Sept. 13, 1949. R. J. MOTT 2,481,525

ICE CUBE TRAY

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Fig. 1.

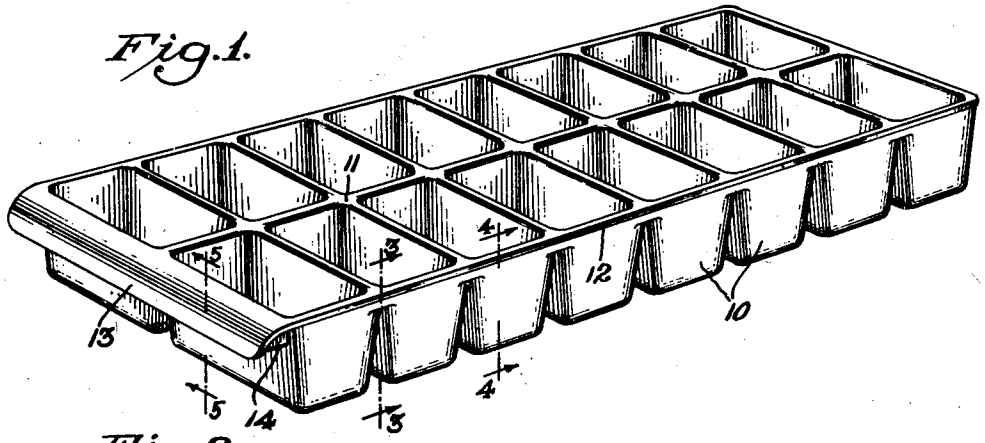

Fig. 2.

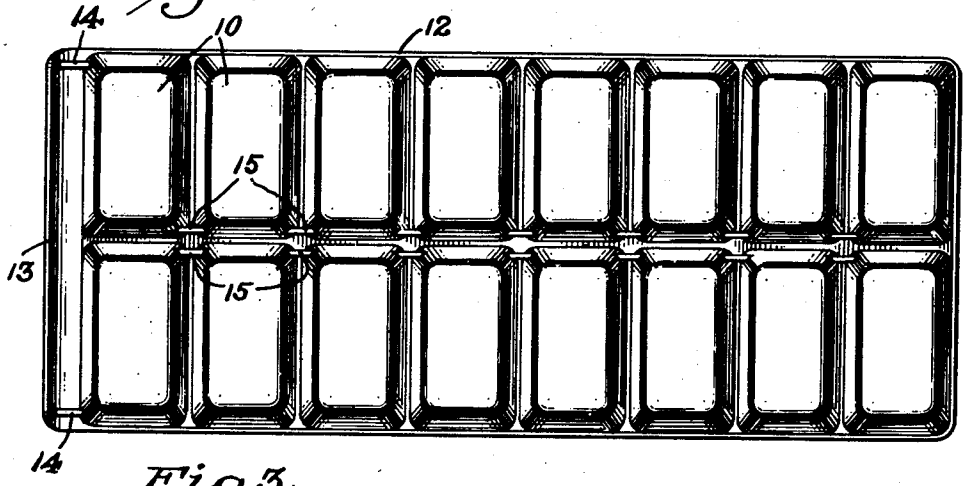

Fig. 3.

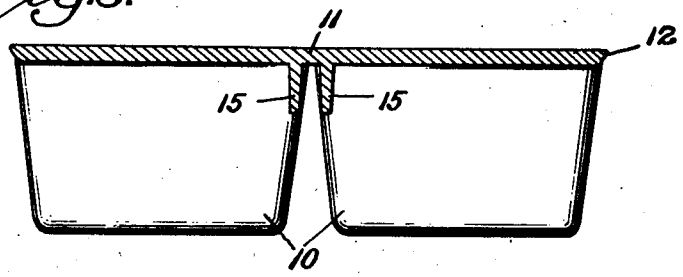

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Fig. 4.

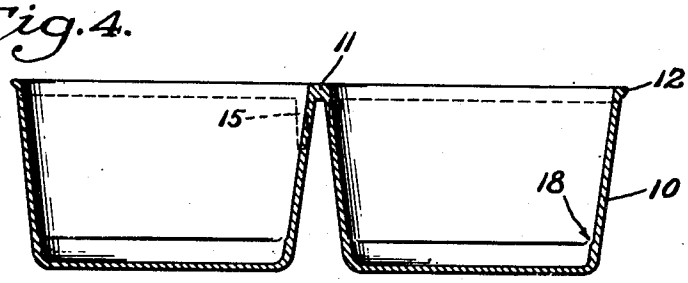


Fig. 5.

