Feb. 13, 1945. C. R. CARNEY 2,369,532

ICE TRAY

Filed Dec. 19, 1940 3 Sheets-Sheet 1

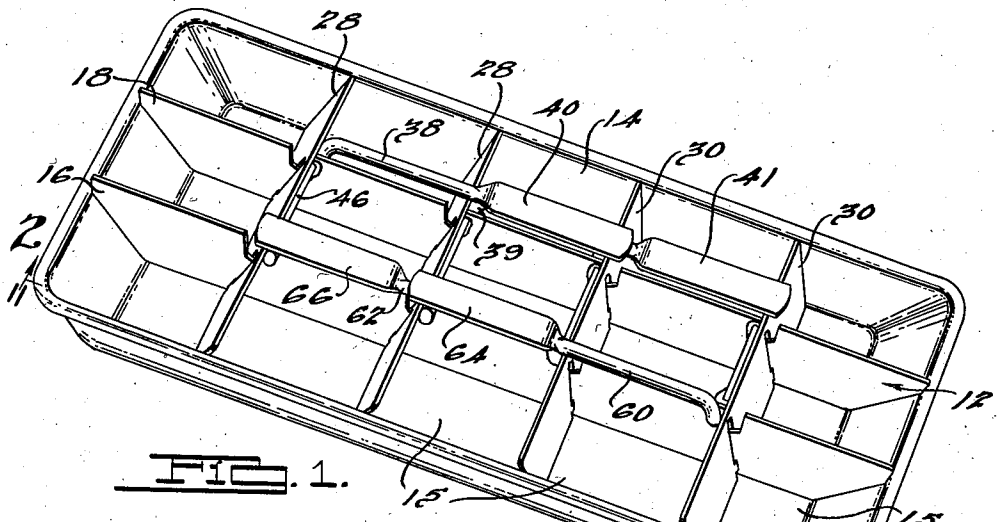


FIG. 1.

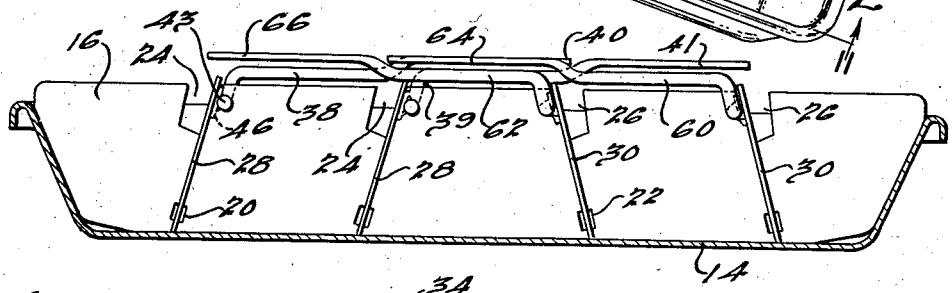


FIG. 2.

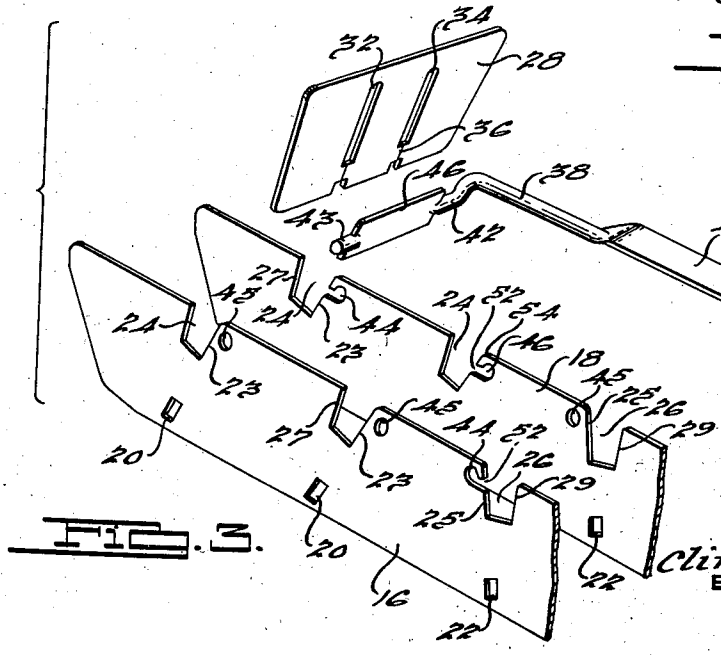


FIG. 3.

