

Sept. 9, 1941.

J. C. CROWLEY

2,255,153

FREEZING TRAY

Filed March 4, 1938

4 Sheets-Sheet 1

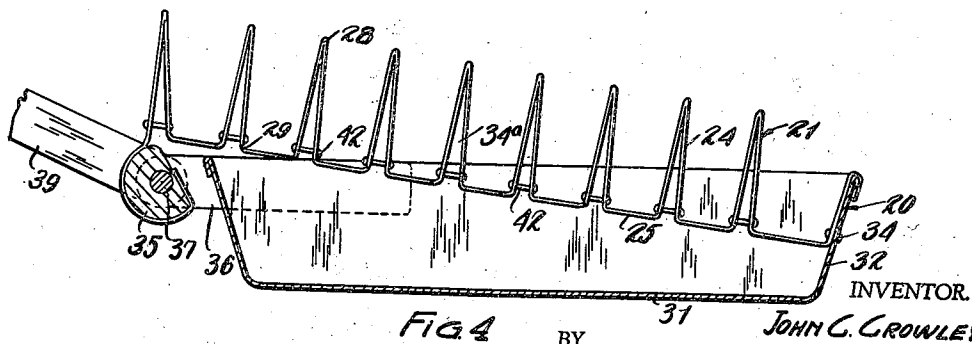
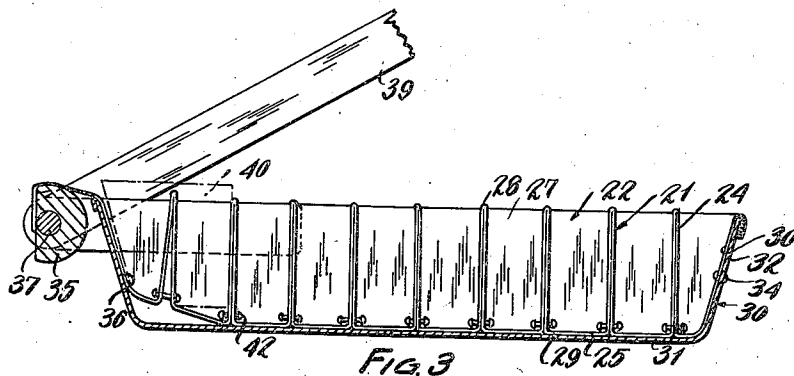
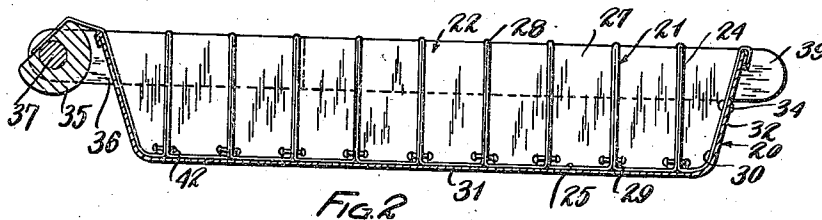
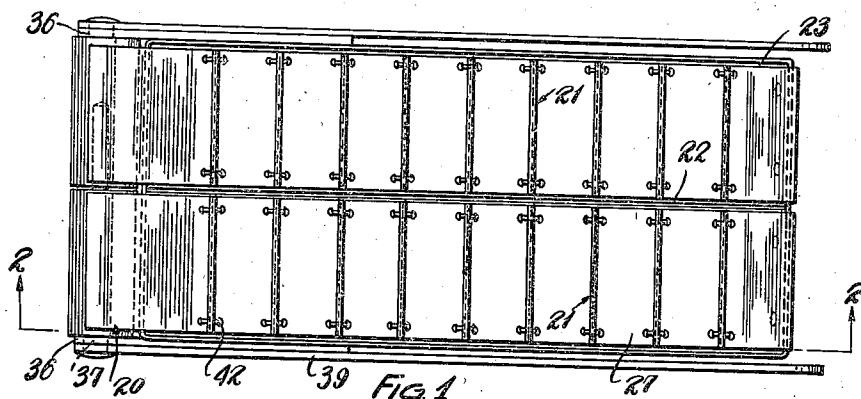


