 are of the shape shown in Figure 3, with a rounded hook 28 on one side and a recess 30 at the other side, and with a small round hole 32 and a horizontally extending slot 34 at the top. In Figure 5 are shown the details of the end member 16, which has at its left side a hook 28 and at the top a rectangular projection 38 which projects in the same direction as hook 28. In the top of end wall 16 is a small round hole 40, and below this hole is a slot 34 similar to the slots in segments 20. The right-hand edge 44 of end member 16 has substantially the same slope as the end wall of tray 10, and along this edge is a small rectangular notch 46. End member 18 is similar to end member 16 but (see Figure 2) is provided with a recess 30 and a hole 32 similar to the corresponding portions of segments 20; the end member is also provided with a projection 38, a hole 40, and a notch 48, the same as is end member 16.

When assembled, webs 13 and the elements of the center wall interfit in the manner shown in Figure 2, with each of hooks 28 extending through the slot 24 in the adjacent web 13, with the round end of the hook fitting into a recess 30 in the next wall portion, and with the hook snugly receiving the web at the top of the slot. Each of rectangular projections 38 on the two end members 16 and 18 extends over the adjacent web and along the top of the adjacent wall segment. Extending along the two sides of the bottom of the center wall are two spring rods 52, illustratively of spring steel, which extend upward at the ends along the edges of the end members 16 and 18. At each end these two rods are connected by a sheet metal clip 50 which extends through the notch 46 in the end member, with the ends of the clip enclosing and clamping the ends of the rods. These rods exert forces against the end members and are adapted to be arched or bowed, as shown in Figure 9, by bending moments applied to the ends of the grid; upon release of the forces causing the bending moments, the rods return to their original form. Rods 52 extend through and are snugly received by holes 27 in the web members 13, with the bosses 26 reinforcing the webs about the holes.

Across the top of each of webs 13, and on opposite sides of the center wall, are two members 54 which are small strips of sheet metal. These

strips (see Fig. 8) are connected at one end to a center wall segment 20 by a rivet 56 fastened in a hole 32, and loosely linked at the other end to the next adjacent center wall section by a rivet 58 which is slidable in a short slot 34. The strips 54 lie in the notch 22 in the top of the web 13 and have a hooked part projecting downward over the side of the web so that the top of the web is hooked to the wall portion at the left.

Extending along the top of the center wall in nested relationship are two channel levers 60 and 62, with the outer channel lever 60 being pivoted at the left on a rivet 64 extending through hole 40 in end member 18, and with lever 62 pivoted at the right on a rivet 66 carried by a hole 40 in end member 16. As shown in Figure 1, when the levers are nested, lever 60 hides most of lever 62, but lever 62 extends to the left at 68 where lever 60 is cut away. At the left-hand end, lever 60 carries a pin 70 (see also Figure 9), and lever 62 is provided with a latch portion 72 which, as shown in Figure 6, is adapted to interengage with pin 70. Thus, when lever 60 is raised to the position of Figure 6, lever 62 falls to the position shown, and when lever 60 is then moved downward, tending to push the tops of the two end members apart, bending moments are exerted upon the two end members 16 and 18, with the result that the backbone or center wall is arched to the position shown in Figure 9.

As pointed out above, each of hooks 28 is hooked to the center portion of the adjacent web 13, thereby holding the center of the web to the right-hand segment 20, and the top of the web is held against the left-hand wall segment 20 by the hooked strips 54. Furthermore, the top of each wall segment 20 is loosely linked to the top of the next wall segment by the strips 54 which permit limited separating movement due to the fact that rivets 58 may slide in slots 34. Thus, when the bending moments are exerted upon the tops of the two end members 16 and 18, the top of each web 13 is pulled to the left a limited distance which is the length of slot 34, while the center portion of the web is pulled to the right; thus, the web is flexed in the manner shown in Figure 9. Assuming that ice has been frozen in the tray prior to the applying of the bending moments to the end members, it will be seen that the arching of the grid to the position of Figure 9 will draw each wall segment away from the adjacent wall segment and will flex the transverse web and this action separates the ice from the tray and from the walls of the grid. At each juncture of one wall segment with the next, the hook portion 28 is interpolated between two portions of the next wall segment and the flexing action pulls the hook portion away so that shearing stresses are set up tending to break the cubes in the adjacent compartments 11 from the longitudinal wall.

It will be obvious to those skilled in the art that changes in the disclosed construction, operation, and arrangement may be made without departing from my inventive concept and, therefore, while I have shown and described herein with more or less particularity one embodiment of my invention, it is to be expressly understood that the invention is not limited to that embodiment or otherwise than by the terms of the appended claims.

I claim:

1. An ice tray and grid structure comprising a tray adapted to hold water, and a grid assembly fitting therein including an articulated plastic backbone structure formed by a number of wall segments in alignment with the segments meeting to form joints in the backbone structure, a plurality of plastic unitary transverse fins positioned with one fin intersecting the backbone structure at each of the joints, each of said joints including hook means upon one of the adjacent wall segments engaging the transverse member at substantially its center, and a hooked member connected to the other adjacent wall segment and engaging the top of the transverse member.

