Nov. 7, 1944. C. H. STEENSTRUP 2,362,320

FREEZING TRAY

Filed June 18, 1938

Fig. 1.

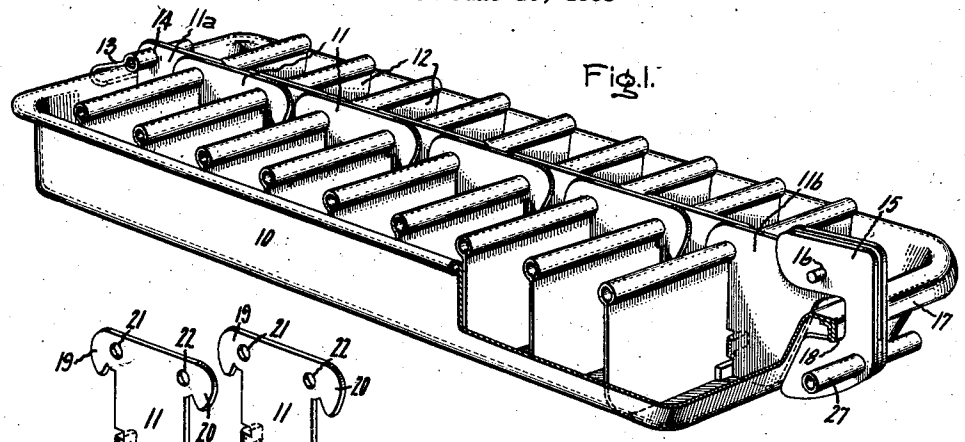


Fig. 2.

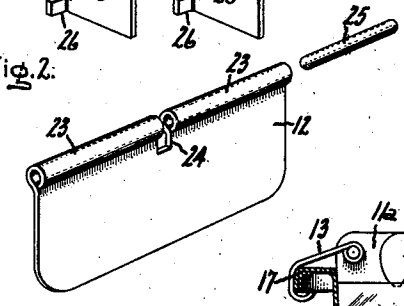
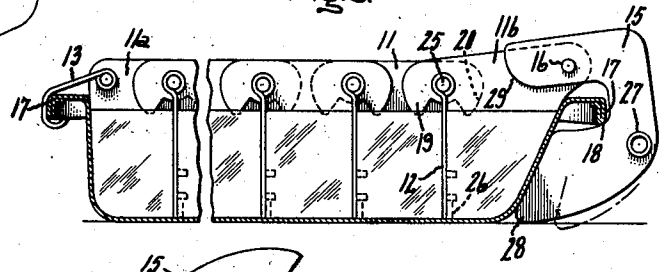


Fig. 3.



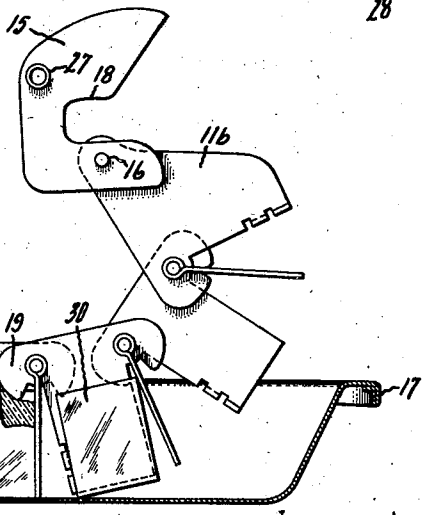


Fig. 4.

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FREEZING TRAY

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9 Claims. (Cl. 62—108.5)

My invention relates to freezing trays for refrigerating machines, and particularly to freezing trays provided with partition assemblies having movable elements for facilitating the release of ice blocks.

It is an object of my invention to provide a removable partition assembly for freezing trays including a plurality of movable partition elements and an improved arrangement for facilitating the release of ice blocks from the partition elements.

