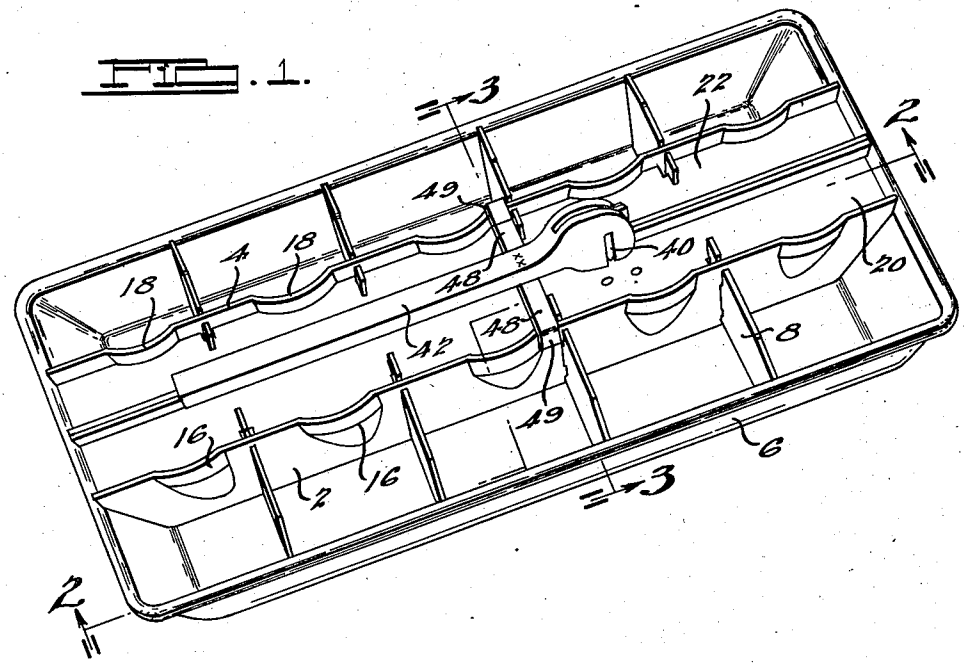
June 30, 1942. C. R. CARNEY 2,287,972

ICE TRAY

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FIG. 1.



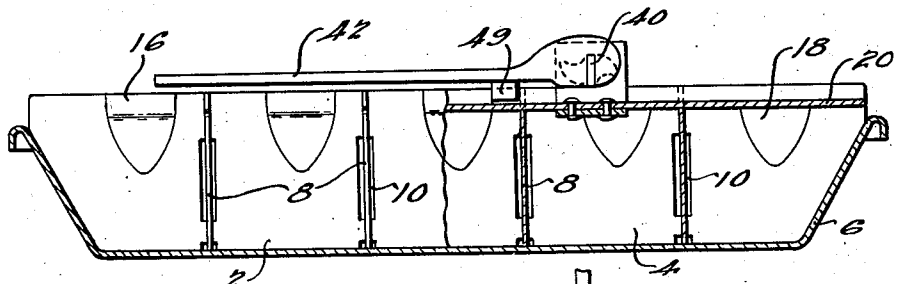


FIG. 2.

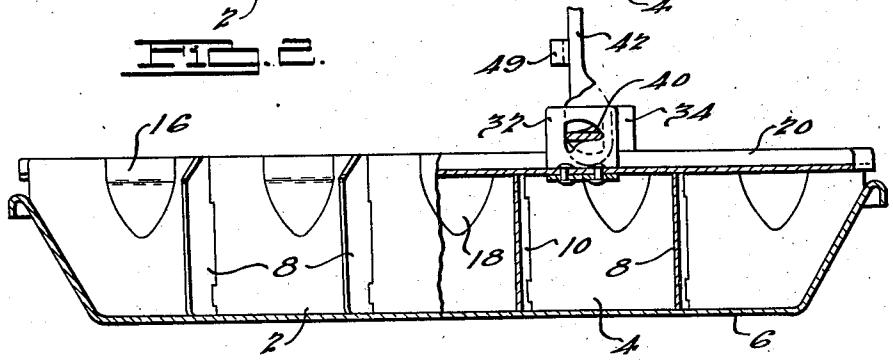


FIG. 3.