FIG. 4

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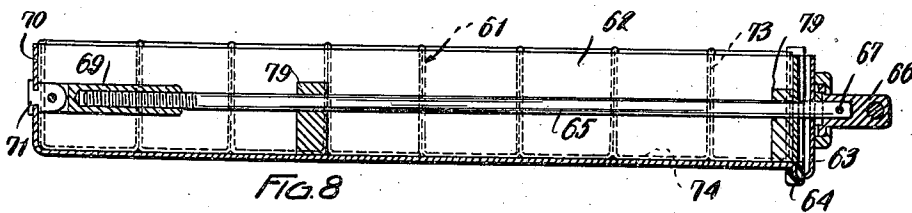
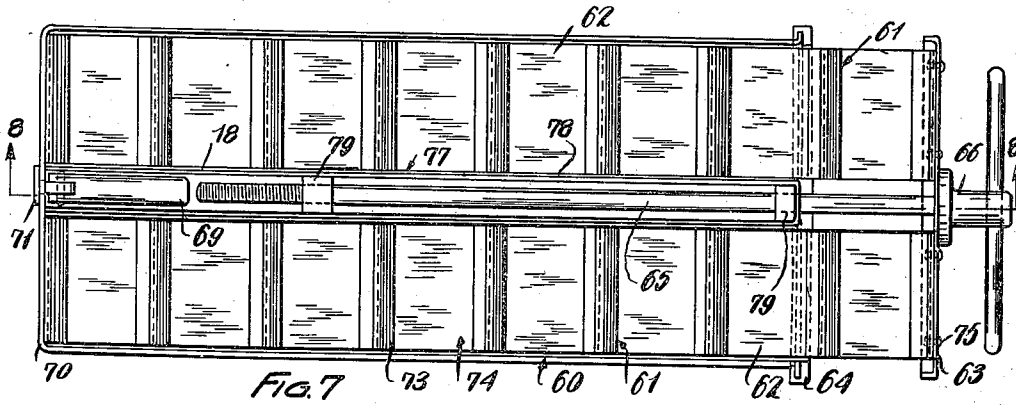
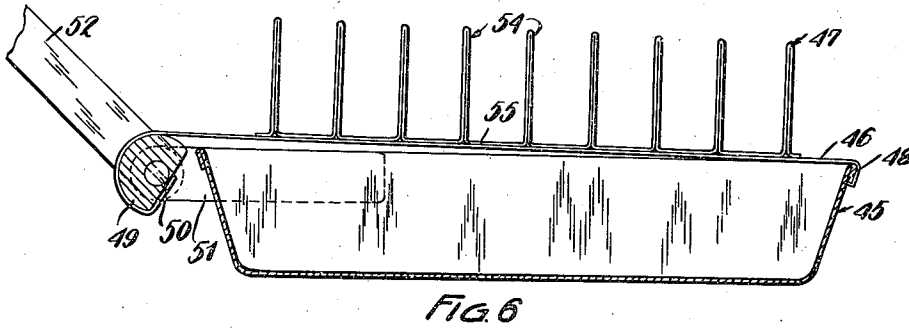
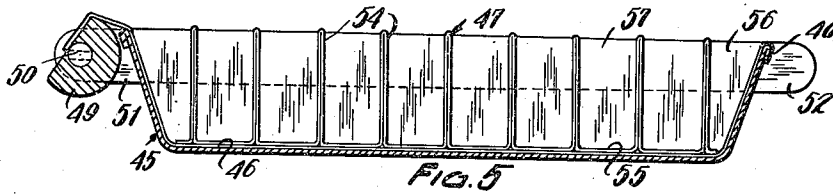
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FREEZING TRAY

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4 Sheets-Sheet 2



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FREEZING TRAY

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4 Sheets-Sheet 3

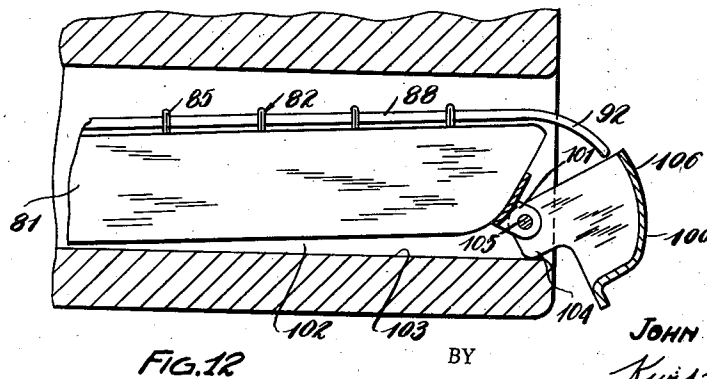
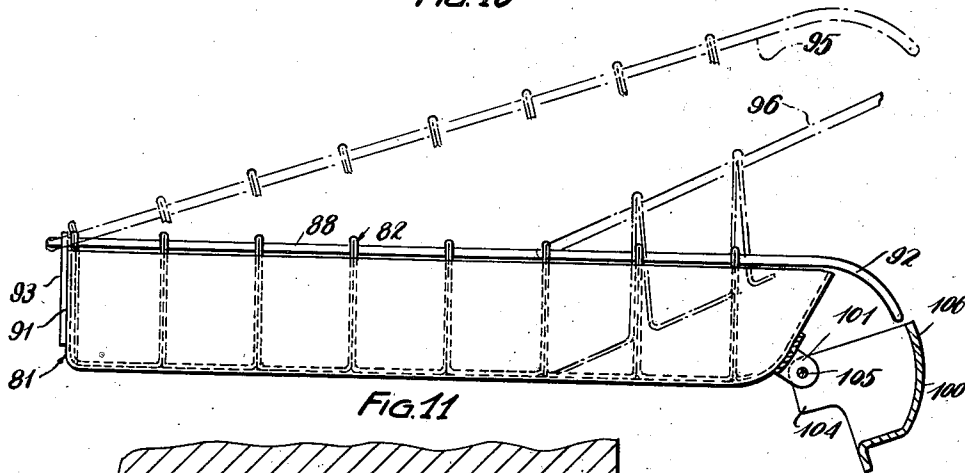
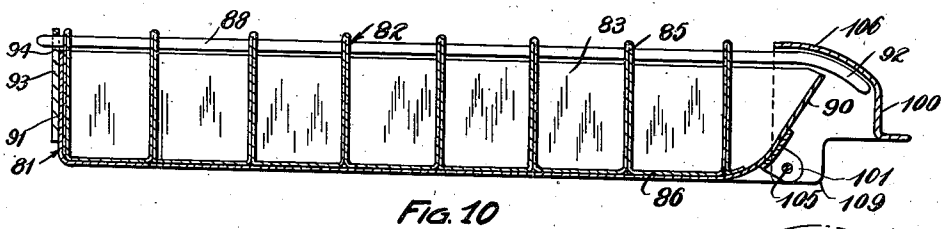
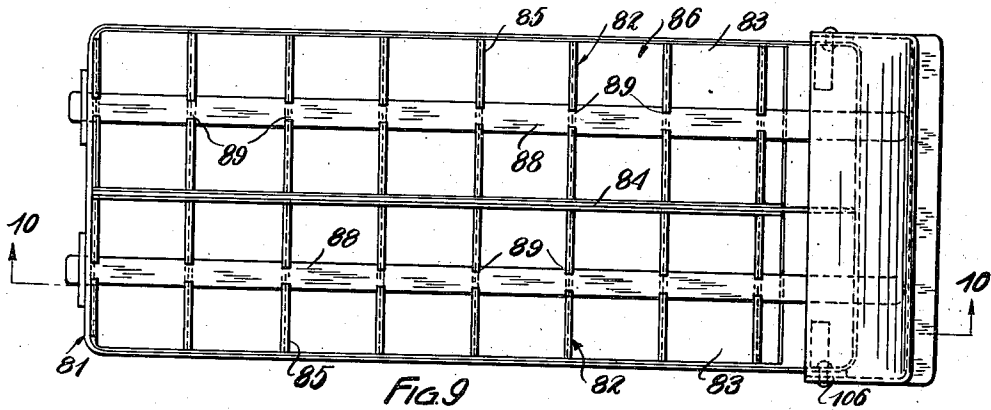


