May 30, 1933. M. K. BUCHANAN ET AL 1,912,065

ICE CUBE PAN

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Fig. 1.

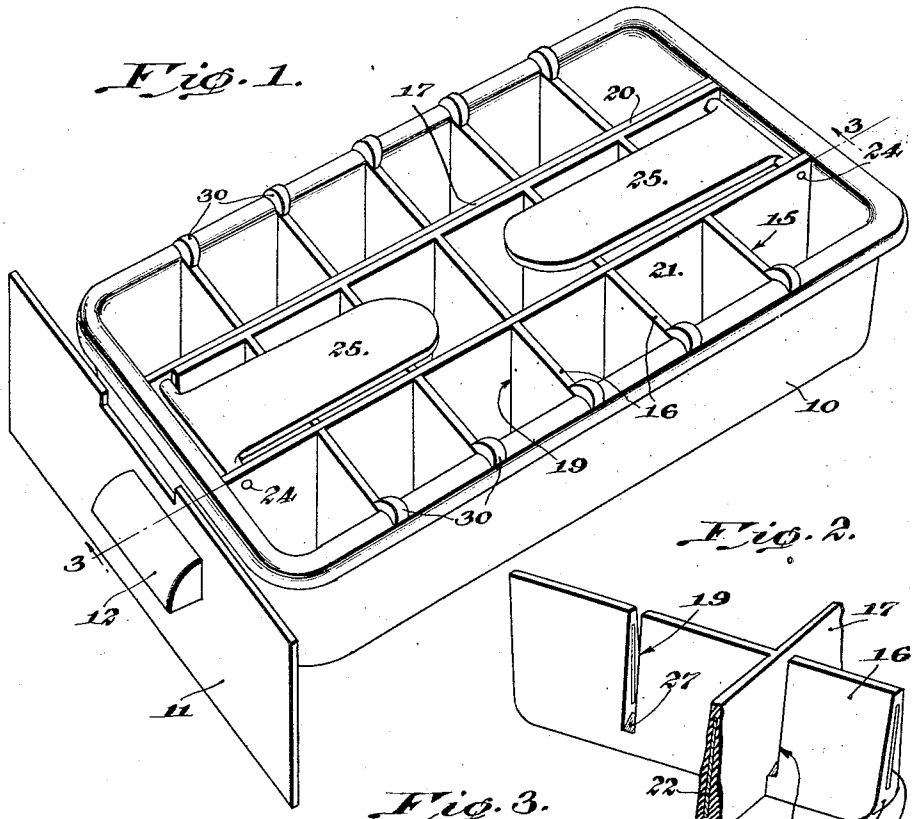

Fig. 2.

Fig. 3.

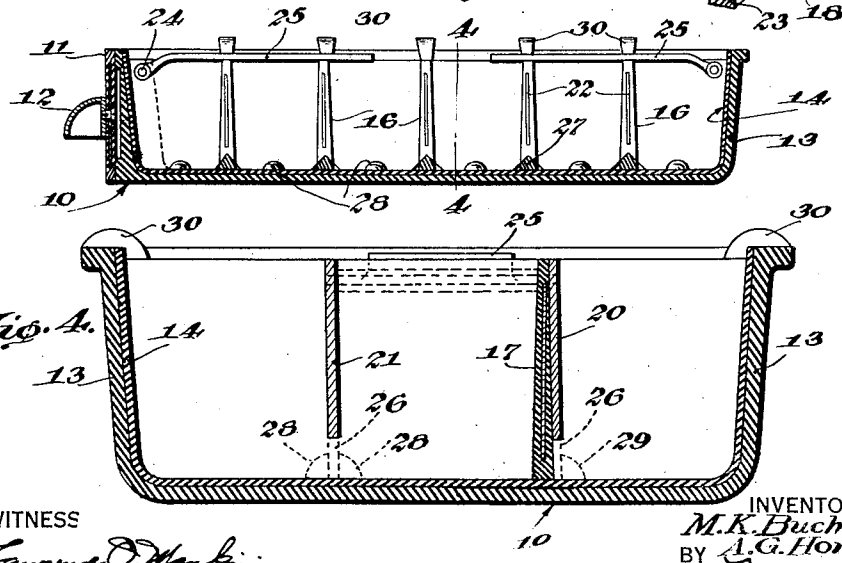

Fig. 4.

