April 16, 1929. R. T. BRIZZOLARA 1,709,709

DEVICE FOR PRODUCING ICE CUBES

Filed Sept. 9, 1927 2 Sheets-Sheet 1

Fig. 1.

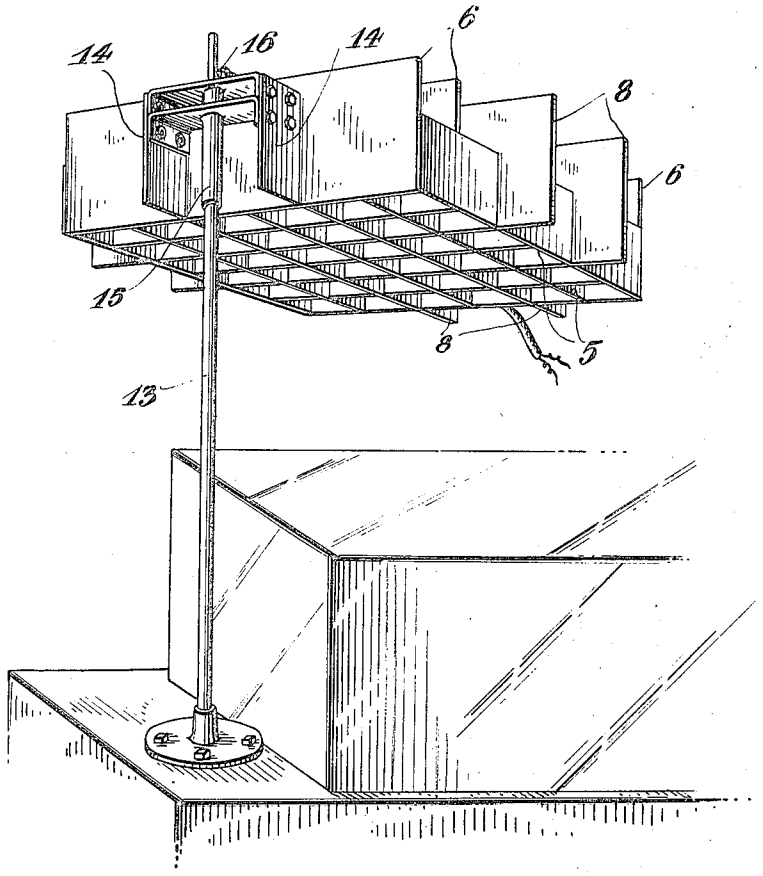
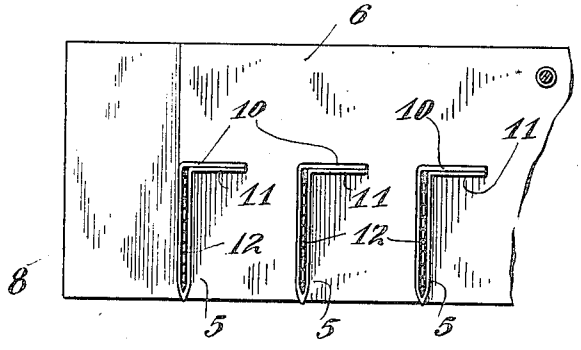


Fig. 5.



INVENTOR
Robert T. Brizzolara
BY C. P. Goepel
his ATTORNEY

April 16, 1929. R. T. BRIZZOLARA 1,709,709

DEVICE FOR PRODUCING ICE CUBES

Filed Sept. 9, 1927 2 Sheets-Sheet 2

Fig. 2.

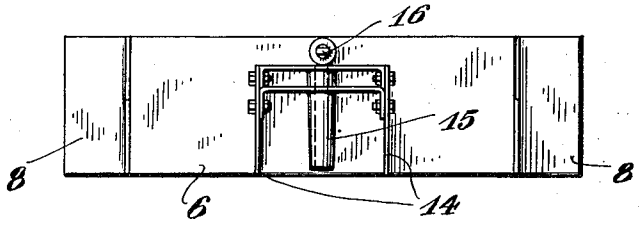


Fig. 3.