INVENTOR
Clifford R. Carney
BY
Dike, Calver & Gray
ATTORNEYS.

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ICE TRAY

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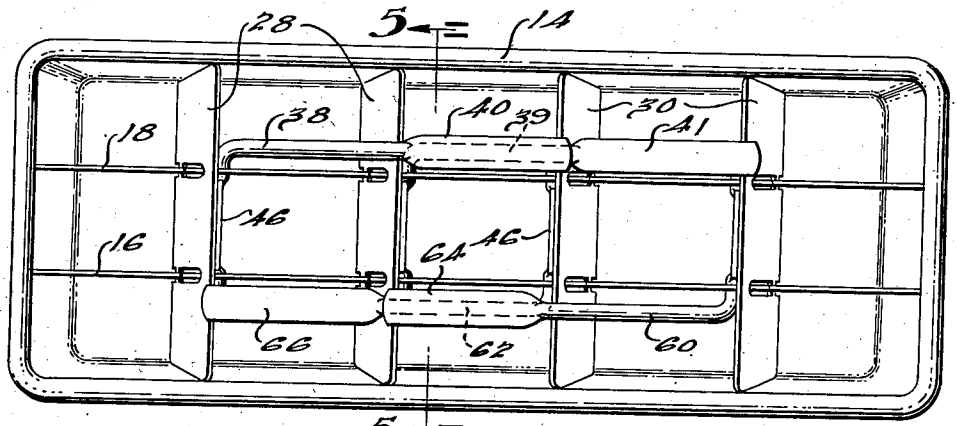


FIG. 4.

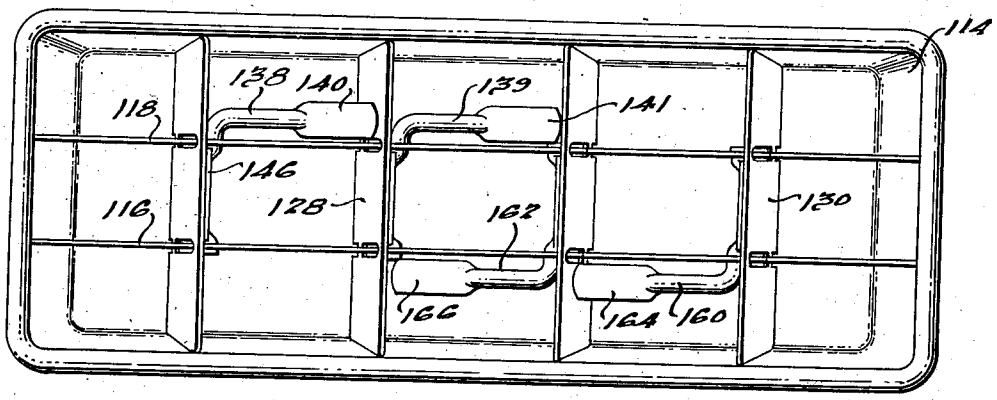


FIG. 3.

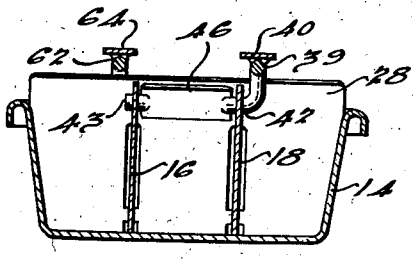


FIG. 5.

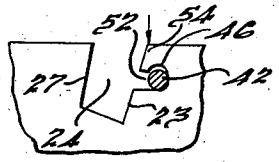


FIG. 6.

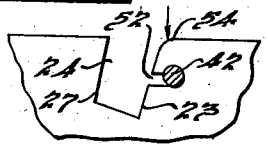


FIG. 7.

INVENTOR
Clifford R. Carney.
BY
Dick, Calver & Gray
ATTORNEYS.