WITNESS

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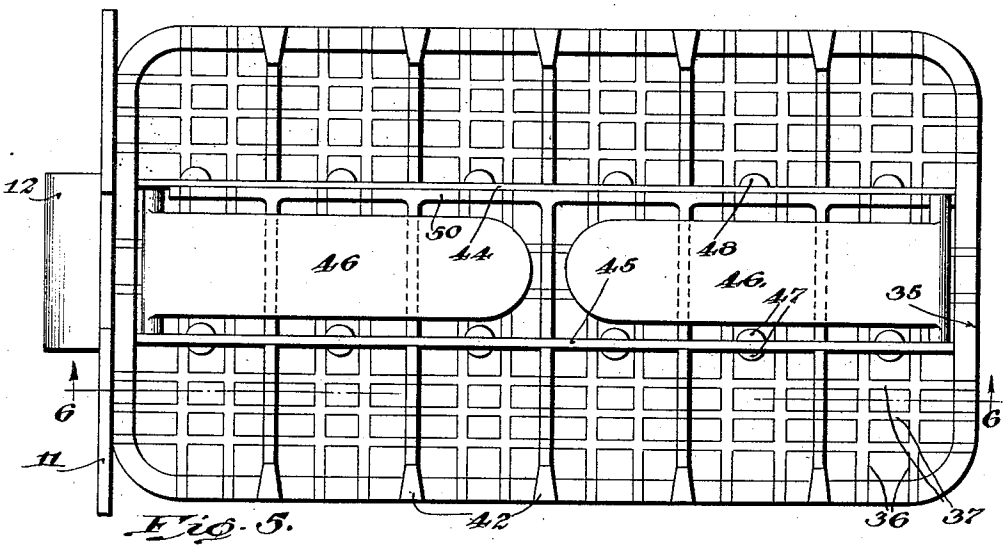


Fig. 5.

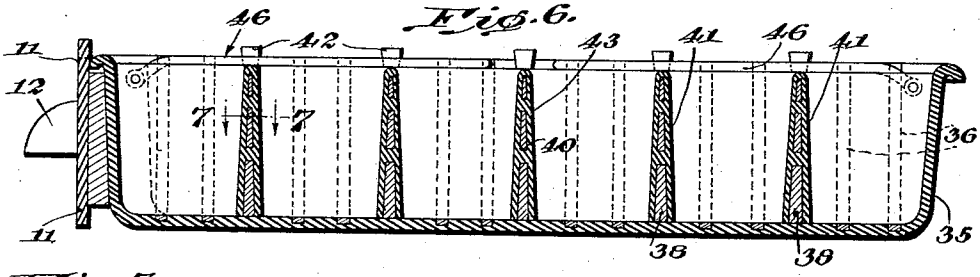


Fig. 6.

Fig. 7.

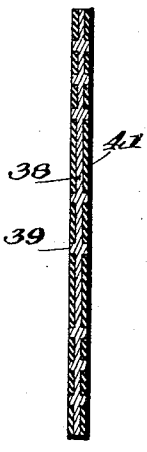


Fig. 8.

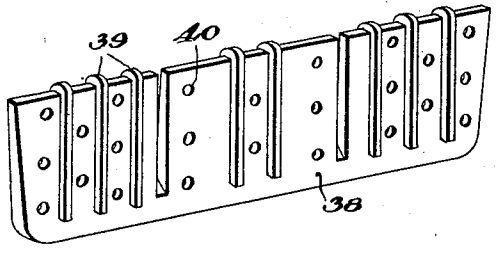
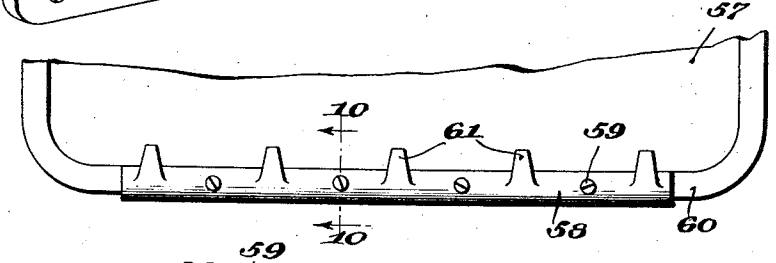


Fig. 9.



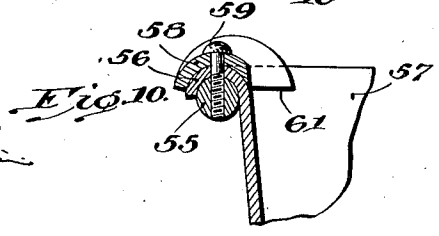


Fig. 10.

WITNESS

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UNITED STATES PATENT OFFICE

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ICE CUBE PAN

Application filed July 3, 1931. Serial No. 548,655.

This invention relates to ice cube pans.

