April 14, 1936. J. N. SALER 2,037,518

LIQUID CONGEALING APPARATUS

Filed April 19, 1935

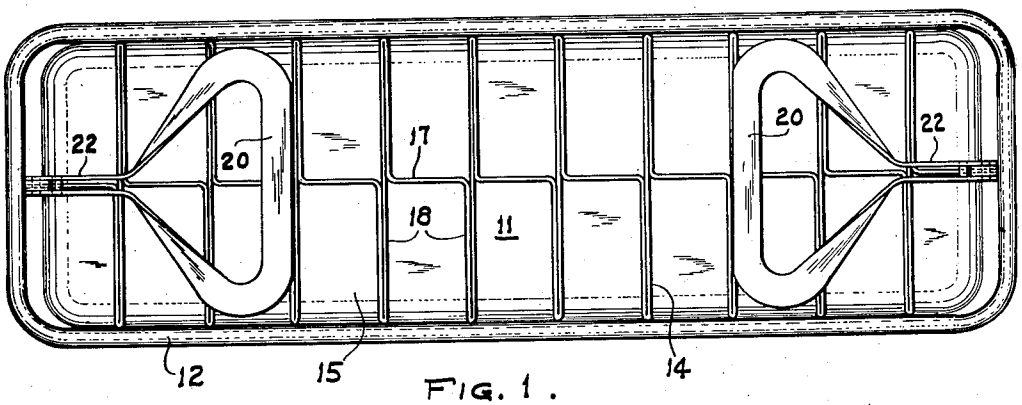


FIG. 1.

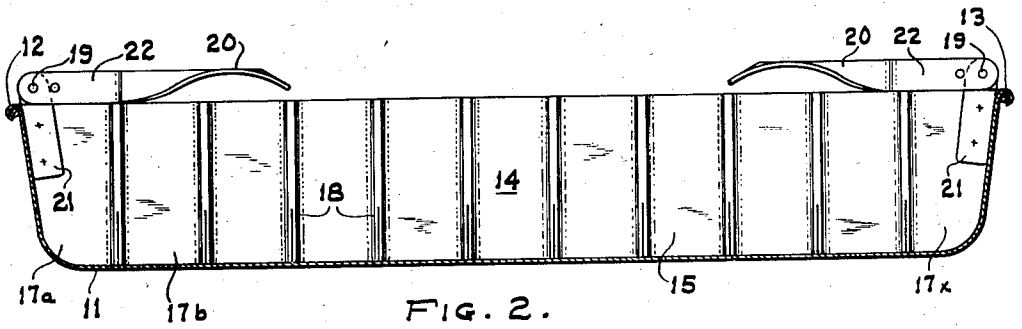


FIG. 2.

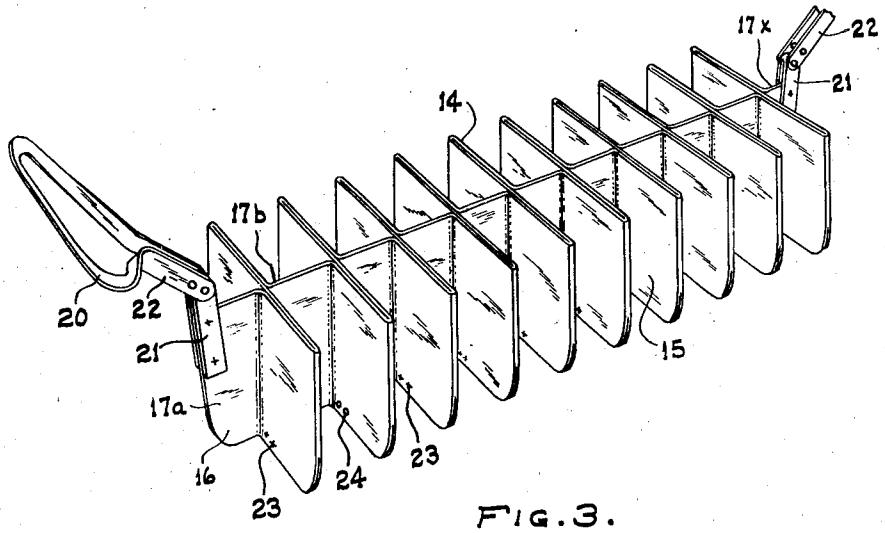


FIG. 3.

