Jan. 7, 1941. J. C. BUCHANAN 2,227,700

ICE CUBE RELEASE

Filed April 27, 1939

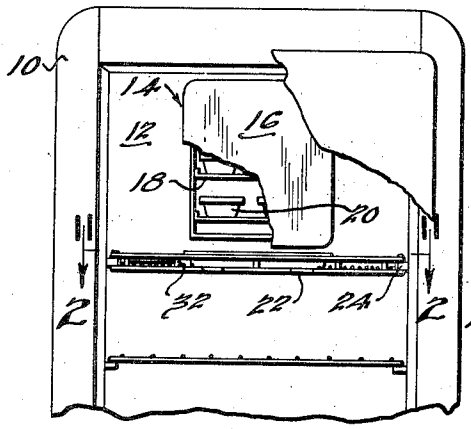


FIG. 1.

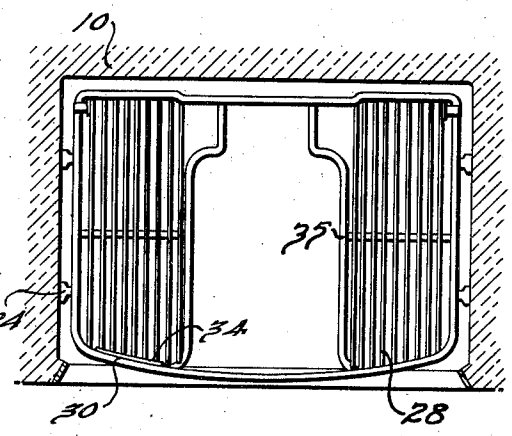


FIG. 2.

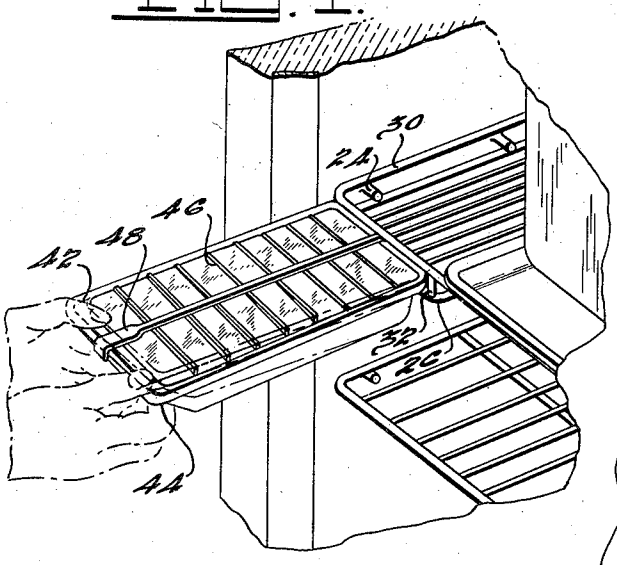


FIG. 3.

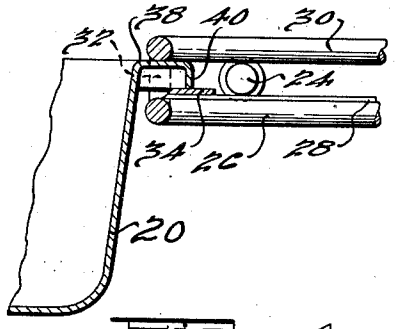


FIG. 4.

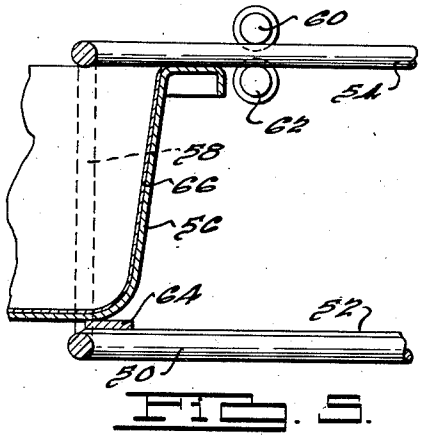


FIG. 5.

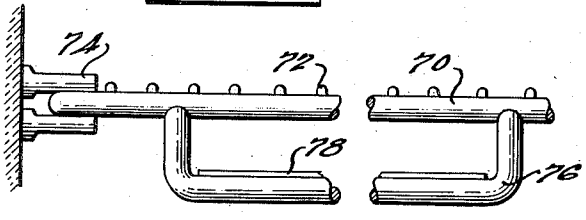


FIG. 6.

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UNITED STATES PATENT OFFICE

2,227,700

ICE CUBE RELEASE

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Application April 27, 1939, Serial No. 270,321

4 Claims. (Cl. 62—1)

This invention relates to domestic refrigerators and has particular reference to means for facilitating the release of ice cubes from the ice freezing trays of a refrigerator.

