Dec. 20, 1938. J. N. SALER 2,140,923

LIQUID CONGEALING APPARATUS

Filed Nov. 28, 1936

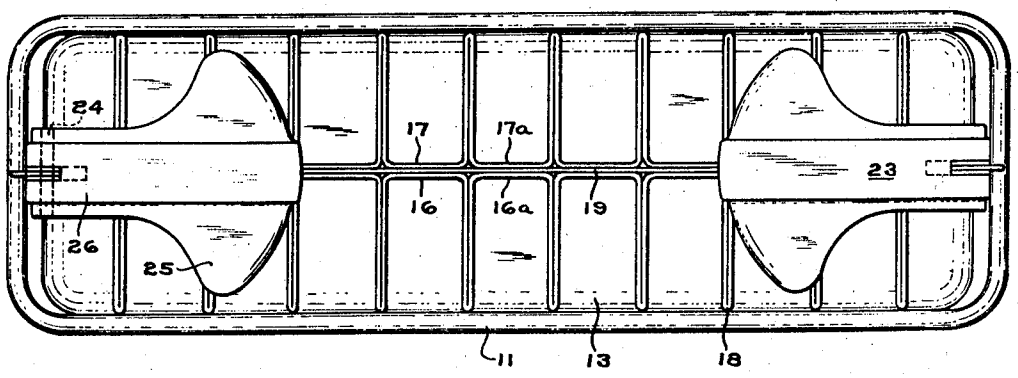


FIG. 1.

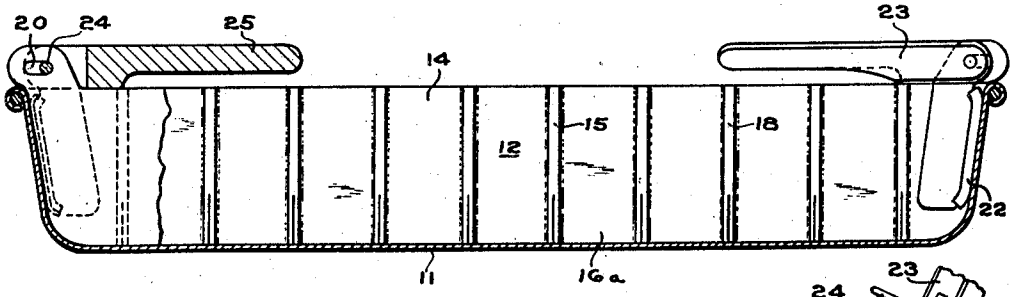


FIG. 2.

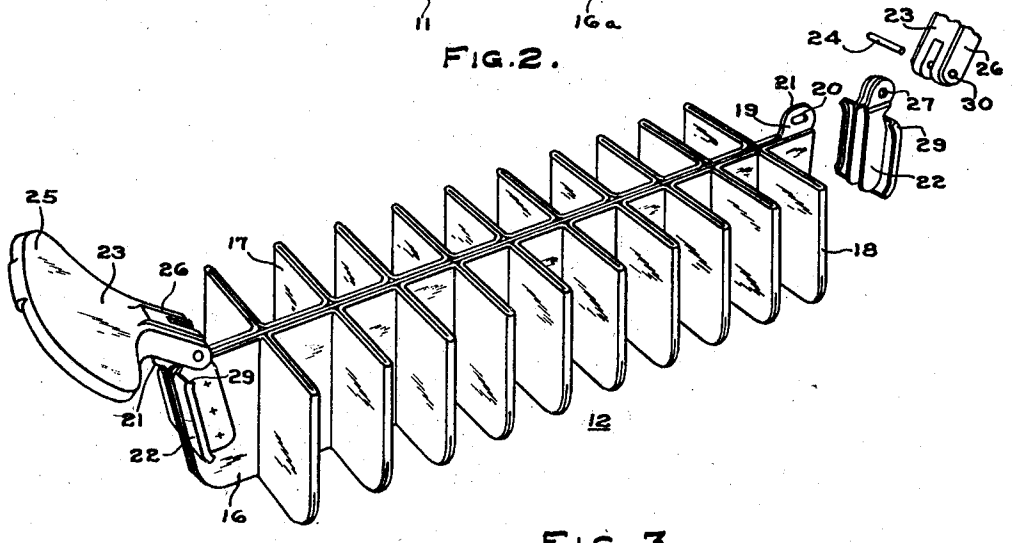


FIG. 3.

WITNESSES:

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Patented Dec. 20, 1938 2,140,923

UNITED STATES PATENT OFFICE

2,140,923

LIQUID CONGEALING APPARATUS

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Application November 28, 1936, Serial No. 113,095

6 Claims. (Cl. 62—108.5)

My invention relates to liquid congealing apparatus and particularly to an ice tray and grid for forming ice cubes suitable for domestic and table use.