WITNESSES:
Wm. M. Van Sciver
E. Lutz

INVENTOR
JULES N. SALER
BY Masteiges
ATTORNEY

Patented Apr. 14, 1936 2,037,518

UNITED STATES PATENT OFFICE

2,037,518

LIQUID CONGEALING APPARATUS

Jules N. Saler, Springfield, Mass., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application April 19, 1935, Serial No. 17,220

20 Claims. (Cl. 62—108.5)

My invention relates to ice congealing apparatus, and particularly to ice congealing apparatus for forming ice particles suitable for table use.

It is an object of my invention to provide an improved flexible metallic grid member for ice congealing apparatus.

It is another object of my invention to provide an improved construction of ice congealing apparatus from which ice particles may be obtained by mechanical expedients without the application of heat.

It is a further object of my invention to provide an improved means for removing frozen particles from a flexible grid member of ice congealing apparatus.

It is another object of my invention to provide improved ice congealing apparatus, in which a removable grid member and/or a pan member in which the grid is normally disposed, are formed of a material especially adapted for this use.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in accordance with the accompanying drawing, forming a part of this application, in which:

Fig. 1 is a top view of an ice pan with a removable flexible grid member disposed therein, illustrating a preferred embodiment of my invention;

Fig. 2 is a side elevational view of the pan and grid construction shown in Fig. 1, with portions of the pan member broken away; and

Fig. 3 is a perspective view of my removable flexible metallic grid member, showing the handle members in the grid flexing position.

Referring specifically to Figs. 1 and 2, numeral 11 designates a shallow pan member having a rolled edge portion 12 peripherally of the open top thereof. The portion 12 is rolled over a heavy wire 13 to strengthen the edge of the pan 11.

Referring now to Figs. 1 to 3 inclusive, a flexible metallic grid member, generally indicated at 14, is removably disposed in the pan member 11, and divides the pan member into a plurality of cells 15 in which ice particles of a size suitable for table use are formed. The grid structure 14 is formed of a thin sheet of metal 16 bent to the form shown in the drawing. The sheet 16 is bent to form a longitudinal wall 17 and a plurality of transverse walls 18, the latter walls comprising two of said sheets 16 in adjacent back-to-back relation. The transverse walls 18 are formed by bending the sheet 16 at right angles to the first section 17a of the longitudinal wall 17 to extend a distance corresponding to the outer extremity of the transverse grid walls 18, then doubling the sheet 16 over to extend a distance corresponding to the other extremity of the transverse grid walls 18, then doubling the sheet 16 back to extend to the plane of the longitudinal wall 17, and then bending the sheet 16 at right angles to form the second section 17b of the longitudinal wall 17. The bending and doubling of the sheet 16 is continued in this manner until a grid structure of desired length is formed and is preferably terminated with a longitudinal wall section 17x. The resulting structure is extremely flexible so that, when the grid structure 14 is removed from the pan member 11, ice particles formed in the cells 15 are easily removed from the grid structure by flexing.

In order to facilitate removal of the grid member 14 from the pan member 11 and also to facilitate removal of ice particles from the grid member, a pair of handles 20 are provided and are pivotally attached at 19 to the extremities 17a, 17x of the longitudinal wall 17 through a pair of stiffening members 21.

In removing the grid member 14 from the pan 11 when ice particles are frozen therein, it is necessary to break the ice bond between the ice particles and the metal pan member. Although the ice bond may be broken by the application of heat, such as by running warm water over the pan, I prefer to break the ice bond by mechanical force. Therefore, when the handle members 20 are rotated, they coact with the pan member 11, and the leverage action therebetween breaks the ice bond between the ice particles and the pan member. The handle members 20 are provided with straight portions 22 which bear on the rolled edge 12 of the pan member 11, the stiffening wire 13 preventing the pan member from bending.