FIG. 12

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2,255,153

FREEZING TRAY

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Application March 4, 1938, Serial No. 193,954

5 Claims. (Cl. 62—108.5)

The invention relates to freezing trays for refrigerators and, more particularly, to freezing trays of the type provided with inserts or grids which divide the interior of the receptacles into cells or matrices for the formation of individual blocks of the material to be frozen.

An object of my invention is to provide an improved construction for freezing trays, of the type mentioned, whereby the blocks of frozen material can be quickly and easily removed.

Another object of my invention is to provide an improved freezing tray having a flexible grid and novel mechanical means adapted to act on a portion of the grid to cause loosening of the grid and of the ice blocks.

A further object of my invention is to provide an improved freezing tray having novel means for facilitating the loosening of the tray from the freezing compartment of the refrigerator.

My invention may be further briefly summarized as consisting in certain novel features of construction and combinations and arrangements of parts hereinafter described and more particularly set out in the appended claims.

In the accompanying sheets of drawings:

Fig. 1 is a top plan view of a freezing tray constructed according to my invention and showing the mechanical loosening means;

Fig. 2 is a longitudinal sectional view taken through the tray as indicated by line 2—2 of Fig. 1;

Fig. 3 is a similar longitudinal sectional view taken through the tray but showing the mechanical loosening means at the beginning of its operation;

Fig. 4 is a similar longitudinal sectional view of the tray but showing the grid fully expanded and the mechanical loosening means at the end of its operation;

Fig. 5 is a longitudinal sectional view similar to Fig. 2 but showing a modified construction in which the grid is not connected to the pan;

Fig. 6 is a longitudinal sectional view similar to Fig. 5 but showing the grid lifted out of the pan by the loosening means;

Fig. 7 is a top plan view of another freezing tray of my invention and showing the tray with the grid partially withdrawn from the pan;

Fig. 8 is a longitudinal sectional view taken through the grid of Fig. 7 but showing the pan closed;

Fig. 9 is a top plan view of another freezing tray constructed according to my invention;

Fig. 10 is a longitudinal sectional view taken

through the tray as indicated by line 10—10 of Fig. 9;

Fig. 11 is a side elevation of the tray, with parts in section, and illustrating another form of loosening means;

Fig. 12 is a partial sectional view taken through a freezing compartment of a refrigerator and illustrating the action of a device for loosening the tray;

Fig. 13 is a top plan view showing still another freezing tray embodying my invention;

Fig. 14 is a longitudinal sectional view taken through the tray and illustrating the operation of the loosening means thereof;

Fig. 15 is a top plan view showing still another freezing tray constructed according to my invention;

Fig. 16 is a longitudinal sectional view taken through the tray, as indicated by line 16—16 of Fig. 15, and illustrating the operation of the loosening means; and

Fig. 17 is a transverse sectional view taken through the tray, as indicated by line 17—17 of Fig. 16.

More detailed reference will now be made to the accompanying drawings in which I have shown several different freezing trays constructed according to my invention. Before proceeding with the detailed description, however, I desire it to be understood that the drawings are mainly illustrative and that the invention may be embodied in various other freezing trays than those herein illustrated and described.