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ICE TRAY

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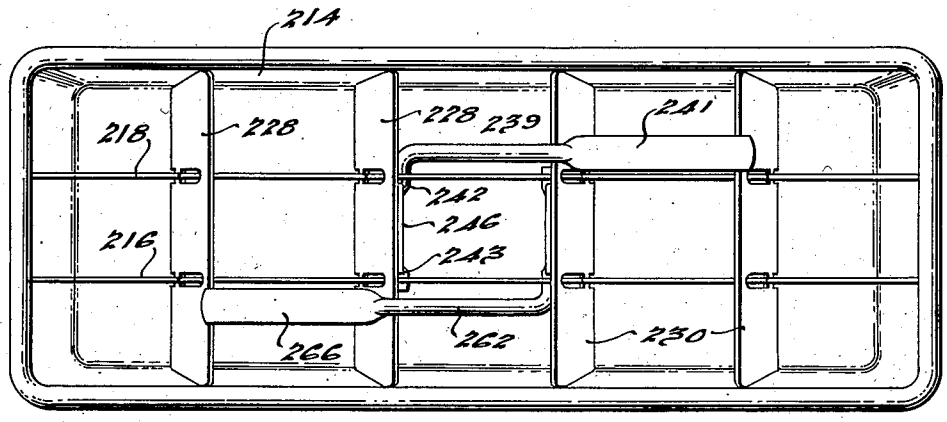


FIG. 9.

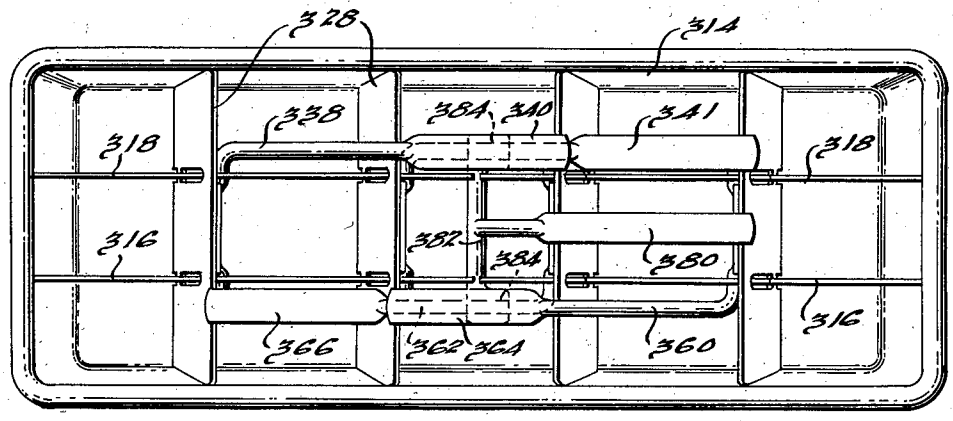


FIG. 10.

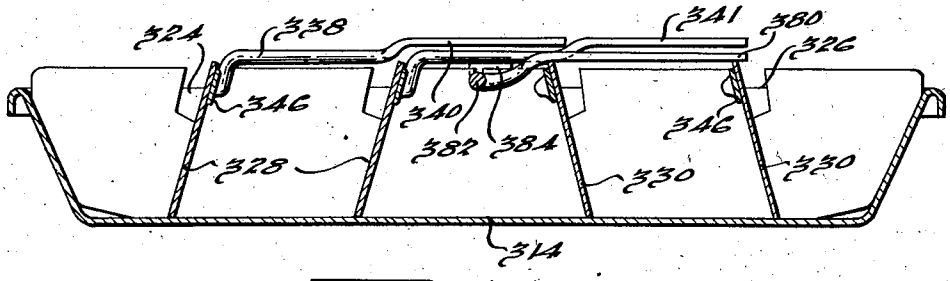


FIG. 11.

INVENTOR
Clifford R. Carney
BY
Pike, Calmer & Ba
ATTORNEYS.

Patented Feb. 13, 1945 2,369,532

UNITED STATES PATENT OFFICE

2,369,532

ICE TRAY

Clifford R. Carney, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application December 19, 1940, Serial No. 370,763

11 Claims. (Cl. 62—108.5)

This invention relates to ice trays and more particularly to a novel and improved grid structure adapted to be positioned within a pan member to divide the space within the pan into a plurality of ice block compartments of convenient size for domestic use.

