Dec. 22, 1942. H. D. GEYER 2,306,307

ICE TRAY

Filed May 10, 1937 2 Sheets-Sheet 1

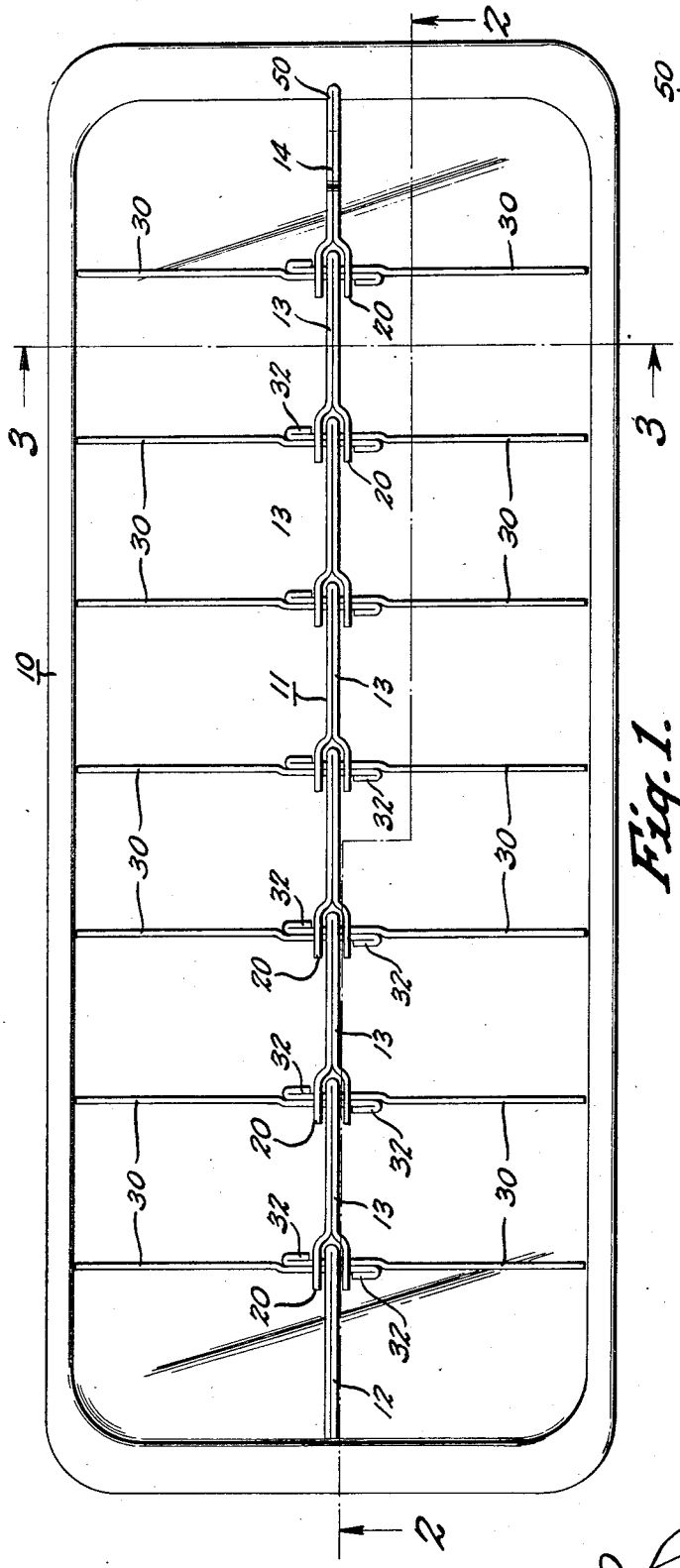


Fig. 1.