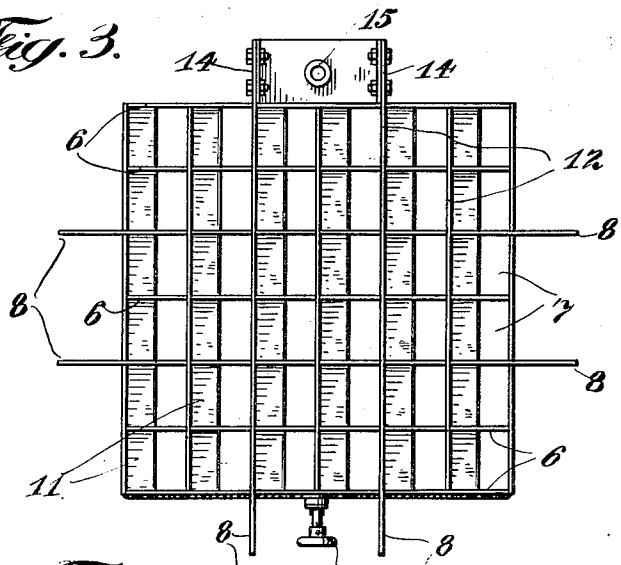
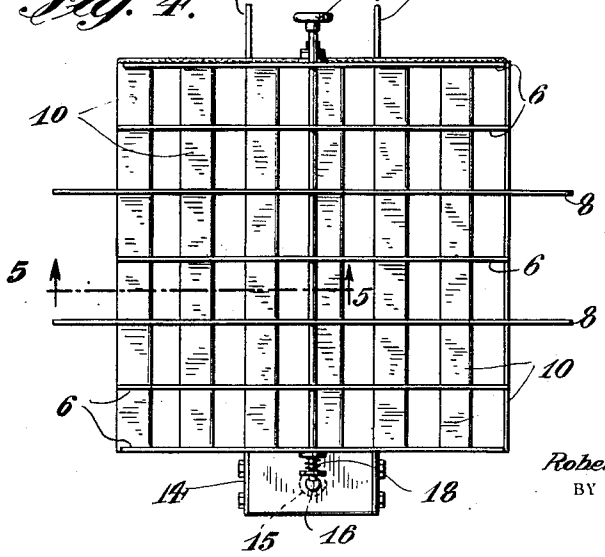


Fig. 4.



INVENTOR
Robert T. Brizzolara
BY C. F. Goepel
his ATTORNEY

Patented Apr. 16, 1929. 1,709,709

UNITED STATES PATENT OFFICE.

ROBERT T. BRIZZOLARA, OF NEW DORP, NEW YORK.

DEVICE FOR PRODUCING ICE CUBES.

Application filed September 9, 1927. Serial No. 218,414.

This invention relates to a device for producing ice cubes, and has for its primary object and purpose to provide a simply constructed device by means of which the householder may readily obtain from a large block of ice contained in the ice chamber of a refrigerator, a number of small sections of uniform size and shape for table use.

More particularly, it is the purpose of my invention to provide such device in the form of a grid which may be suitably mounted and arranged within the ice chamber in relation to the block of ice so that the said grid will melt its way into one face of the ice block, to thereby produce a number of sections remaining intimately connected at one of their ends with the body of the ice block but which may be readily broken off or separated therefrom by the use of a suitable tool.

The melting is accomplished by a combination of pressure, provided by gravity or otherwise, and heat, the source of heat being the warm air circulating in the refrigerator, coming in contact with the metal surfaces of the grid. However, I also contemplate the use of other heating means for the grid or cube forming device, such for instance, as electrical resistance or heating units carried in the grid structure.

It is another object of the invention to provide a device of the above character which is so constructed that it provides an extensive heat absorbing surface to absorb the heat from air circulating in the ice chamber, thereby increasing the rate of melting of the ice and thus subserving a secondary purpose in that the temperature within the ice chamber will be maintained at a minimum.