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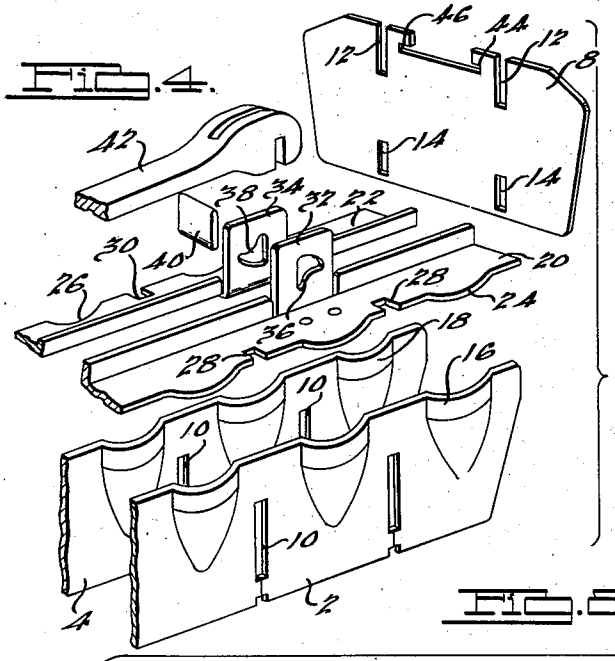


FIG. 4.

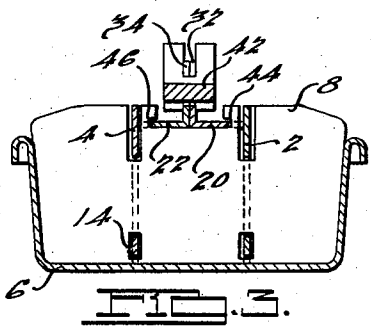


FIG. 3.

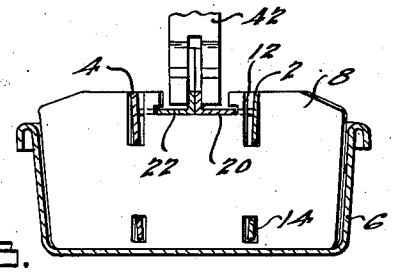


FIG. 5.

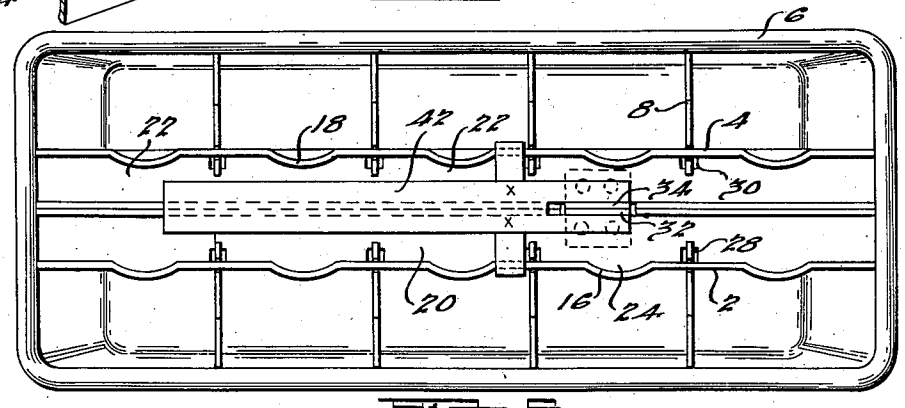


FIG. 6.

