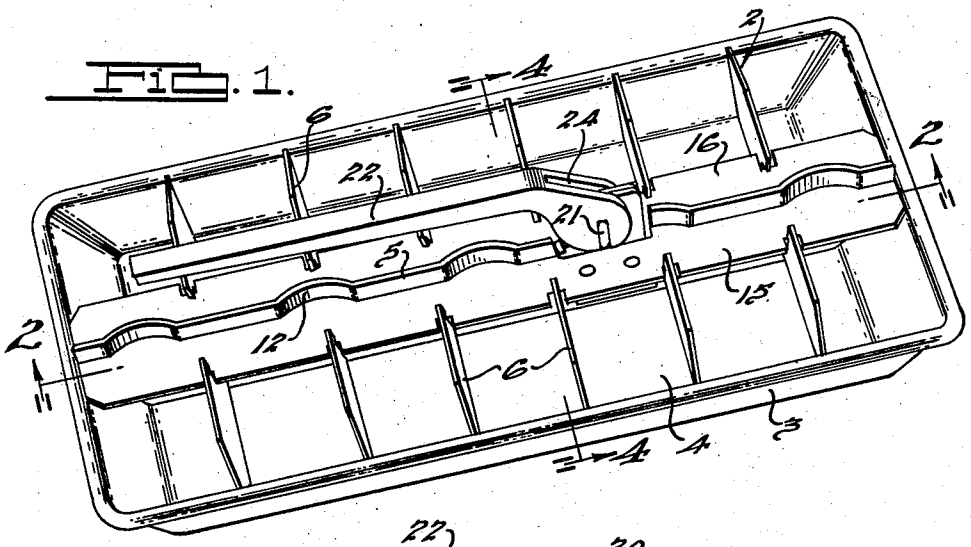
June 30, 1942. C. R. CARNEY 2,287,971

ICE TRAY

Filed Nov. 9, 1940 3 Sheets-Sheet 1

Fig. 1.



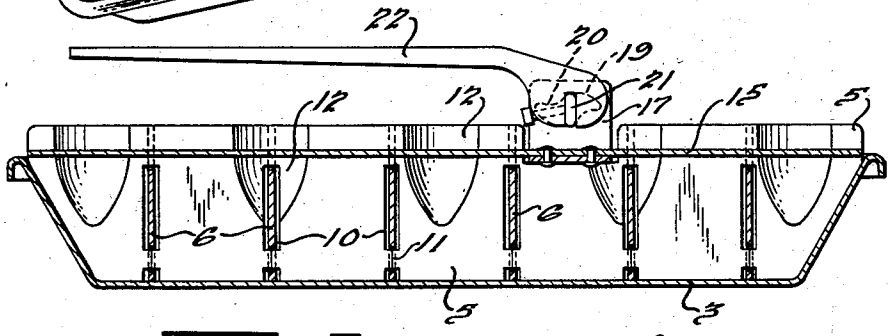
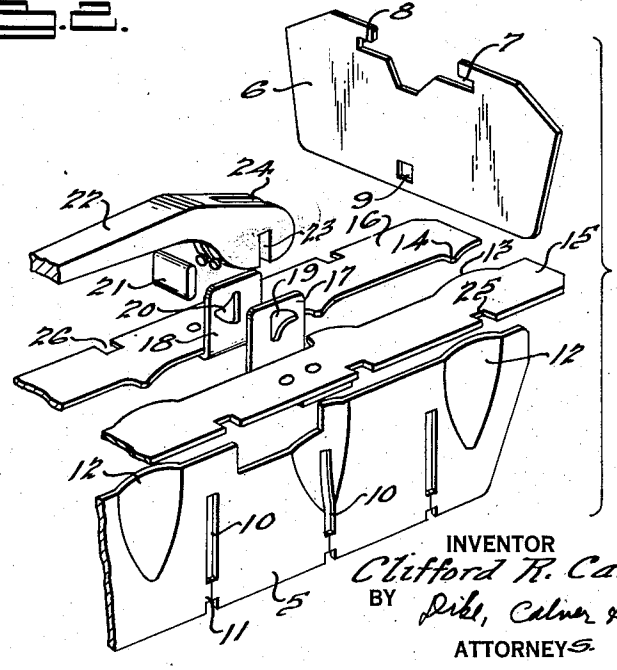


Fig. 2.

