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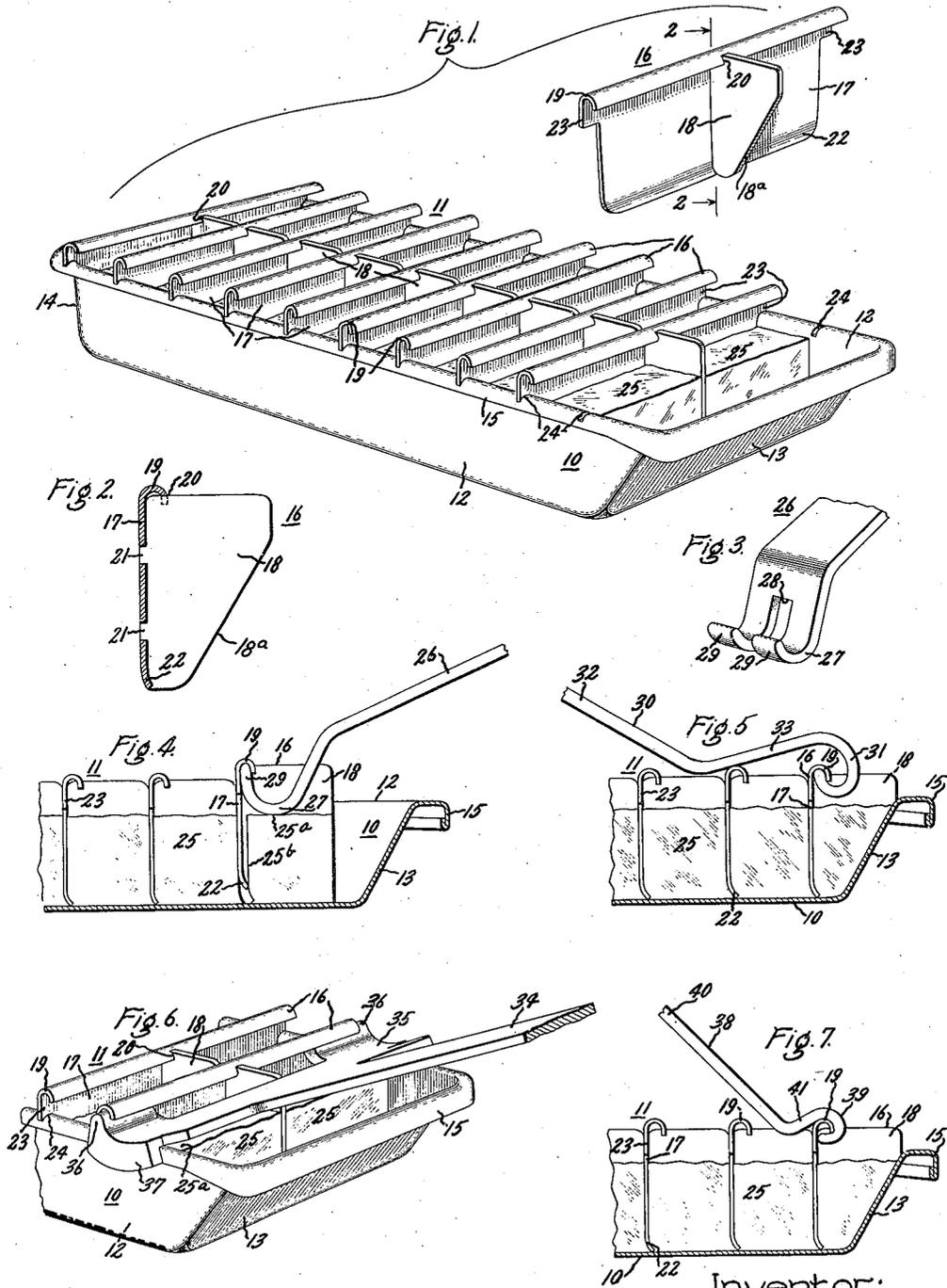
C. H. STEENSTRUP