With the above and other objects in view, the invention consists in the improved ice cube forming device and in the form, construction and relative arrangement of its several parts, as will be hereinafter more fully described, illustrated in the accompanying drawing and subsequently incorporated in the subjoined claims.

In the drawing, wherein I have illustrafed one simple and practical embodiment of the device, and in which similar reference characters designate corresponding parts throughout the several views,—

Fig. 1 is a perspective view showing one practical embodiment of my present invention.

Fig. 2 is an end elevation of the device.

Fig. 3 is a bottom plan view thereof.

Fig. 4 is a top plan view and Fig. 5 is an enlarged detail section taken on the line 5—5 of Figure 4.

Small pieces of ice, usually of cube form and of uniform size, have been used for table purposes in hotels and restaurants for many years, and recently there has been a growing demand for such small ice cubes for home use. This demand was brought about primarily by the advertising campaigns conducted by manufacturers of mechanical refrigerators, and many ice manufacturers are now endeavoring to supply this demand by offering such ice cubes packed in cartons. This, however, was not entirely satisfactory; first, because of the expense involved, and second, because such cubes when stored in the ice chamber of the ordinary refrigerator melted away very rapidly. Two methods are now generally used in producing such ice cubes. First, the cubes are cut by saws from the large ice cakes, or the cubes are frozen independently in separate properly shaped containers. The first method may be economically carried out only in large scale production such as is required in hotels, hospitals, restaurant, and other large institutions. The second method produces ice cubes which are opaque and is only available to owners of mechanical refrigerators.

It is therefore the purpose of my present invention to provide a device which may be procured at relatively small cost, whereby the individual householder may produce the ice cubes in small quantities from the ordinary block of ice stored in the chamber of an ice cooled refrigerator, so that at any time, a moderate quantity of such ice cubes may be economically and quickly obtained. To this end, as illustrated in the accompanying drawings, in one embodiment of the invention, I provide a grid consisting of two series of metal plates 5 and 6, respectively, the plates in each series being arranged in spaced parallel relation to each other and extending at right angles to the plates in the other series and secured in fixed relation with the latter by any suitable means. Thus there is provided a cellular grid structure having a plurality of cubical spaces 7 bounded by the walls of the intersecting grid plates 5 and 6. As shown in the drawings, I preferably provide certain of the grid plates of greater length than the others, so that said longer grid plates project laterally beyond opposite sides of the grid as indicated at 8, and ex-

tend beyond the block of ice, thus providing draining channels to drain off the water of the melting ice. It will also be noted that each of the plates 6 is of greater width than the plates 5, so that said plates 6 project from one of the longitudinal edges of the plates 5, while the other longitudinal edges of the plates 5 and 6 are disposed in a common plane. In this manner an extensive surface is provided for absorption of heat from the warm air circulating in the refrigerator. The wider plates 6 are so oriented in the refrigerator that their length is parallel with the direction of the air circulation in the refrigerator.

The grid may be provided with suitable means acting to limit its movement into the ice block, and for this purpose, I have shown each of the plates 5 provided upon the longitudinal edges thereof which are between the wider grid plates 6, with lateral projecting flanges 10. If desired, these flanges may be covered on the sides thereof which contact with the ice with sheet asbestos or other suitable insulating material indicated at 11.

In order to expedite the melting of the ice, the grid structure may be heated by various other means instead of relying entirely upon the absorption of heat from the air in the ice chamber. Thus as indicated in Figure 5 of the drawings, each of the grid plates may be of double walled or hollow construction to receive an electrical resistance heating unit 12. The entering edges are of sharp wedge shape. In such case, it will be understood that the heated plates of the grid may be well insulated from all other parts which do not come into direct contact with the ice.

The cube forming grid above described may be permanently mounted in the ice chamber of the refrigerator, or may be simply inserted therein upon the ice block when occasion requires.

