

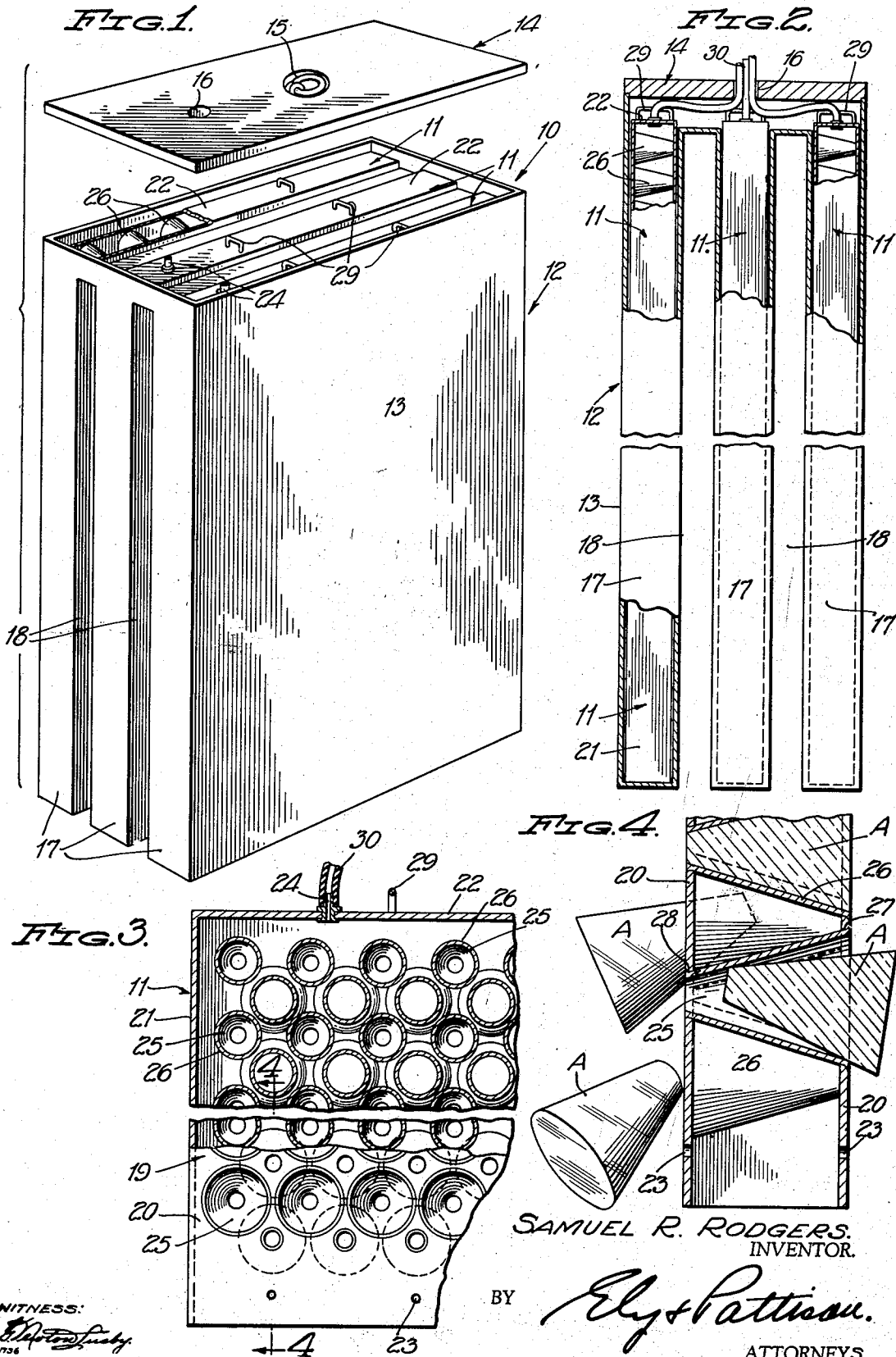
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ICE MAKING MACHINE

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ICE MAKING MACHINE

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3 Claims. (Cl. 62—159)

This invention relates to improvements in ice making apparatus and more specifically to a mold for use in the making of artificial ice in small lump form.