2,265,705

FREEZING TRAY

Filed June 8, 1937

2 Sheets-Sheet 1



Inventor:
Carl H. Steenstrup,
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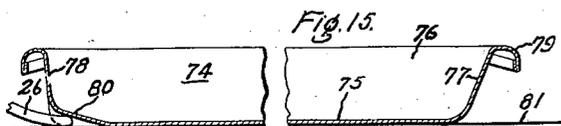
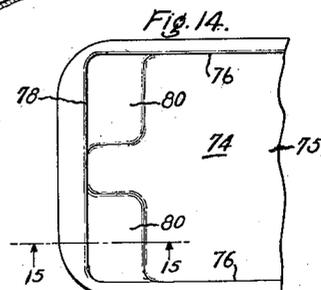
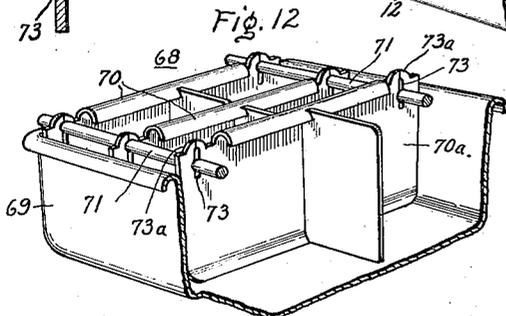
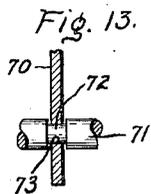
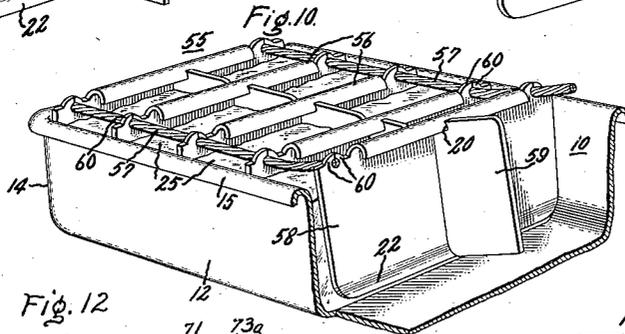
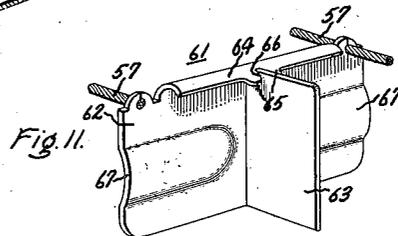
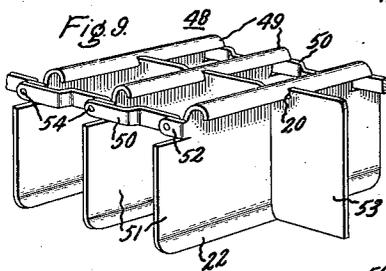
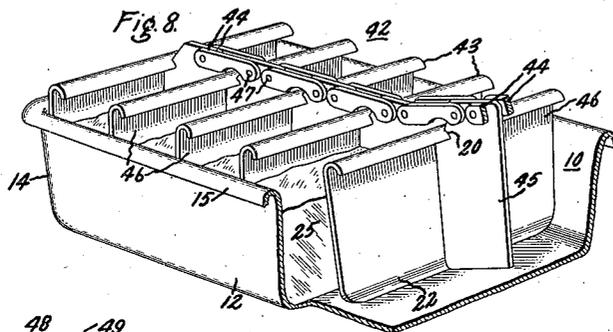
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FREEZING TRAY

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2 Sheets-Sheet 2



Inventor:
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UNITED STATES PATENT OFFICE

2,265,705

FREEZING TRAY

Carl H. Steenstrup, Schenectady, N. Y., assignor to General Electric Company, a corporation of New York

Application June 8, 1937, Serial No. 147,056

14 Claims. (Cl. 62-108.5)

My invention relates to freezing trays employed in refrigerating machines for producing ice blocks or the like.

Many types of refrigerating machines, and particularly those adapted for household use, are provided with a freezing tray supported on a surface of a cooling unit associated with the refrigerating machine for producing ice. A partition assembly is commonly provided in the freezing tray in order to divide the same into a number of small compartments, so that the ice will be frozen in the form of small blocks or cubes. The partition assembly is frequently separate from the freezing tray and removable therefrom in order to facilitate the release of the ice blocks.

Arrangements have been proposed for mechanically releasing the partition assembly and the ice blocks carried thereby from the freezing tray and for mechanically releasing the ice blocks from the partition assembly without thawing the frozen bond between the ice blocks and the walls of the compartments in which they are frozen. These arrangements have not been altogether satisfactory mainly due to the fact that all of the ice blocks are released substantially simultaneously from the freezing tray and the partition assembly, thereby requiring relatively great operating forces. In order to reduce the force required to mechanically release the ice blocks, a coating of waxy material is frequently provided on the interior surface of the freezing tray and on the exterior surface of the partition assembly. Although these coatings reduce the operating forces required to mechanically release the ice blocks while the coatings are intact, these coatings are quickly worn off in use, and particularly if the surfaces are cleaned in hot water. Consequently, such reduction in the required operating forces is only of temporary character.

It is an object of my invention to provide a freezing tray and a partition assembly for producing ice blocks, and an improved arrangement for mechanically releasing the ice blocks from the freezing tray and the partition assembly without thawing the frozen bonds between the ice blocks and the freezing tray and the partition assembly.

Another object of my invention is to provide an improved partition assembly for freezing trays comprising a number of individual partition elements of similar and economical construction.

A further object of my invention is to provide an improved partition assembly for freezing trays

comprising a plurality of similar partition elements forming a plurality of ice block compartments, and an arrangement for retaining the partition elements in assembled relation and for accommodating relative movements between the partition elements to facilitate the release of the ice blocks therefrom.

Another object of my invention is to provide a freezing tray embodying an improved arrangement for breaking the frozen bond between the freezing tray and a supporting surface of a cooling unit.

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 drawings, in which Fig. 1 is a perspective view of a freezing tray and a partition assembly comprising a plurality of similar individual partition elements forming a plurality of ice block compartments, and embodying my invention, the partition element adjacent the front end of the partition assembly being shown removed from the freezing tray to illustrate more clearly the arrangement; Fig. 2 is a side elevational view, partly in section, of the end partition element of the partition assembly along the line 2-2 of Fig. 1; Fig. 3 is a fragmentary perspective view of a lever employed in releasing the ice blocks from the freezing tray and the partition assembly; Fig. 4 is a fragmentary side elevational view, partly in section, of the freezing tray and the partition assembly shown in Fig. 1, and illustrating the mode of operation of the lever shown in Fig. 3; Fig. 5 is a fragmentary side elevational view, partly in section, of the freezing tray, the partition assembly and a modified form of lever for releasing the ice blocks from the freezing tray; Fig. 6 is a fragmentary perspective view of the freezing tray, the partition assembly and a further modified form of lever for releasing the ice blocks from the freezing tray and the partition assembly; Fig. 7 is a fragmentary side elevational view, partly in section, of the freezing tray, the partition assembly and a further modified form of lever for releasing the ice blocks from the freezing tray; Fig. 8 is a fragmentary perspective view of the freezing tray and a modified form of the partition assembly embodying an arrangement employing links for retaining the partition elements in assembled relation and

