Nov. 7, 1933. E. BABCOCK 1,933,615

ICE CUBE TRAY FOR REFRIGERATORS

Original Filed April 16, 1932

Fig. 1.

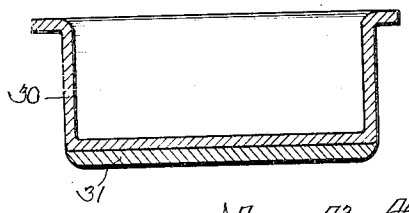


Fig. 2.

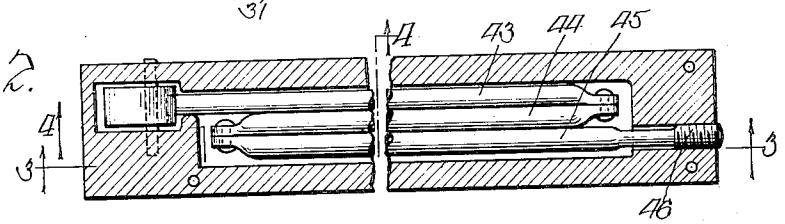
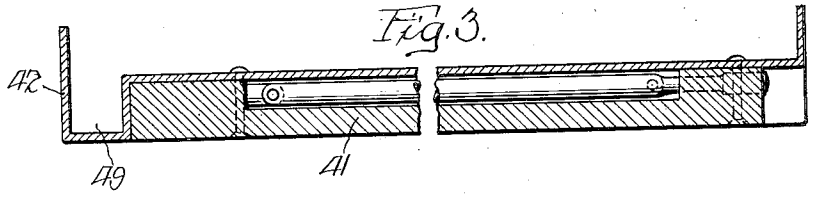


Fig. 3.



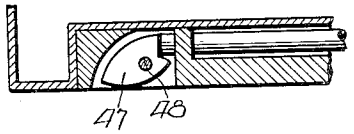
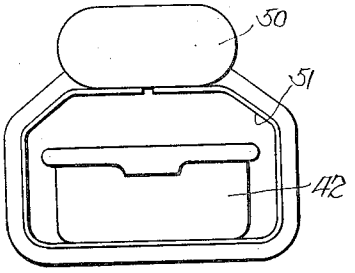


Fig. 4.

Fig. 5.



Inventor:
Earl Babcock

By Harry S. Demarest
Atty.

Patented Nov. 7, 1933

1,933,615

UNITED STATES PATENT OFFICE

1,933,615

ICE CUBE TRAY FOR REFRIGERATORS

Earl Babcock, Evanston, Ill., assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Original application April 16, 1932, Serial No. 605,590. Divided and this application August 28, 1933. Serial No. 687,089

3 Claims. (Cl. 62—108.5)

This application is a division of my copending application, Serial No. 605,590 filed April 16, 1932, for Ice cube tray for refrigerators.

This invention relates to ice pans or trays for refrigerators and more particularly to means associated with the pan for preventing it from freezing solidly to the evaporator in which it is placed during the freezing operation or for dislodging the pan or breaking it free from the evaporator after it has become frozen thereto.

It is a common experience in making ice cubes in an electric refrigerator or the like to find that moisture has collected on the outside of the pan and frozen so that the pan is tightly stuck to the evaporator.

It is an object of the invention to provide means for preventing an ice cube pan from freezing solidly to the evaporator or for automatically dislodging it after the ice has been frozen therein.

Other objects and advantages reside in certain novel arrangements and constructions as will be apparent from a consideration of the following description taken in connection with the accompanying drawing in which

Figure 1 is a cross sectional view of an ice cube pan showing one form of the invention in which means is provided on the bottom thereof for preventing the pan from freezing solidly to the evaporator.

Figure 2 is a cross sectional view of an expansible element adapted to be mounted in the bottom of an ice cube pan to dislodge it from the evaporator and showing still another form of the invention.

Figure 3 is a cross sectional view illustrating how the expansible element of Figure 2 may be mounted in the bottom of the ice cube pan and

Figure 4 is a cross sectional view of a fragment of an ice cube pan showing a portion of the device of Figures 2 and 3 mounted therein, Figures 3 and 4 being taken on the lines 3—3 and 4—4 of Figure 2 respectively.

