United States Patent

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[54] PORTABLE ICE CUBE MAKER

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[52] **U.S. Cl.** **62/320,** 62/457, 62/514

[51] **Int. Cl.** **F25c 1/04,** F25d 3/08

[58] **Field of Search** 62/514, 457, 371, 356, 340

[56] **References Cited**

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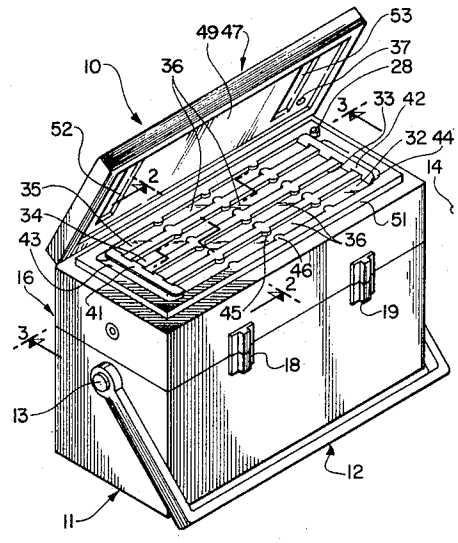
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[57] **ABSTRACT**

This invention provides for a portable ice cube maker, in which ice cubes are made in ice pockets provided in an insulated container having a cover and in which the ice pockets are accessable upon removing the cover, yet providing for an enclosed container space into which the ice cube pockets depend and a cover extendable over the top of the container and removable therefrom to provide access to the ice cube pockets for the addition of water or the removing of the ice cubes. An ice cube pulling extractor is provided having parrallel portions dependable into the bottoms of the ice cube pockets and transverse pull portions available at the opposite ends of the containers for effecting the pulling of the extractor and the ice cubes from the container. Refrigerant is admitted to the space within the container from a refrigerant bottle having a depressable shank extending from the neck of the bottle and the neck of the bottle extending through an opening either through the bottom of the container or through a cover thereof. A push rod is used in one form of the invention to depress the bottle shank and in the other form of the invention a shank is depressed by engaging the same with a ball valve device lying within the container space. Appropriate valves are provided for excess pressure and to prevent the admission of air into the casing and to effect the draining of the bottom of the casing.

6 Claims, 7 Drawing Figures



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2 Sheets-Sheet 1

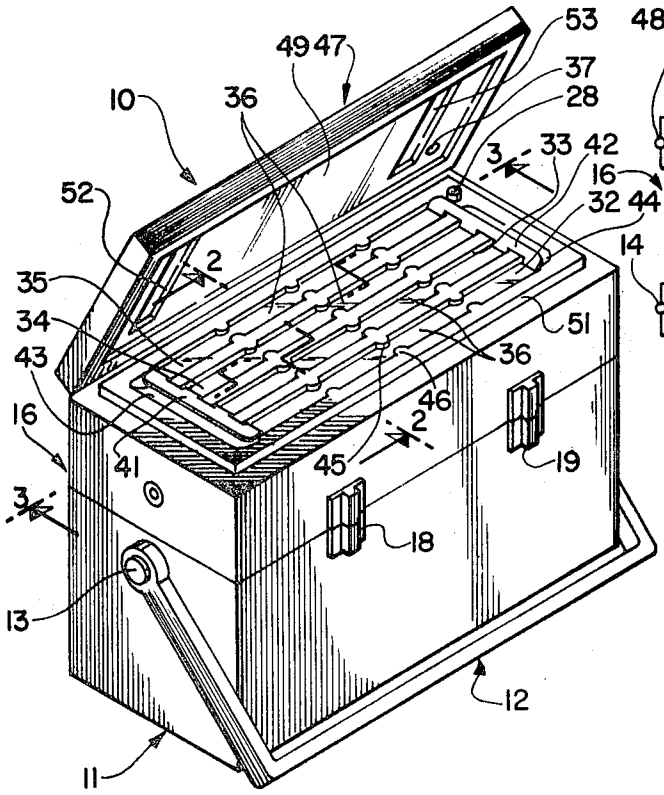


Fig. 1.