Fig. 3.



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ICE TRAY

Filed Nov. 9, 1940 3 Sheets-Sheet 2

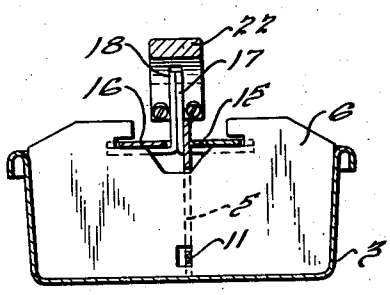


FIG. 4.

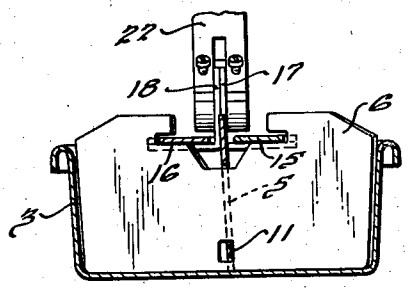


FIG. 7.

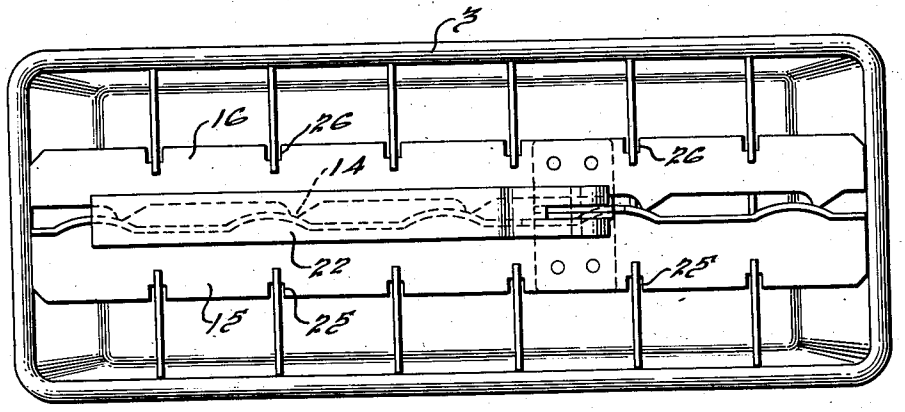


FIG. 5.

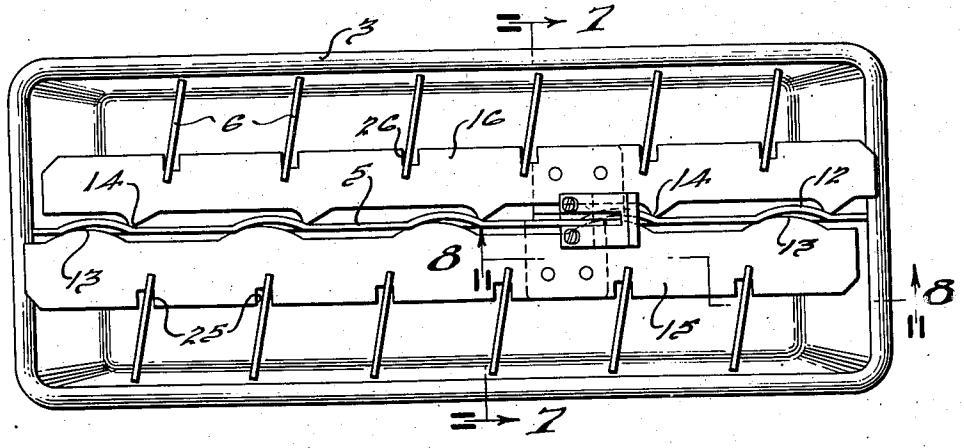


FIG. 6.