2. An ice tray and grid combination comprising a tray to hold water, and a grid assembly fitting therein and defining ice compartments, said grid assembly including a plurality of plastic transverse members, a longitudinal wall structure formed of a plurality of plastic wall segments all in interlocking relationship, said segments being in substantial alignment to form the longitudinal wall with the transverse members intersecting the longitudinal wall where the wall segments meet, each of said wall segments excepting the two end segments being thereby positioned between two transverse members, and a hooked member connected to each of said wall segments except one end segment and engaging the top of one of the transverse members, each of said wall segments except the other end segment having a hooked portion engaging a transverse member at a point spaced from the top thereof.

3. An ice tray and grid combination comprising a tray to hold water, and a grid assembly fitting therein and defining ice compartments, said grid assembly including a plurality of transverse members of plastic material and a longitudinal wall structure formed of a plurality of wall segments of plastic material and all in interlocking relationship, said wall segments being in substantial alignment to form the longitudinal wall with the transverse members intersecting the longitudinal wall where the wall segments meet, and metallic means at each of said transverse members forming a latching engagement with the top of the wall segment on one side of it and the wall segment on the other side of it having an integral portion forming a latching engagement with the central portion of the wall segment.

4. An ice tray and grid combination comprising a tray to hold water, and a distortable grid assembly fitting therein and defining ice compartments, said grid assembly including a plurality of transverse members of plastic material and a longitudinal wall structure formed of a plurality of wall segments of plastic material and all in interlocking relationship, said wall segments being in substantial alignment to form the longitudinal wall with the transverse members intersecting the longitudinal wall where the wall segments meet, said wall segments being adapted to have limited longitudinal relative movement at the top thereof, and at each line where two wall segments meet there being a flexing means, each of said flexing means comprising multiple hook means to engage a transverse member to thereby become effective when the two wall segments are moved relative to each other to bend and distort the transverse member.

5. The combination with a freezing tray, of a grid including a longitudinal wall structure

and a plurality of individual transverse members of plastic material, said longitudinal wall structure comprising a plurality of wall segments of plastic material and in substantial alignment with flexible joints between the segments and with a transverse member positioned at each joint and cooperating with the other elements to form the joint, and hook means each joint comprising a pair of hook-links extending across the top of the transverse member with one end of the pair of links pivoted to one wall segment and with the other end of the pair of links attached to the other wall segment by a pin-and-slot attachment and with the hook-links hooked over and extended down along one side of the transverse member whereby the top of the transverse member is held against one of the wall segments and limited movement is permitted between the top of the transverse member and the other wall segment, and the joint including means to hold the lower portion of the transverse member against the other wall segment.

6. An ice tray and grid structure comprising a tray adapted to hold water, and a grid assembly fitting therein including an articulated backbone structure formed of a number of wall segments of plastic material and in alignment, and a plurality of unitary transverse webs of plastic material and positioned so that one web intersects the backbone structure where each wall segment meets another wall segment, each of said transverse webs having a cut-away portion in alignment with the backbone structure and one of the adjacent wall segments being cut away adjacent the cut-away portion of the transverse web while the other adjacent wall segment has an integral wall portion extended through the cut-away portion of the transverse web and into the cut-away portion of the first-mentioned adjacent wall segment, whereby the second-mentioned adjacent wall segment has a portion interpolated between two portions of the first-mentioned wall segment.

7. An ice tray and grid structure comprising a tray adapted to hold water, and a grid assembly fitting therein including an articulated backbone structure formed of a number of wall segments of plastic material and in alignment, and a plurality of unitary transverse webs of plastic material and positioned so that one web

intersects the backbone structure where each wall segment meets another wall segment, there being at each place where one wall segment meets another wall segment a portion of the one wall segment interpolated between two portions of the other wall segment.

8. An ice tray and grid structure comprising a tray adapted to hold water, and a grid assembly fitting therein including an articulated backbone structure formed of a number of wall segments of plastic material and in alignment, and a plurality of unitary transverse webs of plastic material and positioned so that one web intersects the backbone structure where each wall segment meets another wall segment, there being at each place where two wall segments meet a portion of one wall segment which projects beyond the transverse web and into a recessed portion of the other wall segment so that between each two transverse webs the backbone structure is formed by two separate wall segments which are in alignment and have the same surface planes.

9. The combination with a freezing tray, of a distortable grid having walls of plastic material and including a plurality of individual transverse members and a longitudinal wall structure formed of a plurality of wall segments, said wall segments being in substantial alignment with joints therebetween and with a transverse member intersecting said longitudinal wall at each joint, resilient means at the bottom of the longitudinal wall structure to hold the segments together, and means to distort the grid to free the ice, each transverse member being held at the top against one of the adjacent wall segments and held at a lower portion against the other adjacent wall segment, the distortion of the grid tending to separate the top of each wall segment from the top of said other adjacent wall segment.

10. Apparatus as set forth in claim 9 wherein said resilient means comprises a pair of spring rods, and a notch is provided in the wall segment at each end of the longitudinal wall structure, and a clip releasably positioned within each of said notches and rigidly attached to the adjacent ends of said spring rods.

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