In the drawing, I have shown the vertical rod or standard 13 suitably fixed at its lower end to the floor or base of the ice chamber and to one side of the grid structure a bracket 14 of any suitable form is fixed and is provided with a sleeve 15 slidably engaged upon the rod 13. The rod 13 at its upper end is provided in one side thereof with a notch or recess 16 to receive the end of a latch rod 17 carried by the cube forming grid, said rod being urged to its latching position by the spring shown at 18. In this manner, it will be evident that the grid may be sustained in an inoperative position above the ice block. It is apparent that if desired an additional supporting rod may also be provided at the opposite side of the grid.

When it is desired to form the ice cubes, the grid is released from its supported position and lowered upon the upper surface of the ice block. In order to increase the weight or the pressure of the grid plates upon the ice, any additional weighting means may be placed upon the upper edges of the grid plates. By the absorption of the heat from the air in the ice chamber or by closing the circuit of the electric heating units 12 by operating a convenient switch, the grid will rapidly sink into the upper part of the ice block until the flanges 10 on the grid plates 5 come into contact with the upper surfaces of the sections of ice within the spaces 7 of the grid. Thus all of the plates 5 and 6 of the grid will sink into the ice block to the same depth. The device is then lifted from the ice block and removed from the refrigerator chamber or latched in its raised position upon the rod 13. The formed sections of ice in the shape of cubical knobs or projections in close proximity to one another on the surface of the ice block will of course remain connected with the body of the ice block at their lower ends. These ice sections may, however, be readily separated in various ways, as by a suitable tool to crack off the ice cubes, or by the use of a heated metal plate or wire which will melt its way through the ice at the lower ends of the formed sections. Thus small particles or sections of ice of uniform size and shape may be readily obtained from the ice block.

It is well known that every ordinary icebox contains an upper chamber for the ice and a lower chamber for the food or other articles to be cooled; the two chambers being in communication. The articles to be cooled are of course warmer and the air in the vicinity thereof tends to rise into the chamber where the ice is placed. The cool air in the chamber containing the ice of course tends to sink; thus a circulation up through the ice chamber is automatically started. In the practice of my invention I put the grid on top of the block of ice in the ice chamber so that the ribs 6 are parallel with the direction of flow of the circulating air and the spaces between these ribs above the ribs 5 act as air channels and a continuous circulation through the lower storage chamber and the upper ice chamber of the icebox can take place. The heat of this air is absorbed by the plates 6 and transmitted to the plates 5, with the result that the lower edges of these plates sink into the ice and form the ice cubes, which can very readily be detached, as above stated.

The presence of the projecting ends 8 is very important because unless the water is drained away as the plates 5 and 6 sink into the ice the cubes will not be sharply defined at the corners. In other words if this water were allowed to remain in the cellular spaces 7 it would so increase the melting effect of the plates 5 and 6 that the cubes would be rounded at the corners and would not present a sharply defined cubical configuration.

Of course the melting effect of the plates 5

and 6 can be considerably enhanced if the heating elements 12 are employed.

This device, which is of simple and rugged construction, can be inexpensively manufactured and sold, and also provides a convenient means whereby the individual householder having the ordinary ice cooled refrigerator can easily and quickly obtain the small size ice cubes in moderate quantity without undue waste of the ice. Of course, while I have shown and referred to a device for producing small pieces of ice in the form of cubes, it will be obvious that the cellular grid structure may be made in various other shapes or forms, so as to produce the small sections of ice in various other desired shapes. Also, while I have referred to a particular means for mounting the forming grid in the ice chamber, this is not essential, and various other ways of mounting and arranging the grid for movement with respect to the chamber walls might be resorted to.

Accordingly, it is to be understood that in the further development of my invention, I reserve the privilege of resorting to all such legitimate modifications in the form, construction and relative arrangement of the various elements as may be fairly incorporated in the spirit and scope of the invention as claimed.

I claim:

1. A device of the character described, comprising a grid consisting of two series of heat absorbing metal plates, the plates of one series being transverse to the plates of the other series, and rigidly connected therewith to thereby form a plurality of chambers, said grid adapted to be arranged upon an ice block to melt the same and said elements of the grid sinking into the block to thereby form a plurality of ice sections in the chambers of the grid, adapted to be subsequently separated from the body of the ice block, certain of the grid plates being of greater height than the other plates, and stop means above the bottom edges to limit the penetration of the grid plates into the ice block.