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ICE TRAY

Filed Nov. 9, 1940 3 Sheets-Sheet 3

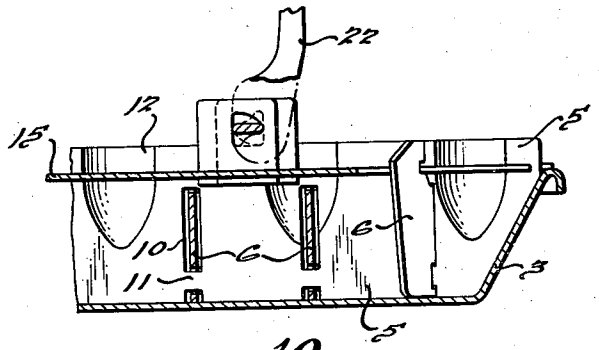


Fig. 8.

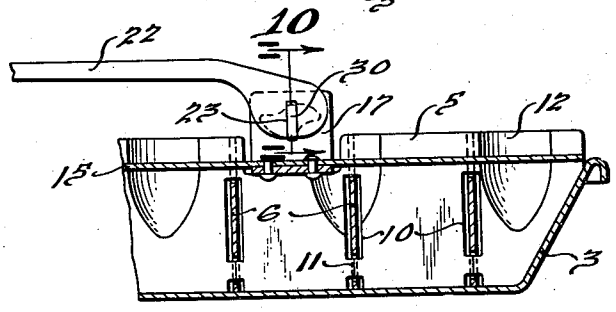


Fig. 9.

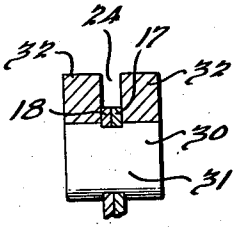


Fig. 10.

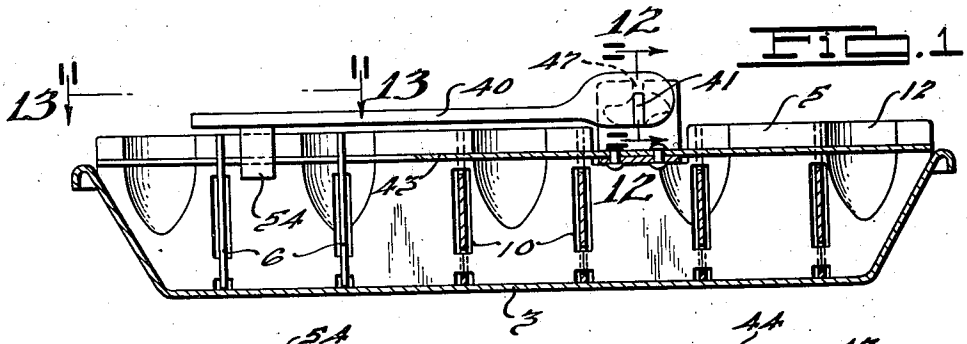


Fig. 11.

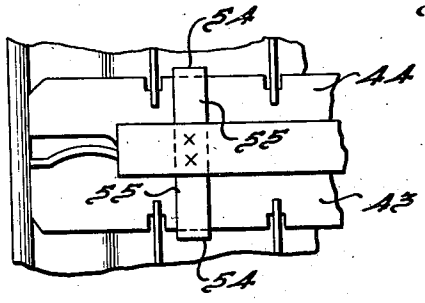


Fig. 13.

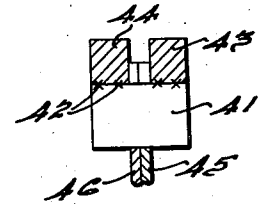


Fig. 12.

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Patented June 30, 1942

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UNITED STATES PATENT OFFICE

2,287,971

ICE TRAY

Clifford R. Carney, Dearborn, Mich.

Application November 9, 1940, Serial No. 364,979

8 Claims. (Cl. 62—108.5)

This invention relates to ice trays and more particularly to an ice tray grid having a plurality of interconnected relatively movable separator members which may be moved angularly relative to each other to produce a shearing force between ice blocks and the grid and pan to release ice therefrom.

An object of this invention is to provide an ice tray grid having a plurality of relatively movable grid members interconnected in such a manner that the members may be moved relative to each other to effect the release of ice.

Another object of the invention resides in the provision of manually operable means to simultaneously move longitudinal and transverse separator members to release ice blocks from the grid and pan members.