It is an object of my invention to provide a grid structure which is readily removable from the ice tray after liquid has been frozen therein and from which ice cubes adhering to the grid may be easily removed without the use of heat.

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

Fig. 1 is a top view of an ice tray containing a grid constructed in accordance with a preferred embodiment of my invention;

Fig. 2 is a side view of the ice tray and grid shown in Fig. 1 with a portion of the ice tray broken away to clearly show the construction of the grid member; and,

Fig. 3 is a perspective view of the improved grid member with portions shown in an exploded view.

Referring specifically to the drawing for a detailed description of my invention, numeral 11 designates an ice tray or pan adapted to receive liquid to be frozen. A grid member, generally designated by the numeral 12, is disposed in the pan member as shown in Figs. 1 and 2 and forms therewith a plurality of cells 13 for forming small pieces of frozen liquid suitable for table use. The cells 13 are arranged in two longitudinally extending rows with four corners cells formed at each longitudinal end of the grid member 12.

The grid member 12 comprises a longitudinal divider or wall member 14 and a plurality of transverse wall members 15. The longitudinal divider 14 and the transverse walls 15 are formed by two continuous strips of flexible metal 16 and 17, such as, for example, thin stainless steel. Each of the strips 16 and 17 is bent to form an L at the ends thereof and to form a plurality of U-shaped enclosures intermediate of the ends. The edges of the transverse walls 15 are, therefore, resiliently connected at 18 where the strips 16 and 17 are doubled and the inner ends of the transverse walls are connected to their respective longitudinal walls 16*a* and 17*a* depending upon the side of the longitudinal divider 14 from which the transverse wall extends. A relatively rigid bar of metal 19, also preferably formed of stainless steel is disposed between the longitudinal wall members 16*a* and 17*a* of the grid 12 and is provided with ears 21 at its upper corners. Shoes 22, which may be considered as a part of the grid 12, are spotwelded to the ends of the both strips 16 and 17, as shown in Fig. 3. The ears 21 of the rigid strip 19 are provided with longitudinally extending slots 20 and the shoe member is provided with apertures 27 registering with the slots 20.

Leverage devices generally indicated at 23 are pivotally attached to the grid 12 by pins 24 extending through apertures 30 in the leverage device, the slots 20 and the apertures 27, which pin is journaled in the apertures 27. The leverage device 23 embody a handle portion 25 and a lever portion 26 for a purpose fully described in the operation of the apparatus.

Operation

The pan 11 is filled with a liquid to be frozen and the grid 12 is placed therein to divide the liquid into a plurality of cells to form ice cubes when frozen. In order to remove the grid 12 from the pan 11, the handles 25 are grasped and rotated outwardly until the lever portions 26 engage the edges of the pan 11. Continued downward movement of the handles 25 lifts the ends of the grid 12 from the pan 11, thus breaking the ice bond between the pan and the ice therein. The grid member 12 is raised a substantially uniform distance along its entire length when lifting force is applied at its ends because the rigid strip 19 prevents any flexing of the grid 12 at this time.

After the grid with the ice cubes adhering thereto has been removed from the pan 11, the handles 23 are grasped and are pulled outwardly. This stretches the grid 12 outwardly and separates the inner ends of the transverse walls 15 where they join the longitudinal walls 16*a* and 17*a*, the flexible walls moving relative to central wall along the slots 20. As the grid 12 is stretched, the ice bond between the grid walls and the ice cubes is broken and the cubes drop from the grid. The length of the slots 20 limit the amount the grid 12 may be stretched, thus preventing over-stretching, and possible breaking of the grid.

From the foregoing, it will be apparent that I have provided improved ice forming apparatus from which ice cubes are readily removable without the application of heat. Furthermore, I have provided a stiffening means for a flexible metal grid without the use of welds and have provided for limited longitudinal stretching of the grid to remove ice cubes therefrom.

The broad idea of utilizing a rigid center bar with a flexible grid structure is disclosed and claimed in the copending application of M. G. Shoemaker, Serial No. 112,480, filed November 24, 1936, for Liquid congealing apparatus, and assigned to Westinghouse Electric & Manufacturing Company.

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. In liquid congealing apparatus, the combination of a pan for containing liquid to be frozen, a grid member disposed therein for dividing the pan into a plurality of cells for forming ice cubes, said grid member including a pair of longitudinal flexible wall members, a strip of relatively rigid material disposed between said flexible wall members and having a longitudinal slot adjacent one end thereof, and leverage means for raising the grid member from the pan to break the ice bond between the ice cubes and the pan and for flexing said flexible wall members, said leverage means being pivotally connected to said longitudinal flexible wall members and to said strip of rigid material adjacent the longitudinal ends of both, said leverage means being slidable along said longitudinal slot in said rigid strip and being rotatably attached to said flexible members in a manner preventing relative longitudinal movement between the leverage means and the flexible members, whereby the flexible wall members are movable longitudinally relative to said rigid strip, said rigid strip preventing substantial upward flexing of the ends of the grid when lifting force is applied by said leverage means to said grid member.