In Figs. 1 to 4 inclusive I show a freezing tray for use in the freezing compartment of a refrigerator and comprising a receptacle or pan 20 adapted to contain the liquid or material to be frozen and one or more members 21 adapted to divide the interior of the pan into a plurality of matrices or cells for the formation of individual blocks of the frozen material. The pan 20 is preferably formed of metal, although it could be formed of other material if desired. In this instance I show the pan as having a longitudinal partition 22 therein, which divides the interior of the pan into two elongated pockets or receptacles 23, and one of the members 21 in each of the pockets. If desired, however, the partition 22 may be omitted, in which case a single member 21 corresponding substantially with the width of the pan receptacle is placed therein.

The member 21, which may also be termed a grid, is formed of a resiliently flexible or springy sheet material, preferably sheet metal, and may

be formed from a single strip of this material which has been bent or folded transversely at longitudinally spaced points to provide the longitudinally spaced double-thickness vertical walls 24 and the longitudinal single-thickness bottom or connecting walls 25 extending between such double-thickness walls. As will be seen from Figs. 2 to 4, the grid thus formed has a series of similar substantially U-shaped pockets with the upright legs of adjacent pockets connected at the top thereof. The strip of sheet material from which the grid 21 is formed is of a width slightly less than the width of the receptacle 23 of the pan in which the grid is to be used.

When the grid is in position in the pan it divides the receptacle of the pan into a series of individual matrices or cells 27. The upright double-thickness walls 24 of the grid form one pair of parallel side walls of the cells and the single-thickness connecting walls 25 form the bottom walls of the cells. The other side walls of the cells are formed, respectively, by the partition 22 and an outer side wall of the pan 20.

In forming the grid 21 from the strip of springy sheet metal, the transverse folds 28 at the tops of the cell walls 24 and the transverse bends 29 at the junction of the side walls with the bottom walls 25 are preferably so formed that when the grid is in a free or released condition it will assume substantially the shape and form shown in Figs. 1 and 2. That is to say, it will assume a shape such that the cell walls 24 stand in upright substantially parallel longitudinally spaced relation in the pan and the bottom and end walls 25 and 30 lie close against the bottom and end walls 31 and 32 of the pan. By reason of the springy character or resiliency of the sheet material of which the grid is formed the grid can be stretched or expanded longitudinally, by means to be presently described, whereby ice blocks which have been congealed in the cells 27 can be quickly and easily loosened.

In the form of my invention shown in Figs. 1 to 4 inclusive, I connect one end of the grid 21 with an end wall 32 of the pan and provide mechanical means adapted to act on the other end of the grid for loosening the grid and ice blocks from the pan and, at the same time, expanding or stretching the grid longitudinally to loosen the ice blocks from the grid itself. The end of the grid may be connected with the end wall 32 by any suitable means, such as by crimping, soldering or brazing, or a combination of such connecting means. The connection between the grid and the end wall may also include a connection formed by rivets 34 or the like and located substantially midway of the vertical height of the end wall 32. When the grid has been expanded longitudinally as shown in Fig. 4, it will be seen that the cells or pockets have been increased in width by spreading of the upright legs thereof and that the adjacent thicknesses of the upright walls 24 have been spread apart to form an air pocket 34^a between each pair of cells. The widening of the cells or pockets of the grid causes the side walls to break away from the ice blocks and this loosening action is aided by heat being transmitted through the side walls from the air in the air spaces 34^a.

The means for loosening and expanding the grid 21 may comprise, in addition to the above mentioned connection between the grid and one end of the pan, a tensioning or winding means,

such as a spool 35, mounted on the opposite end of the pan and having the corresponding end of the grid 21 anchored thereto by any suitable connecting means. The spool 35 may be mounted on the pan by providing the latter with longitudinally projecting spaced arms 36 and a transverse pin 37 carried by the arms and on which the spool is pivoted. Rotation of the spool on its pivot obtained by any suitable means, such as a lever 39 connected with the spool adjacent an end thereof and extending radially with respect to the rotation axis. The spool 35 corresponds substantially in length with the width of the grid and when two grids are employed, as shown in Fig. 1, two spools of corresponding width are provided and an actuating lever 39 is provided for each spool.

From the construction of the grid and the arrangement of the grid loosening or actuating means, as thus far described, it will be seen that when the lever 39 is in a position extending longitudinally of the pan, as shown in Fig. 2, the grid 21 is in its contracted or released condition engaging the bottom and end walls of the pan but when the lever is lifted from this longitudinally extending position and thereby rotated on the pivot shaft 37, the spool 35 will be correspondingly rotated and will wind up a portion of the grid. This causes a tensioning of the grid which results in its being loosened from the pan and lifted relative thereto, and also causes the grid to be expanded longitudinally to release the ice blocks.

If only a few of the ice blocks are needed the lever 39 may be rotated through only a portion of its permissible travel, whereby only the cell wall or walls nearest the spool 35 will be expanded, as shown in Fig. 3, to release the ice blocks 40 in the corresponding cells, while the remainder of the grid and the ice blocks remain substantially undisturbed. If all of the ice blocks are needed, the lever 39 may be rotated through the full extent of its permissible travel, whereupon the entire grid 21 will be lifted and expanded, as shown in Fig. 4, and the ice blocks contained in all of the ice cells will be released.

