A. H. BUCKLEY.

MANUFACTURE OF ICE.

APPLICATION FILED MAY 6, 1909.

961,839. Patented June 21, 1910.

Fig. 1.

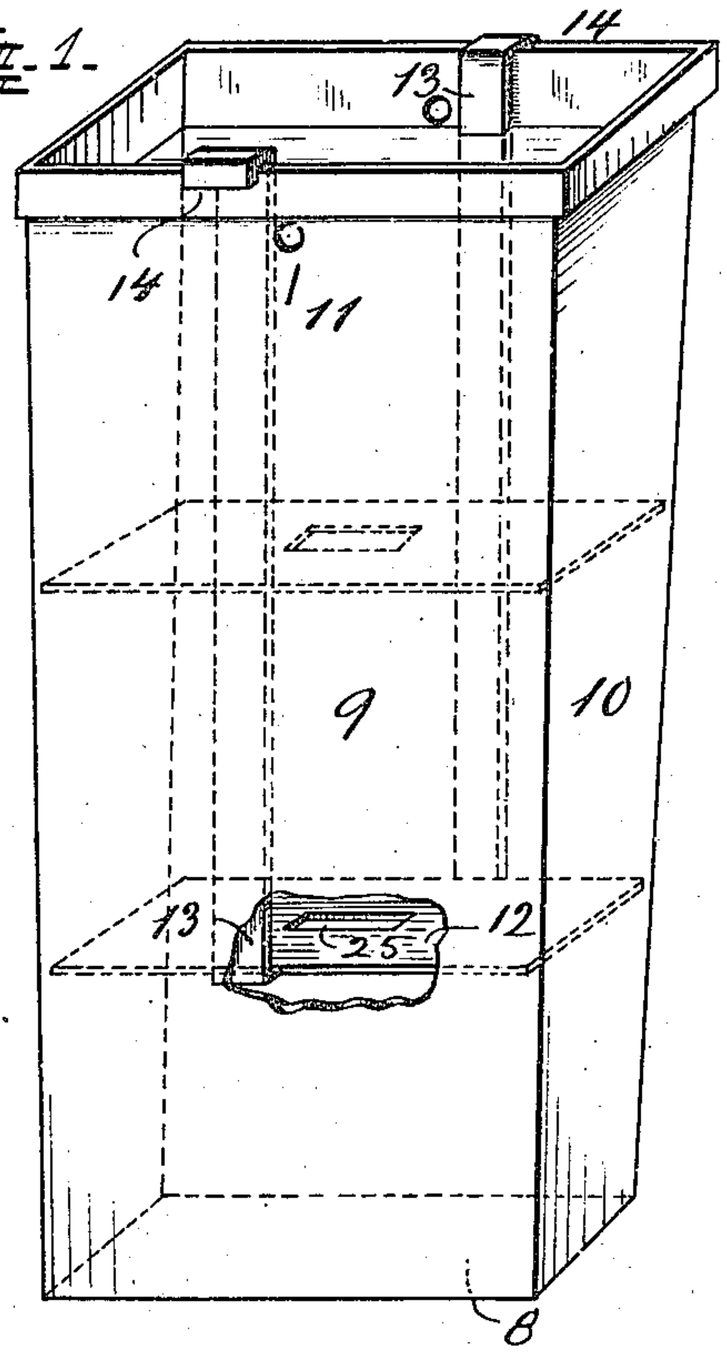


Fig. 2.

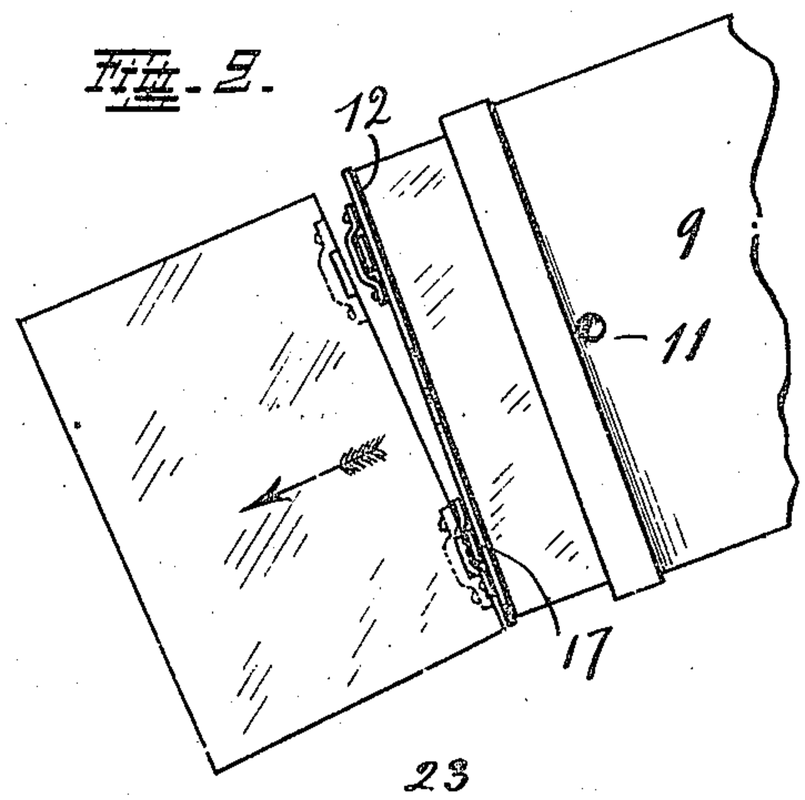


Fig. 3.