In order to prevent upward flexing of the grid member 14, and to impart additional strength thereto, the double sheets 16 of the transverse walls 18 are spot-welded at their bottoms as shown at 23, or the sheets may be riveted together as shown at 24. When the handle members 20 are rotated to remove the grid member 14, the grid member is prevented from flexing upwardly and the center thereof is, therefore, raised the same distance out of the pan as the ends thereof, thus positively breaking the ice bond from all parts of the pan member 11. In addition, the spot-welds or rivets prevent extreme flexing of the grid member 14, which might result in cracking of the metal sheet 16. However, the grid member is still sufficiently flexible so that ice particles are easily removed therefrom after it

has been removed from the pan member and the grid member flexed. An important feature of my invention resides in the fact that, after the grid member 14 is removed from the pan member 11, the grid member may be easily flexed by grasping the handle members 20 when in the position shown in Fig. 3 to impart flexing motion to the grid member. The handles multiply the force applied to the grid structure to remove ice particles therefrom, and also make it unnecessary to grasp the cold and wet grid structure to flex the same. Obviously such an arrangement may be used with any flexible grid formed of other materials.

The pan member 11 and the grid member are both preferably formed of stainless steel. The grid member is formed of this material because it may be formed in thin strips and may be bent and folded, as described, without cracking or breaking, to form a flexible metallic grid. Furthermore, stainless steel is strong, non-corrosive, and is a good conductor of heat.

From the foregoing, it will be apparent that I have provided improved ice congealing apparatus from which ice particles may be easily obtained without the use of heat, and that I have provided for forming the pan member and/or the grid member of a material particularly adapted for such use. Furthermore, I have provided handle means on a flexible grid to facilitate flexing of the grid, which handle means also may function to remove the grid member from the pan member, so that frozen liquid may be obtained easily from the ice congealing apparatus.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. A removable grid member for an ice tray comprising a strip of flexible metal bent to form a longitudinal wall member of single thickness and a plurality of transverse wall members of double thickness extending outwardly from both sides of said longitudinal wall member, and means for imparting sufficient stiffness to the grid member to prevent flexing of said grid in one direction.

2. A removable grid for an ice tray comprising a strip of flexible metal bent to form a longitudinal wall member and a plurality of transverse wall members extending outwardly from both sides of said longitudinal wall member, said longitudinal wall member being formed of a single thickness of said material and said transverse wall members being formed of doubled sheets of said material in back-to-back relation, and means for imparting sufficient stiffness to the grid to prevent substantial flexing of said grid in one direction.

3. A removable grid member for an ice tray comprising a strip of flexible metal bent to form a plurality of transversely extending wall members comprising a doubled sheet of said material in back-to-back relation and a single sheet of said material connecting said transverse wall portions and forming a longitudinal wall member, and means for imparting sufficient stiffness to the grid member to prevent substantial flexing of said grid member in one direction.

4. A removable grid member for an ice tray comprising a strip of flexible metal bent to form a longitudinal wall member comprising a single sheet of said material and a plurality of transversely extending wall members extending outwardly from both sides of said longitudinal wall member and formed, respectively, of two sheets of said material in back-to-back relation, and means for securing the latter two sheets together for imparting sufficient stiffness to the grid member to prevent substantial flexing of said grid member in one direction.

5. A removable grid for an ice tray comprising a strip of flexible metal bent to form a longitudinal wall member comprising a single sheet of said material and a plurality of transversely extending wall members extending outwardly from both sides of said longitudinal wall member and formed, respectively, of two sheets of said material in back-to-back relation and means located in the lower portions of said latter two sheets for securing the same to each other, thereby imparting sufficient stiffness to the grid to prevent substantial flexing of said grid in one direction.

6. A removable grid for an ice tray in which ice particles are to be frozen comprising a strip of flexible metal bent to form a longitudinal wall member comprising a single sheet of said material and a plurality of transversely extending wall members extending outwardly from both sides of said longitudinal wall member and formed, respectively, of two sheets of said material in back-to-back relation, means cooperating with the grid for lifting the grid upwardly from the tray to break the ice bond between the ice particles and the tray, and means located in the lower and inner portions of said two sheets in back-to-back relation for securing the same to each other, thereby imparting sufficient stiffness to the grid member to prevent substantial flexing of said grid in one direction.