In order to secure a substantially uniform degree of extension or expansion along the grid I may provide means for limiting the extent to which the adjacent thicknesses of the cell walls 24 may be spread apart, and particularly for the cell walls nearest the spool 35, which might otherwise be unduly distorted by the pull exerted on this end of the grid. This limiting means may be in the form of headed members or rivets 42 disposed adjacent the bottom walls 29 of the cells and extending longitudinally of the grid through the adjacent thicknesses of the upright walls 24. One or more such headed members may be provided for each of the upright walls 24 and, when the grid is tensioned by rotation of the spool 35, these members will transmit tension from cell to cell and will limit the extent to which the thicknesses of the upright walls 24 may be spread apart thereby preventing the grid from being unduly stretched or distorted.

Thus it will be seen that the improved freezing tray illustrated in Figs. 1 to 4 inclusive is of simple and economical construction, yet it provides for a quick release of some or all of the ice blocks simply by the manipulation of a conveniently arranged lever and that after the grid has been expanded to release the ice blocks the return of the lever to its initial position and the spring

characteristic of the grid will automatically cause the latter to resume its proper position in the pan in readiness for another charge of the material to be frozen.

In Figs. 5 and 6 of the drawings I show another freezing tray which is somewhat similar to the tray of Fig. 1, but in which the grid or insert member is not connected with the pan. In this form of my freezing tray I show a pan 45 adapted to contain a quantity of the liquid or material to be frozen and having a strip 46 extending longitudinally of the pan for loosening and lifting the grid 47. The strip 46 is formed of resiliently flexible or springy sheet material, preferably sheet metal, and has one end thereof anchored to an end wall of the pan, as indicated at 48. The opposite end of the strip is anchored to a winding or tensioning spool 49 which is mounted on a transverse pivot pin 50 and carried by a pair of arms or brackets 51 projecting from the other end of the pan. A lever 52 connected with the spool provides for rotation thereof in one direction to cause tensioning of the strip 46 for loosening and lifting the grid 47, and rotation in the opposite direction to permit the strip to recede into the pan. The strip 46 is preferably of a width slightly less than the width of the pan receptacle which receives the grid 47 and is so formed that when the strip is in its free or released position it will recede into the pan and will assume substantially the form and position shown in Fig. 5, that is to say, will assume a position conforming to and lying closely against the end and bottom walls of the pan 45.

The grid or insert member 47 may be formed from a strip of resiliently flexible or springy sheet material which is bent and folded transversely at longitudinally spaced points to form longitudinally spaced, upright, double-thickness walls 54 and longitudinally extending single-thickness connecting walls 55. When the lifting strip 46 is in its retracted position and the grid 47 is placed in the pan, as shown in Fig. 5, the grid rests on the strip with the double-thickness walls of the grid 54 dividing the interior of the pan into end and intermediate matrices or cells 56 and 57. When the lever 52 is actuated to rotate the spool 49 the strip 46 is tensioned and, in assuming a more or less straight line position as shown in Fig. 6, loosens the grid 47 and lifts the same out of the pan. In this way the grid 47 is loosened from the pan and lifted to an exposed and readily accessible position so that the ice blocks can be released by a single flexing of the grid, such as may be produced by a bending or twisting thereof. The grid 47 is preferably not connected with the strip 46 so that, if desired, it can be removed therefrom to facilitate the releasing of the ice blocks after the grid has been lifted out of the pan by the strip.

In Figs. 7 and 8 I show a freezing tray of a somewhat different form but also embodying a grid or insert member which is expansible longitudinally for releasing the ice blocks. As shown in Figs. 7 and 8, this freezing tray comprises an elongated pan 60 and one or more grids 61 adapted to divide the interior of the pan into a plurality of matrices or cells 62 for the formation of individual ice blocks.

The pan 60 may be formed with a removable end wall 63 which is normally held in sealing engagement with an end of the pan and with a gasket 64 by suitable means, such as the rod 65 extending longitudinally of the pan. The end

wall 63 may have a rod-actuating handle 66 rotatably mounted thereon and connected with the projecting outer end of the rod as by means of a transverse pin 67. The inner end of the rod 65 has threaded engagement with a nut or sleeve 69, which is anchored to the inner end wall 70 of the pan as by means of a headed part 71, the sleeve preferably having a hinge connection with such headed part. By rotation of the handle 66 in one direction, the rod 65 can be screwed into the sleeve 69 for clamping the end wall 63 against the outer end of the pan and, by rotation of the handle in the opposite direction, the rod can be screwed out of the sleeve to move the end wall away from the outer end of the pan.

The grid 61 may be formed from a strip of resiliently flexible or springy sheet material which is bent and folded transversely at longitudinally spaced points to form the longitudinally spaced double-thickness upright cell walls 73 and the longitudinally extending single-thickness bottom walls 74. The outer end of the grid is anchored to the removable end wall 63 by the rivets 75, or other suitable means, so that movement of such wall away from the end of the pan will cause the grid to be extended or expanded longitudinally by spreading the adjacent thicknesses of the upright walls 73. The opposite or inner end of the grid is preferably not connected with the inner end wall of the pan, so that when the rod 65 has been disengaged from the sleeve 69 the grid 61 can be withdrawn to any desired extent or can be completely removed from the pan. The expanding of the grid longitudinally causes the release of the ice blocks so that they can be readily dumped from the tray, or, if desired, can be removed individually in any desired number by sliding them laterally out of these cells or pockets of the grid which have been withdrawn from the pan. In Fig. 7 of the drawings I show the grid in its expanded condition and withdrawn from the pan 60 far enough to permit the ice blocks to be discharged laterally from the end cells.

