

March 31, 1936.

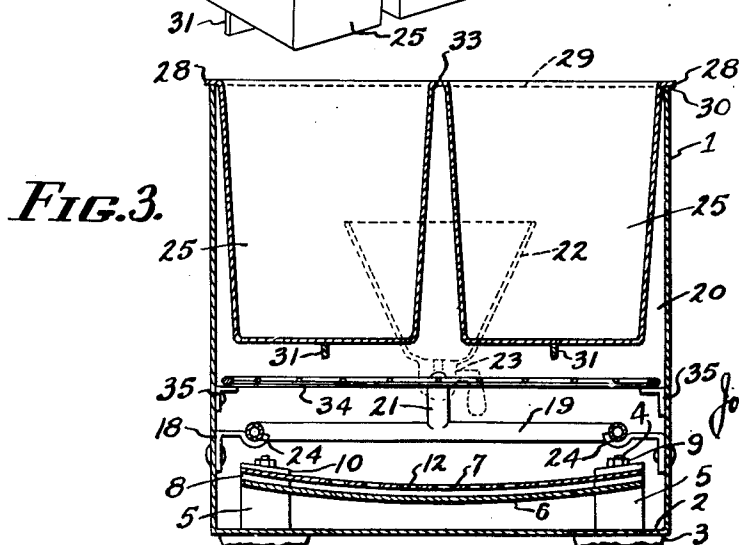
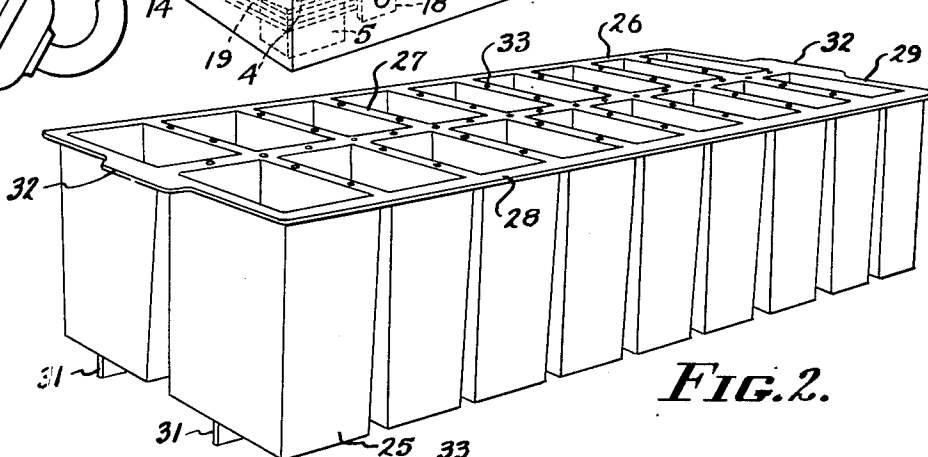
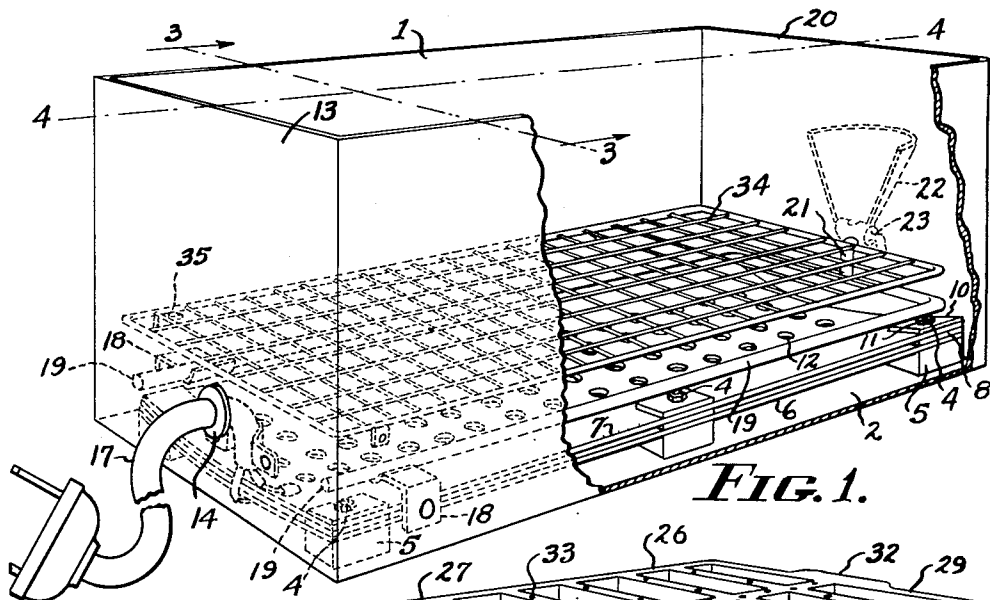
J. C. THOMPSON

2,035,679

ICE CUBE THAWING DEVICE

Filed Feb. 13, 1934

2 Sheets-Sheet 1



INVENTOR.