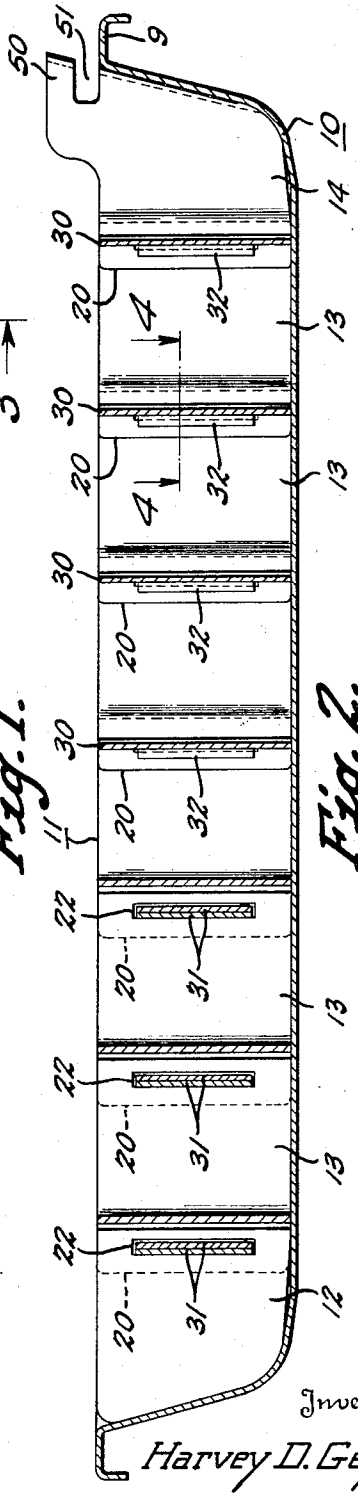


Fig. 2.

Inventor

Harvey D. Geyer

By Spencer Hardman & Fehr

his Attorneys

Dec. 22, 1942. H. D. GEYER 2,306,307

ICE TRAY

Filed May 10, 1937 2 Sheets-Sheet 2

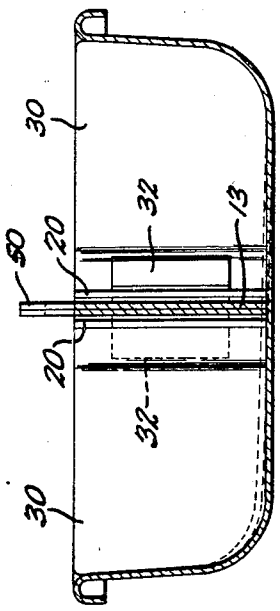


Fig. 3.

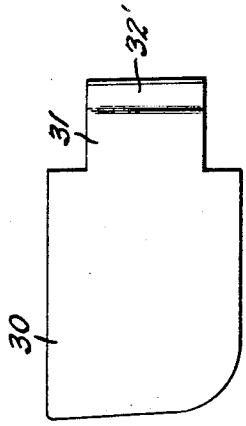


Fig. 7.

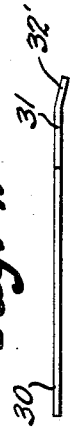


Fig. 8.

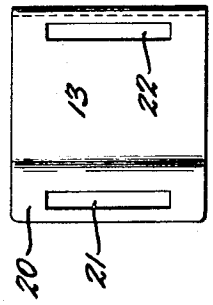


Fig. 9.

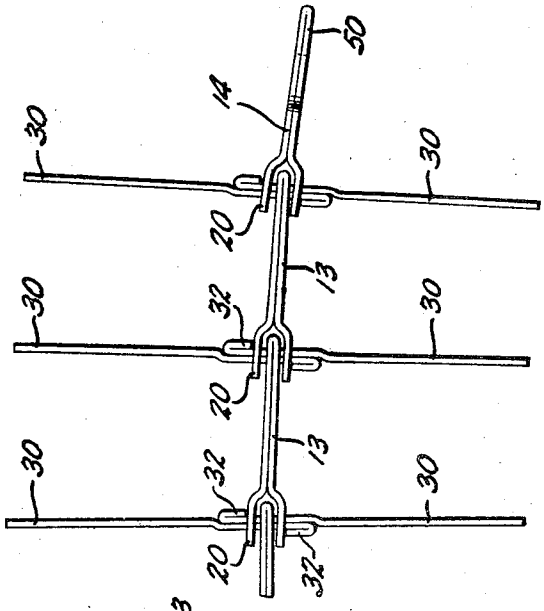


Fig. 5.

