Oct. 15, 1957 A. J. FREI 2,809,500

ICE BLOCK RELEASING DEVICE

Filed March 22, 1956 2 Sheets-Sheet 1

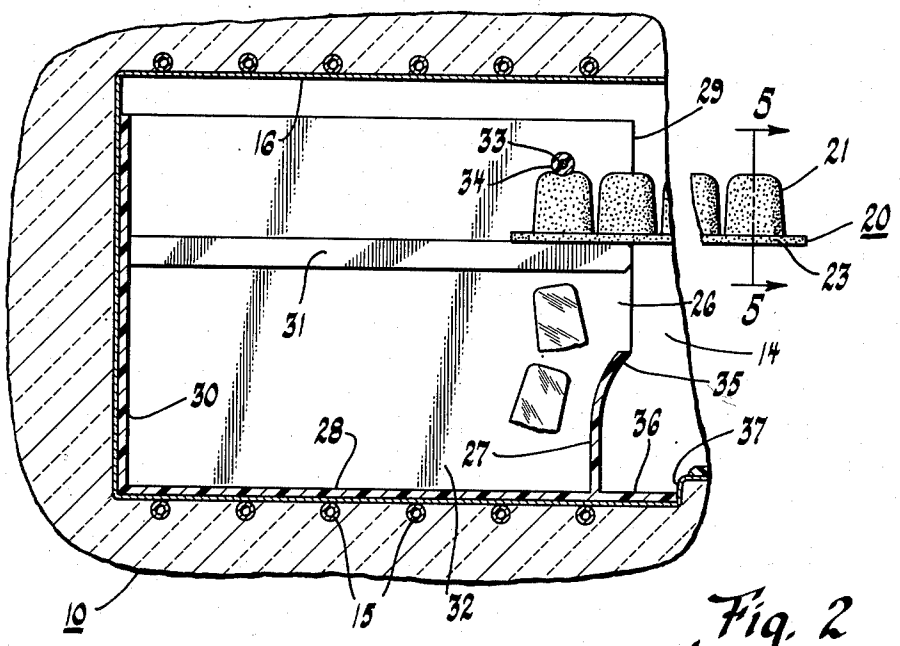


Fig. 2

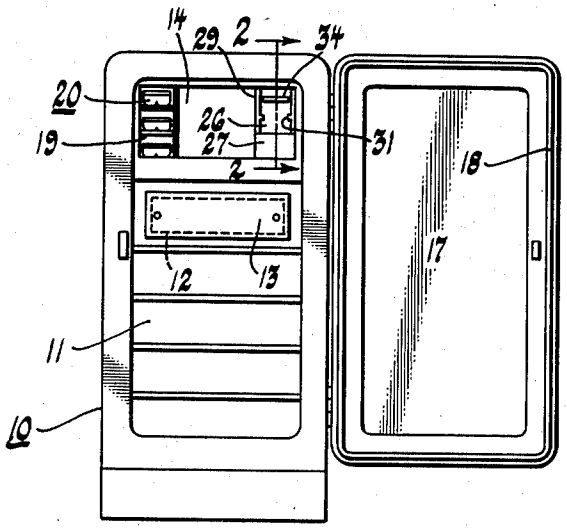


Fig. 1

INVENTOR
Arthur J. Frei
BY
John T. Marvin.
HIS ATTORNEY.