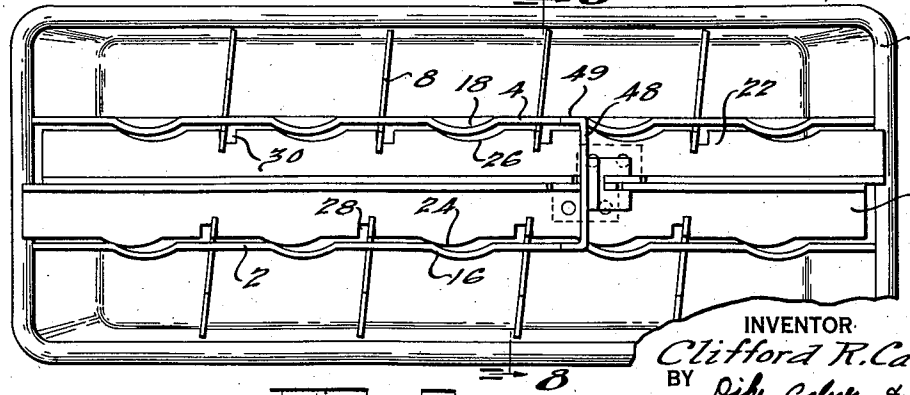


FIG. 7.

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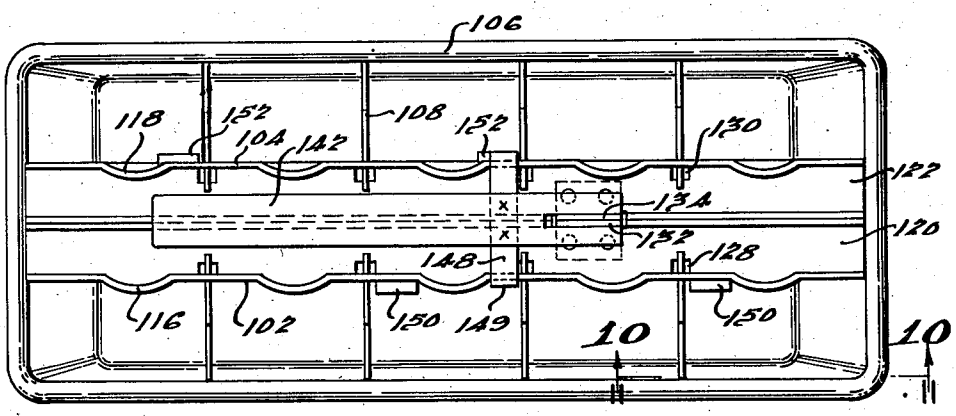


FIG. 9.

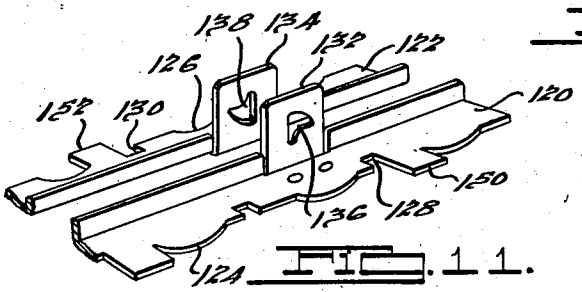


FIG. 11.

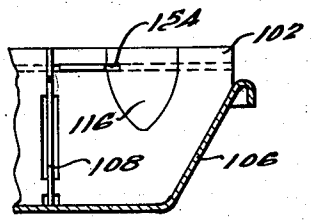


FIG. 10.

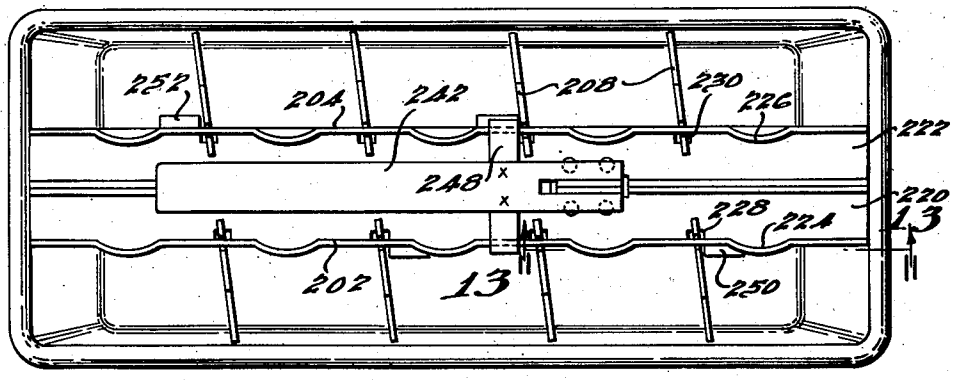


FIG. 12.

