M. B. HILL.

ICE MAKING APPARATUS.

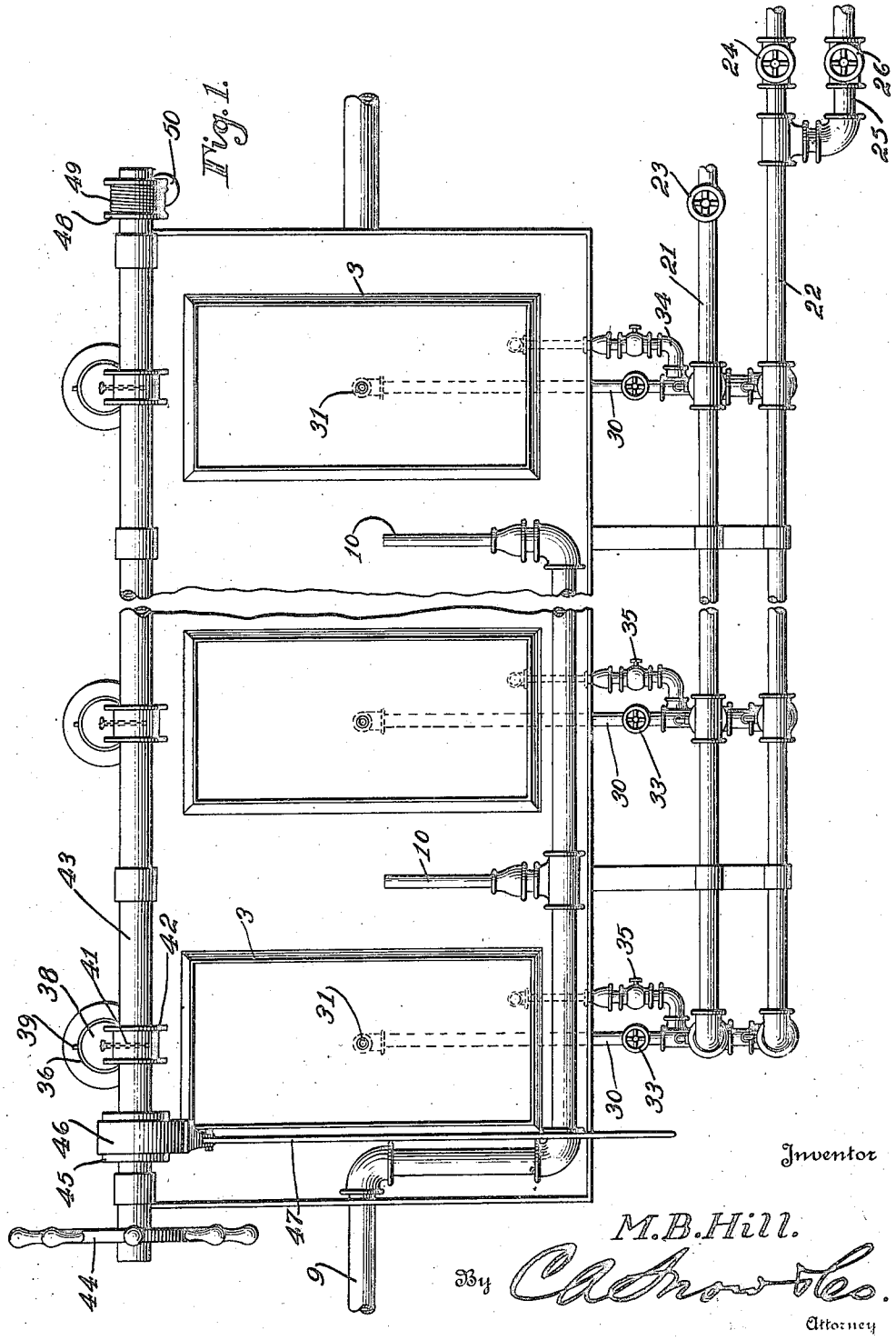
APPLICATION FILED FEB. 21, 1922.

1,426,640.

Patented Aug. 22, 1922.

5 SHEETS—SHEET 1.

Fig. 1.