It is an object of this invention to provide means upon a refrigerator cabinet, or within the cabinet, for holding a portion of an ice tray while the ice is loosened from the tray.

It is another object of this invention to provide means for loosening one or more ice cubes from an ice freezing tray without the use of heat to partially melt the cubes away from the tray.

It is another object of this invention to provide an ice freezing tray for a refrigerator which is particularly adapted to easily release ice frozen in the tray.

It is another object of this invention to provide a grid which is particularly adapted to release ice cubes frozen thereon.

It is another object of this invention to provide a refrigerator shelf arranged to provide means for holding an ice freezing tray while the ice within the tray is loosened from the tray.

Other objects and advantages of this invention will be apparent from a consideration of the following description taken in conjunction with the attached drawings of which there is one (1) sheet and in which:

Fig. 1 represents a cutaway view of the upper portion of a refrigerator cabinet and in which

Fig. 2 represents a section taken along the line 2—2 in Fig. 1;

Fig. 3 represents a perspective view of the ice freezing tray and refrigerator shelf embodying my invention in operative position;

Fig. 4 represents a vertical section taken through a portion of the ice freezing tray and the shelf shown in Fig. 3, while in operative position;

Fig. 5 represents a modified form of my invention and is a view similar to Fig. 4; and

Fig. 6 illustrates a shelf embodying a second modification of my invention.

I have developed a method for removing the ice cubes from the ice freezing trays of a mechanical refrigerator which consists of providing a bracket or other holding means located somewhere either immediately within the refrigerator, or outside, into which the end of the ice freezing tray may be inserted. When the ice tray is of relatively flexible construction it becomes a simple matter to insert one end of the tray into the bracket which holds the tray rigid at that end and then to twist the free end of the tray around the major axis of the ice tray. This action cracks the ice free from the tray so that it may be easily removed without resorting to melting the ice under warm water. If in addition to the flexible tray a flexible grid such as rubber is used to separate the cubes in the tray, each cube may then be removed individually by bending the flexible grid. It should be noted that the operator may thus use the strength of both hands to twist the tray rather than using the strength of one hand as a reaction for the other.

In the preferred form of my invention shown in Figs. 1, 2, 3 and 4, I have illustrated a refrigerator cabinet 10 having a provision compartment 12 in which is located an evaporator 14 having a door 16, and ice freezing shelves 18, on which are supported one or more ice freezing trays 20.

Directly below the evaporator 14 is located a shelf structure 22 supported from the sides of the refrigerator wall by pins 24. The shelf 22 is composed of a lower frame portion 26 having small grid members 28 attached thereto upon which food or other products stored in the refrigerator are adapted to be supported. Spaced above the frame 26 is a second frame member 30 which is connected to the frame 26 by short connecting members 32. The frame members 30 and 26 are separated far enough to permit the pins 24 to slide between the two frame members thus providing a sliding support for the shelf. The frame 30, it is thus seen, will act as a railing around the lower shelf member and will prevent articles from falling off of the shelf. I have shown the lower frame member 26 to be carried back at the center of the compartment as at 35 in order to form an open space in the center of the refrigerator in which a defrosting tray or other refrigerator appliance may be supported. The upper frame member 30 is carried completely around the interior of the refrigerator and is generally of the same shape as the interior of the refrigerator.

At one side of the shelf 22, I have provided a smooth metal strip 34 which is fastened on the top of the grids 28 as by welding to form a smooth and hard base for making contact with the end of an ice tray. I have shown this structure to be embodied in the shelf directly under the evaporator because in most refrigerators this will be at a height which is most convenient to the operator. However, it is evident that this construction may be used in any of the shelves of the refrigerator.

The ice tray to be used in conjunction with this shelf structure must have a portion across one end which may be inserted between the plate

34 and the upper frame 30. In Fig. 4, I have shown the ice tray 20 to have a bent out flange 38 and a down-turned flange 40 from the outer edge of the flange 38. The flanges 38 and 40 are carried continuously around the tray 36 and the thickness of the flange 40 is such that it will conveniently fit between the upper frame 30 and the plate 34. The connecting members 32 between the frame members 30 and 26 are spaced at such a distance as to allow for the insertion of the flange in the ice tray between the connecting members and the two frame members. It will thus be seen that the end of the ice tray may be inserted in such a manner as to have a continuous flat bearing surface upon the plate 34 and underneath the top frame member 30. If the ice tray is grasped at the outer end as indicated in Fig. 3, at 42 and 44, the tray may be twisted along its longitudinal axis as by pressing down on the corner 44. This twisting will cause the ice to crack free from the tray to which it may have adhered in freezing. In Fig. 3, the full lines represent the tray in its twisted position while the dotted lines represent its normal position before twisting.

