Feb. 25, 1941. E. O. VITS 2,233,148

ICE CUBE RELEASE

Filed May 26, 1938

Fig. 1.

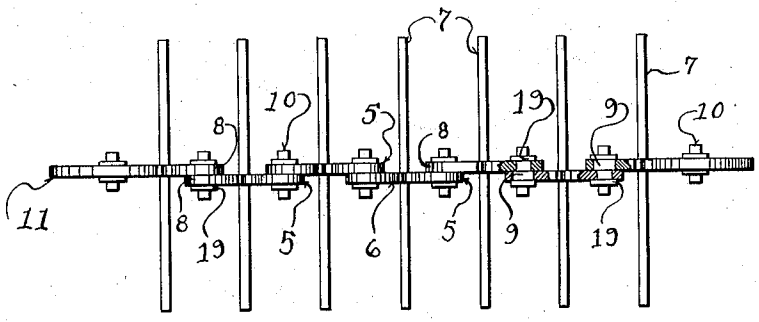


Fig. 2.

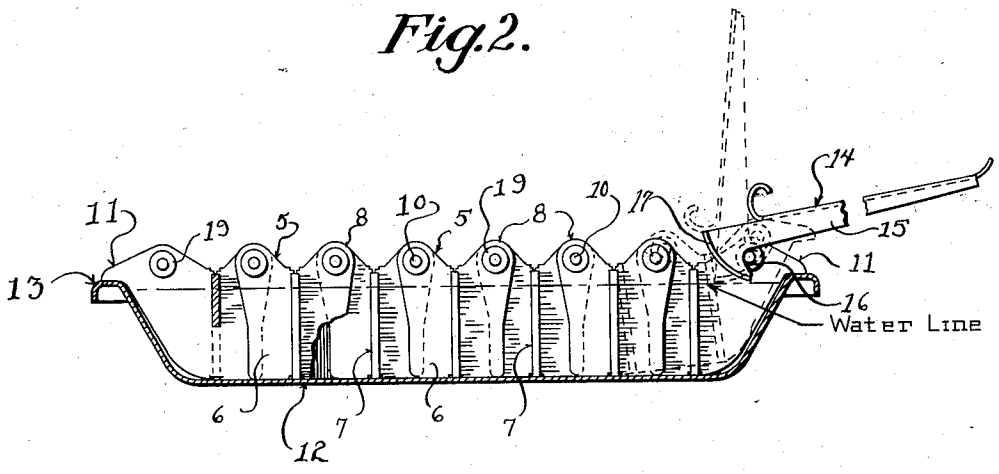


Fig. 4.

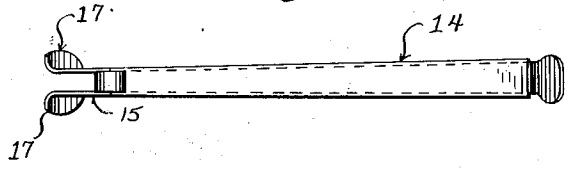
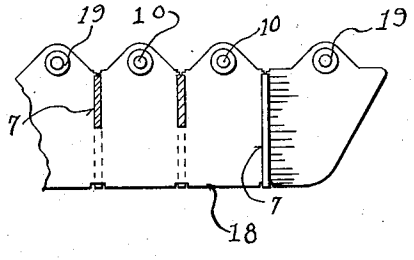


Fig. 3.



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UNITED STATES PATENT OFFICE

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ICE CUBE RELEASE

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Application May 26, 1938, Serial No. 210,178

3 Claims. (Cl. 62—108.5)

This invention pertains to refrigerating apparatus, and more particularly to improvements in grids for ice cube trays employed in household refrigerators.

To facilitate the removal of ice cubes from both the trays and grids, various mechanical means have been resorted to for flexing or shifting the dividers of the grid. As far as is known, these have been found to be impractical for various reasons, such as excessive cost of manufacture, ineffective operation, mutilation of either the grids or trays during operation, and so on.

One of the most serious objections to the present grids results from the fact that they endeavor to release all of the cubes in one operation, which of necessity requires considerable force, and exerts a great strain upon either the tray or grid.

The present invention has primarily for its object to overcome the foregoing objections by the provision of a grid provided with a detachable lever, utilizing a grid as a fulcrum in releasing the grid and cubes from the tray, and then independently releasing pairs of cubes between each set of dividers.

Incidental to the foregoing, a more specific object of the present invention resides in the provision of means for utilizing the longitudinal partition of the grid as a fulcrum for a detachable lever, in both releasing the grid and cubes in the tray, and subsequently ejecting the cubes from the grid.

Inasmuch as aluminum, which has been found to be the most practical material from which to form grids, is exceedingly soft, and, therefore, easily deformed, a more specific object of the present invention resides in attaching hardened projections to the grid for engagement by the releasing lever.

A still further object resides in the application of the foregoing principles to a sectional grid, in which each section is pivotally connected to the adjacent section.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel construction, combination, and arrangement of parts, substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawing are illustrated several forms of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawing:

Figure 1 is a plan view of a grid constructed in accordance with one form of the present invention, parts being broken away and in section to more clearly illustrate structural features.

Figure 2 is a longitudinal section through a conventional ice tray, with the present invention positioned therein.

Figure 3 is a fragmentary elevation of a modified form of the present invention, parts being shown in section to more clearly illustrate structural features; and

Figure 4 is a plan view of the releasing lever.