An object of the present invention is the provision of an inflexible rigid ice cube pan which is formed of non-metalic materials and which has either a coating on its inner surface formed of a mixture of non-metallic and metallic materials or the pan may be formed of metal having a hard coating of non-metallic materials.

Another object of the invention is the provision of a grid member for an ice cube pan including a metal core and a non-metallic coating for the core, the metal of the coating when desired projecting through the non-metallic coating.

A further object of the invention is the provision of a plurality of grid units for an ice cube pan with the units interfitted and removable from each other and likewise removable from the pan, one of the units having a metal core and a non-metallic coating, the other unit being formed of metal with means for removing the said unit from the other grid member and the pan and for releasing the cubes of ice from the grid. One of the units may be made integrally with the pan.

A still further object of the invention is the provision of an ice cube pan formed of metallic and non-metallic materials.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawings forming a part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications which shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a view in perspective of an ice cube pan and grid constructed in accordance with the principles of our invention,

Figure 2 is a fragmentary view in perspective of a portion of a grid member,

Figure 3 is a longitudinal vertical section taken along the line 3—3 of Figure 1,

Figure 4 is a transverse vertical section taken along the line 4—4 of Figure 3,

Figure 5 is a plan view of another form of the ice cube pan,

Figure 6 is a longitudinal vertical section taken on the line 6—6 of Figure 5.

Figure 7 is a fragmentary horizontal section taken along the line 7—7 of Figure 6,

Figure 8 is a view in perspective of a metal core forming part of a grid member,

Figure 9 is a fragmentary plan view showing a further modified form of the invention,

Figure 10 is a transverse vertical section taken along the line 10—10 of Figure 9.

Referring more particularly to the drawings, 10 designates a pan of the usual shape for insertion into a mechanical refrigerating plant which has the usual plate 11 secured at its forward end and a hand grip 12 for removing the pan from its position when desired. The pan per se is formed of hard rubber which is inelastic and is similar in rigidity to a metal pan.

Upon the inner surface of the hard non-metallic shell 13 is provided a coating 14 formed of a mixture of finely divided metal particles and rubber which is known in the trade as metal rubber. The coating 14 provides a highly polished surface similar to that of metal although it has the qualities or rubber in that the ice when frozen in the pan does not adhere so rigidly to the surface. In other words, the metal in the coating 14 aids in the dissipation of heat from the water which is placed in the pan.

The outer wall or shell 13 of the pan may not only be formed of hard or vulcanized rubber, but may also be formed of gutta percha, cellophane, celluloid, or any kind of non-metallic material which may be hardened sufficiently to provide a rigid pan with a highly polished surface. The pan may also be formed with a metal core and be covered with any of the above-mentioned materials. The coating may be also formed of soft rubber, slightly vulcanized and cemented to the core.

A rigid member, generally designed by the numeral 15, is mounted within the pan and consists of a plurality of transverse

plates 16 and a longitudinal plate 17. The transverse plates, as shown at 18 and 19, are provided with slots to receive the longitudinally disposed plates 20 and 21 of a second grid member. The longitudinally disposed plate 17 is formed integrally with the transverse partitions 16. Cross sections of the transverse plates 16 and the longitudinal plate 17 show that the lower edges of said plates are thicker than the upper edges in order to provide tapering cube sections in the pan to facilitate the removal of the grid and the cubes formed in the pan.

Each of the plates 16 and 17 is formed of a metal core 22 and a non-metallic coating 23 which in this case substantially covers the metallic core.

The coating may be hard or vulcanized rubber, sheets of soft rubber, slightly vulcanized and cemented to metallic cores, gutta percha, cellophane, celluloid, or any kind of non-metallic materials.

The second grid unit includes longitudinally disposed metal plates 20 and 21 which are connected at their outer ends by means of pins 24. Formed integrally with the pins are levers 25 which normally lie within the pan and rest upon the upper edges of the transverse plates 16. The lower edges of the plates 20 and 21 are provided with notches 26, as shown in Figs. 3 and 4, which are received by V-shaped connecting members 27 formed upon the lower portions of the transverse plates 16 and these V-shaped members extend upwardly from the bottom of the slots 18 and 19.

Upon opposite sides of one of the plates adjacent the bottom are a plurality of semi-spherical lugs 28 which are adapted to engage the lower portion of the frozen cubes for aiding in elevating the cubes when the levers 25 are operated. A plurality of spaced semi-spherical lugs 29 are formed on one side of the other plate which normally lies in contact with the longitudinal member 17 of a grid member.