Another object of my invention is to provide a freezing tray having a removable partition assembly and an improved arrangement for retaining the assembly in position during the freezing of substances therein.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of my invention, reference may be had to the accompanying drawing in which Fig. 1 is a perspective view partly in section showing a freezing tray and partition assembly embodying my invention; Fig. 2 is a perspective view of a transverse partition element and two cooperating elements and tie pin of the assembly shown in Fig. 1, the elements being shown separately prior to assembly; Fig. 3 is a sectional elevation view of the freezing tray shown in Fig. 1 with the partition assembly shown in full and with ice blocks shown in the positions in which they are frozen; and Fig. 4 is a view similar to Fig. 3 showing the assembly in full and in position during removal of ice blocks therefrom.

Referring now to the drawing, I have shown an elongated freezing tray 10 within which is arranged a partition assembly comprising a plurality of longitudinal partition elements 11, 11*a* and 11*b* providing a partition extending the length of the tray and a plurality of transverse partition elements 12 cooperating with the longitudinal elements and with each other to form a plurality of pairs of ice block compartments. The longitudinal elements 11*a* and 11*b* are at the ends of the tray and conform to the end walls. The transverse elements 12 are pivotally mounted in the longitudinal elements and are, therefore, angularly movable with respect to each other. The partition elements 11, 11*a* and 11*b* are, therefore, pivotally mounted on the transverse elements and are also angularly movable with respect to one another in the plane of the longitudinal partition. In order to maintain the partition assembly in position during the freezing of water to form ice blocks in the compartments, I provide a hook 13 pivoted at 14 to the partition element 11*a* at the rear end of the tray and an arm 15 pivoted at 16 to the longitudinal partition element 11*b* at the forward end of the tray. The arm 15 projects over the end of the ice tray and engages a flange 17 of the tray as indicated at 18, and the hook 13 also engages the flange 17 at the rear end of the tray. The arm 15 and the hook 13 thus cooperate to maintain the partition assembly in position in the tray against forces which may tend to lift the assembly during the freezing of water. The construction and arrangement of the partition elements 11 and 12 are clearly shown in Fig. 2. Each longitudinal element 11 is cut in the shape of a letter T formed by extensions 19 and 20 at the back and front edges respectively, as viewed in Figs. 1 and 2, the extensions having downwardly projecting portions. In alignment with the front and back edges and in the extensions 19 and 20 are provided holes 21 and 22. The transverse elements 12 are provided with substantially cylindrical hollow reinforcing ribs 23 formed along the top edges thereof and a notch 24 extending through the ribs 23 at the top of each element. In order to mount the longitudinal elements 11 and the transverse elements 12 for pivotal movement with respect to each other, the hole 21 of one element 11 and the hole 22 of the other are aligned with the hollow portion or bore of the reinforcing rib 23 and a pin 25 is driven through the rib 23 until it passes through the holes 21 and 22 and secures the longitudinal elements in place in the notch 24. It is thus evident that a partition assembly of any desired length may be built up from a series of partitions 11 and 12. The partitions 11*a* and 11*b* at the ends of the assembly are shaped to conform with the walls of the ice tray but the sides thereof connected to the assembly are identical to the corresponding sides of the other longitudinal elements. The back edge of each of the elements 11 and of the element 11*b* is provided with projections or lugs 26 extending transversely on either side of the element and normal thereto. These projections rest against the adjacent transverse element 12 when the partition assembly is in place in the tray. The function of the projections 26 is to break the ice blocks free from the transverse partitions 12 in a manner to be described below.