Figure 5 is an end view of a known type of evaporator with a pan of the type shown in Figure 3 placed therein.

Referring to the drawing in detail, Figure 1 shows a form of the invention in which the bottom of the ice cube pans is constructed of two metals having different coefficients of expansion. For convenience in illustration these metals are shown as having an exaggerated thickness.

As shown in this figure, the pan proper indicated at 30 may be constructed of aluminum or other metal having a relatively high coefficient of expansion while the bottom plate 31 may be constructed of iron or a metal having a relatively low coefficient of expansion. The arrangement may be such that the bottom plate 31 is substantially flat at a temperature around 32 degrees F. so as to provide good metal contacts with the evaporator and aid in the heat flow from the water in the pan to the evaporator. After the water in the pan has been frozen, the evaporator causes the temperature of the ice to go much lower than 32 degrees F. During the time when the ice cube pan passes from a temperature around 32 degrees F. down to say 10 degrees F. the bottom thereof will bulge slightly due to its bi-metallic construction, and in so doing will automatically break loose from the evaporator, if it has been frozen thereto, except for a small area near the center. To facilitate this action the plate 31 may be secured to the pan 30 only at its periphery.

Another form of automatic means for dislodging the pan after it has become frozen to the evaporator is illustrated in Figures 2, 3 and 4. In this form of the invention a substantially rectangular piece of metal having a high coefficient of expansion is provided as indicated at 41 and is so secured to the tray or pan 42 as to surround other members of the mechanism and form a substantially smooth surface along the bottom of the pan as indicated in Figure 3. The upper surface of the member 41 is provided with a slot adapted to receive and rather snugly engage a plurality of rods, as for example the three designated 43, 44 and 45. Rods 43 and 45 are constructed of a metal having a very low coefficient of expansion. They may be constructed of a substance known as "invar" which has this property. The central rod 44 should be constructed of a material having a high coefficient of expansion. One end of the rod 43 is riveted or otherwise secured to one end of the central rod 44 while the other end of the latter is secured to one end of the rod 45. Thus the arrangement is such that as the temperature of the rods goes down the distance from the outer end of the rod 43 to the outer end of the rod 45 increases.

As shown in Figure 2 one end of the rod 45 abuts against an adjustable screw 46 secured to member 41 while the free end of the rod 43 abuts against a small lever or cam 47 pivotally mounted on the member 41 by the pin 48 at the end opposite the screw 46. Thus, when the temperature of the members goes down the rod 43 actuates the cam 47 and lifts the pan 42. This action is due not only to the actual lengthening of the

distance from the free end of rod 43 to the free end of rod 46 as the temperature goes down, but also to the fact that the member 41 contracts with this change in temperature. The screw 46 may be so adjusted that the cam 47 is not moved at all until the temperature falls below 32° F., so that the pan may remain in good thermal contact with the evaporator during the freezing operation but be broken loose from the evaporator as the temperature goes below that or any other pre-determined point.

As shown in Figure 3 the member 41 may extend substantially the entire length of the pan 42 but the front end of the pan is preferably formed around this element as indicated at 49 so as to provide a construction of sightly appearance.

It will be apparent that many changes may be made in the construction and arrangement of the parts without departing from the spirit of the invention.

I claim:

1. In a device adapted to make ice, the combination of a pan having a portion adapted to be placed in contact with a cooling device, and a pressure exerting device carried by said pan and adapted upon movement thereof to cause movement of a portion of said pan to dislodge the same in the event that it has become frozen to the cooling device said pressure exerting device comprising a metal member having a different coefficient of expansion than an adjacent portion of said pan to thereby cause movement of a portion of said pan as the result of a change in temperature.

2. In a device for making ice cubes or the like, a pan, means for moving said pan with respect to a support and expansible and contractible means mounted on the pan including a series of elongated members having their alternate ends connected to each other, alternate of said members being composed of material having different coefficients of expansion and means for causing said members to actuate said pan moving means in response to a change in temperature.

3. In a device adapted to make ice, a pan adapted to be placed in contact with a cooling device and having a bottom portion consisting of two metals of different thermal coefficients of expansion, the arrangement being such that said bottom portion will tend to change its shape upon a change in temperature occurring therein, thereby tending to break the pan loose from the cooling device in case it has become frozen thereto.

EARL BABCOCK.