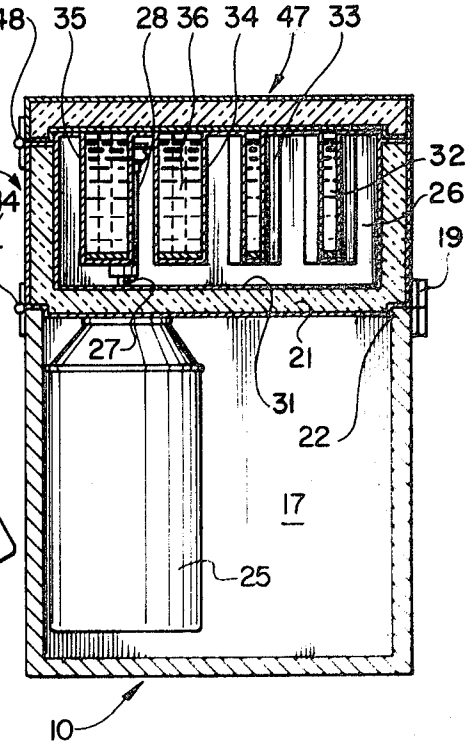


Fig. 2.

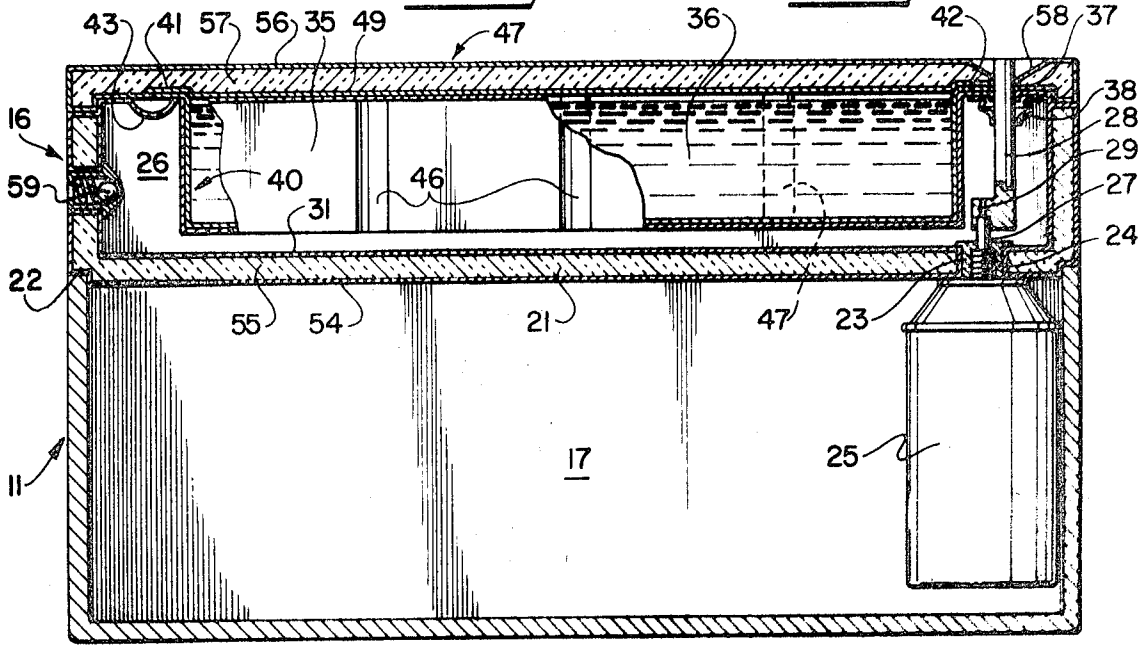


Fig. 3.