An object of this invention is to provide an ice tray grid having a plurality of independently operable members which may be selectively actuated to release any desired number of ice blocks from the grid and tray members.

A further object resides in the provision of an ice tray grid for dividing the space within a pan into a plurality of ice block compartments of convenient size for domestic use wherein separate manually operable means are provided to selectively release varying quantities of ice blocks without disturbing the frozen bond between other ice blocks and the grid and pan members.

A further object resides in the provision of a grid having a plurality of spaced longitudinally extending separator members and a plurality of generally transversely extending separator members hingedly mounted relative to the longitudinal separator members in such a manner that manually operable means hingedly connected with the longitudinal separator members may be independently actuated to selectively move the transverse members angularly to release any desired quantity of ice blocks.

A still further object is to provide a novel and improved actuating member which may be hingedly connected to generally longitudinally extending separator members to exert a force on generally transversely extending separator members to move the transverse members relative to the longitudinal members to release ice.

Another object is to provide an ice tray grid having a plurality of nested handle members associated with longitudinal separator members and so arranged that the handle members may be selectively actuated to move generally transverse separator members to release any desired quantity of ice blocks.

Still another object is to provide a grid having a plurality of spaced longitudinally extending separator members and a plurality of sets of angularly directed transversely extending separator members disposed in opposite angular directions relative to each other and wherein oppositely directed nested handle members are provided to selectively actuate the transverse members of each set.

Yet a further object is to provide a single manually operable member which may be employed to actuate a plurality of separate handle members each associated with a separate transverse separator member hingedly mounted on longitudinally extending separator means whereby all or any desired number of transverse separator members may be simultaneously actuated.

A still further object resides in the provision of novel actuating means hingedly carried by a plurality of generally longitudinally extending separator members to simultaneously or successively actuate transverse separator members associated with the longitudinal separator members.

A further object is to provide a grid member having a plurality of oppositely disposed transverse separator members associated with longitudinally extending separator members wherein means associated with a pair of oppositely disposed separator members are provided to actuate all of the transverse members of each of said oppositely disposed sets.

Other objects and advantages of this invention will be apparent from the following detailed description considered in connection with the accompanying drawings, submitted for purposes of illustration only, and not intended to define the scope of the invention, reference being had for that purpose to the subjoined claims.

In the drawings wherein similar reference characters refer to similar parts throughout the several views:

Fig. 1 is a perspective view of an ice tray grid embodying the present invention.

Fig. 2 is a longitudinal sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view showing the component parts of the grid member in separated relationship.

Fig. 4 is a plan view of the grid structure illustrated in Figs. 1 and 2.

Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 4, looking in the direction of the arrows.

Fig. 6 is a longitudinal sectional view of a portion of the structure showing one step of the operation of assembling one of the handles to one of the separator members of the device.

Fig. 7 is a view similar to Fig. 6 showing another step in the assembling operation.

Fig. 8 is a plan view of a grid structure embodying a modified form of the invention.

Fig. 9 is a plan view illustrating a still further modified form of the invention.

Fig. 10 is a plan view of a grid mechanism

embodying still another modified form of the invention.

Fig. 11 is a longitudinal sectional view of the device illustrated in Fig. 10.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring now to the embodiment of the invention illustrated in Figs. 1 to 7, it will be observed that an ice tray grid designated as a whole by the reference numeral 12 may be positioned in a pan member 14 to divide the space within the pan into a plurality of ice block compartments 15 of suitable size for domestic use. The grid 12 preferably comprises two generally longitudinally extending separator members 16 and 18 which may be positioned in a substantially vertical position. As more clearly illustrated in Fig. 3, the separator members 16 and 18 are preferably each provided with spaced apertured or cut-out portions 20 and 22 formed adjacent their lower edges and are each provided with notched or cut-out portions 24 and 26 formed in or adjacent their upper edges.

A plurality of generally transversely extending separator members 28 and 30 angularly inclined in opposite directions may be mounted on the longitudinal separator members 16 and 18 and may be interlocked therewith to provide a unitary grid structure. Each of the transverse members is provided with a pair of spaced generally vertically extending slots 32 and 34 adapted to receive the longitudinal separator members 16 and 18.