Although only one of the grids 61 may be provided in the pan 60, I prefer to construct the pan with a longitudinally extending hollow partition 77 and to use one of the grids 61 in each of the pockets thus formed in the pan. The hollow partition 77 may be formed by a pair of laterally spaced upright walls 78 which extend longitudinally of the pan and correspond substantially in height with the depth of the pan. This hollow partition provides a convenient space in which the rod 65 and the sleeve 69 may be located. The hollow partition 77 may be provided at longitudinally spaced points with guide and bearing members 79 for guiding and rotatably supporting the rod 65.

It will thus be seen that the freezing tray illustrated in Figs. 7 and 8 provides an easily operated device of simple construction from which some or all ice blocks can be readily removed as desired. It will be seen that the screw connection for the rod 65 provides a powerful means whereby the end wall 63 can be forced away from the pan and the grid 61 thereby expanded longitudinally to release the ice blocks. When the grid is reinserted in the pan and the wall 63 drawn against the end of the pan, the grid will be automatically contracted to the condition shown in Fig. 8 and restored to its proper position for the next freezing operation.

In Figs. 9 and 10 of the drawings I show still

another freezing tray of my invention comprising a pan 81 and one or more insert members or grids 82 disposed therein and dividing the interior of the pan into matrices or cells 83. When two of the grids 82 are employed, as shown in this instance, the pan is provided with a longitudinal partition 84 which divides the pan receptacle into pockets for the respective grids:

The grid or grids 82 may be formed from a strip of resiliently flexible or springy sheet material which is bent and folded transversely at longitudinally spaced points to provide the spaced double-thickness walls 85 and the longitudinally extending single-thickness connecting walls 86. The double-thickness walls 85 form side walls of the cells 83 and the single-thickness walls 86 form the bottom walls of the cells. The grid 82 is so formed that when in its free or released position it assumes a contracted condition substantially as shown in Figs. 9 and 10, in which the adjacent thicknesses of the walls 85 are in face to face contact with each other, and the top edges of such double-thickness walls lie substantially in a common plane which is parallel to the bottom of the pan 81.

For loosening the grid from the pan and causing the release of the ice blocks I provide means for lifting the grid, or a portion thereof, relative to the pan, and which can also be operated to flex or expand the grid to loosen the ice blocks therefrom. This means may comprise a substantially rigid bar 88 extending longitudinally of the pan through the aligned slots 89 formed in the walls 85 adjacent the tops thereof. The grid 82 is preferably made somewhat deeper than the pan 81 so that the slotted tops of the walls 85 will project above the top of the pan and the bar 88 may extend across the end walls 90 and 91 of the pan.

In using the bar 88 as a grid loosening and expanding means, it is actuated as a lever of the second class and during this actuation a lifting force is applied to its curved outer end 92 while its inner end fulcrums either on the inner end wall of the pan when the entire grid is to be lifted or on one of the upright walls 85 when only a portion of the grid is to be lifted. A suitable fulcrum and retaining means for the inner end of the lever may be provided in the form of an upright ear 93 secured to the inner end of the pan and projecting thereabove and provided with a slot 94 through which the inner end of the lever extends.

When the operator wishes to loosen the entire grid 82 by a single operation, such as when all of the ice blocks are needed and it is desirable to remove the grid from the pan for discharging the blocks at one time, the curved outer end of the bar 88 is lifted while its inner end fulcrums on or adjacent the inner end of the pan. In this way the entire grid can be lifted relative to the pan to the dotted line position 95 shown in Fig. 11. During this lifting operation the grid and the ice blocks are broken away from the walls of the pan and, at the same time, more or less flexing may occur in the grid itself to cause the ice blocks to be broken away from the side and bottom walls 85 and 86. After loosening the grid from the pan by the lifting or prying action of the bar 88, as just explained, the ice blocks can be pushed or dumped laterally out of the cells, or, if desired, the bar may be withdrawn from the slots 89 and the grid flexed or twisted to further loosen the ice blocks.

If only a few of the ice blocks are needed or

if the grid and blocks are frozen in the pan too tightly to be lifted in one operation, as explained above, the operator may withdraw the bar 88 part-way from the grid 82 to bring the inner end thereof to a fulcrum position on a certain one of the upright walls 85, whereupon the bar is lifted or swung upwardly to lift and expand the corresponding outer end portion of the grid from which the ice blocks are to be released. The dotted line position 96 of Fig. 11 shows the bar 88 partially withdrawn and actuated in the manner just explained to loosen ice blocks from the three cells at the outer end of the grid 82.

If desired, the pan 81 or any of the other pans herein illustrated may be provided with a novel means which I have devised for facilitating the handling of the tray and the loosening of the same from the freezing compartment. This means may comprise a hollow sheet metal handle 100 which is pivotally connected to the outer end of the tray as by the pair of ears 101 or other suitable means. The handle 100 provides a pulling means for grasping the tray and withdrawing the same from the freezing compartment 102 (see Fig. 12) and also serves as a lever for lifting the outer end of the tray and thereby breaking the same away from the bottom wall 103 of the freezing compartment. For the accomplishment of the latter purpose I provide the handle 100 with a cam or lever portion 104 which is eccentric to the pivot 105 and which bears or cams against the wall 103 of the freezing compartment when the handle is swung relative to the pan as by means of a pulling force applied thereto. The handle is preferably formed with a curved top portion 106 which is adapted to overlie the curved outer end portion 92 of the grid lifting and expanding bar 88 when the handle is in its normal position, as shown in Fig. 10.