for accomodating limited relative movements of the partition elements with respect to each other and to the freezing tray in order to facilitate the release of the ice blocks from the partition assembly and the freezing tray; Fig. 9 is a fragmentary perspective view of a modified form of the partition assembly shown in Fig. 8; Fig. 10 is a fragmentary perspective view of the freezing tray and a further modified form of the partition assembly embodying an arrangement employing flexible strands for retaining the partition elements in assembled relation and for accomodating limited relative movements of the partition elements with respect to each other and to the freezing tray in order to facilitate the release of the ice blocks from the partition assembly and the freezing tray; Fig. 11 is a perspective view of a modified form of the partition element; Fig. 12 is a fragmentary perspective view of a freezing tray and a modified form of partition assembly; Fig. 13 is a fragmentary sectional view of the divider of Fig. 12; and showing one of the supporting rods in elevation; Fig. 14 is a fragmentary plan view of a modified form of the freezing tray; and Fig. 15 is a longitudinal sectional view of the freezing tray along the line 15—15 of Fig. 14.

Referring to the drawings, in Fig. 1 I have shown a shallow rectangular freezing tray 10 having a recess containing a removable partition assembly 11. The freezing tray 10 is provided with a substantially flat bottom wall and an upwardly directed marginal wall forming sides 12 and front and rear ends 13 and 14 respectively, a downwardly turned marginal rim 15 being provided about the upper edge of the marginal wall of the freezing tray.

The partition assembly 11 comprises a plurality of individual and similar partition elements 16 arranged in series within the freezing tray 10. Preferably the freezing tray 10 and each of the partition elements 16 are made of sheet aluminum, but may be made of any other suitable material.

Each of the partition elements 16 comprises a vertically extending transverse dividing wall 17 and a vertically extending longitudinal dividing wall 18 secured to the transverse dividing wall 17 adjacent the center thereof and extending outwardly therefrom. The longitudinal dividing wall 18, together with the transverse dividing wall 17, cooperate with the freezing tray to provide a pair of adjacent ice block compartments. The transverse dividing wall 17 is provided with a laterally projecting curved flange or shoulder 19 adjacent the upper edge thereof extending over each of the ice block compartments. The flange 19 constitutes an abutment, and such an abutment may be made in any suitable manner, as by forming the partition element in any convenient manner, providing openings in the partition element, or by attaching thereto any desired element. The flange 19 is also downwardly turned and provided with a slot 20 therein providing abutments engaging opposite sides of the longitudinal dividing wall 18 to brace the longitudinal dividing wall against lateral movement, as best shown in Fig. 2. The arrangement for securing the longitudinal dividing wall 18 to the transverse dividing wall 17 comprises a plurality of projecting tabs 21 formed on the longitudinal dividing wall 18 and projecting into suitable openings formed in the transverse dividing wall 17, the tabs 21 being retained in place in any suitable manner, as by welding or peening the

outer ends thereof. The transverse dividing wall 17 is also provided with a downwardly inclined flange or projection 22 along the lower edge thereof extending into each of the ice block compartments formed by the partition element 16, which facilitates the mechanical release of the ice blocks from the freezing tray 10.

The individual partition elements 16 of the partition assembly 11 are arranged in juxtaposed relation in the freezing tray 10 with the longitudinal dividing walls 18 extending in the same direction toward the front end 13 of the freezing tray and in substantial alinement along the center line of the partition assembly, the partition elements 16 being retained in assembled relation by cooperating shoulders 23 formed on the partition elements 16 adjacent the upper edge thereof and a plurality of spaced-apart and alined slots 24 provided in the downwardly turned marginal rim 15 of the freezing tray 10. The slots 24 constitute abutments engaging the shoulders 23 provided on each of the partition elements 16 and retain the transverse dividing wall 17 of each of the partition elements 16 substantially in spaced parallel relation in the freezing tray 10, and in engagement with the ends of the adjacent longitudinal dividing wall 18.

The partition assembly 11 is arranged within the freezing tray 10 and the ice block compartments formed by the partition elements 16 are filled with water, and the freezing tray 10 is placed upon the supporting surface of a cooling unit of a refrigerating machine. The water level in the tray will be below the flanges 19, as these flanges are above the upper edge of the freezing tray. After the water contained in the freezing tray 10 has been frozen, the freezing tray is removed from the supporting surface of the cooling unit and a desired number of pairs or all of the ice blocks 25 are released from the freezing tray 10 and the partition assembly 11 for use as desired. The ice blocks 25 are mechanically released from the freezing tray 10 and the partition assembly 11, in accordance with the preferred embodiment of my invention, by employing a lever or element 26 provided with a bifurcated curved end 27 as shown in Figs. 3 and 4 and without thawing the frozen bonds between the ice blocks in the freezing tray and the partition assembly. Instead of using the lever 26 any other suitable instrument or arrangement may be employed for mechanically releasing the ice blocks from the freezing tray and the partition assembly. The bifurcated curved end of the lever 26 is slotted as indicated at 28, in order to provide two spaced-apart curved arms 29. The adjacent pairs of ice blocks 25 are released successively from the front end 13 of the freezing tray 10 towards the rear end 14 thereof, the front end 13 of the freezing tray 10 being upwardly inclined in order to facilitate the release of the pair of ice blocks 25 adjacent thereto. Also, the end partition element 16 of the partition assembly 11 adjacent the front end 13 of the freezing tray 10 is provided with a longitudinal dividing wall 18 having an upwardly inclined portion 18a conforming to the upward inclination of the front end 13 of the freezing tray 10.