7. Apparatus for forming ice particles comprising a tray member and a removable flexible metal grid member, said grid member being rigid when force is applied at the ends thereof to remove the grid member from the tray member, a pair of handles pivotally connected to one of said members and being rotatable to engage with the other of said members so as to provide a lever system to simultaneously raise both ends of the grid member out of the tray member and break the ice bond between the ice particles and the tray member.

8. Apparatus for forming ice particles comprising a pan member, a removable flexible metal grid member disposed in the pan member and comprising a strip of flexible material bent to form a longitudinal wall member of single thickness and a plurality of wall members of double thickness extending outwardly from both sides of said longitudinal wall member, handle members pivoted at both ends of the grid member and being rotatable to coact with the tray member to provide a lever system to lift the grid member out of the tray member and break the ice bond between the tray member and the ice particles frozen therein, and means for imparting sufficient stiffness to the grid member to prevent substantial flexing of the grid member in an upward direction.

9. In liquid congealing apparatus, the combination of a horizontally extending and substantially rigid pan structure, a flexible metallic grid structure removably disposed in the pan structure

and dividing the latter into a plurality of cells, means embodied in the flexible grid structure for rendering the same substantially rigid when moved in an upward direction and handle means attached at each end of the grid structure, at least one of said handle means being movable into abutting relation with the pan structure for effecting removal of the grid structure from the pan structure and both of said handle means being effective for transmitting flexing motion to the grid structure after its removal from the pan structure.

10. In liquid congealing apparatus, the combination of a substantially rigid and horizontally extending pan structure, a grid structure flexible in one or more directions disposed in the pan structure and dividing the same into a plurality of cells, gripping means disposed at opposite ends of the grid structure and formed to engage the pan structure, and means for attaching said gripping means to the grid structure to provide for angular movement thereof relative to the grid structure, said gripping means being angularly movable into engagement with the pan structure for affording simultaneous lifting movement of the grid structure out of the pan structure at both ends of the grid structure, and said gripping means being effective to transmit flexing movement to the grid structure after removal from the pan structure.

11. In liquid congealing apparatus, the combination of a horizontally extending and substantially rigid pan structure, a grid disposed in the pan structure and dividing the latter into a plurality of cells for forming frozen solids, said grid structure being substantially rigid when moved in an upward direction and relatively flexible when moved in another direction, and actuating means attached to opposite ends of the grid structure and engageable with the pan structure for raising the grid structure with the frozen solids therein from the pan structure, said actuating means being removable from the pan structure with the grid structure, whereby said actuating means is effective for transmitting flexing motion to the grid for liberating solids from the cells of the grid structure.

12. In liquid congealing apparatus, the combination of a pan structure having a bottom horizontal wall and substantially vertically extending side and end walls, a grid structure flexible at least in part and removably disposed in the pan structure, said grid structure embodying a plurality of vertically extending walls for dividing the pan structure into a plurality of cells, handles disposed at the ends of the grid structure and means for pivotally attaching said handles to the grid structure, said handles being adjustable to a position inwardly towards each other on top of the grid structure as well as to a position outwardly from each other projecting beyond the grid and pan structure and in abutting relation, respectively, with the end walls of the latter for effecting removal of the grid structure from the pan structure, said handles being removable from the pan as a unitary structure with the grid structure for transmitting flexing movement thereto.

13. In apparatus for forming ice particles comprising a tray member and a removable flexible grid member, a pair of handles pivotally connected to said grid member and being rotatable to engage with the pan member to provide a lever system to raise both ends of the grid member out of the tray member and break the ice bond between the ice particles and the tray member, said handles thereafter being effective to transmit flexing motion to the grid member to remove the ice particles from the grid member.

