Feb. 6, 1940. C. G. HARBORDT 2,189,446

FREEZING PAN ASSEMBLY

Filed June 26, 1936

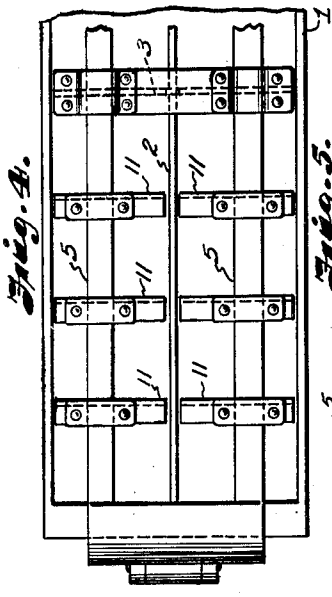


Fig. 4.

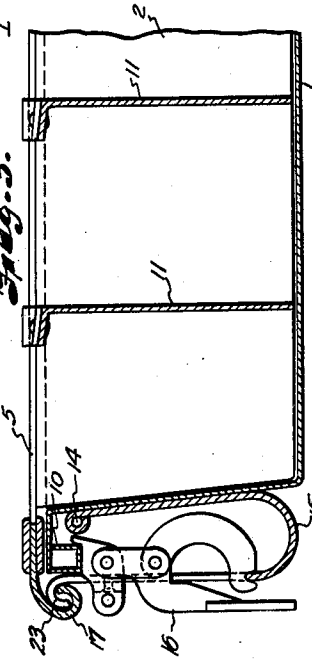


Fig. 5.

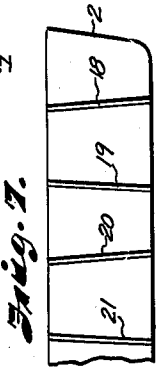


Fig. 7.

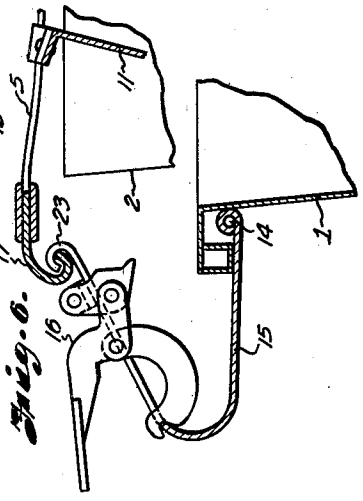


Fig. 6.

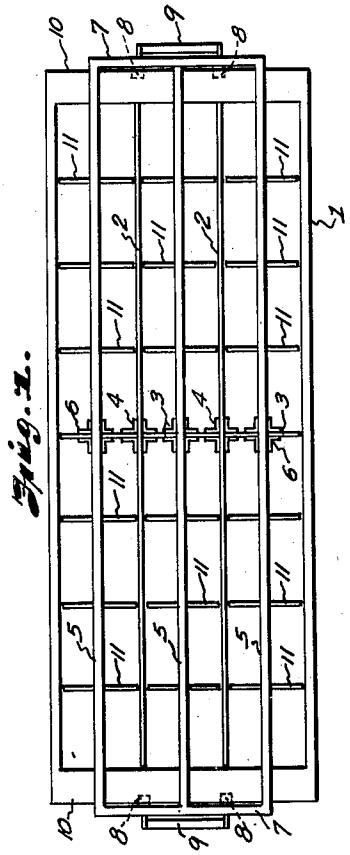


Fig. 1.

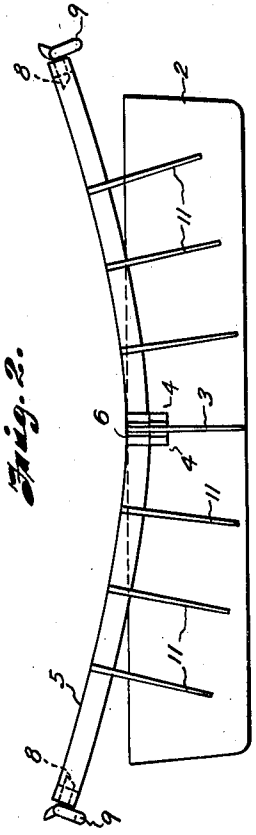


Fig. 2.

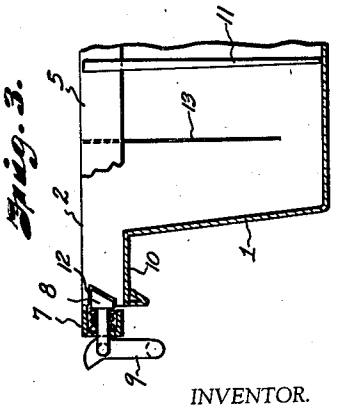


Fig. 3.

