July 23, 1957 L. A. PAPPAS 2,799,998

ICE CRACKING DEVICE

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FIG. 1.

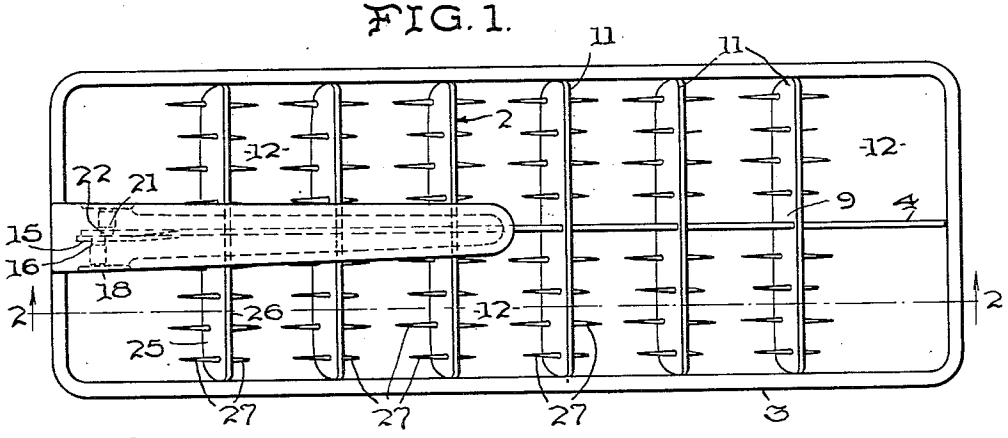



FIG. 2.

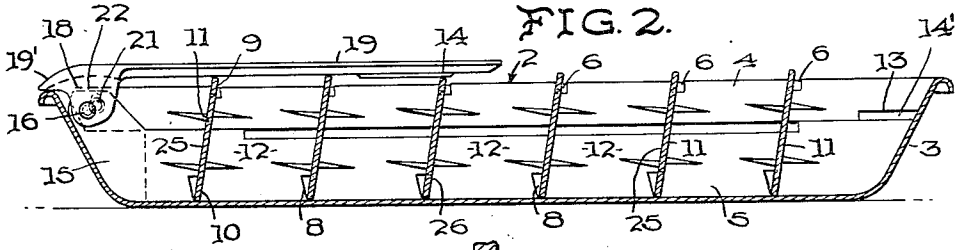
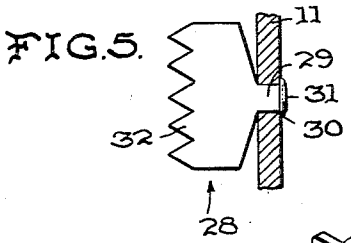



FIG. 5.



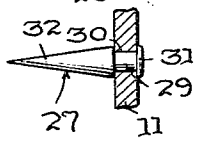
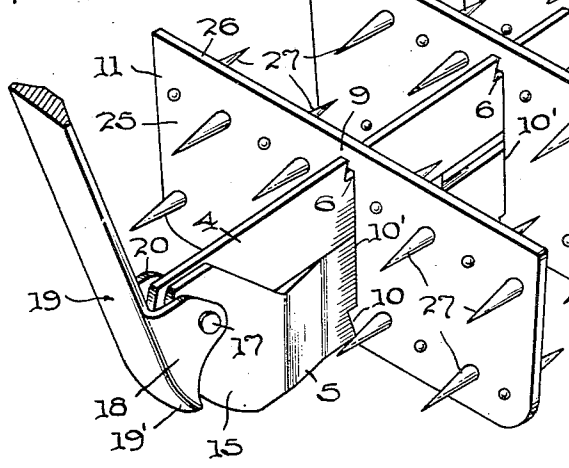




FIG. 4.




FIG. 3.