I have found that a tray which will bend down from one-half to one inch from its normal straight position without permanently deforming the tray gives ample distortion of the tray to crack the ice free. As indicated in Fig. 3, the ice in the ice tray may be divided into cubes by means of a grid 46 which may be of flexible material such as rubber having a tab 48 on the forward end thereof by which the block of cubes may be lifted from the tray after it has been cracked loose from the tray. After the block of cubes has been removed from the tray, the cubes may be detached either one at a time or all at once from the grid by bending the flexible grid.

Fig. 5 illustrates a modification of my invention in which the lower frame 26 with its attached shelf grid 52 is separated from the upper frame or rail 54 by a distance which is sufficient to allow the entire end of the ice tray 56 to be inserted between the two frames. This is accomplished by making the connecting members 58 longer than the corresponding members 32, shown in Fig. 4. The upper frame 54 may be supported upon pins 60 and 62 which fit one underneath the frame and one over the frame 54. This construction prevents the shelf from tipping when a weight or force is applied to the front or back outside of the line of the supporting pins. The shelving grid members 52 have a plate 64 fastened to their forward end in the same manner as the plate 34 is fastened to the grid 28 of Fig. 4. Instead of inserting just the flange of the ice tray between the frame members, the whole end of the tray is inserted as illustrated, and the tray may then be twisted in the same manner as has just been explained in connection with Fig. 3.

Fig. 5 also illustrates a modified form of tray in which I have provided a lining 66 which is arranged to prevent ice from adhering so closely to the tray as it would if the metal were left bare. This lining, or coating, may be of any material, such as wax or rosin plastic, which will have a lower adhesive factor to ice than would the bare metal tray and which will not rub off at temperatures to which the tray will normally be subjected as in cleaning. The compound must also be of such a nature as not to give any odor or flavor to the water which is being frozen in the tray. If a metal grid is used in the tray, it also may be coated with the same compound as the tray.

Illustrated in Fig. 6 is a second modified form of my invention in which the shelf 70 having grid members 72 is supported between a series of pairs of pins 74 projecting from the sides of the refrigerator cabinet. Instead of having a lower frame continuously around the cabinet, I have provided in this modification a short U-shaped member 76 which is rigidly attached to the frame 70 beneath said frame. The U-shaped member 76 must be of sufficient length to allow the end of the ice tray or the flange on the end of the ice tray to be inserted between the U-shaped member and the shelf frame 70. The U-shaped member 76 may be provided with a protecting plate 78 welded on its upper surface to protect the member 76 from wear. The ice cubes may be released in the same manner as described above by inserting the end of the tray into the slot formed by the U-shaped member 76 and twisting.

While I have described my invention with some detail, it is evident that it may take other forms such as providing slots or brackets at some point on the refrigerator other than on the shelf, and I do not intend to be limited to the specific structure herein disclosed.

What I claim is:

1. In a refrigerator compartment having an evaporator, a shelf supported beneath said evaporator comprising a lower frame member carrying supporting rods and having a portion thereof adapted to support a cold storage pan, and an upper frame member arranged to support a drip collector immediately over said cold storage pan, spacer members connecting said frame members and maintaining them in spaced generally parallel relation, said spacer members being of such a length that the space between said frame members will receive and the frame members will hold one end of an ice freezing tray while said tray is being twisted for loosening the ice cubes therefrom.

2. In a refrigerator adapted to freeze ice in trays, a lower frame member, shelf bars supported thereon, an upper frame member of the same over-all shape and size as said lower frame member, connecting members holding said frame members in spaced relation, said frame members and said connecting members defining a socket adapted to receive and hold an ice freezing tray against rotation, and means for supporting said frame members in said refrigerator.

3. In a refrigerator adapted to freeze ice in trays, a lower frame member, shelf bars supported thereon, a flat plate covering one end of said shelf bars, an upper frame member positioned generally over said lower frame member, connecting members holding said frame members in spaced relation, said connecting members, said upper frame member and said flat plate defining a holding means for holding one end of an ice tray against turning, and means for supporting said frame members in said refrigerator.

4. In a refrigerator having an evaporator for freezing ice in trays, means adjacent said evaporator defining a shelf in said refrigerator, said shelf being particularly characterized by the provision of means for receiving and holding one end portion of one of such trays and for converting a turning force applied to the other end of said tray into a distorting force for effecting the removal of the ice cubes.

JOHN C. BUCHANAN.