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FREEZING PAN ASSEMBLY

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10 Claims. (Cl. 62—108.5)

My invention relates to freezing pan assemblies and more particularly to an assembly adapted to be placed in domestic refrigerators for the formation of ice cubes from which assembly ice cubes can be rapidly and more readily released. Currently, mechanical refrigerators adapted to form ice cubes are being widely used in the American homes. The ice cubes are formed by means of a divider adapted to divide the interior of a tray into a number of small compartments so that, when ice is formed, it will take the shape of small blocks or cubes which are used for cooling drinks and the like. One manner of removing the cubes from the ice trays is by subjecting the pan, when it is removed from the freezing compartment, to the melting or thawing action of water. This is usually an annoyance, since it requires time and patience. Then too, it is wasteful of ice, since considerable ice must be melted or thawed before the cubes become free.

One object of my invention is to provide a freezing assembly in which ice cubes may be freed in an expeditious and convenient manner.

Another object of my invention is to provide an assembly in which the ice cubes are automatically freed when they have thawed sufficiently.

Other and further objects of my invention will appear from the following description.

In the accompanying drawing which forms part of the instant specification and is to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is a plan view of a pan and divider assembly containing one embodiment of my invention.

Figure 2 is an elevation of the divider employed in Figure 1.

Figure 3 is a fragmentary sectional elevation of a pan and divider assembly showing a modification of the construction of the form of my invention shown in Figures 1 and 2.

Figure 4 is a fragmentary plan view of the pan and divider assembly showing another embodiment of my invention.

Figure 5 is a fragmentary sectional elevation on an enlarged scale, of the embodiment shown in Figure 4, illustrating the pan and divider assembly of this embodiment in latched position.

Figure 6 is a fragmentary sectional view of the embodiment shown in Figure 5, in unlatched position.

Figure 7 is a fragmentary detail view of a divider containing another embodiment of my invention.

In general, my invention contemplates the provision of one or more longitudinal dividing members and a plurality of transverse dividing members mounted for relative movement with respect to the longitudinal dividing members. Preferably, I mount the transverse dividing members upon flexible ribs which are formed of spring metal such that they normally will assume an arcuate or curved shape. The ribs are normally secured in assembled position by means of latches which latch the ribs either to the longitudinal dividers or to the pan in which the dividing assembly is housed. When it is desired to remove ice from the pan, the latches are unfastened and the ribs tend to assume their inherent arcuate position, thus spreading the transverse dividers to positions wherein they will form divergent walls for the compartments in which the ice cubes are formed, permitting an easy removal of the ice.

More particularly referring now to the drawing, an ice tray or freezing pan 1 may be of any desired size or shape. In combination with the freezing pan, I provide a divider comprising fixed longitudinal members 2, centrally of which is secured a transverse dividing member 3. Member 3 is secured to each of the longitudinal dividing members 2 by means of angles 4 or in any other suitable manner. A plurality of flexible members 5 which may be of spring metal or the like are likewise secured to the central dividing member 3 by means of angles 6. The flexible members 5 are joined at their respective ends by cross members 7. Each cross member carries a pair of latches 8 operated by a handle 9. In the form shown in Figures 1 and 2, the latches 8 are adapted to hook under the end flanges 10 of the pan 1. Each one of the flexible members 5 carries a plurality of transverse dividing members 11 which are secured to the flexible members 5 in any suitable manner. The divider composed of longitudinal and transverse members, when removed from the pan by unlatching the latches will assume the position shown in Figure 2. It will be observed that the transverse dividing members 11 which are secured to the flexible member 5 will assume positions such that they will move relatively to the longitudinal dividing members 2 and their free ends will move away from each other, diverging to free the ice cubes.

In using the embodiment of my invention shown in Figures 1 and 2, the dividing member

is placed in the ice freezing tray 1 and the free ends pushed downwardly, causing the flexible members 5 to assume a straight position. In the straight position, the latches 8 will engage the flanges 10 of the ice tray and the camming action of the latches will cause them to move outwardly until they clear the flanges 10, when the latches will spring into latching position underneath the flanges. With the assembly in this position, the ice freezing tray is filled with water and put into the freezing compartment. After the water has been frozen and it is desired to remove the ice in the form of cubes, the tray is removed from the freezing compartment and handles 9 operated to unfasten the latches. The divider may be removed from the pan and placed upon a platter or the like. The ice adhering to the parts will hold them in straight position. The spring action of flexible members 5 will take charge and tend to move the assembly to the position shown in Figure 2. The pressure exerted by the flexible spring members 5 will tend to cause the ice to melt while the relative movement of the transverse dividing members 11 with respect to the longitudinal dividing members 2 will cause the ice to become free from the sides of the longitudinal dividing members.