Joseph Clem Thompson

Allen & Allen

ATTORNEYS.

March 31, 1936.

J. C. THOMPSON

2,035,679

ICE CUBE THAWING DEVICE

Filed Feb. 13, 1934

2 Sheets-Sheet 2

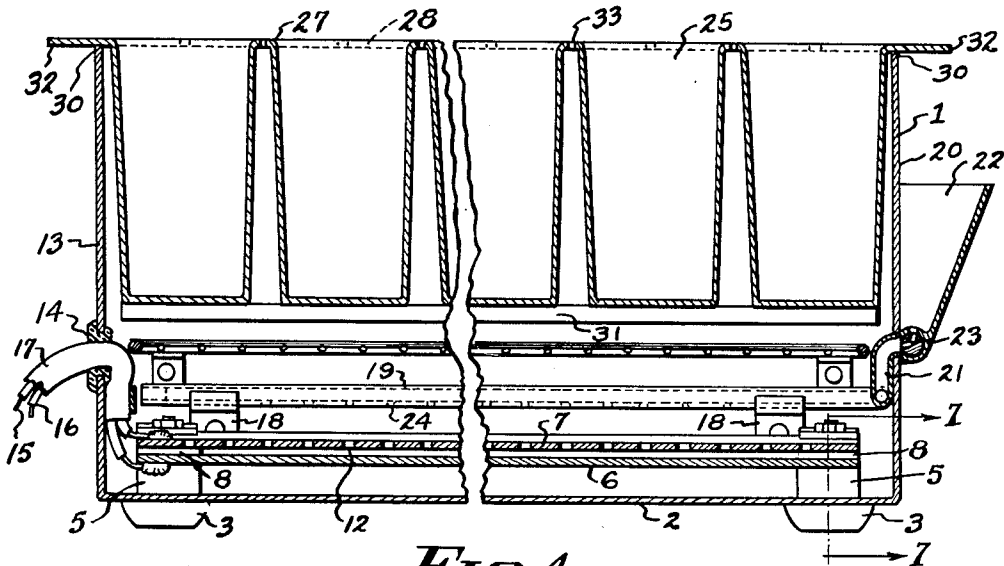


FIG. 4.

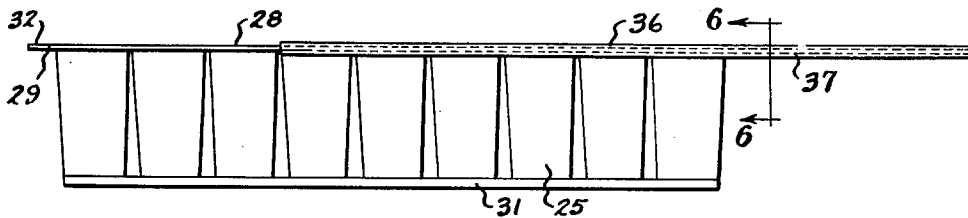


FIG. 5.

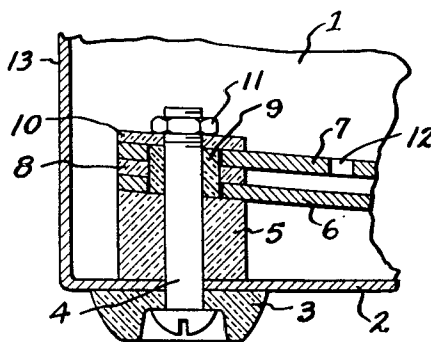


FIG. 7.

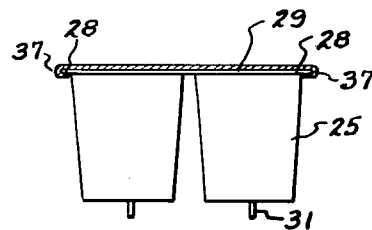


FIG. 6.

