L. B. COSHLAND.

APPARATUS FOR FORMING ICE PACKAGES.

APPLICATION FILED APR. 22, 1916.

1,231,569.

Patented July 3, 1917.

2 SHEETS—SHEET 1.

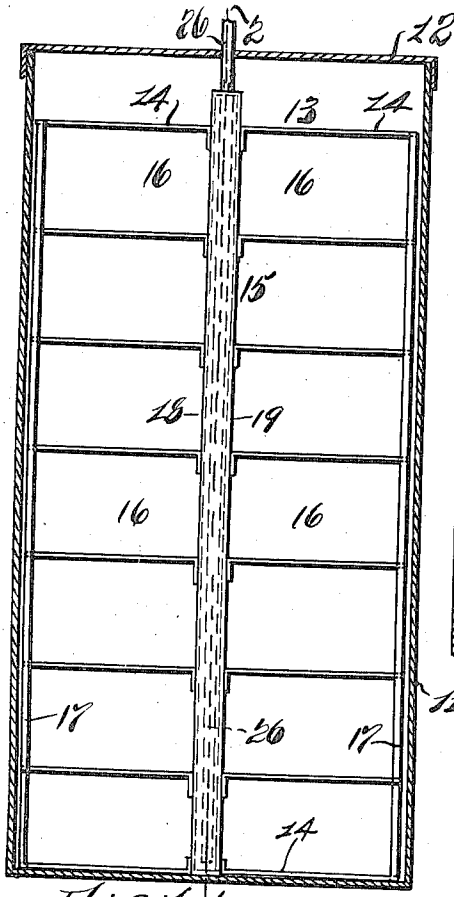


Fig. 1.

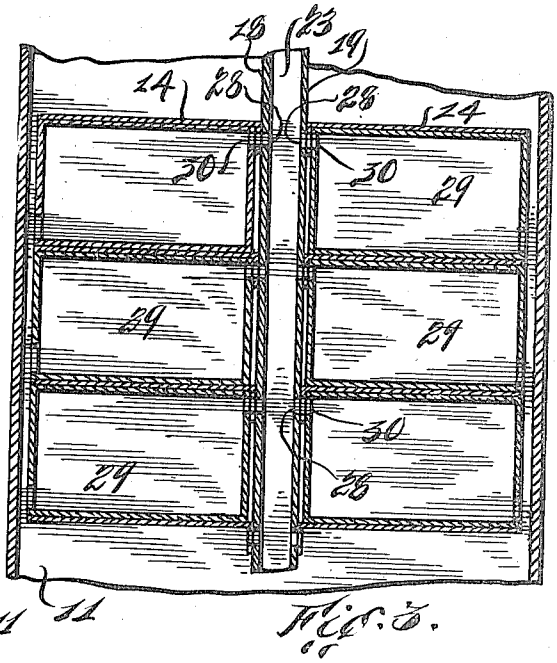


Fig. 3.

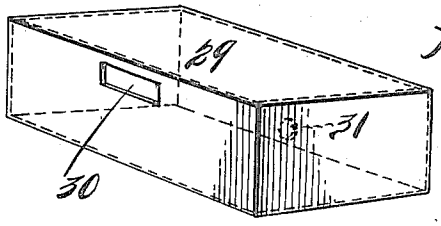


Fig. 5.

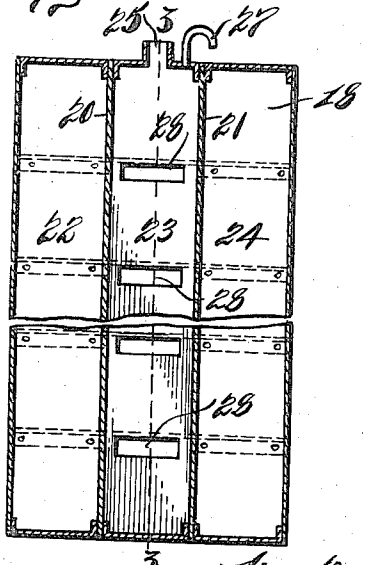


Fig. 2.