In releasing a pair of the ice blocks 25 from the freezing tray 10 and the partition assembly 11, the lever 26 is brought into engagement with one of the partition elements 16, as shown in Fig. 4. The slot 28 in the bifurcated curved end 27 of the lever 26 straddles the longitudinal dividing wall 18, the outer ends of the spaced-

apart curved arms 29 engage the flange 19 provided adjacent the upper portion of the transverse dividing wall 17 on opposite sides of the longitudinal dividing wall 18 of the partition element 16, and the lower surfaces of the curved arms 29 of the bifurcated curved end 27 of the lever 26 engage adjacent top surfaces 25a of the ice blocks 25 disposed on opposite sides of the longitudinal dividing wall 18 of the partition element 16. The outer end of the lever 26 is depressed, causing the lower surfaces of the curved arms 29 of the bifurcated end 27 of the lever 26 to fulcrum on the adjacent top surfaces 25a of the ice blocks 25 and to exert a lifting force upon the partition element 16. The partition element 16 is lifted with respect to the ice blocks 25, causing the frozen bonds between the ice blocks 25 and the transverse and longitudinal dividing walls of the partition element 16 to be broken. As the partition element 16 is lifted with respect to the ice blocks 25 and from the freezing tray 10, the downwardly inclined flange or projection 22 provided adjacent the lower portion of the transverse dividing wall 17 causes a force to be exerted between the side surfaces 25b of the pair of ice blocks 25 being released and an adjacent pair of ice blocks 25, tending to shift the pair of ice blocks 25 being released toward the front end 13 of the freezing tray 10. Shifting of the pair of ice blocks 25 toward the front end 13 of the freezing tray 10 causes the frozen bonds between the pair of ice blocks 25 and the freezing tray 10 to be broken. Adjacent pairs of the ice blocks 25 then may be released in a similar manner until the desired number, or all, of the ice blocks 25 have been released. The ice blocks 25 then may be readily removed for use as desired. Instead of the lever 26 any other suitable arrangement may be used to exert the desired force between the partition element and the top surface of an ice block.

In view of the fact that the ice blocks 25 are released successively in pairs, only a relatively small force is required to operate the lever 26. Moreover, adequate forces are exerted upon a pair of ice blocks 25 to release the ice blocks without thawing the frozen bonds between the ice blocks 25 and the freezing tray 10, and between the ice blocks 25 and the partition assembly 11, even though the freezing tray 10 and the partition elements 16 of the partition assembly 11 are not provided with coatings of waxy material. This arrangement also has the advantage of providing for ready removal of a small number of ice blocks from the freezing tray without disturbing the remaining ice blocks.

The provision of a freezing tray and a partition assembly forming a plurality of adjacent pairs of ice block compartments and an arrangement for and a method of releasing the adjacent pairs of ice blocks successively from one end of the freezing tray toward the other end thereof is not my invention, but is the invention of Larry D. Kelly, and is described and claimed in his application Serial No. 147,057, filed June 8, 1937, and assigned to the General Electric Company, the assignee of my present invention.

In Fig. 5 I have shown a modified arrangement including a lever 30 for mechanically releasing the ice blocks 25 from the freezing tray 10. The lever 30 is provided with a curved bifurcated end 31, a handle portion 32 and a connecting portion 33. In releasing a pair of the ice blocks 25 from the freezing tray 10 with the lever 30,

the bifurcated end 31 of the lever 30 is brought into engagement with the flange 19 provided adjacent the upper portion of the transverse dividing wall 17 of one of the partition elements 16, the arms at the bifurcated end 31 on opposite sides of the longitudinal dividing wall 18 of the one partition element 16, and the connecting portion 33 of the lever 30 is brought into engagement with the upper portion of an adjacent partition element 16. The handle portion 32 of the lever 30 is depressed, causing the connecting portion 33 thereof to exert a downward force upon the adjacent partition element 16 and an upward lifting force upon the one partition element 16, which breaks the frozen bonds between the pair of ice blocks 25 carried by the one partition element 16 and the freezing tray 10. The desired number of pairs or all of the ice blocks 25 are released from the freezing tray 10 in a similar manner. The released ice blocks 25 and partition elements 16 are removed from the freezing tray 10, without disturbing the remaining ice blocks. The ice blocks 25 are then released from the partition elements 16 in any suitable manner for use as desired.

In Fig. 6 I have shown a further modified arrangement including a lever 34 for mechanically releasing the ice blocks 25 from the freezing tray 10 and the partition elements 16 of the partition assembly 11. The lever 34 is provided with a curved bifurcated end 35 providing a pair of spaced-apart arms 36, the spacing between the outer edges of the arms 36 being slightly greater than the width of the freezing tray 10. A pair of downwardly-projecting flanges 37 are provided on the outer sides of the arms 36 in order to position the curved end 35 of the lever 34 upon the downwardly turned rim 15 of the freezing tray 10. In releasing a pair of the ice blocks 25 from the freezing tray 10 and a partition element 16 of the partition assembly 11, the curved end 35 of the lever 34 is placed upon the downwardly turned rim 15 of the freezing tray 10, the curved end 35 being positioned by the pair of downwardly projecting flanges 37 provided on the outer sides of the arms 36. The outer ends of the arms 36 engage the flange 19 provided adjacent the upper portion of the transverse dividing wall 17 of the partition element 16 and the lower surfaces of the arms 36 engage the upper surfaces of the sides of the downwardly turned rim 15 of the freezing tray 10 and fulcrum thereon. When the outer end of the lever 34 is depressed, a downward force is exerted upon the upper surfaces of the sides of the downwardly turned rim 15 of the freezing tray 10 and an upward lifting force is exerted upon the partition element 16 of the partition assembly 11, causing the frozen bonds between the ice blocks 25 and the freezing tray 10 to be broken. Upon further downward movement of the outer end of the lever 34, the adjacent top surfaces 25a of the ice blocks 25 are brought into engagement with the lower surfaces of the arms 36 on the curved end 35 of the lever 34. Downward forces are exerted upon the adjacent top surfaces 25a of the ice blocks 25 and an upward lifting force is exerted upon the partition element 16, causing the frozen bonds between the ice blocks 25 and the transverse and longitudinal dividing walls of the partition element 16 to be broken. The partition element 16 may then be removed from the freezing tray 10 and the pair of released ice blocks 25 may be removed from the freezing trays 10 for use as desired. Any number of pairs