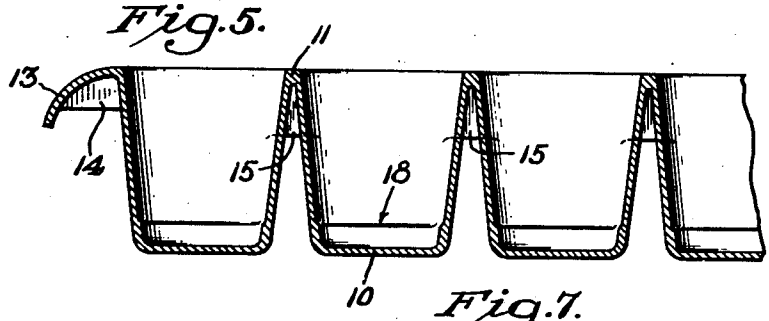


Fig. 6.

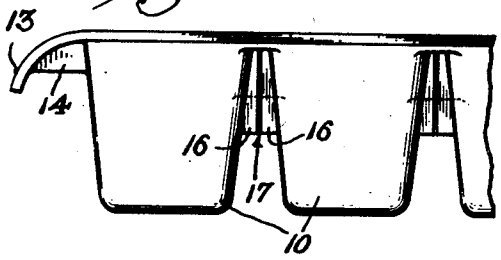
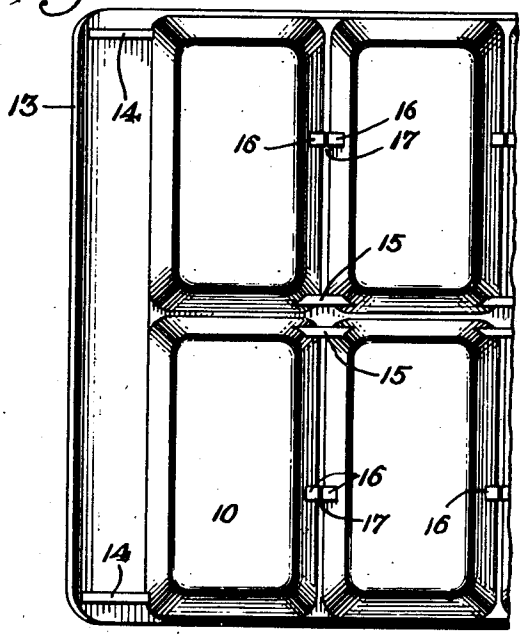


Fig. 7.



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ICE CUBE TRAY

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Application June 9, 1943. Serial No. 490,152

6 Claims. (Cl. 62—108.5)

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The invention relates to ice cube trays and more particularly to trays of the character used in refrigerators in freezing water into ice cubes of convenient size.

An object of the invention is to provide a new and improved ice cube tray formed of a molded plastic material and having novel features and characteristics whereby to facilitate freeing the frozen cubes from the cells in which they are formed and for reducing the hazard of breakage resulting from inept handling of the tray in releasing the cubes therefrom.

Other objects and advantages will become apparent in the following description and from the accompanying drawings in which:

Figure 1 is a perspective view of an ice cube tray embodying the features of the invention.

Fig. 2 is a bottom plan view of the tray.

Figs. 3, 4 and 5 are fragmentary sectional views taken respectively along the lines 3—3, 4—4 and 5—5 of Fig. 1.

Fig. 6 is a fragmentary side view of a modified form of tray.

Fig. 7 is a fragmentary bottom plan view of the modified tray as shown in Fig. 6.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail, the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

The exemplary form of ice cube tray illustrated herein is formed of a plastic material by a suitable molding operation. Plastic materials which may be employed include a low temperature cellulose plastic sold under the trade name "L-T-Ethocell"; a cellulose acetate plastic sold under the trade name "Tenite 1"; and a polystyrene plastic. Materials of this nature do not have the mechanical strength of the metals from which ice cube trays have heretofore been formed. The plastics, for example, do not possess the resiliency of such metals and cannot withstand the shock resulting from the sudden change from a low to a high temperature. Plastic trays, therefore, cannot be removed from the refrigerator and held under the hot water faucet in order to free the cubes from the cell walls and in release by flexing, the tray is apt to be broken. In view of these factors plastic trays embodying the present invention may be provided with means

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for reenforcing the trays against improper flexing or bending and for facilitating the release of the ice cubes from the cells without subjecting the plastic material to temperature shock.

Referring to the drawings, the improved tray is shown as a rectangularly shaped unit made up of a plurality of individual juxtaposed cells 10 arranged in two rows and joined into a single unit only through their upper margins as indicated at 11, Figs. 4 and 5. For strength and appearance the upper margin of the tray preferably has a narrow outstanding peripheral flange 12 thereon. At one end this flange is extended laterally and downwardly, as at 13, Figs. 1 and 5, to provide a finger piece for the grasp of the operator. This flange may be reenforced by suitable cross walls 14 extending between the flange and the side walls of the adjoining cells.