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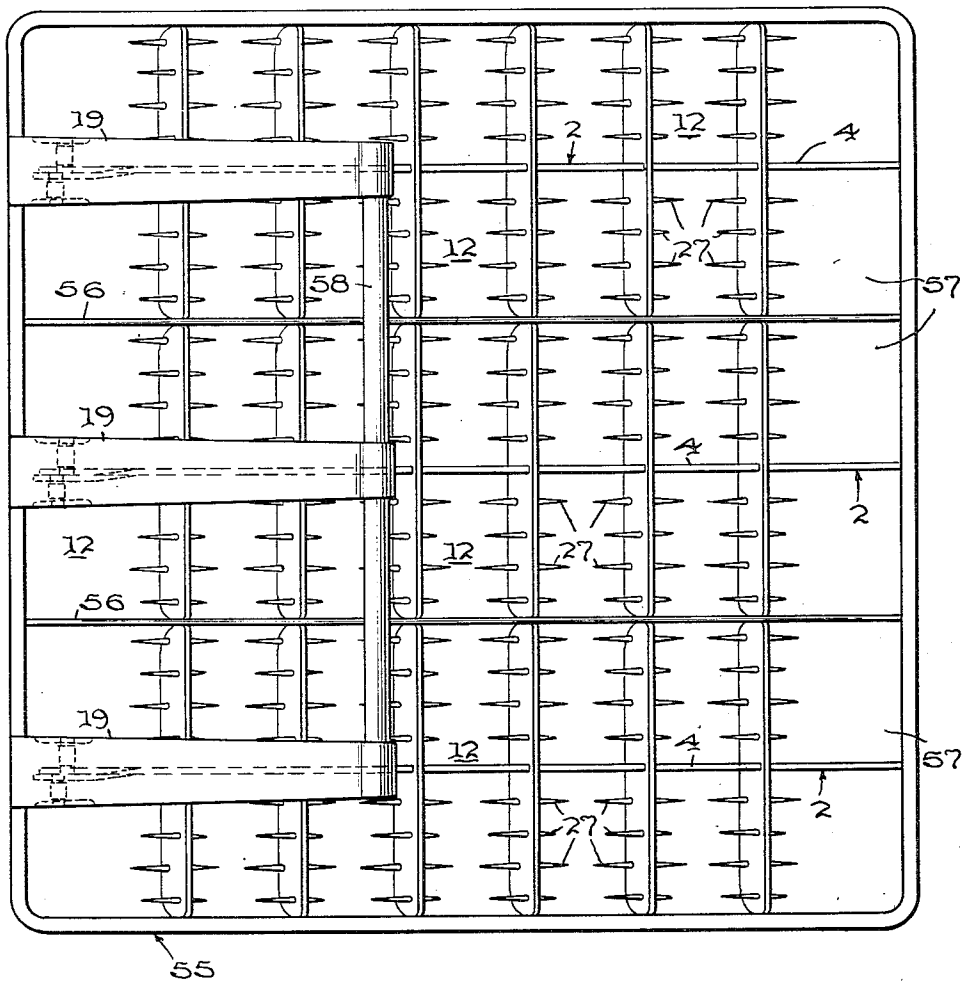



FIG. 6.

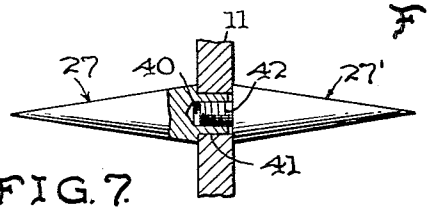



FIG. 7.

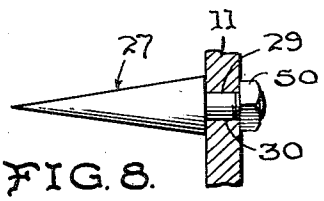



FIG. 8.

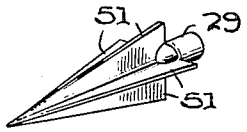



FIG. 9.

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# ICE CRACKING DEVICE

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Application January 7, 1953, Serial No. 330,059

7 Claims. (Cl. 62—108.5)

This invention relates to devices for shattering ice cubes. More particularly, it is concerned with providing a novel ice cracking or shattering device, which can be utilized with conventional ice cube freezing trays, compartments and the like of domestic or commercial refrigerators.

In the preparation and serving of many foods and beverages, it is highly desirable to use cracked ice. Cracked ice is also used for medicinal purposes such as in ice packs, which in turn are applied to inflamed parts of the body to withdraw heat therefrom.

Various devices have been developed in the past for breaking relatively large segments of ice into minute particles to form cracked ice. However, they usually have complex constructions and are very expensive to manufacture. They are also usually so constructed that they are not readily usable with conventional mechanical refrigerators. These disadvantageous features of prior ice cracking devices have also prevented the widespread purchase and use of such devices, even though cracked ice has many practical uses.

By the instant invention, a novel ice cracking device is proposed which can be used with the conventional ice cube trays or compartments of commerical or domestic refrigerators found in practically all homes. This ice cracking device, although efficient for the purposes designed, is yet exceptionally simple in construction with the result that it can be inexpensively manufactured.

Accordingly, it is an object of this invention to provide a novel ice cube cracking device which can be used with the conventional ice cube freezing trays of domestic or commercial refrigerators.

It is a further object of this invention to provide a novel ice cube cracking device which can be inexpensively manufactured.