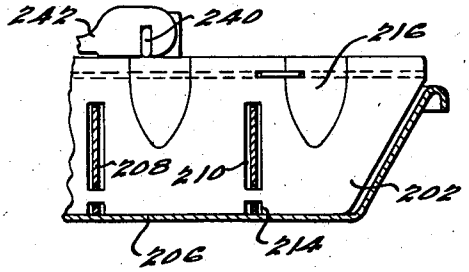


FIG. 13.

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ICE TRAY

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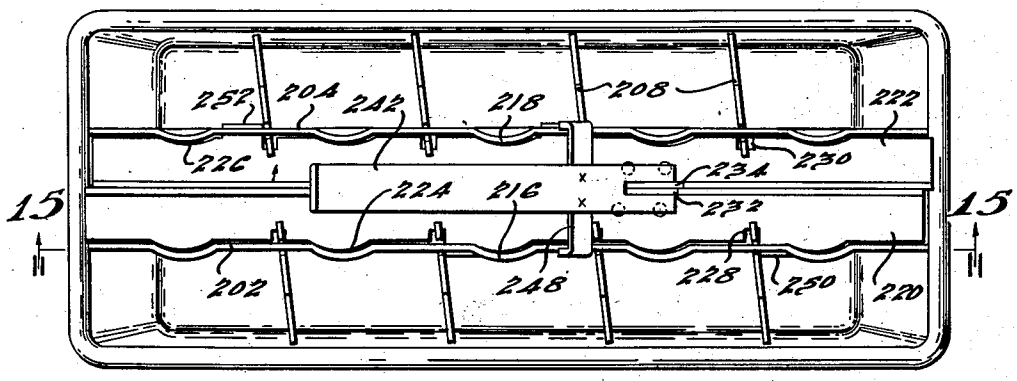


FIG. 14.

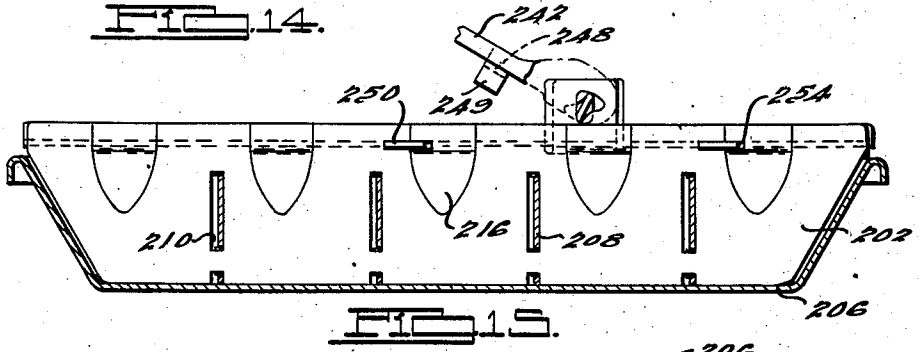


FIG. 15.