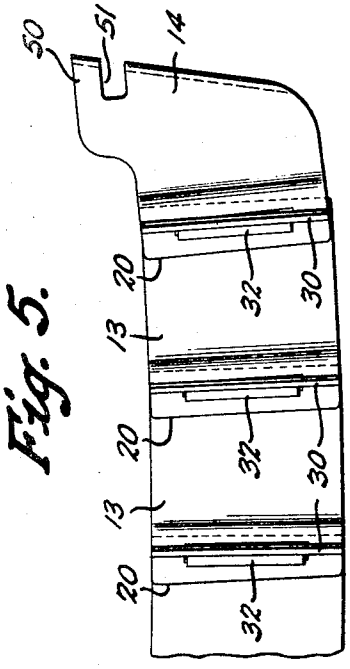


Fig. 6.

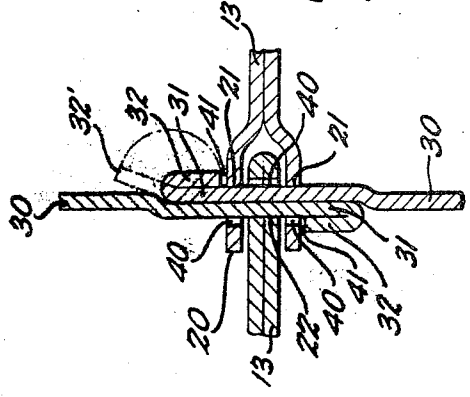


Fig. 4.

Inventor

Harvey D. Geyer

By Spencer Hardman & Fehr

his Attorneys

Patented Dec. 22, 1942 2,306,307

UNITED STATES PATENT OFFICE

2,306,307

ICE TRAY

Harvey D. Geyer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application May 10, 1937, Serial No. 141,609

4 Claims. (Cl. 62—108.5)

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

An object of this invention is to provide an easily distortable metal grid to facilitate the removal of the frozen ice blocks by distortion thereof without first melting the ice free.

Another object is to provide such a grid that can be simply and economically made and assembled from pressed sheet metal parts.

Another object is to provide a grid having a series of separate metal sections loosely connected together by loose joints which permit relative movement between the connected sections.

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 an ice tray and removable grid made according to this invention.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 is an enlarged section on line 4—4 of Fig. 2, and illustrates a method of assembling the grid parts.

Fig. 5 is a view illustrating how the removed grid may be bent laterally due to the loose joints.

Fig. 6 is a view illustrating how the grid may be bent vertically due to the loose joints.

Fig. 7 is a detail of one side of one cross wall as originally formed and ready to be assembled to the other parts as shown in Fig. 4.

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

Fig. 9 is a detail of one of the intermediate sections of the longitudinal wall.

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

Numeral 10 designates the metal container pan which may be of any suitable design, but is here shown to be a slightly flexible metal pan with raised diagonally opposite corners such as that disclosed and claimed in my copending application S. N. 88,559, filed July 2, 1936, which has matured into Patent No. 2,122,937.

The removable distortable metal grid forms the subject matter of this application. The central longitudinal composite wall 11 is formed from a series of wall sections 12, 13, and 14 which are loosely connected together as herein later described in detail. The intermediate sections 13 are all alike and are made by folding a blank of sheet metal to form a main wall of double thickness but having a yoke 20 at one vertical edge thereof, as shown in Figs. 1 and 4. Each section 13 has a vertical slot 21 thru both prongs of yoke 20 and another similar vertical slot 22 thru its other vertical edge (see Fig. 9). The end section 14 is similarly formed with a slotted yoke 20 at its inner vertical edge. The other end section 12 has no yoke but has a vertical slot 22 in its inner vertical edge. This series of wall sections 12, 13, and 14 when all nested loosely together as shown in plan in Fig. 1 will cause the slots 21 of the yokes 20 to substantially register with the slots 22 in the next adjacent sections.

Half of the series of cross wall sections 30 are completely formed as shown in Fig. 1 with an inner tongue 31 having a return bend 32 at its tip. The other half of the cross wall sections 30 are first formed as shown in Figs. 7 and 8, that is, the portion 32' which is later bent back to form the return bend 32 is left extending angularly outward. This is also clearly shown in dotted lines in Fig. 4.

Now to assemble the grid parts together, the central sections 12, 13, and 14 are nested together so that the yoke slots 21 register with the similar slots 22 on the next adjacent section. One set of fully formed cross walls 30 then have their tongues 31 with the return bend 32 thereon threaded thru the aligned slots 21 and 22, these slots being sufficiently wide to permit this. Then the companion cross wall, with its tongue portion temporarily formed as shown at 32' in Figs. 7 and 8, is slipped into place thru the remaining width of the slots 21 and 22 until the parts are in the position shown in Fig. 4, the tongue 32' being then in its dotted position as shown. Tongue 32' is then bent back to form the return bend 32 and thus prevent any subsequent withdrawal of either of the cross sections 30 from the slots 21 and 22.