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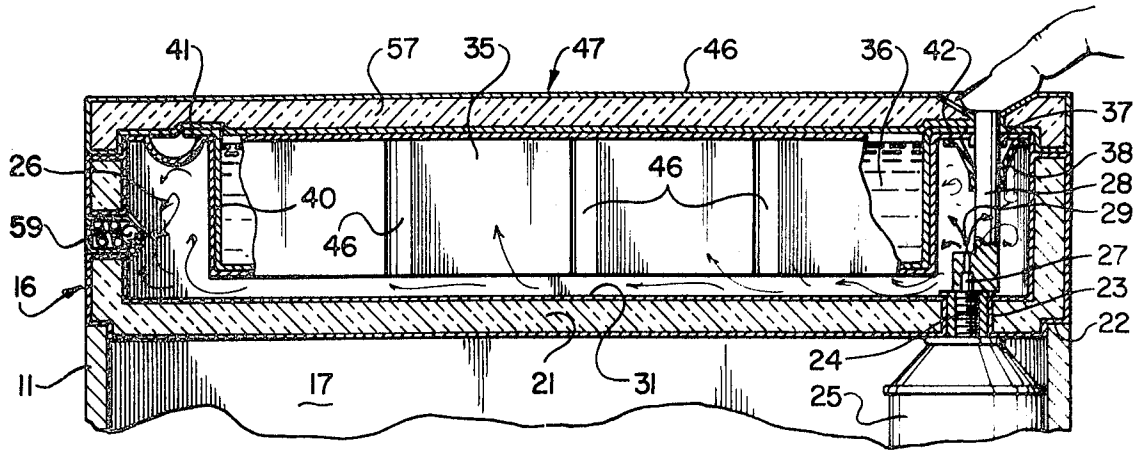


Fig. 4.

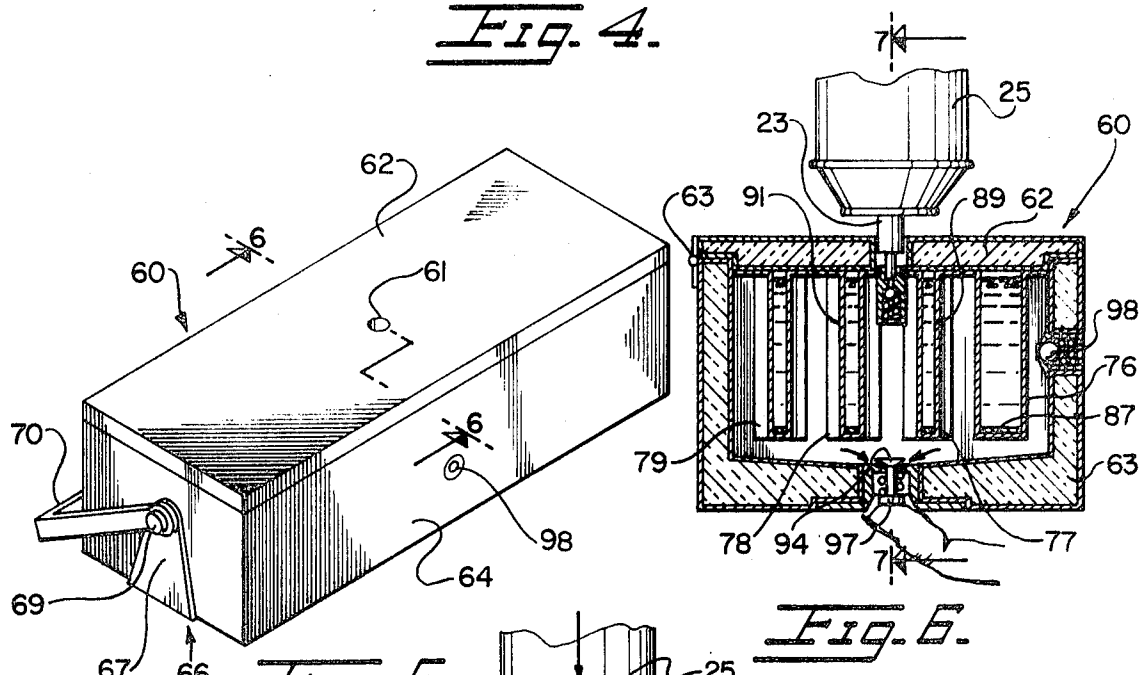


Fig. 5.

Fig. 6.