In Figs. 13 and 14 I have shown still another freezing tray of my invention comprising a pan 110 and one or more insert members or grids 111 therein which divide the interior of the pan into a plurality of matrices or cells 112. When two of the grids 111 are to be employed the pan may be provided with a longitudinally extending partition 113 dividing the interior of the pan into pockets in which the grids may be disposed.

The grid 111 may be similar to the grid 47, shown in Figs. 5 and 6, that is to say, it may be formed from resiliently flexible or springy sheet material which is bent and folded transversely at longitudinally spaced points to provide the upright double-thickness walls 114 and the longitudinally extending single-thickness connecting walls 115. In its normal or free condition the grid assumes a contracted form corresponding substantially with the full line position shown in Fig. 14 but, when lifted relative to the pan 110, is adapted to be flexed or bent to the arcuate condition represented by the dotted line position 116 in which condition the adjacent thicknesses of the walls 114 have been spread apart to expand the grid longitudinally and thereby loosen the ice blocks.

For lifting the grid 111 relative to the pan 110 I provide a resiliently flexible lifting strip 117 which extends longitudinally of the pan and has opposite ends 118 and 119 thereof connected respectively with levers 120 and 121. The strip 117 is such that when in its free or released condition it will assume substantially the form and position shown in full lines in Fig. 14, that is to say, will lie close to the wall of the pan 110 and

will conform to the shape or curvature thereof. The grid 114 is preferably not attached to the strip 117 but rests thereon so that by lifting one or both ends of the strip relative to the pan, the grid will be lifted out of the pan and will be more or less bowed and expanded, as indicated by the dotted line position 116, depending upon the extent which the end or ends of the strip may be lifted relative to the pan.

The levers 120 and 121 may be formed from metal bars bent to substantially U-shape, as shown in Fig. 13, so that intermediate sections of the bars form the handle portions 122 and 123 and end portions of the bars form the pairs of lever arms 124 and 125. The arms 124 and 125 are connected with the sides of the pan by means of pivots 126 located substantially on the vertical transverse mid-plane and are provided respectively with slots 127 and 128 of substantial length through which these pivots extend and which permit longitudinal movement of the levers relative to each other and relative to the pan. Adjacent the handle portions 122 and 123 the levers are provided with transversely extending anchor rods 129 and 130 to which the ends 118 and 119 of the strip 117 are fastened. The rods 129 and 130 extend through the slots 127 and 128 of the levers so that the rods may have relative shifting longitudinally of the slots.

When the grid 111 and the lifting strip 117 occupy their normal positions, as shown in Fig. 14, the levers 120 and 121 lie in substantial alignment with each other and extend longitudinally of the pan just below the top edges thereof. Pairs of laterally projecting clips 131 and 132 engageable with the top edge of the pan may be provided for assisting in holding the levers in this position. When the grid is to be lifted and expanded for releasing the ice blocks, one or both of the levers 120 and 121 are lifted relative to the pan. The lifting of these levers causes the corresponding end or ends of the strip 117 and of the grid 111 to be lifted and at the same time flexed to the bowed condition represented in the broken line position 116.

In Figs. 15 and 16 I show another freezing tray of my invention comprising a pan 133 and an insert member or grid 134 therein. The grid is similar to the grid 111 of Fig. 14 and the grid 47 of Fig. 6, that is to say, it may be formed from a strip of resiliently flexible or springy sheet material which is bent and folded transversely at longitudinally spaced points to provide the double-thickness upright walls 135 and the longitudinal single-thickness connecting walls 136. When the grid is disposed in the pan, as shown in Fig. 16, the walls 135 divide the space into a plurality of matrices or cells 137 having the single-thickness walls 136 as their bottom walls. The grid is so formed from the springy sheet material that when it is in its free or released condition it assumes substantially the shape and form shown in Fig. 16 and is adapted to rest upon and closely engage the bottom of the pan 133.

The strip of sheet material from which the grid 134 is formed may be slightly narrower than the interior width of the pan when a single grid is employed, or if two grids are desired, the pan may be provided with a longitudinal partition wall 138 to divide the interior thereof into two pockets in which the respective grids are received.

For lifting the grid relative to the pan 133 to thereby free the grid and the ice blocks con-

tained therein from the pan, I may provide grid lifting means adapted for convenient manual operation. This grid lifting means may comprise a transverse substantially U-shaped lifting bar 139 disposed in the pan beneath the grid or grids, and linkage operable to apply a lifting force to such transverse bar. Such linkage may include a substantially U-shaped lever 140 having a transverse handle portion 141 disposed adjacent one end of the pan and a pair of substantially parallel arms 142 expanding longitudinally of the pan outside thereof and having their inner ends connected with the pan so as to permit both longitudinal and pivotal movement of the lever relative to the pan. To permit this relative movement the arms 142 may be provided with slots 144 adjacent their inner ends through which rivets or pivot pins 145 carried by the side walls of the pan extend. For transmitting motion from the lever 140 to the transverse lifting bar 139, I provide links 146 which connect the arms 142 of the lever with the ends of the transverse lifting bar. The links 146 have pivotal connection with the ends of the transverse bar 139 and also have pivotal connection with the lever arms 142 at an intermediate point thereof.