It is clearly shown in Fig. 4 that slots 21 and 22 are wider than the combined thickness of the two tongues 31 extending therethru by the clearance distance 40. These clearances 40 are highly important because they permit the two connected sections 13 to move longitudinally relative to each other and to the cross walls 30 and also to hinge in a vertical plane as illustrated in Fig. 6.

Fig. 4 also clearly shows a substantial clearance 41 between the ends of the return bends 32 and the lateral surfaces of the yoke 20. These clearances 41 are also important because they permit the two complementary cross walls 30 to move transversely relative to each other and to the center sections 13 and also permit the composite longitudinal central wall 11 to hinge lat-

erally freely in either direction as illustrated in Fig. 5. It is thus seen that all the metal sections are permanently retained together by loose joints or connections which permit a limited free movement to each individual connected section. This provides a universally distortable grid even tho each individual metal section may be quite rigid.

When the grid is inserted into pan 10 all the metal sections are urged inwardly toward each other by the tapered side walls of pan 10. That is, the parts are in the relative positions shown in Fig. 4 during freezing of the ice. It will also be noted that when the central sections 13 are urged toward each other the cross walls 30 are automatically forced to a position perpendicular to the central wall 11, and hence cross walls 30 all then lie parallel to each other and directly transverse the tray. This action is due to the two slots 21 of each yoke 20 being similarly located on opposite sides of the slot 22 in the next adjacent section 13, as will be clear from viewing Fig. 4.

In operation, the loosely jointed grid is set down into pan 10, whereupon all the grid parts will automatically take the position shown in Fig. 1, as explained above. The pan 10 may be filled with water to the desired level either before or after the grid is inserted in the pan. After the ice is completely frozen the pan 10 may be removed from its grid and ice contents either by flexing the pan as disclosed in my above-mentioned pending application S. N. 88,559, or by any other suitable presently known means. The grid may then be readily distorted in various ways by hand to remove the individual ice blocks. For instance, the grid may be bent or twisted as a whole to loosen the individual ice blocks therefrom since none of the metal sections are rigidly fixed together and all have a limited universal movement which permits them to hinge slightly in any direction. Only a very slight relative movement between the metal sections is necessary to loosen the ice bond, whereupon the ice blocks will either fall out or may be easily picked out with the fingers. Preferably the metal parts are all of anodized aluminum or aluminum alloy which has been subsequently dipped into molten wax to provide a surface thereon to which ice will not adhere with a strong bond.

If desired, the end section 14 of the central composite wall 11 may have a raised lug 50 providing a notch 51 adjacent the lip 9 of pan 10, into which any suitable tool or lever may be inserted to pry out the grid and ice block as a unit from the flexible metal pan 10. Obviously the down force on the lip 9 caused by the prying tool will slightly flex the pan 10 and cause it to peel progressively from the solid ice block.

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. A freezing tray having a removable grid, said grid comprising: a composite longitudinal wall comprising a series of metal sections loosely arranged together so as to be relatively movable longitudinally, and a series of transverse metal walls intersecting said longitudinal wall, said transverse metal walls being slidably connected to said longitudinal metal sections.

2. A freezing tray having a removable grid, said grid comprising: a composite longitudinal wall comprising a series of metal sections loosely arranged together so as to be relatively movable longitudinally, and a series of transverse metal walls each having a pair of metal sections, the two sections of each pair extending laterally upon opposite sides of said longitudinal wall and being relatively movable in a transverse direction.

3. A freezing tray having a removable grid, said grid comprising a composite longitudinal wall comprising a series of metal sections loosely connected together so as to be relatively movable longitudinally, and a series of transverse metal walls loosely joined to said composite wall and having a transverse movement relative to said composite wall.

4. A freezing tray having a removable grid, said grid comprising: a main longitudinal wall comprising a series of relatively short metal sections movably connected together so as to permit a longitudinal bending distortion of said main wall as a whole by relative movement between said metal sections, and a series of transverse walls relatively slidably connected to said main longitudinal wall so as to be slidable transversely thereto.

HARVEY D. GEYER.