The apertures or cut-out portions 20 and 22 formed in the longitudinal separator members are provided to receive locking tabs 36 carried by the transverse separator members to hold the longitudinal and transverse separator members in the assembled relationship. The apertures 20 and 22 are longitudinally spaced with reference to wall portions 23 and 25 of the notched portions 24 and 26 in such a manner that the transverse members 28 and 30 normally engage the wall portions 23 and 25 respectively to maintain the transverse members in an ice forming position inclined at an angle to the vertical as more clearly disclosed in Fig. 2. The transverse members 28 and 30 are free to move angularly in the slots 24 and 26 toward wall portions 27 and 29, thereby moving angularly from the inactive or ice forming position towards the vertical position to release ice.

Means preferably carried by the longitudinal separator members 16 and 18 may be provided to engage and selectively actuate the transverse separator members 28 and 30 to move them angularly to effect the release of ice.

One desirable form of means for actuating the transverse separator members 28 comprises generally longitudinally extending aligned levers 38 and 39 having nested handle members 40 and 41. These nested lever and handle members for actuating the transverse separator members 28 are positioned to extend longitudinally of the grid adjacent the longitudinal separator member 18.

These levers 38 and 39 are provided with generally tranversely extending portions having spaced bearing surfaces 42 and 43 adapted to project through apertures 44 and 45 respectively formed in the longitudinal separator members 18 and 16 respectively.

A camming or actuating member 46 is interposed between the bearing surfaces 42 and 43 of the portion of the levers 38 and 39 between the longitudinal separator members 16 and 18. The camming member 46 is in substantial alignment with the walls 23 of the notches 24 against which the transverse separator members 28 rest when in the normal ice freezing position. Actuation of either of the handle members 40 or 41 results in the exertion by the camming member 46 of a force on the back of the associated transverse separator member 28. The transverse separator members are thus moved angularly in the slots 24 from the walls 23 towards the walls 27 to release ice when the handle members are actuated.

In order to facilitate assembly of the grid structure the apertures 44 in the longitudinal separator member are formed with a forwardly directed slot 52 of sufficient width to permit the bearing surface 42 of the lever 38 or 39 to enter the aperture 46 as more clearly illustrated in Fig. 6. In assembling the handles 38 and 39 to the grid structure, the bearing surface 43 is projected through the aperture 45 of the longitudinal separator member 16 and the bearing surface 42 is moved through the slot 52 into the aperture 46 of the longitudinal separator 18. The upper edge portion 54 of the longitudinal separator member 18 is then bent downwardly as illustrated in Fig. 7 whereupon the metal defining the aperture 46 engages the bearing surface 42 as illustrated to lock the handles in assembled relation with the longitudinal separator members 16 and 18.

The transverse separator members 30 are hingedly mounted on the longitudinal separator members 16 and 18 in such a manner that they also move angularly to release ice accompanied by a movement of their upper edge portions towards the end of the pan.

Means may also be provided to independently actuate each of the transverse separator members 30 to release ice. This actuating means may be similar to that employed to actuate the transverse separator members 28 wherein aligned lever members 60 and 62 are provided with aligned or nested handles 64 and 66 positioned to extend longitudinally of the grid adjacent the longitudinal separator member 16.

The levers 60 and 62 may be operably connected to the longitudinal members and actuate the transverse members in the same manner as the levers 38 and 39 actuate the transverse separator members 28.

It will be noted that the longitudinal separator members 16 and 18 are symmetrical. Only one forming die is required to make the longitudinal separator members because a pair of members may be positioned in opposite directions, the apertures 44 of the longitudinal separator member 18 receiving the levers 38 and 39 to actuate the transverse separator members 28, and the oppositely directed apertures 44 of the member 16 receiving the levers 60 and 62 to actuate the transverse separator members 30.

When it is desired to release ice blocks from this grid and tray structure, any one of the handles 40, 41, 64 or 66 may be actuated to move its associated transverse member angularly rela-

tive to the longitudinal separator members to release ice blocks from the grid and tray structure. If only a small quantity of ice blocks is required, the handles 40 or 64 may be actuated to move its associated transverse separator member 28 or 30 nearest the end of the pan to release three ice blocks.