Inventor

M. B. Hill.

By Cushman & Co.

Attorney

M. B. HILL.

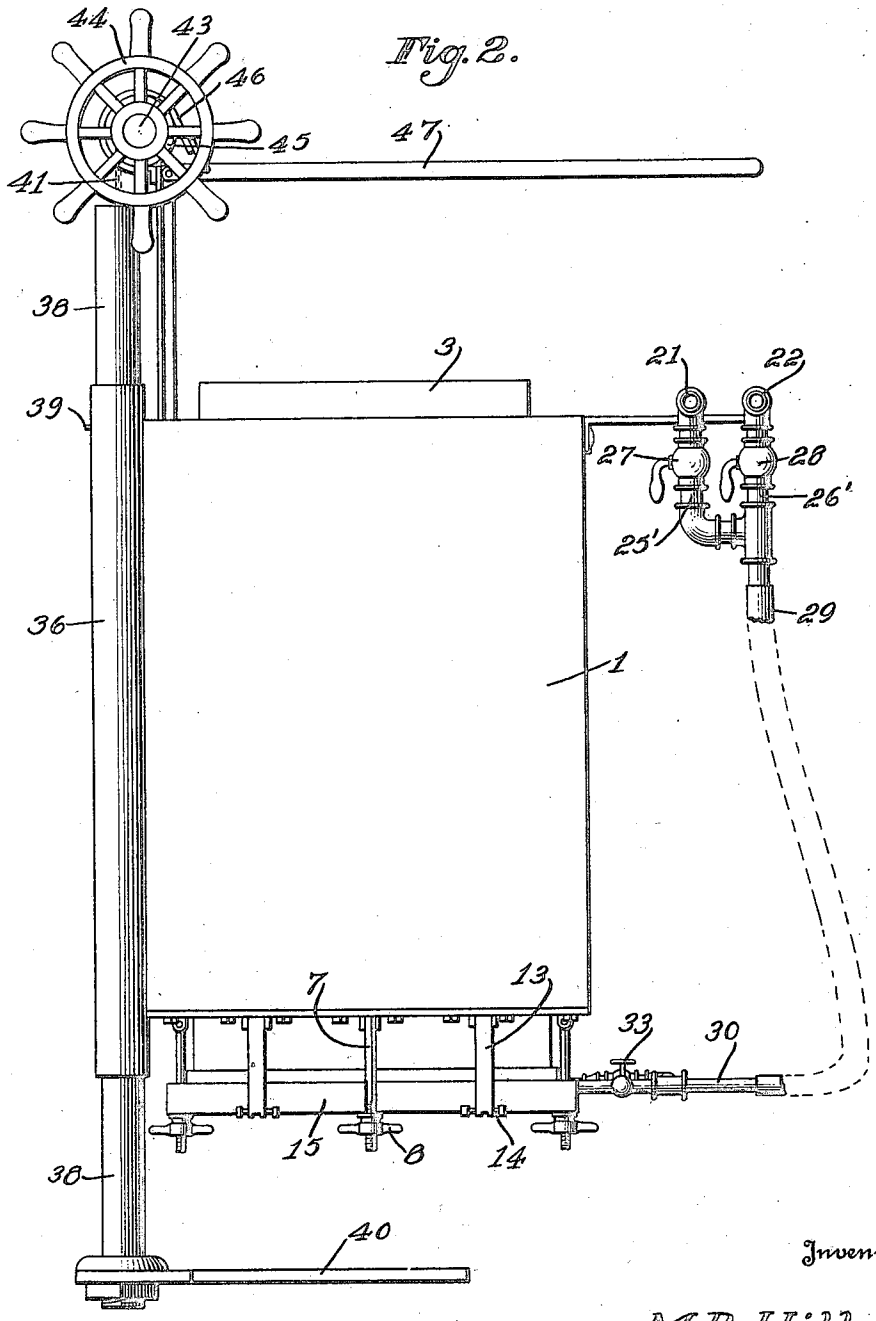
ICE MAKING APPARATUS.

APPLICATION FILED FEB. 21, 1922.

1,426,640. Patented Aug. 22, 1922.