A further object resides in the provision of novel motion transmitting means whereby with a minimum effort applied, a plurality of grid members may be moved relative to each other to release ice.

Yet a still further object of the invention is to provide a grid structure having a vertically disposed longitudinally extending separator member hingedly mounted on a plurality of substantially vertically disposed transverse separator members wherein improved motion transmitting means may be employed to move the longitudinal separator member toward an angular position and to move the transverse separator members angularly about a vertical axis intermediate the ends of the transverse members to release ice.

Another object is to provide an ice tray grid having a pair of longitudinally movable bars associated with a longitudinal separator member in such a manner that movement of the bars in opposite directions actuates longitudinal and transverse grid members to release ice blocks from the grid and tray members.

A further object of the invention resides in the provision of novel motion transmitting means comprising a plurality of oppositely disposed cam members carried by relatively movable members in such a manner that actuation of a manually operable lever moves the members in opposite directions.

Yet another object resides in the provision of an ice tray grid having a longitudinal separator member which may be moved from a substantially vertical position towards an angular position to release ice by movement in opposite direction, of a pair of longitudinally movable bars positioned on opposite sides of the longitudinal separator member.

Other objects and advantages of this invention will be apparent from the following detailed description considered in connection with the accompanying drawings, submitted for purposes of illustration only, and not intended to define the scope of the invention, reference being had for that purpose to the subjoined claims.

In the drawings wherein similar reference characters refer to similar parts throughout the several views:

Fig. 1 is a perspective view of an ice tray grid embodying the present invention.

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view showing the various grid members in separated relationship.

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 1.

Fig. 5 is a top plan view of the grid and pan structure shown in the normal or ice forming position.

Fig. 6 is a view similar to Fig. 5 showing the grid structure in the actuated or ice releasing position.

Fig. 7 is a view similar to Fig. 4 taken substantially on the line 7—7 of Fig. 6.

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 6.

Fig. 9 is a longitudinal sectional view showing a modified form of the invention.

Fig. 10 is a sectional view taken substantially on the line 10—10 of Fig. 9.

Fig. 11 is a longitudinal sectional view of grid and pan members illustrating a still further modified form of the invention.

Fig. 12 is a sectional view taken substantially on the line 12—12 of Fig. 11.

Fig. 13 is a fragmentary plan view taken substantially on the line 13—13 of Fig. 11.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring now in particular to Figs. 1 to 8 inclusive, it will be observed that an ice tray grid designated as a whole by the reference character 2 is adapted to be positioned in a pan 3 to

divide the space within the pan into a plurality of longitudinally and transversely spaced ice block compartments 4.

A longitudinal separator member 5 is mounted on a plurality of transversely extending separator members 6 in such a manner that it may move angularly on the transverse members through a substantially predetermined arc. The transverse members have oppositely disposed horizontally extending slots 7 and 8 formed adjacent their upper edge and an apertured portion 9 adjacent their lower edge. The longitudinal separator member 5 is preferably vertically slotted as illustrated at 10 to receive a portion of the transverse grid members and the longitudinal member is provided with locking projections 11 adapted to lie within the apertured portions 9 of the transverse members 6 to maintain the longitudinal and transverse members in assembled relation.

The upper edge of the longitudinal separator 5 is formed with a plurality of contoured spaced camming portions 12 adapted to cooperate with camming portions 13 and 14 carried by longitudinally movable bars 15 and 16 adapted to lie within the horizontally extending slots 7 and 8 respectively of the transverse grid member 6. It will be observed that the cam portions 13 of the bar 15 are shaped to lie within the contoured portions 12 of the longitudinal separator 5 whereas the cam portions 14 of the bar 16 are shaped to act as stops to limit angular or transverse movement of the separator member 5 relative to the transverse member 6.

The longitudinally movable bars 15 and 16 may be provided with upwardly extending projections 17 and 18 having oppositely disposed apertures 19 and 20 adapted to receive motion transmitting means 21 such for example as a key or flat piece of metal. The apertures 19 and 20 are preferably generally triangular in shape and oppositely disposed whereby movement of the key 21 by any suitable means will move the bars 15 and 16 in opposite directions. One suitable means for actuating the key 21 comprises a handle member 22 having a transversely extending slot 23 adapted to straddle the key member 21 and a longitudinally extending slot 24 adapted to straddle the members 17 and 18 carried by the bars 15 and 16.