It is another object of this invention to provide an efficient ice cube cracking device which can be used with the conventional ice cube freezing trays or compartments of mechanical refrigeration units, and one which is exceptionally simple in construction and design.

A further object of this invention is to provide a unitary grid structure adapted to be disposed in an ice cube freezing tray, which is provided with novel means for shattering the ice cubes formed in the tray into small, minute fragments.

These and other objects are accomplished by providing in combination with the ice cube freezing tray of a domestic or commercial refrigeration unit, a dividing unit or unitary grid structure located within the tray for breaking the tray into a plurality of ice cube compartments. This unit includes cooperating top and bottom central dividing fingers, pin members for pivotally connecting these dividing fingers together at one of their ends, and manually operated lever means attached to the pin members. Associated with the aforesaid dividing fingers is a plurality of floating fin members, each of which is loosely attached at a transverse angle to both of the dividing



fingers. These fin members are also located in spaced parallel relationship to each other. Pointed elements are affixed to the opposing surfaces of the several fin members, with the axis of the pointed elements being located in a plane substantially parallel to that of the top and bottom dividing fingers. Thus, when the dividing fingers are moved in opposite directions lengthwise of each other as a result of the lever means being actauted, the fin members will also be pivoted to loosen the ice cubes formed in the tray, and the pointed elements will in turn be actuated to exert pressure at various points upon the ice cubes formed in each of the compartments in the tray so as to crack and shatter the cubes into small fragments.

Other objects and advantages of the instant invention will become more apparent from a review of the following detailed description when taken in conjunction with the appended drawings, wherein:

Figure 1 is a top plan view of a conventional refrigerator ice cube freezing tray with the novel dividing unit or grid incorporated therein;

Figure 2 is an elevational sectional view of the dividing unit and tray of Figure 1 when taken along lines 2—2 thereof;

Figure 3 is a broken perspective view of the dividing unit provided with the novel ice cube shattering means of the instant invention, as it appears when removed from the freezing tray;

Figure 4 is a sectional view of a portion of a dividing unit fin element and indicates one arrangement for attaching thereto a spear or pointed element for shattering ice cubes;

Figure 5 is a sectional view of a portion of a fin element with a modified type of pointed element affixed thereto;

Figure 6 is a plan view of a large ice cube freezing tray or compartment, such as is found in commercial refrigerators, with a plurality of dividing units, each of which is provided with novel ice shattering means located therein; and

Figures 7, 8 and 9 are sectional views of portions of fin members showing modified forms of pointed ice shattering elements attached thereto.

With further reference to the drawings and particularly Figures 1 and 3, it will be observed that the dividing unit or unitary grid structure 2, which is adapted to be placed in a conventional refrigerator ice cube freezing tray 3, may be generally comprised of a pair of central dividing fingers 4 and 5, placed one on top of the other and movable lengthwise relative to one another.

Dividing finger 4 is provided with a plurality of spaced slots or notches 6 extending downwardly a short distance from the top edge thereof. Dividing finger 5 in turn is provided with a plurality of spaced slots or notches 8 extending upwardly from the bottom edge of the finger member. The slots 6 and 8 of the several dividing fingers cooperate to receive the upper and lower bridging portions 9 and 10 of an elongated vertical aperture 10' cut in the several fin elements 11, which extend transversely of the central dividing fingers 4 and 5 and in parallel spaced relationship to each other. Fin elements 11 act in conjunction with fingers 4 and 5 to divide the interior of the tray into a plurality of ice cube compartments 12 in a manner well known in the art.

The bottom edge of dividing finger 4 is advantageously cut away at one of its ends as at 13 and the top edge of dividing finger 5 is cut away intermediate its end portions so as to provide openings 14 and 14' between the two dividing fingers. The one end of dividing finger 5 is provided with an upwardly projecting shoulder portion 15 also bent outwardly from the main longitudinal plane thereof. This shoulder portion is provided with an

aperture 16 within which a pin 17 is suitably anchored and pin 17 is in turn also rigidly affixed to one of the side flanges 18 of a hand lever member 19.

The other side flange 20 of the lever member 19 is attached to another pin member 21 which is adapted to ride in the small vertically elongated slot 22 located in the upper dividing finger 4. The slot 22 in dividing finger 4 and the pin member 21 are located slightly above and to one side of pin 17 for the purpose of permitting the lever 19 to be elevated or rotated a short distance about its pivot without causing relative movement between the fins or the dividing fingers making up the grid so as to break the bond between the tray and the ice cubes at the time this lever member 19 is initially actuated.