5 SHEETS—SHEET 2.

Fig. 2.



Inventor

M. B. Hill.

By C. A. Snow & Co.

Attorney

M. B. HILL.

ICE MAKING APPARATUS.

APPLICATION FILED FEB. 21, 1922.

1,426,640.

Patented Aug. 22, 1922.

5 SHEETS—SHEET 3.

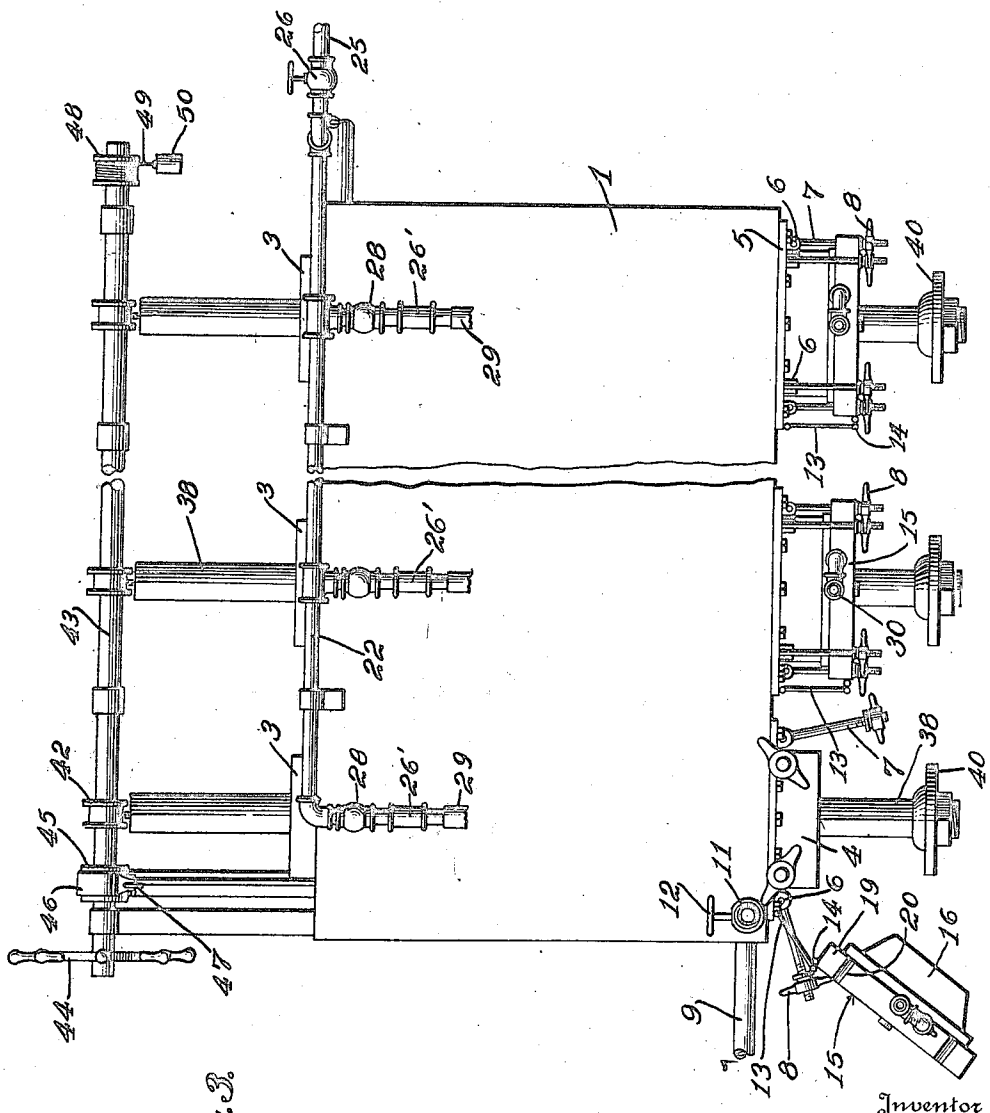


Fig. 3.

Inventor

M. B. Hill.

By C. A. Snow & Co.