INVENTOR.
Joseph Clem Thompson
BY
Allen & Allen
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,035,679

ICE CUBE THAWING DEVICE

Joseph Clem Thompson, Lima, Ohio

Application February 13, 1934, Serial No. 711,021

1 Claim. (Cl. 219—40)

This invention relates to means for thawing without materially altering their shape, pieces of ice which have been frozen in molds; and is more especially intended for thawing or releasing relatively small pieces of ice or ice cubes from the respective compartments of a tray such as is now familiarly in use in mechanical refrigerators.

One of the essential objects in connection with thawing such small pieces of ice or ice cubes is quickness of thawing; another is simplicity of the apparatus. Another object is the application of heat in a very effective way with thorough distribution of the heat to the surfaces of the containers or tray compartments holding the pieces of ice to be released. Along with all of these objects is the desirability of maintaining the pieces or cubes in neat and presentable shape, approximating as closely as possible the shape of the compartments in which they have been frozen and from which they are released by the apparatus.

Further objects will appear in the course of the following description in which:—

Figure 1 is a sectional perspective view of apparatus embodying my invention in a preferred form, the compartmented tray being removed therefrom.

Figure 2 is a perspective view of the compartmented tray which I prefer to use.

Figure 3 is a vertical cross-section on the line 3—3 of Figure 1, with the tray in position.

Figure 4 is a vertical longitudinal section on the line 4—4 of Figure 1 with the tray in position.

Figure 5 is a side elevation of a compartmented tray such as that shown in the preceding figures, provided with a slidable cover.

Figure 6 is a vertical cross-section on the line 6—6 of Figure 5.

Figure 7 is a sectional detail showing the insulated mounting of the resistance elements or plates of the electrical heating device, the section being on the line 7—7 of Figure 4.

As I prefer to construct my apparatus, it comprises a rectangular supporting container 1 which is provided near the four corners of its bottom 2, with respective feet 3, which may be made of rubber or the like. These feet 3 are attached to the container 1 by respective bolts 4 passing up through the feet and through apertures in the bottom 2, and through an apertured insulating supporting member 5, which supports the resistance members or plates 6 and 7, to extend across the major portions of the length and width of the container 1, near its bottom. The plate

7 lies above the plate 6 and is spaced upwardly therefrom by an insulating washer 8 surrounding a bushing 9, which surrounds the bolt 4 and fits in apertures of the plates 6 and 7. A top washer 10 fits around the bolt above the upper plate 7, and the nut 11 is screwed on to the upper end of the bolt and clamps the assembly together as well as clamping the feet 3 to the bottom of the container. The washers 8 and 10 and the bushing 9, like the supporting member 5, are of insulating material so that the plates 6 and 7 are securely insulated from the structure of the container 1. Since these plates are to be heated, it will be understood that the insulating members 5, 8, 9 and 10 shall be of any suitable refractory insulating material, as for instance porcelain. The plate 7 has at suitable intervals in longitudinal and transverse rows, perforations 12. One end 13 of the container 1 has an aperture with an insulating bushing 14 therein through which passes a pair of conductors 15 and 16, enclosed in the sheath 17. These conductors are connected to the plates 6 and 7 respectively. The plates 6 and 7 are curved to have an arc shaped trough cross-section; and the washers 8 are such as to space these plates 6 and 7 only a slight distance apart; and the curvature also is very slight, preferably such that each plate is of the extent of only about 1 degree of a circle of which its arc shape is a part.

Small brackets 18 are fixed on opposite side walls of the receptacle 1 to support a U-shaped pipe structure 19, which has its cross-member or bottom of the U-shape near the opposite end 20 of the container 1, with an upward extension or nipple 21 which passes out through the end 20 of the receptacle to connect with the bottom of a funnel-shaped receptacle 22, which is fastened on the outside surfaces of the receptacle end 20, and has one of its upright walls formed by said end 20. Preferably this receptacle 22 has in its bottom a small valve 23, by which flow of liquid from the receptacle 22 through the nipple 21 into the pipe structure may be controlled. In the bottoms of the side members of the pipe structure 19 is a series of perforations 24; and this pipe structure is supported a short distance above the conducting members or electrodes of the heating device with the side members 19, along over the edge portions of this heating device, so that water or any equivalent liquid passing into the pipe structure 19 will drip on to the upper electrode plate 7 to run thereon down through its perforations 12 and make electrical connection between the upper electrode 7 and the lower electrode 6. In this

manner the water itself is made a part of the electrical circuit, and due to its high resistance such heat is generated as to immediately turn it into steam, which rising will heat the ice cubes mounted in the upper part of the container 1.