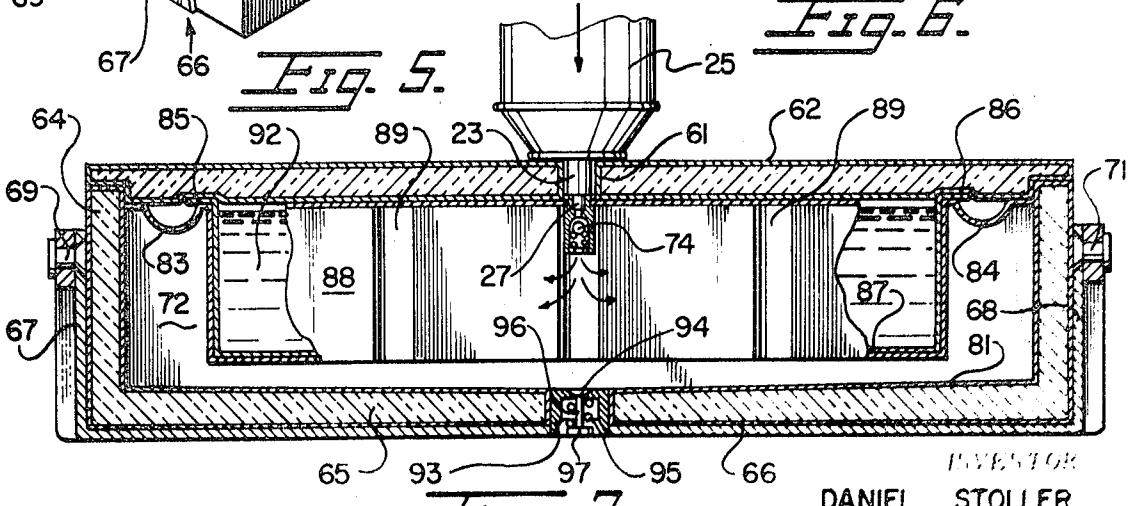


Fig. 7.

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PORTABLE ICE CUBE MAKER

This invention relates to a portable ice cube maker.

It is an object of the present invention to provide an ice cube maker which can be carried from one location to another and which can be operated from a pressurized bottle containing a refrigerant by the mere depressing of the bottle valve shank and discharging the refrigerant into an insulated container space bearing ice forming pockets.

It is another object of the invention to provide an ice cube maker in which access can be readily had to the ice forming pockets within the container space and without opening the container space into which the refrigerant gas is expanded wherein the open ends of the ice pockets are readily closeable by a hinged cover.

It is still another object of the invention to provide a portable ice cube maker including a bottom tray on which the ice cube making container is hingeably mounted and wherein the pressurized refrigerant bottle is extendable from the bottom of the ice cube making container into the tray space and which there is provided a handle extending from the tray and extendable upwardly over the ice cube making container by which the container and the tray can be carried.

It is still a further object of the invention to provide an insulated ice cube making container having ice forming pockets depending from the top thereof into this inner space of the container in which there is provided adequate drain means for any liquid formed within the space and in which there is a pressure valve controlling the in-flow of any atmosphere that may be extended into the container space and to minimize condensation that may be formed on the inner walls of the container.

Other objects of the invention are to provide a portable ice cube maker having the above objects in mind, which is of simple construction, has a minimum number of parts, inexpensive to manufacture, durable, light in weight, of pleasing appearance, efficient and effective in use.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a top perspective view of the portable ice cube maker embodying the features of the present invention, the cover of the maker being lifted to display the ice cube forms.

FIG. 2 is a transverse sectional view of the ice cube maker as viewed on line 2—2 of FIG. 1.

FIG. 3 is a longitudinal sectional view of the ice cube maker as viewed on line 3—3 of FIG. 1.

FIG. 4 is a fragmentary longitudinal sectional view similar to FIG. 3 with illustration being made as to the manner in which the refrigerant is dispensed into the space surrounding the ice cube forms.

FIG. 5 is a top perspective view of an ice cube maker embodying the features of the present invention according to a modified form of the invention, wherein the refrigerant is dispensed into the maker by the mere insertion of a can top into the cover of the container, rather than the refrigerant being contained in a cooling space compartment of the container as with the first form of the invention.

FIG. 6 is a transverse sectional view of the portable ice cube maker as viewed on line 6—6 of FIG. 5.

FIG. 7 is a longitudinal sectional view of the form of the invention shown in FIG. 5, as viewed on line 7—7 of FIG. 6, with illustration being made as to the manner of depressing the external can of refrigerant against a spring inlet valve.