After initially breaking the bond between the ice cube tray and the ice cubes formed therein, it will be observed that the continued upward movement of the lever 19, with the lip 19' thereof engaging a side wall of the tray 3, will cause the upper dividing finger 4 to move toward the left as viewed in Figure 2 lengthwise of the lower dividing finger 5, whereby the several fin elements 11 will be successively moved or tilted from the lever end to the opposite end of the tray structure to thereby cause the ice cubes formed in the several compartments 12 to be freed from the grid structure 2.

Due to the normal angular disposition of the fin members 11 at the time the cubes are formed therein, the movement or tilting of the fins relative to the fingers 4 and 5 from their normal angular positions into vertical positions will cause a change to take place in the cross sectional shape of the compartments and this change progressively and momentarily enlarges each compartment so as to break and free the ice cubes from the fingers 4 and 5 and fins 11.

In order to not only free the frozen cubes of ice from the ice tray, but also to shatter and crush the ice cubes into small fragments at the same time that the cubes are freed from the tray, at least one of the opposing faces 25 and 26 of each of the fin elements 11 is provided with a plurality of sharply pointed elements or pins 27, which may be advantageously made of stainless steel. These pins 27 are attached in any suitable manner to the fin elements 11.

Although these pins 27 are preferably made of stainless steel, they can be made of any suitable metal and they can have various dimensions and configurations depending on the results desired. For example, they can be in the form of the pin 27 indicated in Figure 4, which is provided with the tapered barb 32 of the toothed element 28 disclosed in Figure 5. These pins 27 or toothed elements 28 are attached to the fin members 11 by means of a shank 29 formed integrally with the pins or toothed elements when these shank portions are inserted through suitable apertures 30 in the fin elements.

After the shank 29 of a pin or toothed element has been inserted in an opening 30, the free end portion of the shank is then hammered or mashed to form a head 31 on the side of the fin opposite to the ice contacting and barbed portion 32 of the pin or toothed element so as to lock the pins or toothed element to the fin.

As indicated in Figure 7, the pointed pin element 27 on one opposing face of a fin element 11 may be so constructed that it is provided with a threaded bore 40 located in the shank 41 thereof. When the threaded portion 42, which forms the shank of the pin 27' located on the other side of the fin element, is inserted and rotated in bore 40, the two pin elements 27 and 27' may be both simultaneously attached to different opposing surfaces of a fin member 11.

As indicated in Figure 8, the pin elements 27 may be provided with a threaded shank, about which a locking nut 50 is placed after the shank has been inserted in the aperture 30 in the fin element 11. As indicated in Figure 9, each pointed pin 27 may be provided with a plurality of spaced fins 51.

In the preferred embodiment of the invention, the pointed pins 27 are preferably located in spaced relationship to each other on each opposing fin surface in such a manner that the pins on the surface of one of the two fin members 11 defining each ice cube compartment 12 are located in different horizontal and vertical planes from the pins located on the surface of the other fin member making up the same compartment. In this way, the ice cube in the compartment will be in contact with as many different pins as possible on both sides of the compartment. On the other hand, the various pointed elements 27 will avoid engagement with one another as they are actuated upon pivotal movement of the fins 11.

In an advantageous embodiment of the invention and as indicated in Figure 6, a plurality of dividing units 2, each of which is provided with the novel ice shattering means of the instant invention, may be inserted in a large ice cube freezing compartment or tray 55, such as is used in the large mechanical refrigerators found in commercial establishments, such as restaurants and hospitals.

This large tray or compartment may be provided with one or more upstanding interior walls 56, which break the tray into a plurality of chambers or cells 57. A separate dividing unit of the type shown in Figure 2 is then inserted in each of the cells or chambers 57 and the levers 19 of each dividing unit are tied together by means of the elongated cross bar 58. Thus, when this cross bar 58 is raised, the levers 19 for each dividing unit will also be manipulated and the cubes in each cell or chamber 57 will all be simultaneously shattered to form cracked ice.

By arranging several dividing units 2, provided with the novel ice cracking units of the instant invention, in a large tray in the aforesaid manner, a great quantity of cracked ice can be quickly and cheaply manufactured.

Thus, whenever cracked ice is desired, all the operator has to do is remove the conventional ice tray grid unit and replace the same with the novel dividing unit of the instant invention.

It is to be noted that the pointed elements 27 and the like of the instant invention may be attached to other dividing units besides that specifically shown and described, wherein lever means or the like is employed in combination with the grid unit to free the ice cubes from a freezing tray.