Referring now more particularly to the accompanying drawing, that form of the invention illustrated in Figures 1 and 2 comprises a grid consisting of a plurality of individual dividers **5**, each consisting of a central longitudinal plate **6**, and a transverse fin **7**. The dividers may be cast or fabricated, preferably the latter, wherein the plates and fins are oppositely slotted for reception of each other, and locked together by swedging or upsetting their intersecting edges in a conventional manner.

As best shown in Figure 2, the slots in the longitudinal dividers **5** extend upwardly from their lower edges, while those in the transverse fins **7** project downwardly from their upper edges. The advantage of the foregoing arrangement resides in the fact that any upward force exerted upon the longitudinal dividers **5** is received by the body of the fins **7**, and not the swedged or upset portions.

The longitudinal plate **6** of each divider is provided at its upper edge with an ear **8**, overlapping the ear of the adjacent plate, and pivotally connected thereto by means of a shouldered upset stud **9**, provided at its opposite ends with projections **10**. Here it might be explained that inasmuch as aluminum, which is relatively soft, has been found to be the most practical material from which to form ice tray grids, and, therefore, the studs **9**, upon which force is exerted in releasing the cubes, as will hereinafter described, are preferably formed of relatively hardened metal.

The end plates **11** have their outer edges shaped to conform to the taper of the ends of the tray **12**, while their upper edges extend over the bead **13** of the tray.

As best shown in Figure 2, a lever **14** is provided for releasing both the grid and cubes from the tray, and thereafter independently releasing

cubes from between each set of transverse fins. The lever 14 is preferably stamped from sheet material, and of channel formation. The lower ends of the channel sides 15 are provided with notches 16 for engagement with the projections 10 of the studs 9. Below the notches 16 the sides 15 are flared outwardly to provide arcuate cam surfaces 17.

In operation, the tray 12 is filled with water to a level slightly below the top of the tray, as indicated in Figure 2, and inasmuch as the projections 10 of the pintles are spaced above the top of the tray, when the water in the tray congeals and freezes, sufficient space exists between the projections 10 and the top of the ice cubes to permit the releasing lever 14 to be engaged with the projections 10, as illustrated in Figure 2. To release the cubes, the lever 14 is then forced downwardly to the position indicated in dotted lines, and due to the arcuate cam surfaces 17 on the lever, obviously a spreading action between the grid and ice cubes results. In that form of the invention illustrated in Figure 2, in which sections of the grid are pivotally connected together, the first and second sections are necessarily raised, as shown in dotted lines, which, in actual practice, releases the first four cubes. To progressively release the remaining cubes, the lever 14 is merely shifted to the projections between successive sets of fins.

From the foregoing it will be apparent that a limited number of cubes can be released with each operation, thus not only reducing the effort required, but also conserving cubes.

In the simplified and preferred form of the present invention, as shown in Figure 3, a single rigid longitudinal partition 18 is provided, instead of the hinged plates 6 shown in Figures 1 and 2. The partition 18 is likewise slotted for reception of the transverse fins 7, which are slotted downwardly, the longitudinal partition and transverse fins being secured together in the manner heretofore described. Between the fins 7 the longitudinal partition 18 is provided at its upper edge with hardened studs 19 clinched to the partition, which is formed of relatively soft metal, such as aluminum.

In that form of the invention shown in Figure 3, the mode of operation is similar to that heretofore described, but the results are somewhat different, in that upon engaging the stud carried by the end of the partition with the lever 14 the entire grid and ice cubes carried thereby are released from the tray. However, only the first two cubes are released from the grid. Thereafter each pair of cubes is released independently by shifting the lever to the adjacent stud.

From the foregoing explanation, considered in connection with the accompanying drawing, it will be seen that a very efficient and practical grid has been provided for the quick release of ice cubes with minimum effort, and no strain upon the tray. Due to the fact that the force exerted in releasing the grid and cubes is received by projections, preferably hardened pins carried by the central partition, practically no force is exerted upon the fins, and, therefore, possibility of mutilating or deforming the grid is reduced to a minimum. Also, due to the fact that in operation the releasing lever 14 must straddle the central partition, and simultaneously release the cubes on both sides, there is no tendency to cant or spring either the central partition or transverse fins.

Inasmuch as the projections engaged by the releasing handle are positioned centrally between the transverse fins, the present invention has the added advantage of allowing insertion and rotation of the releasing lever in either direction.

I claim:

1. A grid for ice cube trays comprising, a longitudinal partition, a plurality of spaced transverse fins fixedly carried by said partition to form ice cube compartments upon opposite sides of said partition, lateral projections carried by said partition, and a lever for detachable engagement with said projections to engage and release the ice cubes upon rotation of said lever, said lever comprising a handle to straddle said partition and having its sides notched adjacent the lower end of the handle for reception of said projections and provided with arcuate cam surfaces for engagement with the top surfaces of the ice cubes.

2. A grid for ice cube trays comprising, a plurality of sections each consisting of a longitudinal plate, a transverse fin carried thereby, pintles pivotally connecting said longitudinal plates together and provided with end extensions, and a lever for detachable engagement with said projections to engage and release ice cubes formed in the grid upon rotation of the handle.

3. A grid for ice cube trays comprising, a plurality of sections, each consisting of a longitudinal plate and a transverse fin carried thereby and formed of relatively soft metal, hardened pintles pivotally connecting said longitudinal plates and provided with end projections, and a lever for detachable engagement with said projections to engage and release the ice cubes formed in said grid upon rotation of the lever.

EARL O. VITS.