Referring now particularly to FIGS. 1 to 4, 10 represents a portable ice cube maker embodying the features of the present invention, which comprises a bottom tray 11, to which is attached bail carrying handle 12 that can be pivoted from a drop position as shown in FIG. 1 to a vertical position upon pivot connections 13 located at opposite ends of the tray 11. Hingedly mounted upon the top edge of the tray at one side thereof by means of hinges 14 is an insulated wall compartment container 16 held in a closed position over the tray 11 to close off a space 17 within the tray, various items may be stored for the purpose of being transported, or in which ice cubes can be placed as they are made to have a large source of ice cubes available when they are being used. The tray 11 may be made of insulating material, such as plastic, so that such ice cubes will remain in their frozen state for a long time. The insulated ice cube making compartment 16 is held in its latched position by latch fasteners 18 and 19 provided upon the front of the ice cube maker, but which can be released to lift the cube making container 16 upon the hinges 14 to provide access to the tray space 17.

The ice cube making container 16 has a bottom portion 21 that is recessed about its periphery at 22 to conform to the upper edge of the tray bottom 11 so that the container 16 is held centered thereupon when in its closed position upon the tray 11. At one end of the bottom 21 there is secured a fitting 23 that is internally threaded and to which a threaded neck 24 of a pressurized bottle containing refrigerant, as indicated at 25, is secured so as to depend from the bottom 21 of the container 16 into the tray space 17. The pressurized refrigerant bottle 25 has extending upwardly through the fitting 23 and into container space 26 a depressable valve shank 27 to which an offset shaped push rod 28 is fitted which has a hole 29 through which regrigerant will be dispensed into chamber 26 as the push rod 28 is depressed. The valve shank 27 is hollow and provides a dispensing outlet communicating with the hole 29 of the push rod 28 so that the refrigerant will be delivered from the pressurized bottle 25.

The space 26 of the cube making container is lined with a sheet metal liner 31 that extends over the bottom and along the side walls of the container 16 internally thereof. This liner 31 also extends over the top of the space 26 and is depressed to provide four parrallel longitudinally extending ice making compartments 32, 33, 34 and 35, all of which spaced apart from one another as best seen in FIG. 2 and are open at their upper ends to receive water into which ice cubes 36 can be formed. There is no access to the space 26 from the top of the container 16, but only access to the top of the cube making compartments 32, 33, 34 and 35.

This same liner 31 at the top of the ice cube making container has a hole 37 through which the push rod 28 extends and depending from this liner is a sealing ring 38 which prevents the escape of the refrigerant when admitted to the space 26.

Before pouring water into the ice compartment, an ice extractor formed of sheet material and as indicated generally at 40 and consists of four strips adapted to be dropped into the depending ice making compartments or pockets and joined together at their respective ends by a transversely extending handle or pull portions 41 and 42 can be grasped to lift the frozen ice cubes out of the ice forming compartments. The strips of this ice extractor line the bottom ends of the pockets so that when an upward pull action is effected the ice will be extracted and pulled therefrom. In order to provide access for the locating of the fingers under the pull portions 41 and 42, the liner 31 is depressed as indicated at 43 and 44 and underlying the respective pull portions 41 and 42. These depressions will permit the fingers to be located underneath the pull portions 41 and 42 to effect the lifting action upon the ice and pull outwardly the elongated ice cubes.

Each of the ice pockets or compartments formed of the liner material 31 have three opposing ribs spaced along the length of the ice forming pockets and as indicated at 45 and 46. These ribs 45 and 46 will reduce the width of the ice 36 being formed so as to provide weakened portions in the ice pieces as they are extracted by the extractor 40 so that the ice pieces can be broken into four smaller pieces to render them useful to put into tumblers or small cups. These small pieces will have generally the thickness corresponding to the width of the compartments and will be generally of flake shape. These flake shaped pieces can be readily stored in the tray space 17 as fast as they are made and be available for use.

The extractor sheet having parrallel portions lying within the bottoms of the ice forming compartments or pockets will

be cut to accommodate the opposing ribs **45** and **46** lying along the length of the pockets so that the extractor strips will lie flat on the bottom of the pockets.

Overlying the open ice pockets supported within the container space **26** is a cover **47** that is hinged by hinges **48** at the same side of the ice making container **16** that the ice making container **16** is hinged by its hinges **14** to the tray bottom **11**. This cover is depressed on its inner face as indicated at **49** to be accommodated over raised top formation **51** of the container liner sheet **31** from which the ice compartments are formed and depended into the space **26**. The depression **49** extending generally on the inner side of the cover **47** is further depressed as indicated at **52** and **53** to accommodate the pull portions **41** and **42** of the ice cube extractor **40** as the cover is closed over the raised top liner portion **51**.