It is also obvious that various changes or modifications may be made in the invention without departing from the spirit or scope thereof as defined by the appended claims, wherein what is claimed is:

1. In a device of the character described, a dividing unit adapted to be disposed within an ice cube freezing tray for dividing the tray into a plurality of ice cube compartments, said dividing unit including cooperating top and bottom central dividing fingers, pin means attached to said fingers, lever means attached to said pin means, a plurality of horizontally spaced fin members, each of which is loosely attached at a transverse angle to both of said top and bottom fingers and moved by relative movement of said fingers from a tilted to a substantially vertical position, said fin members also being located in spaced parallel relationship to each other, and pointed elements attached to both of the opposing surfaces of each of the said fin members, with the axes of the said pointed elements being located in planes parallel to that of said dividing fingers, said pointed elements also being attached to both of the opposing surfaces of each of the said fin members in such a manner that the pointed elements on the surface of one of said horizontally spaced fin members defining an ice cube compartment are located in different vertical and horizontal planes from the pointed elements on the surface of the other horizontally spaced fin member defining the said compartment said pointed elements being of a length substantially less than half of the horizontal spacing between said horizontally spaced fin members defining said

compartment, whereby when said lever means are actuated to move the fingers in opposite directions thereby pivoting the fin members to loosen the ice cubes formed in the compartments of the tray, said pointed members will also be actuated to exert simultaneous, opposing pressures at different points upon two sides of the ice cubes in each of the said compartments so as vertically in arcuate path to crack and shatter the cubes into small fragments.

2. A device as described in claim 1 wherein said pointed elements are comprised of a plurality of barbed elements each including a plurality of parallel teeth.

3. A device of the character described in claim 1 wherein said fins are apertured and said pointed elements are comprised of a series of internally and externally threaded cone-like members in assembled engagement with either face of each of said apertured fin members.

4. A device of the character as described in claim 1 wherein said pointed elements are comprised of a plurality of cone-like members having a shank passing through said fins and anchored with respect thereto.

5. A device as defined in claim 1 wherein said pointed elements are comprised of a plurality of tapering vaned elements.

6. In an ice cracking device the combination of a chambered ice cube tray and a separate dividing unit located within each of the chambers of said tray for dividing each of said chambers of said tray into a plurality of ice cube compartments, each of said dividing units including cooperating top and bottom central dividing fingers, pin means attached to said fingers, lever means attached to said pin means, a plurality of fin members each of which is loosely attached at a transverse angle to both of said top and bottom fingers and moveable by relative movement of said fingers from a tilted to a substantially vertical position, said fin members also being located in horizontally spaced parallel relationship with respect to each other, means connecting each of said lever means for simultaneous actuation of all of said lever means, pointed elements attached to the surfaces of each of said fin members with the axes of said elements being located in a plurality of planes parallel to that of said dividing fingers, said pointed elements also being attached to both of the opposing surfaces of each of said fin members in such a manner that pointed elements on the surface of one of the fin members defining an ice cube compartment are located in different horizontal and vertical planes from the pointed elements on the surface or the other fin member defining said compartment, said pointed elements being of a length substantially less than one-half the distance of the horizontal spacing between said horizontally spaced fin members defining said compartment, whereby when said lever means are actuated to move the fingers in opposite directions thereby pivoting the fin members to loosen the ice cubes formed in the compartment of the tray, said members will also be actuated in vertical arcuate paths to exert simultaneous opposing pressure at different points in the plurality of planes upon two sides and within an ice cube in each of said compartments so as to crack and shatter the cubes into small fragments.



7. In combination with ice cube tray a dividing unit adapted to be disposed within said ice cube tray for dividing the tray into a plurality of ice cube compartments, said dividing unit including cooperating top and bottom central dividing fingers, pin means attached to said fingers, lever means attached to said pin means and a plurality of horizontally spaced fin members each of which is loosely attached at a transverse angle to both of said top and said bottom fingers and moved by relative movement of said fingers from a tilted to a substantially vertical position, said fin members also being located in spaced parallel relation to each other, and pointed elements attached to both of the opposing surfaces of each of said fin members with the axes of said pointed elements being located in planes parallel to that of said dividing fingers, pointed elements attached to both of the opposing surfaces of each of said fin members in such a manner that the pointed elements on the surface of one of the fin members defining an ice cube compartment are located in different vertical and horizontal planes from pointed elements on the surface of the other fin member defining the said compartment, said pointed elements being of a length substantially less than one-half of the horizontal distance between said horizontally spaced fin members defining said compartment whereby when said lever means are actuated to move the fingers in opposite directions thereby pivoting the fin members to loosen the ice cubes formed in the compartments of the tray said pointed members will also be actuated in vertical and arcuate paths to exert simultaneous opposing pressures at different points in a plurality of planes upon two sides and within ice cubes in each of said compartments so as to crack and shatter the cubes into small fragments.

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