2. In liquid congealing apparatus, the combination of a pan for containing liquid to be frozen, a grid member disposed therein for dividing the pan into a plurality of cells for forming ice cubes, said grid member including a pair of longitudinal flexible wall members, a strip of relatively rigid material disposed between said flexible wall members and having a longitudinal slot adjacent one end thereof, and leverage means for raising the grid member from the pan to break the ice bond between the ice cubes and the pan and for flexing said flexible wall members, said leverage means being pivotally connected to said longitudinal flexible wall members and to said strip of rigid material adjacent the longitudinal ends of both, said leverage means being slidable along said longitudinal slot in said rigid strip and being rotatably attached to said flexible members in a manner preventing relative longitudinal movement between the leverage means and the flexible members, whereby the flexible wall members are movable longitudinally relative to said rigid strip, said slots also limiting the relative movement between said flexible members and said rigid strip, said rigid strip preventing substantial upward flexing of the ends of the grid when lifting force is applied by said leverage means to said grid member.

3. A grid member for dividing a pan for containing liquid to be frozen into a plurality of cells to form ice cubes, which grid member comprises a pair of flexible wall members and a relatively rigid member disposed therebetween and having a longitudinal slot adjacent each end thereof, means for effecting relative movement between the flexible wall members and the rigid member and for flexing the flexible members comprising handles rotatably attached at the ends of the flexible wall members in a manner preventing relative longitudinal movement between the flexible wall members and the handle means and being also attached to the ends of the rigid wall member by means of said slots which affords relative movement between the handle means and the rigid wall member, whereby the flexible wall members may be flexed and moved relative to the rigid wall member by said handles.

4. A grid member for dividing a pan for containing liquid to be frozen into a plurality of cells to form ice cubes, which grid member comprises a pair of flexible wall members and a relatively rigid member disposed therebetween and having a slot adjacent each end thereof, means for effecting relative movement between the flexible members and the rigid member and for flexing the flexible members comprising handles rotatably attached at the ends of the grid structure and being rotatably attached to the flexible wall members in a manner preventing relative longitudinal movement between the flexible wall members and the handle means and being attached to the rigid wall member by means of said slots which affords relative movement between the handle means and the rigid wall member, whereby the flexible members may be flexed and moved relative to the rigid wall member, said slots being effective to limit the movement of the flexible members relative to the rigid member.

5. In liquid congealing apparatus, the combination of a pan for containing liquid to be frozen, a grid member disposed therein for dividing the pan into a plurality of cells for forming ice cubes, said grid member comprising a longitudinal wall and a plurality of tranverse walls extending outwardly on both sides of said longitudinal wall, said longitudinal wall being formed of two strips of metal, said transverse walls each being formed of two flexible sheets of metal connected at their outer edges and connected to their respective longitudinal strips of metal at the ends adjacent said longitudinal wall, leverage means for raising the grid member from the pan to break the ice bond between the ice cubes and the pan and for effecting separation of the edges of said transverse walls adjacent the longitudinal wall to stretch the grid member longitudinally and thus release the ice cubes therefrom, and a strip of rigid material disposed between the strips of said longitudinal wall and having a longitudinal slot adjacent one end thereof, said leverage means being pivotally connected to said longitudinal grid wall and to said strip of rigid material adjacent the longitudinal ends of both, said rigid strip preventing upward flexing of the grid when lifting force is applied by said leverage means to said grid member, said leverage means including handle means slidably attached to said rigid strip by means of said longitudinal slot in said rigid strip and being rotatably attached to said longitudinal wall in a manner preventing relative longitudinal movement between the handle means and the longitudinal wall, whereby the transverse and longitudinal wall members are movable longitudinally a limited distance relative to said rigid strip.

6. In a freezing tray, in combination, a container pan, a removable grid for said pan, said grid comprising: an elongated flexible metal di-

viding member capable of being readily stretched beyond its normal length to such an extent as to loosen the frozen ice blocks bonded thereto, two handles having a pivot connection to the two opposed ends respectively of said stretchable member by means of which the two opposed ends of said stretchable member may be pulled directly outwardly after the grid and ice contents are moved from the pan, and a relatively non-stretchable member extending between and slidably connected to the pivot connection of said two handles and serving to positively limit the outward movement of the opposed ends of said stretchable member.

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