or all of the ice blocks 25 may be removed from the freezing tray 10 in a similar manner.

In Fig. 7 I have shown a further modified arrangement including a lever 38 for mechanically releasing a pair of the ice blocks 25 from the freezing tray 10. The lever 38 is provided with a bifurcated curved end 39, a handle portion 40 and an intermediate connecting portion 41. In releasing a pair of the ice blocks 25 from the freezing tray 10 with the lever 38, the bifurcated curved end 39 of the lever 38 is brought into engagement with the flange 19 provided adjacent the upper portion of the dividing wall 17 of one of the partition elements 16, the arms at the bifurcated end 39 on opposite sides of the longitudinal dividing wall 18 of the one partition element 16. The handle portion 40 of the lever 38 is then depressed causing the transverse dividing wall 17 of the partition element 16 to fulcrum upon an adjacent pair of the ice blocks 25 and exert a force between the adjacent pair of the ice blocks 25 and the pair of ice blocks 25 being released, which breaks the frozen bonds between the pair of ice blocks 25 being released and the freezing tray 10. The desired number of pairs or all of the ice blocks 25 are released from the freezing tray 10 in a similar manner. The released ice blocks 25 and partition elements 16 are removed from the freezing tray 10, and the ice blocks 25 are then released from the partition elements 16 in any suitable manner for use as desired.

For convenience in handling the partition elements of my improved freezing tray, I may provide any suitable arrangement for retaining the partition elements in assembled relation, so that they can be readily moved with respect to each other as required in breaking the individual partition elements loose from the ice blocks. In Fig. 8 this is accomplished by providing links 44 pivotally connecting together the partition elements at the middle thereof; in Fig. 9 a plurality of links 50 are shown pivotally connecting together the partition elements at the opposite sides thereof; in Fig. 10 the partition elements are connected together along their opposite sides by flexible wire-like connectors or strands 57; and in Fig. 12 the partition elements are connected together by supporting rods 71. All of these connecting arrangements also provide for retaining the partition element in assembled relation, so as to facilitate placement in or removal from the freezing tray of the partition assembly.

In Fig. 8 I have shown a freezing tray 10 of the construction shown in Fig. 1, and a modified form of partition assembly 42. The partition assembly 42 comprises a plurality of individual partition elements 43 of substantially the same construction as the partition elements 16 shown in Fig. 1, and an arrangement including a series of pivotal connections comprising a plurality of pairs of links 44 pivotally connected to the upper portions of adjacent longitudinal dividing walls 45 of the partition elements 43 for retaining the partition elements in assembled relation. It will be observed that the longitudinal dividing walls 45 project somewhat above the transverse dividing walls 46 of the partition elements 43 in order to receive the pivotally connected pairs of links 44. The links of each pair are disposed on opposite sides of the longitudinal dividing walls 45 of the partition element 43 and are connected thereto by a plurality of pins 47 extending through holes provided in the ends of the

portions of the longitudinal dividing walls 45 of the partition elements 43. This arrangement including the links 44 for retaining the partition elements 43 in assembled relation provides for limited relative movements of the partition elements 43 with respect to each other and to the freezing tray 10, in order to facilitate the release of the ice blocks 25 from the partition elements 43 and from the freezing tray 10. The adjacent pairs of ice blocks 25 are mechanically released from the partition elements 43 and from the freezing tray 10 by employing the lever 26 shown in Fig. 3, and in a manner similar to that described in connection with the release of the adjacent pairs of ice blocks 25 from the partition assembly 11 and the freezing tray 10 shown in Fig. 4, without thawing the frozen bonds between the ice blocks and the freezing tray and the partition assembly.

After the desired number of pairs or all of the ice blocks 25 have been released from the partition assembly 42 and the freezing tray 10, the partition elements 43 of the partition assembly 42 may be freely swung from the front end 13 of the freezing tray 10 toward the rear end 14 of the freezing tray 10 to facilitate the removal of the ice blocks 25 from the freezing tray 10. It will be understood that if only a few of the adjacent pairs of ice blocks 25 are released from the partition assembly 42 and the freezing tray 10, only a corresponding number of the partition elements 43 will be swung from the front end 13 of the freezing tray 10 to facilitate removal of the released ice blocks 25. The remainder of the adjacent pairs of ice blocks 25 still bonded to the partition assembly 42 and the freezing tray 10 will not be disturbed.