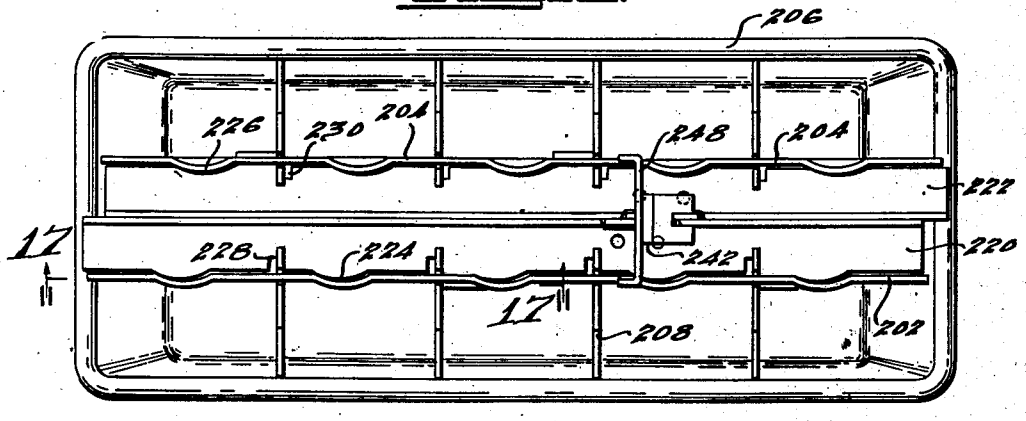


FIG. 16.

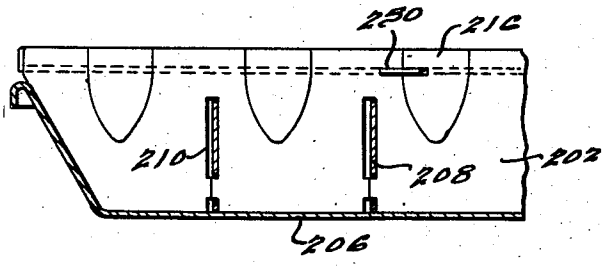


FIG. 17.

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UNITED STATES PATENT OFFICE

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ICE TRAY

Clifford R. Carney, Dearborn, Mich.

Application November 12, 1940, Serial No. 365,140

13 Claims. (Cl. 62—108.5)

This invention relates to ice trays and more particularly to an ice tray grid adapted to divide the space within a pan which may be of a relatively large size into a plurality of ice block compartments of convenient size.

An object of this invention is to provide an ice tray grid having a plurality of oppositely extending separator members to divide the space within the pan into three or more rows of ice block compartments in each direction.

Another object of the invention resides in the provision of an ice tray grid having a plurality of substantially vertically disposed longitudinal separator members and a plurality of vertically disposed transversely extending separator members wherein motion transmitting means are provided to move the longitudinal separator members angularly and to oscillate the transverse separator members about a substantially vertical axis to release ice.

Another object of the invention is to provide an ice tray grid having a plurality of longitudinally extending substantially vertically disposed separator members wherein means positioned intermediate the separator members are provided to move the separator members in opposite directions to release ice.

Another object is to provide an ice tray grid having a plurality of oppositely extending separator members interconnected by novel motion transmitting means whereby the grid members may be readily and easily moved relative to each other to release ice.

Yet a still further object of this invention is to provide a grid structure having a plurality of spaced longitudinal separator members and a plurality of transversely extending separator members wherein motion transmitting means intermediate the longitudinal separator members are provided to move the grid members relative to each other to release ice.

Another object resides in the provision of motion transmitting means to urge longitudinally movable bars in opposite directions to actuate longitudinal and transverse separator members to release ice.

A further object of the invention is to provide an ice tray grid having spaced longitudinal separator members and a plurality of transverse separator members which may be simultaneously or successively actuated by oppositely movable members interposed between the spaced longitudinal separator members.

Still another object is to provide means for moving a pair of spaced longitudinal separator members angularly and longitudinally relative to each other to release ice.

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 one desirable form of ice tray grid structure 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 sectional view taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view showing the component portions of the grid member in separated relationship.

Fig. 5 is a plan view showing the grid structure in the normal or ice freezing position.

Fig. 6 is a view similar to Fig. 5 showing the grid mechanism in the operated or ice releasing position.

Fig. 7 is a sectional view similar to Fig. 2 showing the position of the grid members in the operated or ice releasing position.

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 6 showing the grid in the operated or ice releasing position.

Fig. 9 is a plan view of a device embodying a modified form of the invention showing the grid structure in the normal or ice freezing position.

Fig. 10 is a part sectional view taken substantially on the line 10—10 of Fig. 9, looking in the direction of the arrows.

Fig. 11 is a perspective view of a portion of the motion transmitting mechanism shown in a separated relationship.