When the flexible member 5 is flexed sufficiently, the ice cubes will drop of their own accord on to the platter, being assisted in this action by the fact that the transverse members have moved away from each other.

In the form shown in Figure 3, the latch members 8 latch in the notches 12, formed in the longitudinal dividing members 2 instead of latching under the flanges 10 of the freezing pan 1. In the form shown in Figure 3, the longitudinal divider 2 is itself flexible and will normally assume a curved position, being provided with a plurality of slits 13. In this embodiment of the invention, the dividing assembly is removed from the pan and, when the latches 8 are unlatched, both the flexible members 5 and the longitudinal dividing members 2 will tend to flex in directions opposite from each other, thus expediting the removal of the ice cubes.

In the modification shown in Figures 4, 5, and 6, the longitudinal divider 2 has secured to it, centrally thereof, a transverse dividing member 3 as in the embodiment shown in Figure 1. Similarly, flexible members 5 carrying movable transverse dividing members 11 are provided. In this embodiment of my invention I provide additional spring means for lifting the dividing assembly out of the freezing pan 1. To the pan 1 I pivot at 14 a spring 15 and provide a latch assembly 16 adapted to latch the flexible members 5 under the flanges 10 of the freezing pan 1. Any suitable latch assembly may be employed. The parts are shown in latched position in Figure 5 in which the end 23 of spring 15 is hooked over a curved part 17 of the flexible member 5. In this position, the free end 23 of the spring 15 thrusts outwardly against the curved end 17 of flexible member 5 and the flexible members 5 are held to the pan by the latch assembly 16. In unlatched position, the parts will assume the position shown in Figure 6. It will be noted that spring 15 tends to lift the divider assembly out of the pan and, at the same time, permits the flexible members 5 to assume their inherently curved position. With the form of the invention shown in Figures 4, 5, and 6, when it is desired to remove the ice cubes, the latch 16 is operated and the bias exerted by spring 15 will tend to lift the ice cubes and divider assembly out of the freezing tray 1, while the tendency to flex of the spring members 5 will tend to free the cubes. Upon removing the tray full of ice from the freezing compartment, all that is necessary is to operate the latches 16 to move them to unlatched position and the force exerted by the springs will tend to melt the ice and the cubes, when freed, will drop into the ice tray without further attention.

In the embodiment shown in Figure 7, I form the divider with stationary longitudinal members 2 and transverse members secured to the longitudinal dividing members in such a manner that diverging angles are formed by adjacent transverse dividers. For example, divider 18 forms an angle with divider 19 which is wider at the bottom than at the top, while divider 19 forms an angle with divider 20 which is wider at the top than at the bottom. Divider 21 forms an angle with divider 20 so that the compartment is wider at the bottom than at the top. In this manner, compartments with tapered sides can be formed without the necessity of using dividing members which are tapered themselves. One half of the ice cubes are removed with the divider held in one position and the other half of the ice cubes are removed with the divider held in the other position. This enables tapered sides to be achieved in a simple and convenient manner.

It will be observed that I have accomplished the objects of my invention. I have provided an ice tray assembly in which the ice cubes can be simply, expeditiously and conveniently removed with a minimum of effort and with a minimum waste of ice by melting or thawing. In the embodiment of my invention shown in Figures 4, 5, and 6, removal of the ice cubes is automatic, the ice being melted by the force exerted by spring members 15 tending to flex and moving the transverse dividers to the position which will enable the ice cubes to drop from the divider by gravity.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. In a freezing pan assembly a freezing pan adapted to receive water to be frozen, a divider positioned in said pan having a longitudinal dividing member and a plurality of transverse dividing members, a flexible member secured at one portion thereof to said longitudinal dividing member, said transverse dividing members being carried by said flexible member, said flexible member having a free end adapted to be moved with respect to said longitudinal divider, the construction being such that upon flexing of said flexible member the transverse dividing members will be moved to form diverging angles with each other.