In a modified form of partition assembly 48, shown in Fig. 9, a plurality of individual partition elements 49 of substantially the same construction as the partition elements 43 shown in Fig. 8 are provided and retained in assembled relation by a series of pivotal connections comprising a plurality of links 50. In this arrangement the transverse dividing walls 51 of the partition elements 49 are provided with rearwardly extending tabs 52 disposed adjacent the upper portions thereof and on opposite sides of the longitudinal dividing walls 53. One of the links 50 is arranged on each side of the longitudinal dividing walls 53, and is pivotally connected to the tabs 52 disposed adjacent the upper portions of the transverse dividing walls 51 of adjacent partition elements 49 and are secured thereto by a plurality of pins 54 extending through holes provided in the ends of the links 50 and through holes provided in the ends of the tabs 52. Preferably, the ends of each of the links 50 are laterally offset with respect to each other in order that one end of the link may be pivoted to the inside wall of one of the tabs 52 and the other end of the link 50 may be pivoted to the outside wall of an adjacent tab 52 disposed on an adjacent partition element 49. This arrangement provides for free swinging movements of the partition elements 49 with respect to each other and to the freezing tray 10 to facilitate the release of the ice blocks 25 from the partition assembly 48 and from the freezing tray 10, and lends additional rigidity to the partition assembly 48 along its longitudinal axis.

A preferred form of partition assembly 55 arranged in the freezing tray 10 is shown in Fig. 10. This form of the partition assembly 55 comprises a plurality of individual partition elements

56 of substantially the same construction as the partition elements 16 shown in Fig. 1. The partition elements 56 are retained in assembled relation by a pair of flexible strands 57 formed of steel wire or any other suitable material and secured to the transverse dividing walls 58 and disposed on opposite sides of the longitudinal dividing walls 59 of the individual partition elements 56. Preferably, the flexible strands 57 are formed of twisted plural strand stainless steel wire as such material is very strong and flexible. The flexible strands 57 are secured in place by a plurality of upstanding tabs 60 provided adjacent the upper portion of the transverse dividing walls 58 of the partition elements 56, the upstanding tabs 60 being bent toward each other about the flexible strands 57 to securely grip the same. The flexible strands 57 provide for free swinging movements of the partition elements 56 with respect to each other and to the freezing tray 10 to facilitate the release of the ice blocks 25 from the partition assembly 55 and from the freezing tray 10. The ice blocks produced by this form of the refrigerating apparatus are mechanically released from the partition assembly 55 and the freezing tray 10 without thawing the frozen bonds between the ice blocks and the freezing tray and the partition assembly, in a manner similar to that described in connection with the constructions shown in Figs. 4 and 8.

In Fig. 11 I have shown a modified form of partition element 61 which comprises a transverse dividing wall 62 and a longitudinal dividing wall 63 secured to the transverse dividing wall 62 in a manner similar to that shown in Fig. 2, and adapted to cooperate with a freezing tray to form an adjacent pair of ice block compartments. The transverse dividing wall 62 of the partition element 61 is provided with a laterally projecting flange or shoulder 64 adjacent the upper portion thereof extending over each of the ice block compartments and constituting an abutment. The flange 64 is utilized in connection with the lever 26 shown in Fig. 3 to mechanically release the ice blocks from a freezing tray and the partition element 61. In this construction the flange 64 is downturned somewhat less than the flange 19 provided adjacent the upper portion of the transverse dividing wall 17 of the partition element 16 shown in Fig. 1 in order to insure that the arms 29 provided on the bifurcated curved end 27 of the lever 26 will not engage the outer edge of the flange 64 and bend the same during the release of the pair of ice blocks carried by the partition element 61. This is accomplished by cutting off a portion of the outer edge of the flange 64. It will be observed that the portion of the outer edge of the flange 64 which is cut off stops short of the longitudinal dividing wall 63 of the partition element 61, in order to provide a pair of downwardly turned tabs 65 disposed on opposite sides of the longitudinal dividing wall 63 and cooperating with a slot 66 formed in the flange 64 to form abutments for bracing the longitudinal dividing wall 63 of the partition element 61 against lateral movement. Also, a pair of indentations 67 are formed in the transverse dividing wall 62 and provide portions thereof extending into each of the ice block compartments in order to facilitate the release of the ice blocks disposed in the compartments from a freezing tray by shifting the ice blocks in a manner similar to the flange 22 provided adjacent the lower portion of the trans-

verse dividing wall 17 of the partition element 16 shown in Fig. 2. A plurality of partition elements 61 are retained in assembled relation by a pair of flexible strands 57 in order to provide a partition assembly of substantially the same construction as the partition assembly 55 shown in Fig. 10, and are arranged in a freezing tray.

A modified form of partition assembly 68 is shown in Fig. 12 arranged in a freezing tray 69. This partition assembly comprises a plurality of individual partition elements 70 of substantially the same construction shown in Fig. 10. The partition elements 70 are retained in assembled relation in such manner as to be relatively movable with respect to each other, by rods 71 having reduced portions 72 slidably fitted in vertical slots 73 in each side of the transverse dividing walls of the partition elements, as shown in Fig. 13. The opposite ends of the rods 71 are supported on the upper edge of the ends of the freezing tray, and the reduced portions 72 of the rods are retained in the upper ends of the vertical slots. The slots 73 are preferably arranged above the top of the ice blocks to avoid the formation of ice in the slots which would interfere with the vertical sliding of the partition elements on the rods. Thus, when one of the partition elements is pried upwardly as shown at 70a to break the ice blocks loose therefrom and from the freezing tray, the vertical slots 73 provide for upward movement of the partition element 70a with respect to the other partition elements as required. In making this partition assembly the vertical slots 73 are formed so as to be open at the top, and the reduced portions 72 of the supporting rods 71 are arranged in the slots. The upper ends of the slots are then closed by forcing together the opposing sides of ears 73a formed at the top of the slots.