All portions of the ice cube making container **16**, including the bottom and side walls, are formed of spaced metal walls, including the liner sheet **31**, as providing the inner wall and an outer wall sheet **54** that conforms generally to the liner sheet **31** and extends upwardly to enclose the vertically extending end and side walls of the container **16** and over the upper edges of the side and end walls to close upon the inner liner **31**. In between the liner **31** and the outer metal covering **54** is provided insulating material **55**. The cover **47** is similarly constructed and has an outer metal layer **56** spaced outwardly from the recessed metal layer **49** and insulating material **57** lying therebetween. Thus with the cover **47** closed upon the container **16** a confined insulated gas compartment or space **26** is provided so that any refrigerant gas passing therethrough will have good contact with the metal depressed ice pockets to effect the quick freezing of water provided therein.

The cover top layer of metal **56** is depressed at **58** to accommodate the upper end of the push rod **28** which will lie flush with the top surface of the cover and also to provide space into which the finger, as illustrated in FIG. **4**, can be thrust to depress the push rod **28** and cause the valve dispenser element **27** to be depressed so that the refrigerant gas will pass from the refrigerant bottle **25** into the space **26** and effect a cooling action due to the expansion of the gas upon the side walls of the ice pockets which will extract heat from the water and cause the water to be frozen and the ice cubes thereby formed. At the opposite end of the space **26** is a one-way spring depressed ball valve device **59** through which the refrigerant gas will be exhausted upon the pressure within the compartment reaching a predetermined amount. The ball valve device **59** will prevent moist outside air from entering the ice cube making container space **26** that would freeze and tend to block the passage of the refrigerant gas through the spaces **36** between the ice forming compartments or pockets and along the sides of the liner **31**. Once the container space **26** has received sufficient refrigerant to cause the water to be frozen, the cover **47** can be lifted and by grasping the pull portions **41** and **42** the extractor **40** will lift the ice pieces from the ice compartments or pockets and these ice pieces can thereafter be broken and put to use. Thereafter water is added to the ice pockets and the cover **47** closed and by depressing the push rod **28** new ice cubes or flakes can be made. This performance can be continued until an adequate number of ice flakes are obtained.

It should now be apparent that there has been provided a simple and portable means for the making of ice cube or flakes by merely supplying a compartment having ice cube forming pockets with a refrigerant gas expanded from its container and directed into the ice cube forming space to cause ice cubes to be formed. This ice cube maker can be carried by its handle **12** to any location where it is desired to have ice cubes made.

Referring now to FIGS. **5**, **6** and **7**, **60** represents generally a portable ice cube maker constructed according to a modified form of the invention, of which the bottom tray of the first form of the invention enclosing the refrigerant bottle is dispensed with and wherein the ice cube maker is charged by applying the refrigerant bottle **25** of the same construction as above described with reference to this bottle to an opening **61** in top cover **62** hingedly connected by hinges **63** to an ice cube making container **64**. Both the cover **62** and the container **64**, including its bottom wall **65**, is heavily insulated.

To provide a support for the bottom wall **65** there is extended throughout the length of the same an underslung support member **66** having upturned ends **67** and **68** that overlie the end walls of container **64** and serve to support pivot pins **69** and **71** on which a bail handle **70** is pivotally connected so that it may be swung from a position shown in FIGS. **5** and **7** upwardly and over the cover to provide a carrying member by which the portable ice cube maker **60** can be carried.

This container **64** provides an expansion chamber or space **72** into which refrigerant from the bottle **25** having its unthreaded neck **23** extended downwardly through the hole **61** centrally located in the cover **62** and with its valve shank **27** being depressed against a spring operated ball valve device **74** gas under pressure is expanded into the space **72**. Upon the pressurized refrigerant bottle **25** being lifted from the valve device **74** and cover **62**, the valve device **74** will be automatically closed and the refrigerant left to cool ice pockets or compartments **76**, **77**, **78** and **79** running parrallel to each other throughout the length of the container **64** and depending from the top of a closed inner liner or casing **81** of substantially the same shape and arrangement as described in connection with the first form of the invention. The ice forming compartments or pockets are spaced apart from each other and from the side walls of the container **64** so as to allow free expansion of the refrigerant along thin walls of the pockets. This top wall of the liner **81** as indicated at **83** and **84** have depressions disposed respectively at the ends of the pockets to provide finger openings for the fingers as they are extended underneath end pull portions **85** and **86** of an ice extractor **87** having individual runners lying in the bottoms of each of the ice pockets **76**, **77**, **78** and **79**. These ice pockets have opposing pairs of ribs **89** and **91** to provide weakened portions in strips of ice **92** that are provided in the several compartments or pockets that depend from the top of the inner liner **81**.