Attorney

M. B. HILL.

ICE MAKING APPARATUS.

APPLICATION FILED FEB. 21, 1922.

1,426,640.

Patented Aug. 22, 1922.

5 SHEETS—SHEET 4.

Fig. 5.

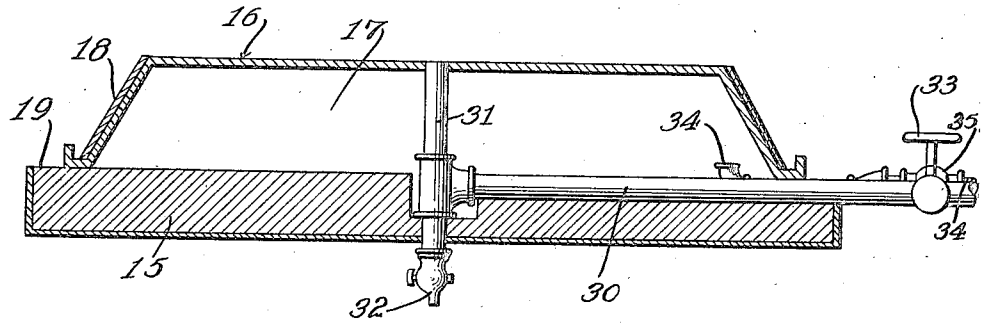
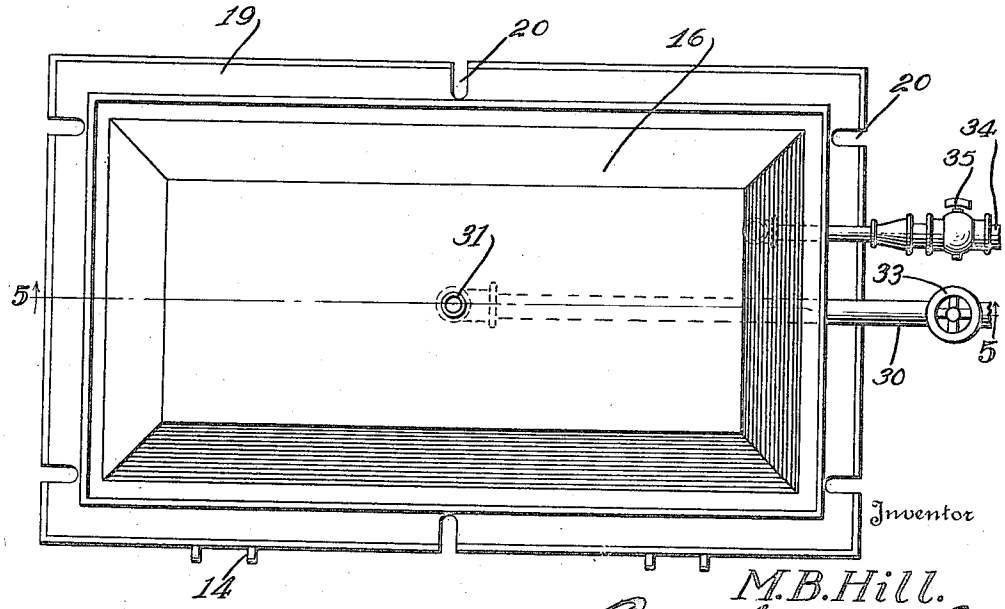


Fig. 4.



Inventor

M.B.Hill.

By Cushman & Co.

Attorney

M. B. HILL.

ICE MAKING APPARATUS.

APPLICATION FILED FEB. 21, 1922.

1,426,640.

Patented Aug. 22, 1922.

5 SHEETS—SHEET 5.

Fig. 6.