The partition assemblies for freezing trays illustrated in Figs. 10 to 13, inclusive, form the subject matter of my application Serial No. 325,141, filed March 21, 1940, and which is a division of my present application.

A modified form of freezing tray 74 is shown in Figs. 14 and 15 and comprises a substantially horizontal bottom wall 75 and an upwardly directed marginal wall providing sides 76 and front and rear ends 77 and 78 respectively. Also, a downwardly turned rim 79 is provided adjacent the upper edge of the marginal wall of the freezing tray 74. The front end 77 of the freezing tray 74 is upwardly inclined in order to facilitate the release of the adjacent pair of ice blocks from the freezing tray 74 and a partition assembly disposed therein in a manner similar to that described in connection with Figs. 1 and 4. Downwardly opening inclined recesses 80 are provided at the corners of the bottom of the rear end 78 of the freezing tray, in order to facilitate the release of the freezing tray from the supporting surface of a cooling unit.

As shown in Fig. 15, the bottom wall 75 of the freezing tray rests directly upon the supporting surface 81 of the cooling unit, the rear end 78 of the freezing tray being arranged adjacent the front of the cooling unit. When the water placed in the freezing tray has been frozen into ice blocks, the freezing tray is mechanically released from the supporting surface 81 of the cooling unit by employing the outer end of the lever 26 shown in Fig. 3. The outer end of the

lever 26 is placed between the supporting surface 81 of the cooling unit and the lower wall of one of the recesses 80, the lower wall of the recess 80 being disposed at an angle of approximately 15 degrees with the supporting surface 81. The curved end of the lever 26 is depressed causing the outer end of the lever 26 to exert a force between the supporting surface 81 of the cooling unit and the lower wall of the recess 80 which breaks the frozen bond between the surface of the cooling unit and the bottom wall of the freezing tray. The freezing tray may then be removed from the supporting surface of the cooling unit and the desired number of ice blocks released therefrom and the partition assembly arranged therein in a manner similar to that described in connection with Figs. 1 and 4.

The freezing tray illustrated in Figs. 14 and 15 forms the subject matter of my application Serial No. 325,142, filed March 21, 1940, and which is a division of my present application.

While I have shown and described several embodiments of my invention, modifications thereof will be apparent to those skilled in the art. I do not, therefore, desire my invention to be limited to the particular constructions shown and described, and I intend in the appended 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. In combination with a freezing tray having upwardly directed sides and ends, a partition element cooperating with said freezing tray to form a plurality of ice block compartments, said partition element comprising a transverse dividing wall and a longitudinal dividing wall rigidly secured to said transverse dividing wall and extending from one side of said transverse dividing wall, said transverse dividing wall having a flange adjacent the upper portion thereof extending over at least one of said compartments, said transverse wall including an inclined projection, and manually operable means adapted to exert a force between the flange on said transverse dividing wall and an adjacent top surface of an ice block disposed in said one compartment for breaking a frozen bond between said ice block and said partition element and to exert a force between the inclined projection on said transverse dividing wall and an adjacent side surface of said ice block for breaking a frozen bond between said ice block and said freezing tray, the inclined projection on said transverse dividing wall being arranged to shift said ice block with respect to said freezing tray.

2. In combination with a freezing tray having upwardly directed sides and ends, a partition element cooperating with said freezing tray to form a plurality of ice block compartments, said partition element comprising a transverse dividing wall and a longitudinal dividing wall rigidly secured to said transverse dividing wall and extending from one side of said transverse dividing wall, said transverse dividing wall having a flange adjacent the upper portion thereof extending over at least one of said compartments, said transverse wall including an inclined projection, and manually operable means adapted to exert a force between the flange on said transverse dividing wall and an adjacent top surface of an ice block disposed in said one compartment for breaking a frozen bond between said ice block and said partition element and to exert a force between the inclined projection on said trans-

verse dividing wall and an adjacent side surface of said ice block for breaking a frozen bond between said ice block and said freezing tray, the inclined projection on said transverse dividing wall being arranged to shift said ice block toward one end of said freezing tray, said one end of said freezing tray being upwardly inclined to facilitate shifting of said ice block.

3. In combination with a freezing tray having upwardly directed sides, a partition assembly comprising a plurality of similar individual partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall extending from one side of said transverse dividing wall and cooperating with said freezing tray to form a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation in said freezing tray with said longitudinal dividing walls extending in the same direction and in substantial alignment, said partition elements being individually movable with respect to said freezing tray to facilitate the release of ice blocks from said compartments, and means including a plurality of spaced apart and aligned abutments provided on the sides of said freezing tray for retaining said partition elements in assembled relation in said freezing tray.

4. In combination with a freezing tray, a partition assembly comprising a plurality of similar partition elements, each of said partition elements including a vertically extending transverse dividing wall and a vertically extending longitudinal dividing wall secured to and extending from one side of said transverse dividing wall and cooperating with said freezing tray to form a plurality of ice block compartments, each of said partition elements having an abutment adjacent the upper portion thereof, said partition elements being arranged in juxtaposed relation in said freezing tray with said longitudinal dividing walls extending in the same direction and in substantial alignment, means for retaining said partition elements in assembled relation and for accommodating limited independent relative movements between said partition elements and between said partition elements and said freezing tray, and manually operable means including an element adapted to engage the abutment on any one of said partition elements and an adjacent top surface of an ice block disposed in one of said compartments for breaking a frozen bond between said ice block and said one partition element and for breaking a frozen bond between said ice block and said freezing tray.