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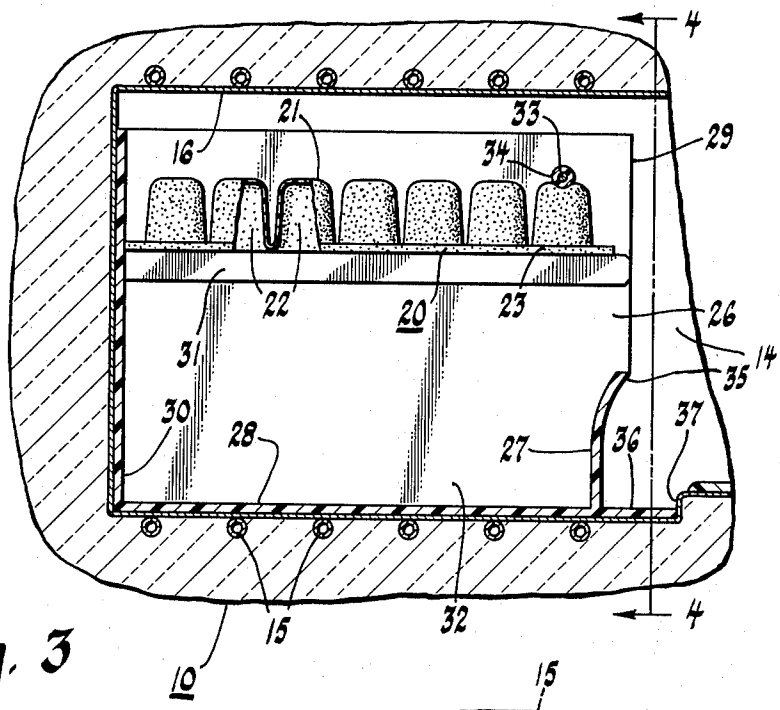


Fig. 3

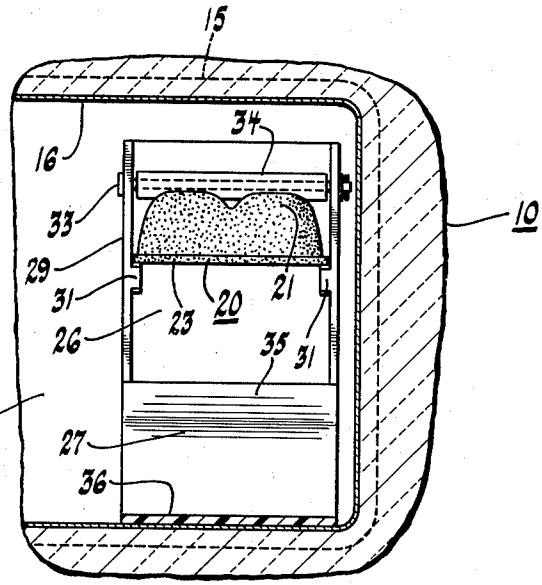
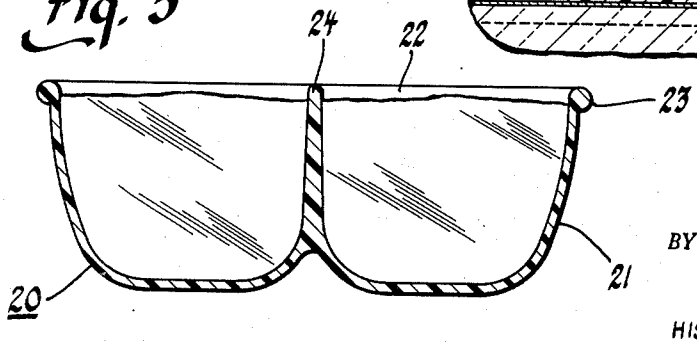


Fig. 4

Fig. 5



INVENTOR
Arthur J. Frei
BY
John T. Marvin.
HIS ATTORNEY.

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ICE BLOCK RELEASING DEVICE

Arthur J. Frei, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application March 22, 1956, Serial No. 573,249

1 Claim. (Cl. 62—108.5)

This invention relates to refrigeration and particularly to an arrangement for releasing ice blocks from freezing devices.