With the grid lifting arrangement just described it will be seen that when a person grasps the handle portion 141 of the lever 140 and pulls forward on the same to cause relative longitudinal movement between the lever arms 142 and the pan, it will cause swinging of the links 146 from a relatively inclined position to a substantially vertical position. This swinging of the links will cause a powerful thrust force to be applied to the ends of the transverse bar 139 tending to lift the grid relative to the pan. This initial thrust force acting on the grid breaks the same and the ice blocks away from the walls of the pan so that, by subsequently swinging the lever 140 upwardly to its broken-line position 147 or higher, it will lift the grid and the ice blocks to the corresponding elevated broken-line position, shown in Fig. 16, or entirely clear of the pan if desired. When the grid and ice blocks have been lifted out of the pan by the operation of the lever 140, as just explained, the grid can be grasped and flexed or twisted slightly to further release the individual ice blocks.

When the grid 134 occupies its normal position in the pan 133, as shown in Fig. 16, the lever 140 extends longitudinally of the pan with the lower edge of the lever substantially flush with the bottom face of the pan. Hence, when the pan is inserted into the freezing compartment of the refrigerator, the lever 140 will engage the face or bottom of the freezing compartment upon which the bottom of the pan rests. When the pan is to be removed from the freezing compartment the lever 140 can be drawn forward to cause the initial lifting force to be applied to the grid 134, as explained above, and then can be pressed downwardly against the bottom of the freezing compartment and thus used as a lever for loosening the pan. This downward movement of the lever 140 for loosening the pan from the freezing compartment is illustrated in Fig. 16, where I show the broken line position 150 to which the lever may be moved for this purpose.

When the pan 133 contains two of the grids 134 and is provided with the longitudinal partition 138, the transverse grid lifting bar 139 is preferably formed with a doubled interme-

plate portion 131 which extends over the top of the partition, as shown in Fig. 17.

From the foregoing description and accompanying drawings it will now be readily understood that I have provided an improved freezing tray for refrigerators which is so constructed that the ice blocks formed in the cells of the tray can be quickly and easily removed therefrom. It will also be seen that the facility with which the ice blocks can be removed from my improved freezing tray results, in part, from the use of a novel form of resiliently flexible and expansible grid and, in part, from the use of a conveniently operable manual means for loosening the grid and ice blocks from the pan. Additionally, it will be seen that I have provided simple and convenient means for loosening the pan from the freezing compartment when the tray is to be removed therefrom.

While I have illustrated and described my improved freezing tray in a somewhat detailed manner it will be understood, of course, that I do not wish to be limited to the particular embodiments and details of construction herein disclosed but regard my invention as including such changes and modifications as do not constitute a departure from the spirit of the invention and the scope of the appended claims.

Having thus described my invention, I claim:

1. A freezing tray for refrigerators, comprising a receptacle adapted to contain liquid, an elongated flexible member for dividing the interior of the receptacle into a series of matrices for the formation of ice blocks, said member being extensible longitudinally to cause release of the ice blocks and having one end thereof connected with the receptacle, and winding means having connection with the receptacle and with the other end of said member and operable to apply a pulling force to extend the latter.

2. A freezing tray comprising a receptacle adapted to contain liquid and having a partition or dividing the interior thereof into a plurality of longitudinally extending recesses, independent flexible and extensible members in said recesses for dividing the same into a plurality of independent rows of matrices for the

formation of ice blocks, and lever actuated rotary means having connection with one end of said members and with the adjacent end of said receptacle and operable to cause simultaneous lifting and extending of said members independently of each other to release the ice blocks from the pan and members.

3. In a freezing tray for refrigerators, a receptacle adapted to contain liquid, a member for dividing the interior of the receptacle into matrices for the formation of ice blocks comprising a metal strip having portions thereof folded to form longitudinally spaced side walls of double thickness and connecting bottom walls of single thickness, said member being flexible and extensible longitudinally to thereby increase the spacing of the side walls and to form air pockets between adjacent matrices, and lever actuated tensioning means having connection with one end of said member and with said receptacle and operable to cause simultaneous lifting and extending of said member.

4. In a freezing tray for refrigerators, a receptacle adapted to contain liquid, a member for dividing the interior of the receptacle into matrices for the formation of ice blocks comprising a resilient metal strip having portions thereof folded to form longitudinally spaced side walls of double thickness, said member being extensible longitudinally by separation of said wall thicknesses and being provided with means for limiting the separation of said wall thicknesses, and actuating means having connection with one end of said member and with said receptacle and operable to cause simultaneous lifting and extending of said member.

5. In a freezing tray for refrigerators, a receptacle adapted to contain liquid, a resilient sheet metal strip having one end connected with the receptacle, and means mounted on the receptacle and acting on the other end for tensioning the strip to cause lifting of the same relative to the receptacle, said strip having longitudinally spaced matrix-forming means projecting therefrom and adapted to be extended longitudinally during the tensioning and lifting of the strip.

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