The bottom of the container **64** has a valve seat **93** on which a valve **94** is normally seated by a compression spring **95**. The valve **94** has a shank **96** and a press button on the lower end thereof as indicated at **97** that is excessable through an opening in the bottom of the underslung support **66** and can be depressed at any time to effect drainage of any water or condensation that may have accumulated in the space **72** of the container and to leave the space clear for further expansion of the refrigerant gas in the space **72**.

In one side of the container **64** is a ball valve device **98** which will open under predetermined pressure but will while permitting exhausting of the gas prevent the inflow of the air from outside of the container. Both the container **64** and the cover formed with metal or plastic inner and outer casing members with insulating material therebetween in order to maintain the container space **72** free of any outside heat and the external walls of the container and the cover free of condensation resulting from any chilling of the internal space **72**.

It should now be apparent that there has been provided a portable ice making container that can be operated from a charged pressurized bottle bearing a refrigerant and without the need of an automatic refrigerating machine requiring an electric source for energization.

I claim

1. A portable ice cube maker comprising: an ice cube making container having a top and bottom and having ice-forming compartments comprising ice-pockets depending from the top of the container into an internal space thereof, said container having an opening in its wall for receiving a neck of a pressurized bottle containing a valve shank; means associated with the opening for effecting the depression of the valve shank to admit refrigerant from the pressurized container into the internal space of the ice making container; said container having a cover adapted to be extended over these pockets and removable for the insertion of water into the ice pockets and the removal of the ice cubes therefrom, said ice-forming

pockets having opposing ribs to provide weakened portions in the ice extracted from the pockets, said ice cube container having an inner liner with a top and bottom, said inner liner being closed at the top and

said ice pockets being depressed from the top of the inner liner and into the container space, said pockets running longitudinally of the container and parallel to one another and spaced from each other and from the sides of the container to provide space into which the refrigerant gas may expand for full contact with the walls of the ice pocket; an ice extractor extendable into the ice pockets and running along the bottoms thereof, and said extractor being cut to be accommodated to the vertically extending ribs within the pockets so as to lie flush upon the bottoms of the pockets.

2. A portable ice cube maker, as defined in claim 1, and the top of said container having depressions adjacent to the opposite ends of the ice pockets, said extractor having handle pull portions overlying the depressions whereby fingers can be extended into the depressions and under the pull portions to grasp the extractor for effectively pulling the same from the ice pockets.

3. A portable ice cube maker, as defined in claim 1, and said container having a bottom wall, the valve seat extending through the bottom wall and a depressable valve cooperating with the valve seat to open the space within the container to drain the bottom of the container from liquid.

4. A portable ice cube maker, as defined in claim 3, and underslung support member extending across the bottom of the container and upwardly along the sides thereof, a handle pivotally connected to the upper ends of the underslung support at the sides thereof and serving when extended over the container to permit the carrying of the container by the handle, said valve seat extending through said underslung support with the drain valve being excessable there through.

5. A portable ice cube maker, as defined in claim 1, and a ball valve carried upon the container and said cover having an opening through which the neck of the refrigerant bottle may be extended for engagement with the ball valve to depress the valve shank of the bottle and inject refrigerant gas into the container below said inner liner.

6. A portable ice cube maker, as defined in claim 1, said refrigerant bottle being secured to the bottom of the ice making container, a push rod extending from the refrigerant container and carried on its valve shank and extending upwardly through the container and through the cover and accessible from the top thereof to be depressed, a bottom tray and said container being recessed to receive the bottom of the container into the tray, and handle carrying means connected to the tray being extendable over the cover to permit the carrying of the ice cube maker.

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