In a plastic ice cube tray of the character above described, the frozen ice cubes may be broken free from the sides and bottom of the cells by flexing them to produce relative movement between the cell walls and the ice. However, a plastic tray cannot be bent or flexed in a longitudinal direction without risking breakage thereof at one or more of the unions between the upper edges of the cells. It can, however, be safely flexed or twisted out of its normal flat plane within reasonable limits by grasping the tray at its diagonally opposite corners and twisting it in opposite directions. Such flexing or twisting produces the necessary relativity of movement between the ice and the cell wall to free the ice cube.

Since the normal tendency of the user is to bend the tray improperly, i. e. longitudinally, means is provided for reenforcing the tray against the breaking strains imposed thereon in such instances and for reducing the lengthwise flexibility of the tray. This means, as shown in Figs. 2, 3 and 5, may comprise narrow wedge-shaped walls 15 extending downwardly and spanning the gap between longitudinally adjoining cells. These walls not only reenforce the unions between the cells but resist bending of the tray from end to end. The walls are in this instance relatively short and are preferably spaced relatively closely to the longitudinal line which separates transversely adjacent cells. Consequently they offer little resistance to the proper flexing of the unit by twisting.

The tray may be further reenforced against improper bending by such means as that shown in Figs. 6 and 7. Such a tray has in addition to the centrally located wedge-shaped walls 15, op-

posed members 16 on the side walls of the cells and located between the ends thereof. These members are normally spaced apart, as indicated at 17, to permit the tray to be twisted but are caused to abut when the tray is improperly bent only slightly whereby to increase the resistance offered to such bending.

I have found that the ice cubes will release from the cell walls if the latter have a certain angularity within rather close limits with respect to a vertical plane perpendicular to the cell bottom. If the angularity at which the side and end walls slope outwardly is seven and one-half degrees the ice cubes detach themselves from the cell walls relatively quickly and easily as compared with the results obtained when the walls have a greater or lesser angularity. If the angularity of these walls is greater than eight and one-half degrees or smaller than six and one-half degrees the effect is substantially lost.

A further improvement in the ice-freeing action of the tray when twisted is obtained by providing the cells with what may be termed "stepped surfaces." Thus, as shown in Fig. 4, each internal surface of a cell has near the bottom thereof an outwardly facing shoulder or ledge 18 which may be so narrow as to be barely perceivable. The shoulder preferably is not abrupt but in general slopes outwardly of the cell from the inner to the outer surfaces. Preferably this slope is provided by forming the shoulder on a short radius.

It appears that this shoulder assists in loosening or freeing the ice cube from the cell walls, possibly by breaking the seal between the cube and the cell walls formed when the cube begins to melt. Or it may be that in freezing slight stresses are set up which as soon as the ice melts slightly act against the shoulder to free the cube. In any event when the ice tray has been removed from the freezing chamber and allowed to stand at room temperature for a minute or so a twist of the tray will free all of the cubes immediately.

I claim as my invention:

1. In an ice cube tray the combination of a plurality of individual cells formed of a plastic material, said cells being arranged in longitudinally and transversely alined rows and being united at their upper margins into an integral unit, each of said cells having walls sloping outwardly and related to the cell bottom at angles of approximately ninety-seven and one-half degrees, each of said cells near the bottom thereof having a narrow ledge formed on the inner face of one of the cell walls, and integral reenforcing members traversing the gap between opposed external surfaces of the walls of adjoining cells in the longitudinal rows, said members being located

adjacent to the line of division between said longitudinal rows.

2. In an ice cube tray the combination of a plurality of cells formed of a plastic material united at their upper margins, each of said cells near the bottom thereof having a narrow ledge formed on an inner wall of the cell, and reenforcing members extending between opposed external surfaces of certain walls of adjoining cells.

3. In an ice cube tray, a plurality of individual cells formed of a form sustaining plastic material united at their upper margins, each of said cells having side walls sloping outwardly and related to the cell bottom at angles of approximately ninety-seven and one-half degrees, and each of said walls near the bottom thereof having inner stepped surfaces defining a narrow ledge.

4. In an ice cube tray, a plurality of cells formed of a plastic material united at their upper margins, each of said cells having side walls thickened near the bottom thereof to define a narrow ledge projecting inwardly of the cell.

5. In an ice cube tray the combination of a plurality of cells connected at their upper margins and arranged in longitudinally and transversely alined rows, and means for preventing undue flexing of the unit in a longitudinal direction including spaced means between longitudinally adjoining cells arranged to abut as the unit is longitudinally flexed.

6. In an ice cube tray the combination of a plurality of individual cells formed of a plastic material, said cells being arranged in longitudinally and transversely alined rows and being united at their upper margins into an integral unit, each of said cells having walls sloping outwardly and related to the cell bottom at angles of from ninety-six and one-half degrees to ninety-eight and one-half degrees, each of said cells near the bottom thereof having a narrow ledge formed on the inner face of one of the cell walls, and integral reinforcing members traversing the gap between opposed external surfaces of the walls of adjoining cells in the longitudinal rows, said members being located adjacent to the line of division between said longitudinal rows.

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