The operation of removing cubes from the pan 10 is as follows: The levers 25 which normally rest upon the upper edges of the transverse plates 16 are moved outwardly until they rest upon the free edges of the end walls of the pan 10. The free ends of these levers are then moved downwardly with the ends of the side walls acting as a fulcrum whence the grid member composed of the metal plates 20 and 21 are forced upwardly, thereby breaking the cubes loose from the side walls and the grid from the bottom of the pan. Thus said grid member will be removed from the pan. By this operation all of the cubes have been released and the second grid member may be shifted longitudinally of the pan since the longitudinal plate 17 of said grid member is of less length than the length of the interior of the pan. By this movement the ends of the plates 16 are moved away from their respective holding lugs 30. These lugs are adapted to retain the grid member and the plates 16 in position when the grid member which contains the plates 20 and 21 is elevated from its co-operating grid member.

In the modified forms shown in Figs. 5 to 8, inclusive, it will be seen that the pan 35 is formed of one of the non-metallic materials described above but the inner face is reinforced by the metal ribs 36 which extend transversely and longitudinally of the pan, as shown at 37. The metal ribs 36 not only provide for the reinforcement but aid in the dissipation of heat from the water which is placed in the pan.

In this case the metal core 38 is provided with ribs 39 and perforations 40 so that when a non-metallic coating of one of the materials previously described is molded onto the core 38, as shown at 41, the outer surface of the ribs 39 will appear flush with the non-metallic coating while the perforations 40 receive the non-metallic coating and act as a means for binding the coating to the core.

The upper edge of the side walls of the pan 35 are provided with lugs 42 which project inwardly and engage over the transverse plates 43 for retaining them in position when the second grid unit formed of the metal plates 44 and 45 is removed from the pan by the levers 46 when said levers are moved outwardly with the end walls of the pan acting as fulcrums. The lower ends of the side plates are provided with lugs 47 which support the cubes and since the walls of the grid members are tapered the cubes will likewise be tapered. The lugs 48 which are connected to the outer face of the plate 44 likewise engage the lower ends of the cubes of ice and aid in forcing said cubes from the pan when the levers 46 are operated for the purpose.

The construction of the pan shown in Figs. 5 to 8, inclusive, is similar in all respects to the construction shown in Figs. 1 to 4 except that the metal ribs 39 are formed on the cores 38 and appear at the surface of the grid members. The core not only provides for sufficient strength for the grid member but the exposed portions of the core aid in the dissipation of the heat from the water.

It will be noted that the longitudinal plate 50 of one of the grid members terminates short of one end wall of the pan 35 so that said grid member may be shifted to remove the transverse plates from beneath the holding lugs 42.

In the form shown in Figs. 9 and 10, provision is made for applying the grid members to an ordinary pan which is now in use in a refrigerator. In other words, a rein-

forcing rod 55 is secured to the underface of the usual flange 56 of the metal pan 57. The curved plate 58 is mounted upon the flange 56 and aligned perforations are provided in the member 58, the flange 56 and the reinforcement rod 55. The passages in the rod 55 are threaded to receive the bolts 59 which secure the curved plates 58 to the upper edge of the side walls 60 of the pan 57. Projecting from the curved plate 58 are lugs 61 which are adapted to engage over the ends of the transverse plates of the grid member for retaining said grid member in place when the complementary or auxiliary grid member is removed from the other grid member and from the pan by the operation of the levers such as shown in Figures 1 and 5 and respectively numbered 25 and 46.

We claim:

1. An ice cube pan formed of rigid non-metallic materials and a hard coating for the inner surfaces formed of metallic and non-metallic materials.

2. An ice cube pan, a plurality of interfitted grid members in the pan, said grid members being removable from the pan, one of said grid members being removable as a unit from the other grid member, means for retaining the last-mentioned grid member in the pan while the other grid member is being removed and comprising a bar fitted on an edge of a side wall of the pan and provided with lugs resting upon the upper edges of the last-mentioned grid member, and means for securing the bar to the side wall.

3. An ice cube pan, a relatively fixed grid member in the pan composed of transverse bars and a longitudinal bar fixed to the transverse bars, each of the transverse bars being provided with a plurality of transverse slots extending for a portion of the depth of the transverse bars, one of the slots in each transverse bar being located adjacent the longitudinal bar, a movable grid member composed of a plurality of longitudinal bars secured together and provided with a plurality of slots complementary to the slots in the transverse bars so that the movable grid member may be fitted into the relatively fixed grid member, and means for forcibly raising the movable grid member from the relatively fixed grid member when ice cubes have been formed in the pan for breaking the cubes from the pan and grid members.

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