Fig. 12 is a plan view of a device embodying a still further modified form of the invention shown in the normal or ice forming position.

Fig. 13 is a sectional view taken substantially on the line 13—13 of Fig. 12, looking in the direction of the arrows.

Fig. 14 is a plan view similar to Fig. 12 showing the grid structure in the partially operated or ice releasing position.

Fig. 15 is a sectional view taken substantially on the line 15—15 of Fig. 14, looking in the direction of the arrows.

Fig. 16 is a plan view similar to Fig. 12 showing

the device in the fully operated or ice releasing position.

Fig. 17 is a sectional view taken substantially on the line 17—17 of Fig. 16, looking in the direction of the arrows.

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 8 inclusive, it will be observed that a plurality of spaced longitudinally extending separator members 2 and 4 are provided to divide the space within a pan 6 into three or more transversely spaced longitudinally extending rows of ice block spaces. A plurality of transverse grid members 8 are associated with the longitudinal separator members 2 and 4 in such a manner as to divide the transversely spaced longitudinal rows of ice block spaces into a plurality of longitudinally spaced ice block compartments.

The longitudinal separator members are provided with substantially vertically extending slots 10 adapted to receive portions of the transverse separator members 8 between upper and lower apertures 12 and 14 formed in the transverse members 8. The members 8 are thus maintained in a substantially vertical position in the pan member 6 by means of the walls of the substantially vertically extending slots 10.

The upper edges of the longitudinal separator members 2 and 4 are formed with spaced indentations or cam portions 16 and 18 respectively which may extend in the same or opposite directions.

A pair of longitudinally movable bars 20 and 22 are interposed between the longitudinal separator members 2 and 4. The bars 20 and 22 may be provided with suitable cam portions 24 and 26 to lie within or receive the cam portions 16 and 18 of the longitudinal separator members 2 and 4 respectively. The bars 20 and 22 may be formed with spaced notches 28 and 30 respectively to receive spaced edge portions of the transverse members 8 adjacent the upper slots 12.

The bars 20 and 22 may each be provided with upwardly extending projections 32 and 34 respectively having suitable oppositely disposed generally triangularly shaped apertures 36 and 38 formed therein. An actuating member or key 40 may be positioned in the cooperating apertures 36 and 38 to move the projections 32 and 34 and the bars 20 and 22 in opposite directions when the key is actuated by means of a suitable handle member which may be of the type illustrated at 42.

The operation of this grid is as follows: When it is desired to release ice blocks or other frozen substances from the grid and pan members the handle 42 may be elevated from the position shown in Fig. 2 toward the position shown in Fig. 7. The key 40 moves in the apertures 36 and 38 to urge the upwardly extending projections 32 and 34 and the bars 20 and 22 to move in opposite directions. The camming portion 24 carried by the bar 20 engages the camming portion 16 of the longitudinal separator member 2 and moves that member angularly about a horizontal axis as will be noted by comparing Figs. 3 and 8. The cam portion 26 of the bar 22 engages the cam portions 18 of the longitudinal separator member 4 and urges that member angularly about a substantially horizontal axis as will be noted by comparing Figs. 3 and 8.

The notches 28 and 30 formed in the outer edges of the oppositely movable bars 20 and 22 engage spaced portions 44 and 46 of the transverse grid members 8 to move the transverse grid members angularly about a substantially vertical axis intermediate their ends, as illustrated by comparing Figs. 5 and 6. The longitudinal and transverse separator members are thus actuated about horizontal and vertical axes to effect the release of the ice from the tray and grid members.

Transversely extending projections 48 having downwardly directed lugs 49 may be carried by the handle member 42 to engage the longitudinal separator members 2 and 4 in the normal or ice freezing inoperative position to maintain the longitudinal separator members in engagement with the inner edges of the slots 12 of the transverse members 8 whereby the longitudinal members may be free to move outwardly upon actuation of the handle member 42 to release ice.

The embodiment of the invention illustrated in Figs. 9 to 11 is similar in many respects to that illustrated in Figs. 1 to 8. Corresponding parts have therefore been given corresponding reference numerals with the addition of 100.