If six ice blocks are desired, the handle members 40 and 41 may be successively actuated or the handle members 40 and 64 may be actuated to release the ice blocks associated with a pair of transverse members 28 or 30. If it is desired to remove all of the ice blocks from the grid and tray, the handles may be moved simultaneously or successively to actuate all of the transverse grid members 28 and 30 to release the ice and the grid structure 12 may be removed from the pan 14 thereby effecting the release of the ice blocks between the inner transverse members 28 and 30.

Attention is called to the fact that it is immaterial which handles are actuated first because if any handle is actuated ice will be released. If either of the handles 41 or 66 is actuated first to move its associated transverse member 28 or 30 angularly, force will be exerted through the ice blocks between the transverse separator members 28 and 30 to actuate the transverse separator members adjacent the ends of the pan, thereby releasing ice.

The embodiment of the invention illustrated in Fig. 8 is similar in many respects to that illustrated in Figs. 1 to 7. Corresponding parts have therefore been given corresponding reference numerals with the addition of 100. If it is desired to eliminate the overlapping or nesting of the handles depicted in Figs. 1, 2 and 4, relatively short handle members 140, 141, 164 and 166 may be provided to actuate relatively short levers 138, 139, 160 and 162 to move the transverse separator members 28 and 30 angularly to effect the release of ice.

Referring now to the embodiment of the invention illustrated in Fig. 9, it will be observed that the grid structure is generally similar to that illustrated in Figs. 1 to 7. Corresponding parts have therefore been given corresponding reference numerals with the addition of 200.

In this embodiment of the invention it will be observed that the transverse separator members adjacent the ends of the pan are not provided with actuating members, and that a single actuating member is provided to move a plurality of the transverse members which are disposed in one angular direction. In the operation of this device, the handle member 241 provided to actuate one of the transverse members 228 may be employed to exert a force to move the forward transverse member 228 by a force directed through the ice blocks interposed between the transverse members 228. In the operation of this embodiment of the invention it is only necessary to actuate one member to release six ice blocks at a time because force is transmitted through the intermediate ice blocks to actuate the transverse members adjacent the ends of the pan.

Figs. 10 and 11 illustrate an embodiment of the invention wherein all of the separate lever or handle members employed to actuate each transverse separator member may be moved simultaneously by manipulation of a single handle member 380 having oppositely directed arms 382 pivotally mounted in the longitudinal separator members 316 and 318 and provided with actuating cam members 384 positioned to engage the levers to which each of the handle members associated with each transverse member is connected. By merely elevating the handle member 380 the handle members associated with all of the transverse separator members may be simultaneously actuated to release all of the ice within the pan 14.

It will be understood that this actuating mechanism may be employed in a grid structure having a single longitudinal separator member rather than spaced longitudinally extending separator members. In the practical application of this type of actuating mechanism to a grid having a single longitudinal separator member, the actuating handles may be connected to occupy inoperative positions adjacent the longitudinal separator member but on opposite sides thereof.

I claim:

1. In an ice tray grid, a plurality of spaced longitudinally extending separator members, a plurality of generally transversely extending separator members interlocked with the longitudinal separator members and movable thereon through arcs to effect the release of ice, and separate manually operable means carried by the longitudinal separator members to engage the transverse separator members to selectively actuate each transverse member to release ice.

2. In an ice tray, a pan member, and a grid member to divide the space within the pan into a plurality of ice block compartments of convenient size for domestic use, said grid comprising a plurality of generally longitudinally extending separator members, a plurality of generally transversely extending separator members mounted on the longitudinal separator members and movable from an angular position toward the vertical to release ice, and separate means hingedly mounted on the longitudinal separator members to engage each transverse separator member to move each transverse member angularly to release ice.

3. A grid member adapted to be positioned in a pan to divide the space within the pan into a plurality of ice block compartments of convenient size for domestic use comprising a pair of generally longitudinally extending substantially vertically disposed separator members, a plurality of generally transversely disposed normally angularly inclined separator members mounted on the longitudinal separator members and movable thereon from a normal ice forming position toward the vertical to release ice, separate actuating means carried by the longitudinally extending separator members to engage each transverse separator member to move it angularly to release ice, and separate manually operable means to move each of said actuating means.