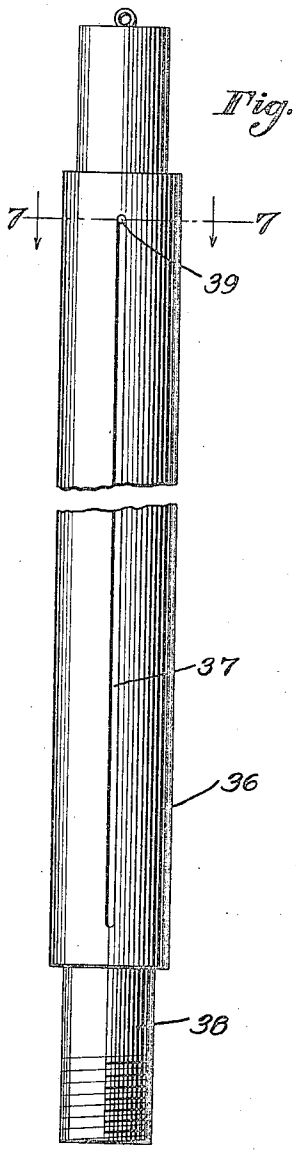


Fig. 9.

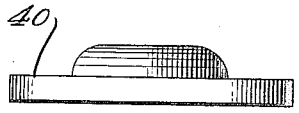


Fig. 10.

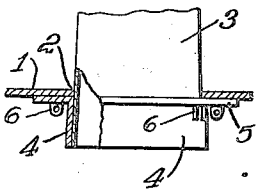


Fig. 8.

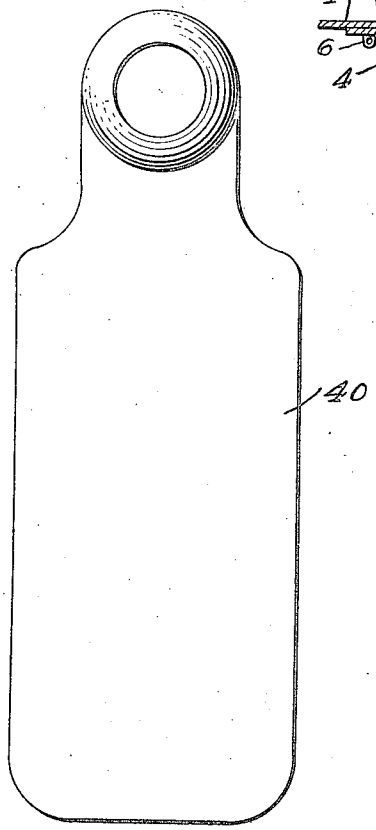
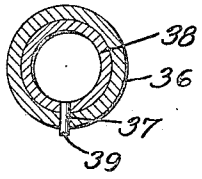


Fig. 7.



Inventor

M.B.Hill.

By Cushman & Co.

Attorney

UNITED STATES PATENT OFFICE.

MARTIN B. HILL, OF HOUSTON, TEXAS, ASSIGNOR OF FORTY-FIVE PER CENT TO J. J. SULLIVAN, OF HOUSTON, TEXAS.

ICE-MAKING APPARATUS.

1,426,640. Specification of Letters Patent. Patented Aug. 22, 1922.

Application filed February 21, 1922. Serial No. 538,274.

To all whom it may concern:

Be it known that I, MARTIN B. HILL, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented a new and useful Ice-Making Apparatus, of which the following is a specification.

This invention relates to apparatus for use in the manufacture of can ice, one of the objects of the invention being to greatly simplify the apparatus by providing an overhead tank containing stationary cans provided with doors at their lower ends whereby, after the completion of the freezing operation, the ice can be lowered and removed readily without requiring the use of expensive overhead carriers and other ice handling apparatus such as heretofore necessary.

Another object is to provide each can with a door of novel construction adapted to be heated so as to release it from the cake of ice and from the can, thus to free the ice and permit it to be removed easily.

Another object is to provide apparatus the cans of which are filled through the bottoms thereof, it being possible to agitate raw water with air, after being delivered to the cans, thus to produce cakes of ice without necessitating the use of distilled water.

A further object is to provide a means whereby, after the completion of the freezing operation, the water remaining in the cans and with which the sediment is mixed, can be drained out of the cans.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that, within the scope of what is claimed, changes in the precise embodiment of the invention shown can be made without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings

Figure 1 is a plan view of the apparatus, parts being broken away.

Figure 2 is an end elevation.

Figure 3 is a side elevation, parts being broken away and one of the bottom doors being shown open.