The ice cubes are thus supported in position for being heated in the compartments 25, in which they have been frozen in the mechanical refrigerator. As I prefer to construct these ice cube compartments, they are tapered so as to be larger at their open tops than they are at their bottoms, for easy escape of the ice cubes therefrom as is usual in the design of such compartments; and their tops are joined by a plate 26 of grid-like form, such that its portions 27 extend between the top rims of adjacent compartments 25 at all points, and so that there are side rims 28 and end rims 29 which are of ample width to rest firmly upon the top rims 30 of the container 1, with the compartments 25 suspended in the container. In order to make this structure amply strong for use in freezing the cubes, as well as during the time of thawing them, strips 31 are fastened by their upper edges to the bottoms of the compartments 25; the arrangement here shown being that of two rows of compartments 25, with a strip 31 extending along under each row of compartments. These strips 31 not only serve to reinforce the connection of the compartments to each other, but to act as legs when one set of compartments is set upon another in the refrigerating apparatus, which present a minimum area of contact for the sets of trays to freeze together, so that they are very easily separated. The top rim structure has at its ends extensions 32 with which the fingers may be engaged for lifting the tray or set of compartments from the refrigerating apparatus, or placing it therein, or lifting it from the thawing device or replacing it therein. The portions 27 joining the adjacent rims of the compartments 25, preferably have perforations 33 which allow the escape of such steam as remains uncondensed by the thawing of the ice cubes in the compartments.

In order to guard against accidental contact of the person or of ice cubes or the like with the conducting elements 6 and 7, I prefer to provide a screen 34 above the pipe structure 19 and resting on small brackets 35, fixed to the opposite side walls of the receptacle 1.

By providing a sliding cover 36, as shown in Figure 5, a number of cubes less than the entire number in the series of compartments, may be discharged, while the others are retained, accordingly as the cover 36 is slid across a greater or less number of the compartments. This cover 36 is preferably a strip of sheet metal with its opposite lateral edge portions 37 turned down and under and slidably fitting the side rim portions 28 of the assembly of compartments 25.

In the use of the device, the set of compartments 25 with the ice cubes therein is taken from the refrigerating apparatus and set into the top of the container 1. The plates 6 and 7 may be connected to a source of electrical current in any desired manner either before or after placing the cubes in the thawing apparatus; or these plates may be maintained in connection with the source of current at all times. It will be understood that the circuit is closed merely by the water coming in contact with both plates 6 and 7, and this does not take place until water is released from the small outside receptacle 22 into the pipe structure 19. Only a small quantity of water need be placed in this receptacle 22, and when the valve 23 is provided the exact time and quantity of supply of water may nicely be determined. When the water is allowed to enter the pipe structure 19 and flow on to the upper plates 7, and thence through its perforations 12, so that the water by its cohesion with the plates, establishes a connection between them, there is a very quick evaporation of the water due to the flow of current therethrough, as before mentioned. It will be understood that since the exterior surfaces of the compartments 25 are by far the coldest part of the apparatus, substantially all of the condensation will occur on these surfaces. Since the quantity of water evaporated is very small, it will only just break the frozen connection of the cubes with the interior surfaces of the compartments 25, and this will occur very quickly. It then is necessary only to lift the set of compartments from the apparatus and invert the compartments, discharging the cubes where desired.

It will be understood that modifications of my invention may occur and that I am therefore, not limited to the precise disclosure herein, but what I claim as new and desire to secure by Letters Patent is:—

In a device of the character described, a receptacle and a plurality of electrical conducting plates arcuate in shape, one over the other, arranged across the lower part of said receptacle, and insulated from each other and from the receptacle, means leading into the receptacle connecting the respective plates to a source of current supply, the upper one of said plates being perforated, means for supplying a liquid to slowly flow on to the upper one of the plates and through the perforations thereof to establish electrical connection between the two plates by said liquid, and means for supporting containers of pieces of ice in said receptacle above said plates from which the ice is to be thawed by the evaporation arising from the heating due to the electrical connection by the liquid.

JOSEPH CLEM THOMPSON.