I am aware of an arrangement recently placed on the market for ejecting ice blocks from a freezing tray into a storage receptacle wherein the tray is moved along tracks inclined or curved relative to one another which cause the tray to be twisted. While the public has accepted this arrangement with favor there are some users of refrigerators in which this arrangement is embodied who have expressed objections thereto. One of these objections is that of the intense force required to be applied to a freezing device by a person in order to push the tray thereof along the tracks for twisting same during the act of ejecting ice blocks from the device. I contemplate an arrangement for harvesting ice blocks from a freezing device or tray which is simple in nature, of low manufacturing cost and of a type that will overcome the objections mentioned.

An object of my invention is to provide an improved arrangement in the freezing chamber of a household refrigerator for releasing or ejecting ice blocks from a freezing device.

Another object of my invention is to divide or break up the force required to be imparted to a freezing device or tray in order to flex same and release ice blocks therefrom into a plurality of small forces whereby to ease the operation of releasing all the ice blocks.

A further and more specific object of my invention is to progressivly flex different portions of a freezing tray upon pushing same along supporting rails therefore in inverted fashion whereby ice blocks are released from compartments in succession and without necessitating twisting of the tray.

Moreover it is an additional and particular object of my invention to provide a combined ice bucket and freezing device tray support structure or unit for use in combination with a household refrigerator cabinet which is portable and equipped with means for ejecting ice blocks from their compartments in a tray invertedly placeable on the support of the portable unit while the same is disposed inside the refrigerator and/or located exteriorly thereof at an ice block serving point remote therefrom.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a front view of a multiple compartmented household refrigerator cabinet with its door open and showing my invention embodied in a freezing chamber thereof;

Figure 2 is an enlarged fragmentary sectional view taken on the line 2—2 of Figure 1 showing a freezing tray placed in inverted fashion into an association with a combined freezing device support and ice block storage bin structure constructed in accordance with our invention;

Figure 3 is a view similar to Figure 2 and shows a freezing tray pushed all the way into the combined structure to progressively eject ice blocks from pockets of the tray;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 3 showing a freezing tray supported in an inverted position on the support of the combined structure; and

Figure 5 is a sectional view through the freezing tray taken on the line 5—5 of Figure 2 showing the tray in an upright position and ice blocks located in pockets thereof.

Referring to the drawings I show in Figure 1 thereof a refrigerating apparatus including an insulated household refrigerator cabinet **10** of the multiple compartment type having the present invention embodied therein. Cabinet **10** is provided with a lower unfrozen food storage compartment or chamber **11** which is cooled to a temperature above 32° F. by a plate-like sheet metal evaporator **12** of a refrigerating system associated with the cabinet and mounted behind a protecting cover **13**. Cabinet **10** is also provided with an upper freezing or frozen food storage compartment or chamber **14** which is cooled to a temperature well below 32° F. for the storage of frozen foods, for freezing foods and/or for freezing water into ice blocks for table use in chilling drinks in glasses. Chamber **14** is refrigerated by an evaporator **15** (see Figure 2) of the refrigerating system associated with cabinet **10** which evaporator is in the form of a conduit coiled or wrapped around the outside of and secured to a metal can-like member **16** forming the liner of chamber **14**. An insulated door structure **17**, hingedly mounted on cabinet **10** for horizontal swinging movement relative thereto, extends across the front of both chambers **11** and **14** and is provided with a gasket **18** for sealingly engaging the front side of cabinet **10**. Another smaller door (not shown) separate from door **17** may be hingedly mounted at the front access opening of chamber **11** for vertical swinging movement to provide an individual closure for its opening as is conventional in the art. A plurality of metal shelves **19** are secured in any suitable manner, directly to a side wall of liner **16** so as to be in intimate metal to metal contact therewith and consequently with evaporator **15**. Each of the shelves **19** is adapted to support an elongated freezing device or tray, generally represented by the reference numeral **20**, and shown more in detail in Figures 2, 3 and 4. Each freezing device or tray **20** is formed in one piece from any suitable or desirable non-metallic material and can be fabricated by any of the now well known molding processes. Each device or tray **20** has walls **21** providing a row or rows of pockets **22** (see Figure 3) an integral rim **23**, bounding the rows of pockets **22**, and a central web-like wall **24** (see Figure 5) intermediate the rows of pockets. The pockets **22** form individual compartments tapered outwardly toward their open tops and adapted to contain water to be frozen into separated ice blocks. The material from which a tray or freezing device **20** is formed at least at the bottom and at a lower portion of upright walls of the pockets is resilient and capable of being flexed while the remainder of the tray or device may be substantialy inflexible to stiffen same and facilitate handling thereof. In this connection it is to be understood that the bottom of the pockets or compartments **22** can be bowed downwardly away from side walls thereof whereby only the bottom wall of a pocket need be resilient and flexible such as may be the case if a metal tray is desired to be flexed in the ice block ejector of the type herein disclosed.