2. In a freezing pan assembly a tray adapted to receive water to be frozen, a divider positioned in said tray, said divider having a longitudinal dividing member and a plurality of relatively

movable transverse dividing members, a spring member normally adapted to assume an arcuate shape, said transverse dividing members being supported by said spring member, means for latching said spring member in a substantially straight position against the action of said spring whereby said transverse dividing members will be moved to positions substantially normal to the bottom of said tray, said transverse dividing members being relatively movable with respect to said longitudinal dividing member whereby when said latching means are moved to unlatching position said spring member will tend to assume its arcuate shape, moving said transverse dividing members to positions tending to free ice blocks formed therebetween when the assembly is subjected to freezing.

3. In a freezing pan assembly a tray adapted to receive water to be frozen, a longitudinal dividing member positioned in said tray, a plurality of transverse dividing members positioned in said tray, means for mounting said transverse dividing members for movement relative to said longitudinal dividing member, spring means for moving said transverse dividing members relative to said longitudinal dividing member, and means for latching said spring means against operation while water in said tray is being frozen, said latching means adapted to be unlatched when it is desired to remove ice from said tray to permit said spring means to move said transverse dividing means, whereby ice may be readily removed from said divider.

4. In a freezing pan assembly, a tray adapted to receive water to be frozen, a divider assembly adapted to be positioned in said freezing pan comprising a longitudinal dividing member and a plurality of transverse dividing members relatively movable to said longitudinal dividing member, spring means for moving said relatively movable members, spring means tending to lift said divider assembly out of said tray and a latching means for latching both said spring means while water is being frozen.

5. In a freezing pan assembly, a pan adapted to receive water to be frozen, a divider in said pan comprising a normally arcuate, flexible member, a plurality of fins carried by said normally arcuate, flexible member, said fins adapted to divide said pan into a plurality of compartments, and means for latching said normally arcuate member in a substantially straight position, the construction being such that, upon release of said last named means, the normally arcuate member will assume an arcuate shape moving the outer ends of the fins secured thereto to form diverging angles with each other.

6. In a freezing pan assembly, a tray adapted to receive water to be frozen, a divider positioned in said tray, said divider comprising a spring member normally adapted to assume an arcuate shape and fins carried by said spring member, means for latching said spring member in a substantially straight position against the action of said spring whereby said fins will be moved to a position substantially normal to the bottom of said tray, the construction being such that, when said latching means is moved to unlatching position, said spring member will tend to assume its arcuate shape moving said fins to positions tending to free ice blocks formed therebetween when the assembly is subjected to freezing.

7. The combination with a tray adapted to receive water to be frozen, of a grid removably positioned in said tray, said grid comprising a spring member having an arcuate shape when unstressed and fins carried by said member, means for latching said grid in position with the fins extending substantially normal to the bottom of the tray and the spring member straightened out in a stressed condition, the construction being such that, when said latching means is moved to unlatching position, said spring member may assume its arcuate shape moving said fins to a position tending to free any ice blocks formed therebetween.

8. In an ice cube forming assembly, a tray, a grid removably positioned therein, said grid comprising a spring member extending along the upper part of the tray and a plurality of spaced fins extending therefrom toward the bottom of the tray in parallel relation, and latching means releasably retaining said grid in the tray, the spring member being arcuate when unstressed and the inherent resiliency of said member tending to cause opposite ends of the grid to creep from the tray when the latching means is released and thereby weaken the bond holding the ice cubes in said assembly.

9. A freezing tray provided with a removable partition assembly comprising a stiff resilient longitudinal partition element having a cambered shape when unstressed, and a series of transverse partition elements rigidly secured to said longitudinal partition element at spaced intervals along the longitudinal axis thereof and extending therefrom, said resilient longitudinal partition element being deformable upon the application of pressure thereto to a position in which the peripheral portions of said partition assembly conform to the inner surfaces of said freezing tray for reception therein, said resilient longitudinal partition element being returned to its cambered shape by its inherent resiliency after removal of said partition assembly from said freezing tray to facilitate the release of ice blocks or the like from said partition assembly.

10. A freezing tray provided with a removable partition assembly comprising a stiff, resilient, longitudinally extending member having a cambered shape when unstressed, and a series of transverse partition elements rigidly secured to said longitudinal element at spaced intervals along the longitudinal axis thereof and extending therefrom, said resilient longitudinal element being deformable upon the application of pressure thereto to a position in which the peripheral portions of said partition assembly conform to the inner surfaces of said freezing tray for reception therein, said resilient longitudinal element being returned to its cambered shape by its inherent resiliency after removal of said partition assembly from said freezing tray to facilitate the release of ice blocks or the like from said partition assembly.

CARL G. HARBORDT.