Figure 4 is a plan view of one of the doors.

Figure 5 is a section on line 5—5, Figure 4.

Figure 6 is an elevation of one of the guide tubes and the slidable member therein.

Figure 7 is a section on line 7—7, Figure 6.

Figure 8 is a plan view of one of the supporting brackets.

Figure 9 is an end elevation thereof.

Figure 10 is an elevation of a portion of one of the cans, parts being broken away and a portion of the bottom of the tank being shown in section.

Referring to the figures by characters of reference 1 designates a brine tank which can be suitably insulated and formed in the bottom of this tank at desired distances apart are openings 2 in each of which is fitted a can 3 the bottom of which is open. Secured around the lower end of the can is a reenforcing member 4 provided with a flange 5 riveted or otherwise fastened to the bottom of the tank thus to support the can within the tank. It is to be understood that the lower open end of the can is larger than the upper end and that the walls of the can converge upwardly. Ears 6 extend downwardly from the flanges 5 and support pivoted bolts 7 the threaded free end portions of which are engaged by wing nuts 8.

The brine tank 1 has an inlet pipe 9 opening into the lower portion thereof, this pipe having branches such as shown at 10 for directing the brine between the cans. A drain opening 11 can be provided near the bottom of the tank, there being a valve 12 for controlling the overflow of brine from the tank through this opening.

Connected to one of the flanges of each of the cans are the intermediate members 13 of double hinges, these intermediate members being pivotally attached, as at 14 to one side portion of a closure 15. As shown in Figures 4 and 5 the closure is provided on its inner side with a hollow, tapered extension 16 providing a heating chamber 17. This extension is designed, when the closure is shut, to fit tightly within the lower end of the can thereabove, there being any suitable arrangement of packing 18 for effecting a tight seal between the parts. Each closure is surrounded by a flange 19 in which are formed slots 20 open at their

outer ends. When the closure is shut these slots are designed to receive the bolts 7 and by turning the nuts 8 the closure can be forced tightly shut against the lower end of the can thereabove.

Adjacent the apparatus are provided two pipe lines, to wit, a water line 21 and an air line 22. A valve 23 is provided in the water line 21 and another valve 24 is provided in the air line 22. A steam supply pipe 25 can open into the air line 22 and has a valve 26. Depending from the pipe lines 21 and 22 opposite each of the cans 3 are communicating outlet pipes 25′ and 26′, there being a valve 27 in the pipe 25′ and a valve 28 in the pipe 26′. A flexible pipe 29 communicates with these connected pipes 25′ and 26′ and with a pipe 30 which extends into the closure 15 of the door or closure belonging to the can opposite which the pipes 25 and 26 are positioned. Formed within this closure at the center thereof is a discharge pipe 31 communicating with pipe 30 and having one open end flush with the surface of the extension 16. The other end of this pipe 31 opens outwardly through the closure and is provided with a drain tap 32. A valve 33 is preferably situated in the pipe 30. A branch pipe 34 extends from the pipe 33 and opens into the heating chamber 17, there being a valve 35 for controlling the flow of fluid through this branch pipe.

Located at one side of the tank and adjacent each of the cans 3 is a guide tube 36 having a longitudinal slot 37. A slide 38 is mounted in each tube and has a pin 39 projecting radially therefrom and slidable in the slot 37. To the lower end of each slide 38 is secured one end portion of a bracket 40 extending at right angles to the slide and normally projecting under the closure 15 adjacent thereto. The upper ends of the slides 38 are connected by chains or other strong flexible devices 41 to spools 42 secured to a longitudinal shaft 43. This shaft has a hand wheel 44 or the like whereby it can be rotated readily and secured to the shaft is a friction pulley 45 straddled by a brake band 46. This brake band is adapted to be operated by a lever 47 so as to control the rotation of the shaft. A spool 48 is attached to the shaft and has a chain or other flexible element 49 wound thereon and supporting a weight 50. This weight serves to hold the slides 38 normally elevated with the brackets 40 under and close to the closures 15.