2. A device of the character described, comprising a grid consisting of two series of heat absorbing metal plates, the plates of one series being transverse to the plates of the other series, and rigidly connected therewith to thereby form a plurality of chambers, said grid adapted to be arranged upon an ice block to melt the same and said elements of the grid sinking into the block to thereby form a plurality of ice sections in the chambers of the grid, adapted to be subsequently separated from the body of the ice block, certain of the grid plates being of greater height than the other plates, and the latter plates being provided with stop flanges on one of their edges to limit the penetration of the grid plates into the ice block, certain of the grid plates being of greater length than the others and projecting beyond opposite sides of the grid.

3. A device of the character described, comprising a grid consisting of two series of heat absorbing metal plates, the plates of one being transverse to the plates of the other series, and rigidly connected therewith to thereby form a plurality of chambers, said grid adapted to be arranged upon an ice block to melt the same and said elements of the grid to sink into the block to thereby form a plurality of ice sections in the chambers of the grid, adapted to be subsequently separated from the body of the ice block, part of the grid being provided with means to limit the penetration of the grid plates into the ice block.

4. A device of the character described, comprising a grid consisting of two series of heat absorbing metal plates, the plates of one series being transverse to the plates of the other series, and rigidly connected therewith to thereby form a plurality of chambers, said grid adapted to be arranged upon an ice block to melt the same and said elements of the grid to sink into the block to thereby form a plurality of ice sections in the chambers of the grid, adapted to be subsequently separated from the body of the ice block, certain of the grid plates being of greater length than the others and projecting beyond the sides of the grid for the purpose set forth.

5. A device of the character described comprising a grid consisting of two series of heat absorbing metal plates, the plates of one series being transverse to the plates of the other, said grid adapted to be disposed upon an ice block so that the edges of said plate penetrate the block and form a plurality of ice sections between the plates, said grid having a bracket mounting a bearing cylinder, a vertical standard received in said cylinder and securing means mounted upon the grid to engage the standard to hold the grid in elevated position, said securing means being releasable to permit the grid to be lowered to rest upon the block of ice to be divided.

6. The method of forming sections on a block of ice which consists in disposing the block in a refrigerator, allowing air from the storage chamber of the refrigerator to circulate over said ice, arranging plates on the top of the ice block and in the path of said air to extract heat therefrom with the edges of said plates in intersecting position to sink into the block of ice to define said sections, and draining away the water caused by the melting of the ice as said plates sink into the same.

7. The method of making cubes of ice which consists in forming sections on a block of ice by making deep intersecting grooves in the surface of the block; thus providing cubical knobs or projections in close proximity

to one another on the ice block and then separating said knobs or projections so that cubes of ice can be obtained.

8. The device according to claim 3 wherein heating means is associated with the grid.

9. The device according to claim 3 wherein electrical heating means is associated with the grid.

10. The method of refrigeration which consists in subjecting a current of air to a channeled air engaging grid in direct contact with a block of ice within the ice chamber so that the surfaces of the grid exposed exteriorly to the ice will abstract heat from the current of air, the grid itself entering the block of ice thereby, then subjecting the heat abstracted air in the course of its circulation through the ice chamber, to the cooling influence of the block of ice as the heat abstracted air flows in contact with the block of ice, and then transmitting such cooled air to the article to be cooled.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

ROBERT T. BRIZZOLARA.

DISCLAIMER

1,709,709.—*Robert T. Brizzolara*, New Dorp, N. Y. DEVICE FOR PRODUCING ICE CUBES. Patent dated April 16, 1929. Disclaimer filed October 1, 1938, by the assignee, *Joseph A. Martocello.*

Hereby enters this disclaimer to claims 3, 7, and 8 in said specification.

[*Official Gazette October 18, 1938.*]