In Fig. 3, the grid assembly is shown in position in the tray with the ice blocks in the compartments. The arm 15 is provided with a handle 27 which may be pulled forward to rotate the arm about the pivot 16. The initial rotation of the arm from the position in which it is shown in Fig. 3 forces the lower end of the arm indicated at 28 downwardly against the freezing shelf or other supporting surface as indicated by the dotted lines, and will break a frozen bond between the freezing tray and the supporting surface. The tray may then be removed from the freezing compartment or evaporator shelf and placed on a table or other convenient support. In order to release the ice blocks from the tray and from the partition assembly, the handle 15 is first rotated about the pin 16 until an end 29 of the handle contacts the upper edge of the wall of the freezing tray; further movement of the arm 15 exerts a force between the pin 16 and the tray tending to lift the partition element 11b out of the tray and to rotate the element 11b about the adjacent pin 25 and break the ice blocks in the compartments on either side of the element 11b free from the transverse partition 12 adjacent thereto and from the freezing tray. The rotation of the element 11b in the first compartment also rotates the ice block in one of the compartments against the downwardly extending projection 20 on the element 11 in the next or adjacent compartment thereby tending to break the block of ice free from the element 11b in the first compartment. The edge 29 of the handle 11 exerts a downward force on the block of ice on the other side from the block broken free by the element 20 and thus both blocks are broken free from all partition elements and from the tray in the first pair of compartments. Further rotation of the element 11b and the adjacent element 11 which may be produced by pulling the handle 15 upwardly and backwardly along the tray as shown in Fig. 4 will break loose the ice blocks in each pair of compartments in turn, the function of the end 29 of the arm 11 in breaking loose the ice block from the longitudinal element 11b in the first compartment being performed by the projections 19 on the elements in succeeding compartments. The projections 26 on either side of the back edges of the longitudinal elements 11 and 11b are particularly effective in breaking the ice cubes free from the transverse partition elements 12, and it has been found that this provides a more positive and effective release of the blocks. The action of the projections 19 has been indicated clearly in Fig. 4, in which an ice block 30 is shown as just being released from one compartment while the projection 19 is pressing into the ice block in the adjacent compartment.

It is readily apparent that any desired number of pairs of ice blocks may be removed from the freezing tray by manipulation of the partition assembly as described above. The entire contents of the tray may be removed quickly by pulling the arm 15 toward the rear of the tray until the last blocks have been released. The hook 13 is also useful to maintain the freezing assembly attached to the tray so that chips of ice or ice blocks are not thrown out during the release of the last pair of blocks since the hook prevents the sudden jerking of the entire assembly away from the tray.

From the foregoing, it is evident that I have provided a partition assembly of simple and rugged construction for removing ice blocks from a freezing tray without first breaking the frozen bond by heating the tray, and further that I have provided a partition assembly comprising a plurality of relatively movable elements which is nevertheless maintained in position in the tray regardless of forces exerted during the freezing of water in the tray which tend to lift the assembly therefrom.

While I have described a particular embodiment of my invention in connection with a freezing tray for household refrigerators, other applications will readily be apparent to those skilled in the art. I do not, therefore, desire my invention to be limited to the particular construction shown and described, and I intend in the accompanying claims to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A removable partition assembly for a freezing tray including a plurality of alined longitudinal partition elements and a plurality of transverse partition elements arranged between said longitudinal elements, said longitudinal and transverse elements cooperating to form side walls of a plurality of ice block compartments, means for retaining said partition elements in assembled relation and for affording relative bodily movement between said elements, said longitudinal elements being angularly movable with respect to each other in their plane of alinement, means adapted to move said elements with respect to each other for breaking a frozen bond between said partition elements and ice blocks frozen between said compartment walls, and means including lateral projections on each of said longitudinal elements for facilitating the breaking of the frozen bond formed between said blocks in the compartments on either side of each said longitudinal element and the adjacent ones of said transverse members constituting walls of the same compartments.

2. A removable partition assembly for a freezing tray including a plurality of alined longitudinal partition elements and a plurality of transverse partition elements arranged between said longitudinal elements, said longitudinal and transverse elements cooperating to form a plurality of side walls of ice block compartments, means for retaining said partition elements in assembled relation and for affording relative bodily movement between said elements, said longitudinal elements being angularly movable with respect to each other in their plane of alinement, means adapted to move said elements with respect to each other for breaking a frozen bond between said partition elements and ice blocks frozen between said compartment walls, said last-mentioned means including a rigid extension on each of said longitudinal partition elements arranged to exert pressure upon the upper portion of an ice block frozen to another of said longitudinal elements when said longitudinal elements are moved angularly with respect to one another, and means including projections on each of said longitudinal elements near the lower end thereof for facilitating the breaking of the frozen bond between said blocks and the adjacent ones of said transverse members.