It will be observed that the longitudinally movable bars 120 and 122 are provided with transversely extending lugs 150 and 152 respectively to engage in suitable apertures 154 formed in the longitudinal separator members 102 and 104 to engage and move the longitudinal separator members in opposite directions when the bars 120 and 122 are moved relative to each other.

In the operation of this grid, the longitudinal separator members 102 and 104 are moved angularly about a horizontal axis from the substantially vertical position, and the transverse grid members 108 are moved about a substantially vertical axis intermediate their length. The longitudinal separator members are also moved lengthwise in the pan in opposite directions by the lugs 150 and 152 carried by the bars 120 and 122. Complete actuation of the grid members to thoroughly release the ice is thus effected.

The embodiment of the invention illustrated in Figs. 12 to 17 is similar in certain respects to the embodiments illustrated in Figs. 9 to 11. Corresponding parts have therefore been given corresponding reference numerals with the addition of 100.

Referring to Fig. 12, it will be observed that the vertically extending slots 210 formed in the longitudinal separator members 202 and 204 are longitudinally spaced relative to each other in such a manner that the transverse separator members 208 are normally positioned at an angle other than a right angle to the longitudinal separator members.

When the handle 242 is actuated to move the bars 220 and 222 in opposite directions the camming portions 224 and 226 associated with the camming portions 216 and 218 of the longitudinal separator members 202 and 204 urge the longitudinal separator members outwardly from a substantially vertical position toward an angular

position and the notches 228 and 230 formed in the movable bars 220 and 222 engage spaced points of the transverse members 208 to move them angularly toward the right angular position relative to the longitudinal separator members 202 and 204.

When the lugs 250 and 252 carried by the movable bars 220 and 222 approach the end of the slots 254 formed in the longitudinal separator members 202 and 204, they move the longitudinal separator members 202 and 204 in opposite directions relative to each other to introduce a further movement to insure the complete release of ice from the tray and grid structure.

I claim:

1. An ice tray grid comprising a plurality of spaced longitudinal separator members having substantially vertically disposed slots, a plurality of transverse separator members mounted in said slots, a pair of longitudinally extending actuating bars interposed between the longitudinal separator members, camming means between said bars and longitudinal separator members, and motion transmitting means associated with said actuating bars to move the bars in opposite directions to actuate the camming means and move the longitudinal separator members angularly to release ice.

2. An ice tray grid comprising a plurality of generally vertically disposed transversely extending separator members, a plurality of longitudinally extending separator members mounted on the transverse separator members and movable angularly relative thereto, a pair of longitudinally extending actuating bars interposed between the longitudinal separator members, camming means between the bars and longitudinally extending separator members, and means associated with said actuating bars to move the bars in opposite directions to actuate the camming means and move the longitudinal separator members angularly to release ice.

3. An ice tray grid comprising a plurality of transversely extending separator members, a plurality of longitudinally extending separator members, a pair of actuating bars interposed between the longitudinal separator members, motion transmitting means associated with said bars and longitudinal and transverse separator members whereby movement of the actuating bars in opposite directions moves the longitudinal separator members angularly about substantially horizontal axes and moves the transverse members about substantially vertical axes to release ice, and means to move said bars in opposite directions.

4. An ice tray grid comprising a plurality of spaced longitudinal separator members having substantially vertically disposed slots and longitudinally spaced cam members, a plurality of transverse separator members mounted in said slots, a pair of actuating bars having longitudinally spaced cam members interposed between the longitudinal separator members, and motion transmitting means associated with said actuating bars to move the cam members of the bars relative to the cam members of the longitudinal separator members to actuate said longitudinal separator members angularly about substantially horizontal axes and to move the transverse separator members about substantially vertical axes to release ice.

5. An ice tray grid comprising a plurality of generally vertically disposed transversely extending separator members, a plurality of longitudinally extending separator members mounted on the transverse separator members and movable angularly relative thereto, a pair of actuating bars interposed between the longitudinal separator members and having outwardly directed notches engaging the transverse separator members, cooperating longitudinally spaced cam means associated with the actuating bars and longitudinal separator members, and motion transmitting means to move the actuating bars in opposite directions to transmit forces through said cooperating cam members to the longitudinal members to move them angularly about horizontal axes and to move the transverse members about vertical axes to release ice.