In accordance with this invention I provide a combined or unitary freezing device support and ice block storage bin structure within the freezing or frozen food chamber

14 of cabinet 10 and preferably render same removable therefrom for a purpose to be hereinafter described. This combined structure is horizontally elongated and is substantially of a box-like character having an upper open front portion 26, a short lower front wall 27, a bottom wall 28, side walls 29 and a back wall 30 (see Figure 2). The combined open front support and bin structure is preferably constructed of light-weight plastic material and has integral horizontally elongated stationary spaced apart opposed rails 31 on the inner face of side walls 29 thereof adapted to support one of the freezing devices or trays 20. The lower portion of the combined structure between the rails 31 and the bottom wall 28 thereof forms a storage bin or bucket 32 bounded by the walls 27, 29 and 30. An aluminum rod 33 extends across the interior of the combined structure and is mounted in suitable holes provided in the side walls 29 of the box-like structure. Rod 33 supports a roller 34 which is stationary and rollable about the rod. The rod 33 and roller 34 are disposed inwardly of the upper open front portion 26 of the combined structure and are spaced above the rails 31 a suitable distance to cause the roller 34 to engage the bottom portion of each of the pockets or compartments 22 progressively during the act of pushing a freezing device or tray 20 into the combined structure with the rim 23 of the device or tray supported on and sliding along the rails 31. Spacing of roller 34 inwardly of the open front 26 of the combined structure, and the provision of an outwardly directed lip indicated at 35 at the top of wall portion 26, insures that ice blocks released from a device or tray 20 will fall into and be received by the storage bin 32. The back wall 30 of the combined freezing device support and ice block storage bin structure abuts against the rear wall of liner 16 of chamber 14 and its bottom wall 28 is provided with a forwardly extending projection 36 which engages a raised portion 37 formed on liner 16 at the access opening leading to chamber 14. The top edge of back wall 30 and side walls 29 of the structure are spaced from the top wall of liner 16 for the purpose of permitting the combined freezing device support and storage bin or bucket structure to be inserted into freezing chamber 14 and removed therefrom if desired. The abutment of the combined structure with the rear wall of liner 16 and the engagement of projection 36 with the raised front portion 37 or liner 16 prevents the structure from shifting back and forth within chamber 14 when a freezing device or tray 20 is inserted into the structure or withdrawn therefrom.