The bars 15 and 16 are provided with longitudinally spaced slots 25 and 26 respectively adapted to lie within the slots 7 and 8 respectively of the transverse members 6 to move transversely spaced portions of the separator members 6 in opposite directions when the bars 15 and 16 are moved in opposite directions by actuation of the handle 22. It will be observed that the transverse members 6 are maintained in a substantially vertical position by means of the vertically extending slots 10 formed in the longitudinal separator member 5 and that the transverse members may be moved angularly about a substantially vertical axis intermediate their ends.

In the operation of this device the grid structure 2 is positioned in the pan 3 as illustrated in Fig. 5 and the space within the pan is filled with liquid or other substance which is to be frozen. After the substance has frozen and it is desired to release the blocks of ice or other substance from the pan and grid structures the pan is removed from the evaporator or other cooling device and the handle 22 is elevated to actuate the grid members. Movement of the handle 22 operates through the key 21 and oppositely disposed apertures 19 and 20 to move the bars 15 and 16 in opposite directions relative to the longitudinal separator member 5.

Referring now to Fig. 6, it will be observed that upon actuation of the handle 22 the bar 15 moves toward the left. The camming portions 13 engage the contoured portions 12 of the longitudinal member 5 to urge the longitudinal separator 5 from a substantially vertical position toward an angular position. The locking projections 11 of the longitudinal separator member 5 being confined in the apertures 9 of the transverse members 6 restrain the longitudinal member 5 from bodily lateral movement in the pan. The cam portions 14 of the bar 16 move away from the contoured portions 12 of the longitudinal member 5 to permit the longitudinal member to move from a substantially vertical position toward an angular position as illustrated in Fig. 7. It will be noted that the metal forming the ends of the slots 7 and 8 of the transverse members 6 lies within the slots 25 and 26 of the bars 15 and 16 respectively to prevent the bars from separating.

Movement of the bars 15 and 16 in opposite directions operates through the metal forming the slots 25 and 26 and the metal forming the slots 7 and 8 respectively to move the transverse members 6 angularly about a substantially vertical axis intermediate the ends of the transverse members. This angular twisting of the transverse members 6 occurs simultaneously with the movement of the longitudinal member 5 from a substantially vertical position toward an angular position as illustrated in Figs. 6, 7 and 8. Ready release of the ice blocks is thus effected.

In the embodiment of Figs. 9 and 10, it will be observed that enlarged key 30 is formed with a central section of reduced diameter adapted to be engaged by the upwardly extending projections 17 and 18 in the normal position illustrated in Fig. 9 to lock the grid structure in assembled relation. The handle 22 has a transverse slot 23 adapted to straddle the key 30 and a longitudinal slot 24 between spaced members 32 to receive the projections 17 and 18 carried by the oppositely movable bars 15 and 16. The handle 22 may thus be detachable from the grid mechanism or if desired it may be fixed to the key 30 in any suitable manner as by spot welding and be an integral part of the grid structure.

Referring to the embodiment of the invention illustrated in Figs. 11 to 13, it will be observed that a handle member 40 is designed in such a manner as to occupy minimum vertical space above the grid structure. The handle member 40 may be fixed to a grid actuating key 41 in any suitable manner as by spot welding indicated at 42. Oppositely movable bars 43 and 44 associated with the longitudinal and transverse grid members may be provided with upwardly extending projectors 45 and 46 respectively having upwardly opening apertures 47 formed therein for the reception of the key 41 carried by the handle 40 to move the bars 43 and 44 in opposite direction to actuate the separator members of the grid structure to release it.

The handle 40 may, if desired, be provided with downwardly projecting lugs 54 carried by transversely extending members 55 to engage the oppositely movable bars 43 and 44 to maintain the grid structure in the inoperative or ice forming position.