3. A removable partition assembly for a freezing tray including a plurality of similar partition elements cooperating to form a plurality of ice block compartments, means for retaining said

elements in assembled relation and for affording relative bodily movement between said elements to facilitate the release of ice blocks from said compartments, manually operable means for applying force to break the frozen bonds between said elements and the ice blocks in said compartments successively from one end of said assembly to the other, and means secured to said other end of said assembly for engaging the end wall of an ice tray to anchor said other end of said assembly with respect to the tray during operation of said manually operable means.

4. In combination with a freezing tray, a removable partition assembly including a plurality of partition elements cooperating to form a plurality of ice block compartments in the tray, and a movable arm secured to one end of said assembly and having a portion adapted to lie in a position adjacent a surface on which the freezing tray is supported, said arm being adapted to lock said assembly to the freezing tray and on an initial movement to break a frozen bond between the freezing tray and its supporting surface and on further movement to effect the release from said tray of an ice block in one of said compartments.

5. In combination with a freezing tray, a partition assembly comprising a plurality of relatively movable partition elements cooperating with the walls of said tray to form a plurality of ice block compartments, and manually operable means including an arm pivotally mounted on said assembly at one end thereof for breaking a frozen bond between said tray and a supporting surface and for effecting a release of ice blocks from said compartments, said arm having a portion occupying a normal position of rest near the lower edge of said tray and being adapted in its normal position to lock said assembly in said tray and on an initial pivotal movement thereof from its position of rest to break the frozen bond between said tray and its support, and said arm having another portion adapted upon a further pivotal movement of said arm to initiate the release of at least one ice block from said tray.

6. In combination with a freezing tray, a partition assembly comprising a plurality of relatively movable partition elements cooperating with the walls of said tray to form a plurality of ice block compartments, manually operable means including an arm pivotally mounted on said assembly at one end thereof for locking said assembly in said tray and for breaking a frozen bond between said tray and a supporting surface and for effecting a release of ice blocks from said compartments, said arm having a portion occupying a normal position of rest near the lower edge of said tray to lock said assembly in said tray and being adapted on an initial pivotal movement thereof from its position of rest to break the frozen bond between said tray and its support, and said arm having another portion adapted upon a further pivotal movement of said arm to initiate the release of at least one ice block from said tray, and means including a hook secured to said assembly at the end remote from said arm and adapted to engage the end wall of said tray for anchoring said remote end of said assembly during the removal of the ice blocks from said compartments.

7. In combination with a freezing tray, a removable partition assembly including a plurality of separate partition elements cooperating with the walls of said tray to form a plurality of ice block compartments, and a movable arm pivotally mounted on one end of said assembly and having a portion overhanging said tray for effecting the release of ice blocks from said tray and said assembly successively from said one end of said tray to the other end thereof, said arm being adapted to lock said assembly in said tray and on pivotal movement from its locking position to effect the release from said tray of at least one of the ice blocks in said compartments.

8. In combination with a freezing tray, a removable partition assembly including a plurality of separate partition elements cooperating with the walls of said tray to form a plurality of ice block compartments, means including a movable arm pivotally mounted one one end of said assembly and having a portion overhanging said tray for effecting the release of ice blocks from said tray and said assembly successively from one said end of said tray to the other end thereof, said arm being adapted to lock said assembly in said tray and on pivotal movement from its locking position to effect the release from said tray of at least one of the ice blocks in said compartments, and means including a hook secured to said other end of said assembly for engaging said tray to prevent longitudinal movement of said assembly in said tray during operation of said arm to release ice blocks from said tray.

9. A removable partition assembly for freezing trays including a plurality of substantially parallel transverse partition elements spaced from one another to provide a plurality of side walls of ice block compartments, substantially cylindrical hollow reinforcing ribs formed along the tops of said elements, means including longitudinally arranged links for movably connecting said transverse elements to form a unitary grid the separate elements of which may be moved relatively to one another for facilitating the breaking of frozen bonds between said elements and ice blocks frozen between said compartment walls, said last-mentioned means including pins retained within said ribs and engaging said links for securing said links to said elements.

CARL H. STEENSTRUP.