One of the important objects of the invention resides in an ice forming mold in which a maximum number of individual lumps of ice may be made in a given amount of space.

Another feature of the invention is to provide an ice mold in which mold cells are of conical shape to produce lumps of ice substantially frusto-conical shape whereby the lumps of ice will gravitationally slide and drop from the mold when the same is standing in an upright position.

A further feature of the invention is the provision of an ice mold for making frusto-conical shaped ice lumps in which the conical shaped mold cells are arranged in staggered rows and are alternately arranged relative to the opposed sides of the mold to provide a maximum number of cells in a given amount of space, and to cause the ice lumps formed therein to fall from opposite sides of the mold when the mold is in an upright position and the frozen bonds between the ice lumps and the walls of the mold cells are broken.

A further feature of the invention is to provide a novel means of agitating the water in the mold cells during a freezing operation to assure crystal clear ice lumps which is essential for the use of ice lumps for drink cooling purposes.

A still further feature of the invention is to make an individual lump of ice of substantially conical shape which reduces the chances of the lumps of ice from freezing together when thrown into contacting engagement with each other after their removal from the mold, it being understood that the present conventional "ice cubes" readily fuse together due to their flat surfaces contacting. By making the ice lumps of conical shape the major portion of the lump presents curved surfaces which lessens the chances of the lumps of ice becoming strongly frozen together.

Other features of the invention will become apparent as the following specification is read in conjunction with the accompanying drawing, in which,

Figure 1 is a perspective view of the ice making apparatus with the cover of the freezing containers separated from the body thereof.

Figure 2 is an end elevational view with parts broken away in transverse section.

Figure 3 is a fragmentary side elevational view of one of the ice molds with parts broken away in section.

Figure 4 is an enlarged detail vertical transverse sectional view on the line 4—4 of Figure 3, and illustrating the manner in which the frusto-conical shaped lumps of ice drop from opposite sides of the mold.

Referring to the drawing by reference characters, the numeral 10 designates my improved ice making apparatus in its entirety which includes one or more ice forming molds 11 and a receptacle 12 for receiving the mold or molds 11. In the present instance I have illustrated in the drawing a receptacle 12 for accommodating three molds 11, and the receptacle includes a rectangular shaped receptacle body 13 which is open at its top. The open top of the body 13 is closed by a removable cover 14 having a lifting ring 15 disposed centrally thereof. The cover 14 is also provided with an opening 16 for a purpose to be hereinafter explained. Any suitable latching means may be provided to secure the cover to the body 13 for the apparatus 10 is lowered and lifted into the freezing tank by hoisting and lowering apparatus which may connect with the ring 15.

The receptacle body 13 is constructed of metal and includes three separate spaced compartments 17 which communicate adjacent the open top of the body. The confronting side walls of the compartment 17 provide spaces 18 between adjacent compartments to permit the refrigerant to contact the maximum surface of the walls of the compartments during a freezing operation.

Each of the ice forming molds 11 includes a rectangular shaped hollow metal casing 19 of a size to snugly fit into a compartment 17. The casing 19 comprises spaced parallel side walls 20—20, end walls 21—21, and a top wall 22. The bottom of the casing is open, and the side walls 20—20 adjacent the bottoms thereof are provided with spaced apart air outlet openings 23. The top wall 22 is provided with an air inlet coupling 24 for it is intended that air under pressure be passed downwardly through the mold 11 during a freezing operation as will be fully explained hereinafter.

Horizontal rows of spaced vertically aligned ice forming cells 25 are provided within the casing 19, and each cell is formed by a hollow cell member 26 of frusto-conical shape open at opposite ends. The large end of the member 26 is secured in an opening 27 in one of the side walls 20 and the small end of the member is secured in an opening 28 in the other side wall 20. Each pair of related openings 27 and 28 are axially aligned and the ends of the cell member may be

secured to the walls of the openings by welding or by any other attaching means.

The horizontal rows of cells are staggered relative to each other and the frusto-conical shaped members 26 of one row are reversely arranged with respect to the members 26 of the next adjacent row so that alternate rows of the cell members 26 have their large open ends opening through the same side wall 20 while the large open ends of the intermediate rows of cell members 26 open onto the other side wall 20. The staggering of the cell members and the reversing of their relation to dispose the large open ends of the cell members of one horizontal row at one side of the mold and the large open ends of the cell members of the next staggered row at the other side of the mold permits of the formation of a maximum number of ice forming cells 25 in a mold of a given size.