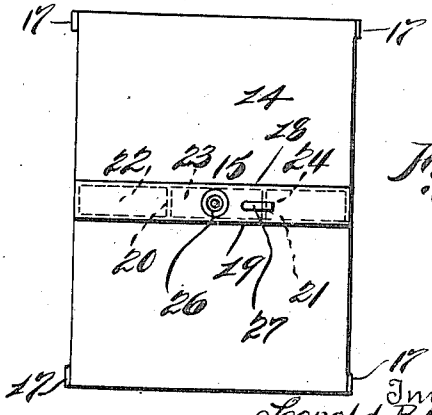


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 6.

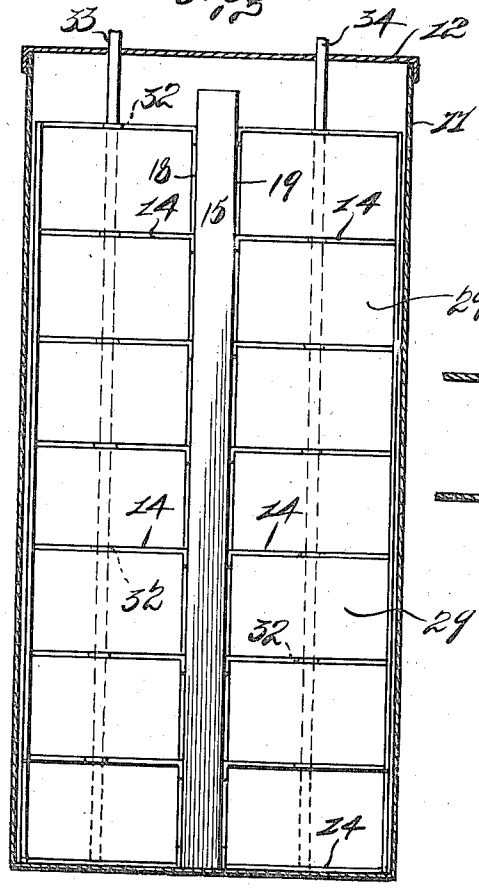


Fig. 7.

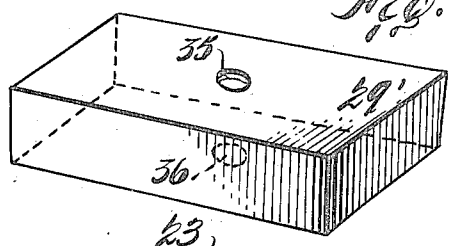


Fig. 8.

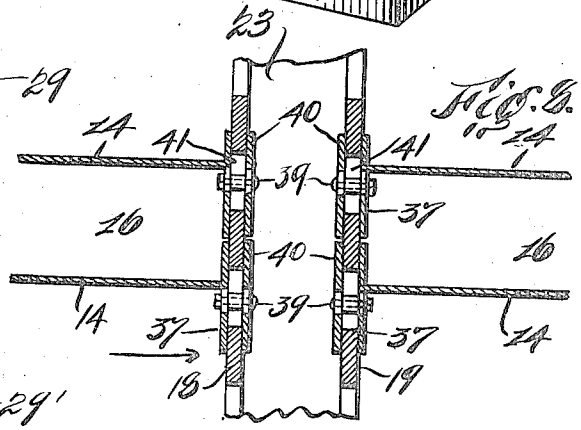
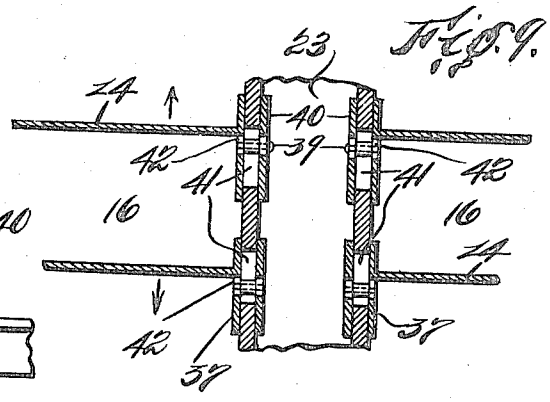


Fig. 9.