In using this apparatus a circulation of brine is set up within the tank and the closures 15 are clamped securely in shut positions. All of the valves except valves 23 and 33 are then closed so that water will flow from the pipe line 21 to the several pipes 30 and thence upwardly through the branch pipes 31 into the cans. After the proper amount of water has been supplied to the cans the valves 33 and 23 are closed. Obviously where one or more of the cans is to be filled without filling the other can or cans the flow of water will be controlled by the manipulation of valves 27. Air is now directed into the cans by opening valves 24 and 28, this air flowing upwardly through the branch pipes 31 and thoroughly agitating the water in the cans. The air is shut off at the proper time and when the water has been frozen in the cans the drain cocks 32 can be opened so as to allow the sediment and the small amount of water containing the same to drain from the center of the can. The next step is to open the valve 26 while valve 24 is closed. Thus steam will be directed to the pipe 34 of each can, it being understood that valves 33 are first closed. The steam admitted in this way to the heating chamber 17 will thaw the ice away from the closures 15 and allow the closures to be lowered by releasing the bolts 7 therefrom. The ice blocks can thus be deposited on the brackets 40 which will support the blocks as long as the brake band 46 is properly applied to the brake pulley 45. By means of lever 47 the brake can be gradually released so that the brackets will move downwardly slowly carrying the cakes of ice therewith. After the ice has been removed from the brackets the weight 50 will return the brackets to their elevated positions and all of the parts can be reset so as to repeat the operation described.

It is to be understood of course that the tank 1 is to be supported in any suitable manner at a sufficient elevation above the floor to permit the blocks or cakes of ice to be handled and loaded therebeneath. No supporting means for the tank has been illustrated.

Instead of using steam for heating the closure of each can any other means, such as an electrical heater, could be provided in the closure.

What is claimed is:—

1. Apparatus of the class described including a tank, a can therein and opening downwardly through the bottom thereof, a closure for the bottom of the can, and means for heating the closure.

2. In apparatus of the class described a brine tank, a can therein and open at the bottom, a closure for the bottom of the can, means for fastening the closure in shut position, means for feeding water through the closure and into the can, and means for heating the closure.

3. Apparatus of the class described including a brine tank, a can opening downwardly through the bottom thereof, a closure for the bottom of the can, air and water supplies, means for directing either air or water from said supplies upwardly into the

can through the bottom closure, and means for directing a heating medium into the closure.

4. Apparatus of the class described including a brine tank, a can therein and opening downwardly through the bottom thereof, a closure for the bottom of the can, means for securing the closure in shut position, means for directing water into the can through the closure, means for directing air through the closure and into the can to agitate the water, a drain connected to the closure, and means for heating the closure.

5. In apparatus of the class described a brine tank, a can therein and opening downwardly therethrough, a closure for the bottom of the can, means for fastening the closure in shut position, movably mounted means extending under the can for receiving an ice block released from the can, and means for controlling the downward movement of said movable means when subjected to the weight of the ice.

6. The combination with a brine tank, a can therein and opening downwardly through the bottom thereof, and a closure for the bottom of the can, of ice supporting means movably mounted below the can, and means for controlling the downward movement of said supporting means when subjected to the weight of ice from the can.

7. The combination with a brine tank and a can therein and opening downwardly through the bottom thereof, of a closure for the bottom of the can, a slide, means extending from the slide for receiving the weight of the ice when delivered downwardly from the can, and means for controlling the downward movement of the slide.

8. The combination with a brine tank and a can therein and opening downwardly through the bottom thereof, of a closure for the bottom of the can, a slide, means extending from the slide for receiving the weight of the ice when delivered downwardly from the can, means for controlling the downward movement of the slide, and means for automatically returning the slide to its initial position when relieved of its load.

9. The combination with a brine tank, a can therein and opening downwardly through the bottom thereof, and a closure for the bottom of the can, of a slide, a guide therefor, a bracket extending from the slide and under the can for receiving the weight of a released block of ice, means rotated by the downward movement of the bracket when subjected to the weight of the ice, a brake for retarding the rotation of said means, and means for automatically returning the slide and bracket to their initial positions when relieved of their load.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MARTIN B. HILL.

Witnesses:
M. C. Boyle,
J. M. Clark.