14. In liquid congealing apparatus, the combination of a pan structure having a bottom horizontal wall and substantially vertically extending side and end walls, a grid structure flexible in at least one direction and removably disposed in the pan structure, said grid structure embodying a longitudinally extending vertical wall and a plurality of vertical walls extending transversely of the longitudinally extending wall, for dividing the pan structure into a plurality of cells, handles disposed at the ends of the grid structure, and means for pivotally attaching said handles to the grid structure, said handles being adjustable to a position inwardly towards each other on top of the grid structure as well as to a position outwardly from each other projecting beyond the grid and pan structures and in abutting relation, respectively, with the end walls of the latter for effecting removal of the grid structure from the pan structure, said handles being removable from the pan as a unitary structure with the grid structure for transmitting flexing movement thereto.

15. In liquid congealing apparatus, the combination of a pan structure having a bottom horizontal wall and substantially vertical extending side and end walls, a grid structure flexible in at least one direction removably disposed in the pan structure, handles attached to opposite ends of the grid structure and angularly movable to engage with the end walls of the pan structure, said end walls forming fulcrums and said handles forming levers coacting with said fulcrums to raise the grid structure from the pan structure, and said handles being removable from the pan structure with the grid structure for transmitting flexing movement to the grid structure after removal from the pan structure.

16. In liquid congealing apparatus, the combination of a pan structure having a bottom horizontal wall and substantially vertically-extending side and end walls, a grid structure embodying longitudinally and transverse dividing walls removably disposed in the pan structure, means embodied in the grid structure for rendering the same rigid upon the application of force at a longitudinal end thereof to move an end of the grid structure upwardly out of the pan structure, the longitudinal wall of said grid structure being readily deformable upon the application of force in other directions, and handle means engageable with the pan structure for removing the grid structure from the pan structure, said handle means being attached to and removable with the grid structure for transmitting deformation movement to the grid structure after its removal from the pan structure.

17. In liquid congealing apparatus, the combination of a pan structure having a bottom horizontal wall and substantially vertically-extending side and end walls, a grid structure embodying longitudinal and transverse dividing walls removably disposed in the pan structure, means embodied in the grid structure for rendering the same rigid upon the application of force at a longitudinal end thereof to move the grid structure upwardly out of the pan structure, said grid structure being readily deformable upon the application of force in other directions, and handles attached to each end of the grid structure, at

least one of said handles being engageable with the pan structure for removing the grid structure from the pan structure and both of said handles being removable with the grid structure for transmitting flexing movement to the grid structure after its removal from the pan structure.

18. Apparatus for forming ice particles comprising an open-top tray member and a removable, flexible grid member disposed therein for dividing the tray member into a plurality of cells in which ice particles may be formed, said grid member comprising a unitary structure inherently flexible in various directions and dependent entirely for its flexibility upon elasticity of the material of which it is composed, handles attached to the respective ends of the grid member, at least one of said handles being engageable with the tray member for raising the grid member relative to the tray member, and means embodied in the grid member for effecting a rigid condition of the grid member upon the application of raising forces at an end thereof by said handle, said handles being removable with the grid member and both handles being effective for transmitting flexing movements to the grid member to separate the ice particles from the grid member.

19. A receptacle for producing ice particles comprising a pan and a grid structure flexible in part and dividing said pan into four corner cells and a series of intermediate cells disposed in rows and extending between said corner cells, said grid structure embodying a longitudinal, vertically disposed wall and a plurality of vertically disposed walls extending transversely from the longitudinal wall on opposite sides thereof, and handles attached to the ends of the longitudinal wall, at least one of said handles being formed to engage the pan to provide a lever system to raise the grid structure out of the pan and to break the ice bond between the ice particles and the pan, both of said handles thereafter being effective to transmit flexing motion to the grid structure to remove the ice particles from the grid structure.

20. A receptacle for producing ice particles comprising a pan and a grid structure flexible in part and dividing said pan into four corner cells and a series of intermediate cells disposed in rows and extending between said corner cells, said grid structure embodying a longitudinal, vertically disposed wall and a plurality of vertically disposed walls extending transversely from the longitudinal wall on opposite sides thereof, means embodied in the grid structure for rendering the same substantially rigid when force in an upward direction is applied at an end thereof, a handle attached to an end of the grid structure and engageable with the pan for raising the grid structure from the pan, said handle being thereafter effective to transmit flexing movement to the grid structure.

JULES N. SALER.