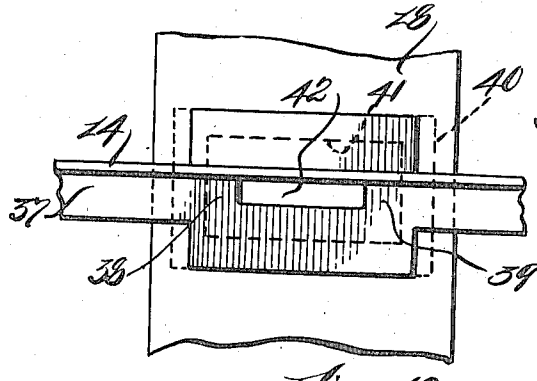


Fig. 10.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING ICE-PACKAGES.

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Application filed April 22, 1916. Serial No. 92,818.

To all whom it may concern:

Be it known that I, LEOPOLD B. COSHLAND, a citizen of the United States, and a resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Forming Ice-Packages, of which the following is a specification, reference being made to the accompanying drawings, forming a part thereof.

My invention relates to improved devices for freezing water into ice formed in packages of predetermined size and shape, and the objects of my invention, among other things, are to provide an improved apparatus, whereby cakes of artificial ice of a smaller size than are usually formed in artificial ice-plants, may be readily produced, which shall be suitably wrapped and inclosed in receptacles of paper or other similar heat-insulating material. By this means, paper-inclosed cakes of ice in suitable sizes and of predetermined weight for family use, may be obtained without sawing or cutting with inevitable waste, and such packages will not only keep the ice-cakes free from dirt or other contamination, but also greatly reduce the melting by preventing air from reaching the outer surfaces of the individual cakes or blocks. The aim of my invention, therefore, is to enable clean, wholesome and pure artificial ice to be produced and delivered to consumers as formed and packed in the ice-making plant, of a specified weight, and with a minimum loss due to melting and chipping off or breaking of the pieces of the separate cakes themselves.

My improved apparatus also presents other features of novelty and usefulness to accomplish these and other objects, all of which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings—

Figure 1 is a sectional elevation of my improved apparatus, showing the partition rack and central upright dividing member in the ice-can;

Fig. 2 is a sectional view of the dividing member taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view enlarged, taken on the line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the partition rack;

Fig. 5 is a perspective view of the ice-inclosing package;

Fig. 6 is a view similar to Fig. 1, showing a modified form of the apparatus;

Fig. 7 is a perspective view of the ice-inclosing package used in such modified form shown in Fig. 6;

Figs. 8 and 9 are enlarged vertical-sectional views similar to that shown in Fig. 3, illustrating a form of mechanism for adjusting the horizontal plates in the partition rack for ice-cakes of different sizes; and

Fig. 10 is a detail side view of the parts shown in Figs. 8 and 9, looking in the direction of the arrow in Fig. 8.

Similar numerals refer to similar parts throughout the several figures.

Referring to the drawings (Figs. 1 to 5), 11 indicates a vertical container or ice-can of suitable size and shape, such as are usually employed in plants for the manufacture of artificial ice. These cans are usually made of galvanized sheet-metal, slightly tapering toward the bottom, and the can 11 has the cover 12 adapted to fit over the top of the can 11, as shown in Fig. 1. 13 indicates the removable partition rack which is arranged within the can 11, as shown; the rack 13 comprises a series of horizontal plates 14 which are suitably affixed or riveted through flanges to the central dividing member 15, which is vertically disposed in the rack 13, and divides same into an equal number of package spaces 16 arranged in tiers on either side of the member 15, as shown in Fig. 1. The supports 17 hold the separate plates 14 in position at their corners.