The pockets or compartments 22 of a freezing device or tray 20 are substantially filled with water and the device or tray is placed in upright fashion on one of the shelves 19 within chamber 14 (see Figure 1) until the water is frozen into ice blocks. When it is desired to harvest ice blocks from a device 20 such device or tray together with ice blocks adhering to walls of pockets 22 is removed from shelf 19 and chamber 14, rotated into an inverted position, and then inserted through the open front portion 26 of the combined freezing device receiving and storage bin or bucket structure with portions of the rim 23, adjacent one end of the device or tray 20, supported on front parts of the opposed rails 31. Thereafter tray or device 20 is pushed inwardly of the combined structure and the roller 34 engages the resilient or flexible bottom portions of two end pockets 22 whereby to flex or distort same and eject ice blocks therefrom (see Figure 2). The first two ejected or released ice blocks fall into the storage bin 32 and upon continued pushing of device or tray 20 rearwardly into the combined structure the flexed pockets or compartments 22 pass beyond roller 34 and this stationary roller then engages the bottom portion of the next or adjacent pockets or compartments 22 and so on until the rows of pockets are flexed in succession and all ice blocks are progressively removed from a tray 20 and received in the storage bin or receptacle 32. For clarity reasons the accumulation of released ice blocks in the ice block storage bin has not been shown in Figure 3 of the drawings. Tray 20 is thereafter removed from the combined structure and released ice blocks contained therein may be removed therefrom through the front opening 26 thereof. It is to be understood that it is within the realm of this invention, if desired, to eject only a few ice blocks from a tray 20. This may be accomplished by moving the tray only partially or a short distance into the combined structure whereupon the tray may be thereafter withdrawn from the combined structure and replaced in an upright position on a shelf 19 until more ice blocks are required. This feature is intended to satisfy different users of a refrigerator and particularly those who do not wish to maintain a stored supply of released ice blocks and would prefer that the combined freezing device support and storage bin structure be removed from chamber 14 to provide more frozen food storage space therein. In such a case the unitary combined structure can be removed from chamber 14 by elevating same therein until the projection 36 rises above the raised portion 37 on liner 16 and clears the door jamb of this chamber whereupon the combined structure is moved forwardly out of chamber 14. The combined freezing device support and storage bin structure may be placed and supported on a kitchen ledge or the like and may be utilized at this point for harvesting ice blocks from a tray or device if desired. Thus this feature does not restrict the use of the ice block ejector or releasing structure of the present invention to the interior of a refrigerator cabinet and serves to satisfy the desire of different or various housewives.

It should, from the foregoing, be apparent that I have provided an improved means for harvesting ice blocks from freezing devices or trays while at the same time affording a novel arrangement which increases the utility of a refrigerator cabinet with which the same is associated and rendering the same universal in use. The combined freezing device support and ice block storage bin structure can be used within or outside of a refrigerator cabinet to satisfy the desires of various purchasers of a refrigerator cabinet equipped with the present ice block ejecting structure. By progressively flexing only small portions or sections of a freezing device or tray to eject ice blocks therefrom one after the other in succession and without twisting the tray, the force required to release all ice blocks from the tray is broken up into a plurality of smaller forces which can be applied thereto without undue effort on the part of the user. The progressive flexing of bottoms of ice block pockets or compartments in a device as herein disclosed occurs substantially unnoticed during the act of and solely by pushing the tray along its support as compared to a force applied to a freezing device of sufficient intensity to twist the tray thereof. This thus overcomes an objection inherent in mechanism wherein a force sufficient to twist a freezing device or tray for simultaneously releasing all ice blocks therefrom must be applied at one time to the device or tray. My simplified arrangement eliminates the purchase or making of special tools and devices for forming or cutting odd shaped recessed tracks or the like in freezing device supports of ice block ejecting means or apparatuses to thereby reduce the cost of manufacturing such means and supplying a refrigerator cabinet with same. My arrangement also eliminates the necessity of providing a complicated cam or lever mechanism on a freezing device or on a support therefor and operation of such mechanism.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claim which follows.

What is claimed is as follows:

An ice bucket and tray support structure for receiving in an inverted position an ice tray having a plurality

of separated ice blocks frozen in compartments thereof, said structure being constructed as a portable unit with the ice bucket inseparable from the tray support and preventing relative movement therebetween, said unit being insertable into and transportable away from a chamber in a refrigerator for selectively storing ice blocks contained in the bucket within the refrigerator or for transferring the contained ice blocks from the unit exteriorly of the refrigerator at an ice block serving point remote therefrom, and means on the bucket of said portable unit for ejecting ice blocks from a tray invertedly placed on said support thereof while the same is inside the refrigerator chamber and/or outside thereof.

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