4. In an ice tray grid, a pair of generally longitudinally extending separator members, a plurality of generally transversely extending separator members, each of said transverse separator members being movable from an angularly inclined position toward the vertical position to release ice, the transverse members adjacent one end of the grid being inclined angularly in the opposite direction to the transverse members adjacent the other end of the grid, actuating means pivotally mounted in the longitudinally extending separator members to engage each transverse separator member to move each of said members angularly to release ice, and nested handle members operably connected to said actuating means.

5. An ice cube forming device including a pan

member and a grid member adapted to divide the space within the pan into a plurality of ice block cells, said grid member comprising a plurality of longitudinal separator members, a plurality of transverse separator members hingedly mounted on the longitudinal separators and movable from an angularly inclined position towards the vertical to release ice, the transverse separator members at opposite ends of the grid being inclined angularly in opposite directions, and manually operable means hingedly mounted in the longitudinal separator members adjacent each transverse separator member whereby each transverse member may be independently actuated to release ice.

6. A grid member comprising a generally longitudinally extending separator member, a plurality of generally transversely extending separator members interlocked with the longitudinal separator member in such a manner that the transverse members may move from an angularly inclined position toward the vertical to release ice, and manually operable means pivotally connected to the longitudinal separator member adjacent each transverse member and arranged to directly engage and tilt forward said transverse members, whereby each transverse member may be actuated to release ice.

7. In an ice tray grid, a plurality of spaced longitudinally extending separator members, a plurality of generally transversely extending separator members, each transverse separator member being interlocked with the longitudinal separator members and movable thereon through an arc to effect the release of ice, and a plurality of manually operable means each pivotally mounted on the longitudinal separator members and operably connected to each transverse separator member to engage each of said transverse members to move it through said arc to release ice.

8. In an ice tray, a pan member, a grid member to divide the space within the pan into a plurality of ice block compartments of convenient size for domestic use, said grid comprising a longitudinally extending separator member, a plurality of generally transversely extending separator members mounted on the longitudinal separator member and movable from an angular position toward the vertical to release ice, and spaced means hingely mounted on the longitudinal separator member adjacent each transverse member to engage each of said transverse separator members to selectively move them angularly to release ice.

9. A grid member adapted to be positioned in a pan to divide the space within the pan into a plurality of ice block compartments of convenient size for domestic use comprising a pair of generally longitudinally extending substantially vertically disposed separator members, a plurality of generally transversely disposed normally angularly inclined separator members mounted on the longitudinal separator members and movable thereon from a normal ice forming position toward the vertical to release ice, actuating means pivotally mounted on the longitudinally extending separator members adjacent each transverse separator member to move each transverse separator member angularly to release ice, and manually operable means including nested oppositely directed handle members associated with each longitudinal grid member controlling said actuating means.

10. In an ice tray grid, a pair of generally longitudinally extending separator members, a plurality of generally transversely extending separator members, each of said transverse separator members being movable from an angularly inclined position toward the vertical position to release ice, some of said transverse separator members being angularly inclined in opposite directions to other of said transverse members, actuating means pivotally mounted in the longitudinally extending separator members to engage each transverse separator member to move each of said members angularly to release ice, nested handle members operably connected to said actuating means, a single handle member pivotally mounted in the longitudinal separator members, and motion transmitting means carried by said single handle member and positioned to engage the nested handle members whereby movement of said single member actuates all of the transverse separator members to release ice.

11. An ice cube forming device including a pan member and a grid member adapted to divide the space within the pan into a plurality of ice block cells, said grid member comprising a plurality of longitudinal separator members, a plurality of transverse separator members hingedly mounted on the longitudinal separators and movable from angularly inclined positions towards the vertical to release ice, the transverse separator members at opposite ends of the grid being inclined angularly in opposite directions, actuating means hingedly mounted in the longitudinal separator members adjacent each transverse separator member whereby each transverse member may be independently actuated to release ice, and oppositely directed handle members carried by the actuating means and extending longitudinally of the grid adjacent the longitudinally extending separator members.

CLIFFORD R. CARNEY.