The member 15 comprises two oppositely disposed plates 18 and 19, which lie in substantial parallelism and are sealed by plates on their ends and sides, as shown in Fig. 2, thereby forming a hollow member; within the hollow space so formed, are secured, in any suitable manner, the upright dividing plates 20 and 21, forming, within the member 15, three separate chambers 22, 23, and 24, extending vertically through the member 15, the chambers 22 and 24 constituting air chambers on either side of the central water flue chamber 23. The top of the water flue 23 has an opening 25 formed therein through which the blower-pipe 26 projects downwardly, as

shown in Fig. 1. The pipe 26 is connected with a suitable source of supply of compressed air (not shown). A water overflow-pipe 27 is secured to the top of the water flue 23 to carry off any excess supply of water in the flue 23 when the freezing operation is being carried out. 28 indicates a series of passages formed in the plates 18 and 19, oppositely disposed in pairs, and preferably located near the top of the separate spaces 16, as shown in Fig. 3. These passages 28 are preferably rectangular in shape, as shown in Fig. 2, though I do not wish to limit myself to the form or location of such passages leading into the flue 23 from the different spaces 16.

29 represents the ice-package proper, consisting of a rectangular carton or container, shown in Fig. 5, preferably made of paraffined paper which serves not only to shed the water from the ice as it melts, but also to reduce such melting to a minimum by preventing air from reaching the outer surfaces of the ice-cake inclosed within. As shown in Fig. 5, the container 29 has a rectangular slot 30 cut in one of the sides, preferably of the same size as the passages 28, and adapted to aline therewith, as shown in Fig. 3. In the side of the container 29, opposite to the slot 30, is formed the hole 31 which allows water to enter the successive containers in the different tiers in the rack 13 as the can 11 is filled with water preparatory to freezing. The slots 30 act as air and surplus water vents emptying into the water flue 23, as shown in Fig. 3.

Referring to the modification shown in Figs. 6 and 7, the plates 14 have holes 32 cut therein, as shown in Fig. 6, through which the blower-pipes 33 and 34 project and extend nearly to the bottom of the can 11. The holes 32 act as air and water passages, and are used in lieu of the passages 28 and slots 30 in the preferred construction shown in Figs. 1 to 5. The dividing member 15 in this modified form consists of the plates 18 and 19 sealed at their sides and ends, forming the hollow member having the interior dividing plates 20 and 21 to create the two air chambers 22 and 24, and the water flue 23 as in the preferred embodiment, but without having the passages 28 cut in the plates 18 and 19. The container 29′, shown in Fig. 7, has the vertically disposed holes 35 and 36 cut in the top and bottom of the container respectively, and these holes 35 and 36 are arranged to aline vertically with the different holes 32 cut in the plates 14, as shown in Fig. 6. When water is poured into the can 11, the successive containers 29 are filled by having the water rise and enter through the lower holes 36, while the air escapes from the successive containers through upper holes 35 as the level of the water rises through the can 11. The blow-pipes 33 and 34 are inserted in the apparatus, as shown in Fig. 6, when the can 11 has been made ready for the freezing process with the cover 12 in place.

In order that ice-packages of different sizes and weights may be produced in my apparatus, the plates 14 of the rack 13 may be constructed and affixed to the member 15 to be vertically adjustable, to increase or decrease the size of the spaces 16 as required. I have shown one means of vertically adjusting these plates 14 on the central dividing member 15 in Figs. 8, 9 and 10. The plates 14 are mounted on flanges 37 which carry the screw-threaded bolts 38 and 39, which in turn support the inner plates 40 adapted to seal in all positions the openings 41 cut in the side plates 18 and 19. The flanges 37 have formed therein the rectangular slots 42 which correspond in size and shape to the slots 30 shown in Fig. 2, and perform the same functions. In Fig. 8, the space 16 is restricted for an ice-cake of small size; in Fig. 9, the plates 14 and flanges 37 have been separated from one another, as shown by the arrows, thereby enlarging the container-space 16, while access to the water flue 23 continues to be preserved by the slots 42 always affording a free and unobstructed passage from the containers 29 to the water flue 23, as in the preferred embodiment.