I claim:

1. An ice tray grid comprising a plurality of

substantially vertically disposed transversely extending separator members, a longitudinal separator member mounted on the transverse separator members and movable from a substantially vertical normal ice forming position to an angularly inclined ice releasing position, and means comprising oppositely movable longitudinally extending bars associated with the longitudinal member whereby longitudinal movement of the bars in opposite directions moves the longitudinal separator member angularly from said normal substantially vertical position to release ice.

2. An ice tray grid comprising a plurality of substantially vertically disposed transversely extending grid members, a longitudinally extending grid member mounted on the transverse members, means comprising a pair of oppositely movable bars associated with the longitudinal and transverse members whereby the longitudinal separator member may be moved from a substantially vertical position toward an angular position and the transverse members may be rotated about substantially vertical axes intermediate their length to release ice, and manually operable means to move said bars in opposite directions.

3. An ice tray grid comprising a longitudinal separator member having a plurality of spaced camming portions formed adjacent its upper edge, a plurality of oppositely movable bars having portions engaging said camming portions adapted to lie on opposite sides of the longitudinal separator member and means to move said bars longitudinally in opposite directions to move the longitudinal separator member from a substantially vertical to an angularly inclined position to release ice.

4. An ice tray grid comprising a plurality of vertically disposed transversely extending separator members, a longitudinal separator member mounted on the transverse members and movable from a substantially vertical position to an angularly inclined position, a plurality of longitudinally extending oppositely movable bars associated with the longitudinal and transverse members, means to move the bars in opposite directions, and cooperating means between the oppositely movable bars and the longitudinal and transverse members whereby movement of the bars in opposite directions moves the transverse members angularly about substantially vertical axes intermediate their length and moves the longitudinal separator member from a substantially vertical toward an angular position to release ice.

5. An ice tray comprising a plurality of transversely extending separator members having apertures formed adjacent their lower edges and spaced oppositely directed notched portions formed adjacent their upper edges, a longitudinal separator member having a plurality of spaced substantially vertically disposed slots for the reception of the transverse members, a pair of oppositely movable bars positioned on opposite sides of the longitudinal separator member and having notched portions interlocking with the oppositely directed notched portions formed adjacent the upper edges of the transverse separator members, and manually operable means to move said bars in opposite directions.

6. An ice tray grid comprising a plurality of substantially vertically disposed transversely extending separator members, a longitudinal separator member having spaced camming portions mounted on the transverse members and movable thereon from a substantially vertical position to an angularly inclined position, a plurality of longitudinally extending bars positioned on opposite sides of the longitudinal separator member and engaging the transverse separator members, manually operable means to move the bars in opposite directions, and means comprising spaced cam members formed in the bars cooperating with the camming portions of the longitudinal separator member and spaced notched portions formed in the oppositely movable bars and engaging the transverse members whereby movement of the bars in opposite directions moves the transverse members angularly about substantially vertical axes intermediate their length and moves the longitudinal separator member from a substantially vertical toward an angular position to release ice.

7. An ice tray comprising a plurality of transversely extending separator members having apertures formed adjacent their lower edges and spaced oppositely directed notched portions formed adjacent their upper edges, a normally vertically disposed longitudinal separator member having a plurality of spaced substantially vertically disposed slots for the reception of the transverse members, and a plurality of longitudinally spaced cam portions formed adjacent its upper edge, a pair of oppositely movable bars positioned on opposite sides of the longitudinal separator member and having notched portions interlocking with the oppositely directed notched portions formed adjacent the upper edges of the transverse separator members, cam portions engaging the cam portions formed adjacent the upper edge of the longitudinal separator, and manually operable means to move said bars in opposite directions to move the longitudinal separator from a substantially vertical position towards an angular position and to move the transverse separator members about substantially vertical axes to release ice.

8. An ice tray grid comprising a plurality of relatively movable intersecting longitudinal and transverse separator members, connecting means between the intersecting separator members whereby a plurality of said separator members may be moved about substantially vertical axes intermediate their length and another separator member may be moved about a horizontal axis from a substantially vertical position toward an angular position, and actuating means comprising bars positioned on opposite sides of the longitudinal separator member whereby said members may be actuated to release ice.

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