In use, the cover 14 is removed from the body 12 and the compartments 17 are supplied with sufficient water to fill the cells 25. The molds 11 are respectively dropped into the respective compartments and come to rest on the bottom walls thereof. Hand grips 29 may be provided on the top walls 22 of the molds to facilitate handling of the same. As the molds are dropped into their compartments, the cells 25 fill up with water from the lowermost row of cells to the uppermost row of cells. Air tubes 30 are inserted through the opening 16 in the cover and respectively connected to the air inlet couplings 24, whereupon the cover is applied over the top of the body 13 and securely locked by any suitable means. The apparatus 10 is now placed in a brine freezing tank or subjected to any other refrigerant where it is left until the water in the cells 25 has congealed or become frozen. During the freezing operation, air under pressure is passed through the tubes 30, which air enters the hollow casing 19 of the molds 11 and passes downward, thence out through the air outlets 23, and upwardly between the molds and the walls of the compartments 17, a certain amount of the air circulating through the cells as it ascends to find escape through the opening 16 in the cover 14. The circulation of air through the mold during a freezing operation, causes the water to be slightly agitated which air agitation is inductive of the making of crystal clear ice. When ice is formed in the cells 25 of the molds, the apparatus 10 is removed from their freezing tank and the cover 14 removed from the receptacle body 13. The air tubes are disconnected from the couplings 24 and the molds 11 withdrawn from their compartments. Should the molds 11 freeze to the walls of the compartments 17, the exterior of the receptacle body may be exposed to hot water or heat to break the frozen bond. The molds 11 may be stood upright in the open and as the frozen bond between the ice formed in the cells and the walls of the cells become broken, the frusto-conical shaped lumps of ice A slide outwardly from the cells at opposite sides of the mold, as illustrated in Figure 4 of the drawing. A receptacle may be placed at each side of the mold to catch the lumps of ice A as they drop. To expedite the release of the lumps

of ice from the mold, the mold may be inverted in position, with its open end up, and hot water may be poured into the casing 19, after which the mold may be returned to its normal position and the hot water emptied therefrom.

By making the lumps of ice A of frusto-conical shape, the likelihood of the lumps becoming frozen together is reduced in comparison with "ice cubes" of the conventional kind. Should the rounded surface of two lumps of ice A contact during storing of a supply of lumps, only a minimum amount of surface is in contact, whereas the flat sides of "ice cubes" when frozen together necessitates a striking blow to separate. In the event that the surfaces of two lumps of ice A become frozen together, the same may be easily separated by the hands.

While I have shown and described what I consider to be the preferred embodiment of my invention, I wish it to be understood that such changes in details of construction and design as come within the scope of the appended claims may be resorted to if desired.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. An ice making mold comprising a rectangular shaped casing open at its bottom and having a top wall, opposed longitudinal side walls, and opposed transverse end walls, the distance between the side walls determining the length of the lump of ice to be formed, horizontal rows of conical shaped cell members mounted in said side walls and opening therethrough, the conical shaped cell members of one row being reversely arranged relative to the conical shaped cell members of the next adjacent row and being staggered relative thereto, whereby conical shaped lumps of ice may be formed in said cells and be expelled therefrom by gravitation from opposite sides of said casing when the mold is in upright position and the frozen bonds between the walls of the cells and the lumps of the ice have become broken.

2. An ice making mold as set forth in claim 1, including an air inlet provided in the top wall of the casing, and spaced outlets in the side walls of the casing adjacent the open bottom thereof whereby air may be circulated through said casing and into the cell members when the mold is enclosed in a freezing receptacle during a freezing operation.

3. An ice making mold comprising a rectangular shaped casing open at its bottom and having a top wall, opposed longitudinal side walls, and opposed transverse end walls, the distance between the side walls determining the length of the lump of ice to be formed, cell members mounted in said side walls and opening therethrough, an air inlet provided in the top wall of said casing, and spaced outlets in the side walls of said casing adjacent the bottom thereof whereby air may be circulated through said casing and into said cell members when the mold is enclosed in a freezing receptacle during a freezing operation.

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