The method of utilizing this apparatus in the manufacture of the ice-packages is substantially as follows: The containers 29, made of suitable size and shape, are placed in package spaces 16 so that they fit snugly therein, as shown in Fig. 3. Then the rack 13, loaded with its full quota of containers, is placed in the ice-can 11 in which the water will be poured, which will fill each of the containers 29 in the different tiers successively, and also the water flue 23 through the slots 30 and passages 28. The ice-can 11 with its cover 12 is then immersed in the brine or other freezing mixture, and the water in the containers is gradually transformed into ice, the freezing working toward the central dividing member 15, by reason of the fact that the water adjacent the walls of the can 11 freezes first. As soon as the can 11 has been immersed, the blow-pipe 26 is inserted in the water flue 23, and compressed air is forced to the bottom of the flue which keeps the water agitated and bubbling in this flue, tending to draw any impurities in the water within the several containers 29 through the slots 30 and passages 28 into the flue, thereby rendering the ice formed within the containers 29 of exceptional purity and clearness. All excess water due to expansion by freezing and carrying the sediment and impurities is thereby collected at the top of the flue 23, due to the air

blast, and passes out of the water flue 23 through the pipe 27.

In the modified form shown in Figs. 6 and 7, the pipes 33 and 34 perform the same function as the pipe 26 in keeping the water agitated by the air blast, the pipes being withdrawn before the ice-packages have been completely frozen.

When the freezing has been completed, the rack 13 is lifted out of the can 11, and on heating the plates 14 and other metallic parts of the apparatus by any of the customary methods, the ice-packages may be readily removed from their individual spaces in the rack, the paraffined paper aiding this operation, and are then ready for delivery to the consumer.

Many variations in form and dimensions may be made in my apparatus without departing from the principles of my invention, and without sacrificing any of its advantages.

I claim as my invention:

1. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a sealed hollow dividing member, provided with a central open flue chamber, extending vertically through the rack, and side openings between said flue chamber and the transverse spaces formed in said rack.

2. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, and containers of heat-insulating material having apertures therein held in the compartments of said rack.

3. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, and means for introducing compressed air through the rack.

4. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, containers of heat-insulating material having apertures therein held in the compartments of said rack, and means for introducing compressed air through the rack.

5. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, and openings leading from said hollow member to the separate compartments in the rack.

6. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, openings leading from said hollow member to the separate compartments in the rack, and containers of heat-insulating material having apertures therein held in the compartments of said rack.

7. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, openings leading from said hollow member to the separate compartments in the rack, and means for introducing compressed air through said hollow member.

8. In an apparatus of the class described, the combination with a can for freezing the water into ice, of a removable transverse partition rack, having a hollow dividing member extending vertically through the rack, openings leading from said hollow member to the separate compartments in the rack, containers of heat-insulating material having apertures therein held in the compartments of said rack, and means for introducing compressed air through said hollow member.

9. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates secured to a sealed hollow dividing member, provided with a central open flue chamber extending vertically through the rack, and side openings between said flue chamber and the transverse spaces formed in said rack.

10. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates secured to a hollow dividing member extending vertically through the rack, and openings leading from said hollow member to the separate compartments in said rack.

11. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber.

12. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber, and openings leading from said flue chamber to the separate compartments in said rack.

13. A transverse partition rack for an upright ice-forming can, comprising a plural-

ity of horizontally disposed plates secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber, and a compressed air pipe extending to the bottom of said flue chamber.

14. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber, openings leading from said flue chamber to the separate compartments in said rack, and a compressed air pipe extending to the bottom of said flue chamber.

15. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates adjustably secured to a sealed hollow dividing member, provided with a central open flue chamber extending vertically through the rack, and side openings between said flue chamber and the transverse spaces formed in said rack.

16. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates adjustably secured to a hollow dividing member extending vertically through the rack, and openings leading from said hollow member to the separate compartments in said rack.

17. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates adjustably secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber.

18. A transverse partition rack for an upright ice-forming can, comprising a plurality of horizontally disposed plates adjustably secured to a dividing member extending vertically through the rack, said dividing member consisting of a sealed air chamber vertically disposed on either side of a central open flue chamber, and openings leading from said flue chamber to the separate compartments in said rack.

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