5. In combination with a freezing tray, a partition assembly comprising a plurality of similar partition elements, each of said partition elements including a vertically extending transverse dividing wall and a vertically extending longitudinal dividing wall extending from one side of said transverse dividing wall and cooperating with said freezing tray to form a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation in said freezing tray with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means for retaining said partition elements in assembled relation and for accommodating free swinging movements of said partition elements with respect to each other and to said freezing tray to facilitate the release of ice blocks from said compartments, said means being arranged to accommodate successive free swinging movements of said partition elements

from one end of said freezing tray toward the other end thereof.

6. A removable partition assembly for freezing trays comprising a plurality of similar partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall extending from one side of said transverse dividing wall and forming walls of a plurality of ice blocks compartments, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means including a series of links for retaining said partition elements in assembled relation, said links providing for limited independent relative movements between said partition elements to facilitate the release of ice blocks from said compartments, each one of said links being pivotally connected to each of a pair of adjacent partition elements.

7. A removable partition assembly for freezing trays comprising a plurality of similar partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall extending from one side of said transverse dividing wall and forming walls of a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means including a series of links for retaining said partition elements in assembled relation, said links providing for limited independent relative movements between said partition elements to facilitate the release of ice blocks from said compartments, each of said links being pivotally connected to the upper portion of each of a pair of adjacent longitudinal dividing walls.

8. A removable partition assembly for freezing trays comprising a plurality of similar partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall extending from one side of said transverse dividing wall and forming walls of a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means including a series of links for retaining said partition elements in assembled relation, and links providing for limited independent relative movements between said partition elements to facilitate the release of ice blocks from said compartments, each of said links being pivotally connected to the upper portion of each of a pair of adjacent transverse dividing walls.

9. A removable partition assembly for freezing trays comprising a plurality of similar partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall extending from one side of said transverse dividing wall and forming walls of a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means including a series of pairs of links for retaining said partition elements in assembled relation, the individual links of each of said pairs of links being disposed on opposite sides of said longitudinal dividing walls and being pivotally connected to the upper portions of each of a pair of adja-

cent transverse dividing walls, said links providing for limited independent relative movements between said partition elements to facilitate the release of ice blocks from said compartments.

10. A removable partition assembly for freezing trays comprising a plurality of similar partition elements adapted to form walls of a plurality of ice block compartments, each of said partition elements including a transverse wall having an opening therein and a longitudinal wall secured thereto and having a portion extending through said opening, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls in substantial alignment, and means pivotally connecting adjacent ones of said longitudinal dividing walls for retaining said elements in assembled relation, said means affording relative swinging movement between adjacent ones of said elements to facilitate release of ice blocks from the walls of said ice block compartments.

11. In combination with a freezing tray, a partition assembly cooperating with said freezing tray to form a plurality of ice block compartments, said assembly comprising a plurality of similar partition elements each having a transverse dividing wall and a longitudinal dividing wall rigidly secured thereto and extending from one side thereof, each of said elements having an abutment adjacent the upper portion thereof, and manually operable means adapted to engage the abutment on one of said elements and exert on said element a force directed away from said tray to break a frozen bond between said tray and any ice blocks adjacent the longitudinal wall of said one of said elements, each of said elements being arranged to be independently movable to at least a limited distance from said tray without disturbing the remaining ones of said elements.

12. In combination with a freezing tray, a removable partition assembly comprising a plurality of similar partition elements, each of said elements including a transverse dividing wall and a longitudinal dividing wall rigidly secured thereto and forming walls of a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation with said longitudinal dividing walls extending in the same direction and in substantial alignment, and means including a series of pivotal connections for retaining said elements in assembled relation and for facilitating the release of ice blocks from said compartments, said series of pivotal connections being arranged to accommodate successive free swinging movements of said partition elements from one end of said freezing tray toward the other end thereof.

13. In combination with a freezing tray, a removable partition assembly cooperating with said freezing tray to form a plurality of ice block compartments, said assembly comprising a plurality of similar partition elements each including a transverse dividing wall and a longitudinal dividing wall rigidly secured thereto, said partition elements being arranged in juxtaposed relation in said tray with said longitudinal dividing walls extending in the same direction and in substantial alignment, each of said elements having an abutment adjacent the upper portion thereof, manually operable means adapted to engage the abutment on one of said elements and exert on said element a force directed away from said tray to break a frozen bond between said tray and any ice blocks ad-

adjacent the longitudinal wall of said one of said elements, and means including a series of pivotal connections for retaining said elements in assembled relation and for facilitating the release of ice blocks from said compartments, said series of pivotal connections being arranged to accommodate successive swinging movements of said partition elements from one end of said freezing tray toward the other end thereof.

14. A removable partition assembly for freezing trays comprising a plurality of similar partition elements, each of said partition elements including a transverse dividing wall and a longitudinal dividing wall rigidly secured thereto and forming walls of a plurality of ice block compartments, said partition elements being arranged in juxtaposed relation with said longi-

tudinal dividing walls extending in the same direction and in substantial alignment, said means including two series of links for retaining said partition elements in assembled relation, one of said two series of links being arranged on one side of said longitudinal dividing walls and the other of said two series of links being arranged on the other side of said longitudinal dividing walls, each of the links of said two series of links being pivotally connected to each of a pair of adjacent partition elements, said links providing for limited independent relative movements between said partition elements to facilitate the release of ice blocks from said compartments.

CARL H. STEENSTRUP

CERTIFICATE OF CORRECTION.

Patent No. 2,265,705.

December 9, 1941.

CARL H. STEENSTRUP.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 7, first column, line 9, claim 6, for "blocks" read --block--; line 52, claim 8, for "and" read --said--; page 8, first column, line 6, claim 13, for "af" read --of--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of February, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)