6. An ice tray grid comprising a pair of transversely spaced longitudinal separator members having longitudinally spaced camming portions, a pair of longitudinally extending bars interposed between said separator members and having spaced camming portions engaging the camming portions of the separator members and manually operable means to move the bars in opposite directions relative to the separator members to move said separator members angularly to release ice.

7. An ice tray grid comprising a plurality of transversely extending separator members, a plurality of longitudinal separator members interlocked with the transverse members in such a manner that the longitudinal members may move angularly about horizontal axes and the transverse members may move angularly about vertical axes, and manually operable means to move the longitudinal members about the horizontal axes and to move the transverse members about the vertical axes to release ice.

8. An ice tray grid comprising a pair of transversely spaced longitudinal separator members, a plurality of generally transversely extending separator members interlocked with the longitudinal separator members and movable about substantially vertical axes, a pair of longitudinally movable actuating bars engaging the transversely extending separator members, and manually operable means to move said actuating bars in opposite directions to move the transverse separator members about said substantially vertical axes to release ice.

9. An ice tray grid comprising a plurality of substantially vertically disposed transversely extending separator members, a pair of longitudinal separator members interlocked with the transverse separator members and movable angularly on the transverse separator members, a pair of longitudinally movable actuating bars having motion transmitting means adapted to engage the longitudinal and transverse separator members in such a manner that movement of the actuating bars in opposite directions moves each longitudinal separator member angularly about a horizontal axis and moves each transverse separator member angularly about a vertical axis intermediate the length of the transverse member, and manually operable means to move said actuating bars in opposite directions.

10. An ice tray grid comprising a pair of transversely spaced longitudinal separator members having longitudinally spaced camming portions, a plurality of transversely extending separator members having transversely spaced edge portions, a pair of oppositely movable actuating bars interposed between said longitudinal separator members and having spaced camming portions cooperating with the camming portions of the

longitudinal separator members and spaced notches positioned to engage the transversely spaced edge portions of the transverse separator members, and manually operable means to move the actuating bars in opposite directions to move the longitudinal separator members angularly and to twist the transverse separator members about substantially vertical axes to release ice.

11. An ice tray grid comprising a plurality of transversely extending separator members, a plurality of longitudinal separator members interlocked with the transverse members in such a manner that the longitudinal members may move angularly about horizontal axes and the transverse members may move angularly about vertical axes, a pair of oppositely movable spaced bars associated with the longitudinal and transverse members, and manually operable means to move said bars in opposite directions to move the longitudinal and transverse separator members about horizontal and vertical axes respectively to release ice.

12. An ice tray grid comprising a pair of spaced longitudinal separator members, a plurality of generally transversely extending separator members interlocked with the longitudinal separator members and movable about substantially vertical axes, a pair of longitudinally movable actuating bars and motion transmitting means including cooperating cam means between the longitudinal separator members and bars whereby movement of the bars relative to the longitudinal separator members moves the longitudinal separator members angularly and thereafter moves one of said longitudinal separator members longitudinally relative to the other longitudinal separator member.

13. An ice tray grid comprising a plurality of substantially vertically disposed transversely extending separator members, a pair of longitudinal separator members interlocked with the transverse separator members and movable angularly on the transverse separator members, a pair of longitudinally movable actuating bars, cooperating longitudinally spaced cam means between the bars and the longitudinal separator members, cooperating motion transmitting means between the bars and the transverse separator members whereby movement of the bars in opposite directions moves each longitudinal separator member angularly about a horizontal axis and moves each transverse separator member angularly about a vertical axis intermediate the length of the transverse member, cooperating locking means between the longitudinally movable bars and the longitudinal separator members whereby the longitudinal separator members are moved longitudinally in opposite directions after substantially predetermined movements of the longitudinally movable actuating bars, and manually operable means to move said bars in opposite directions.

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