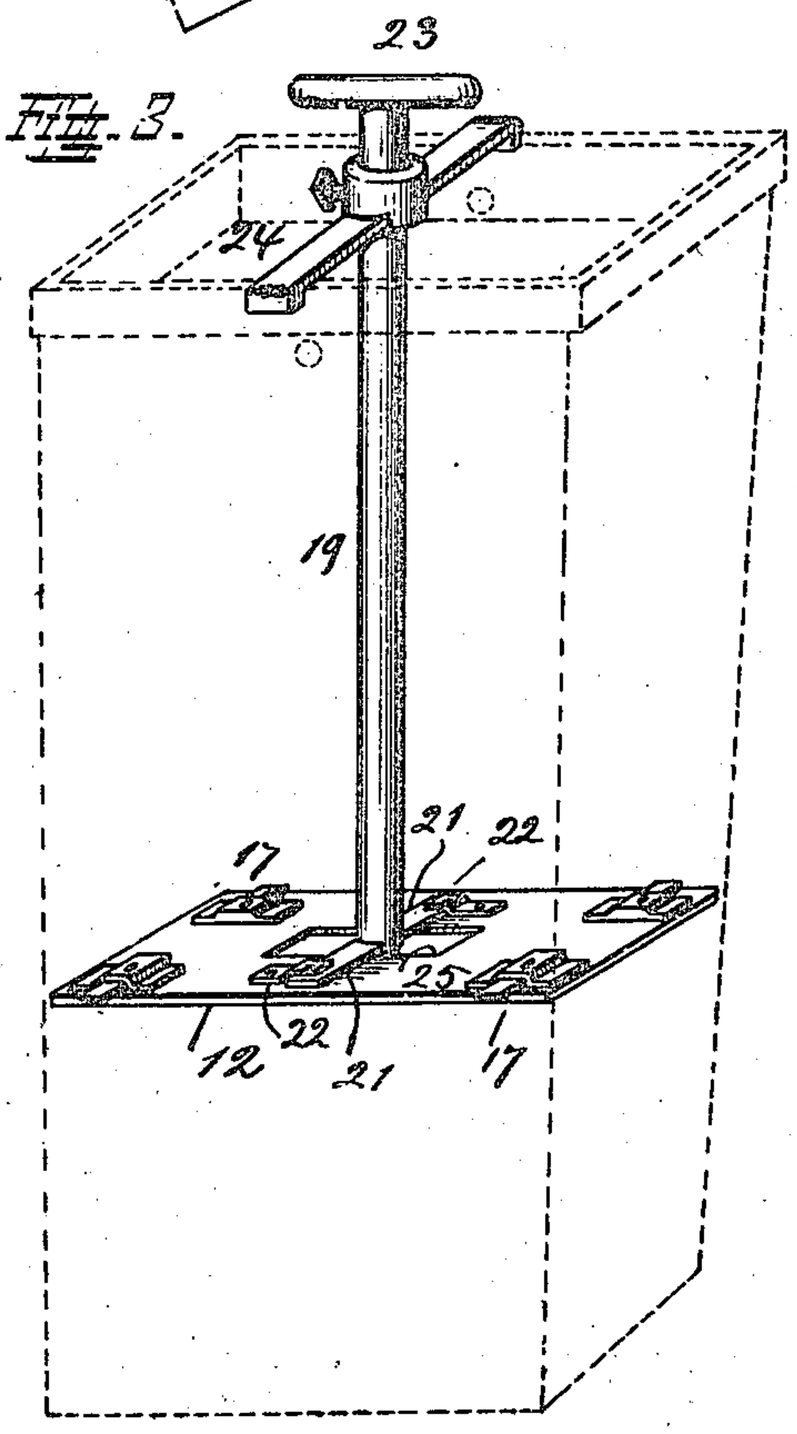


Fig. 4.

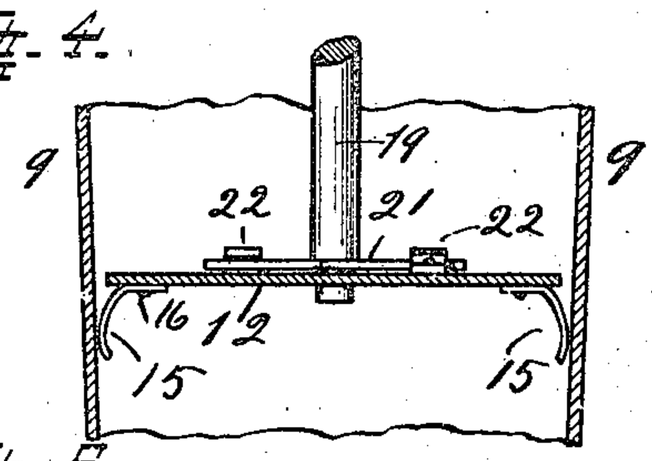


Fig. 5.

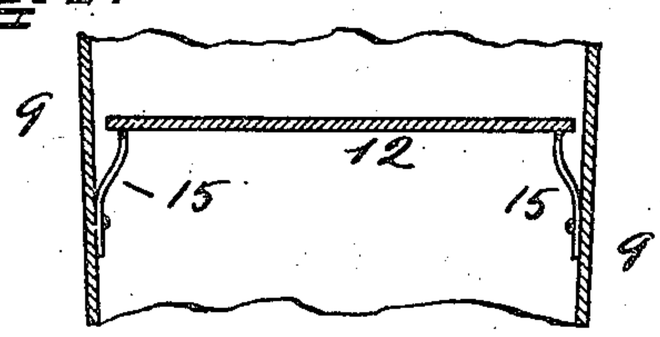
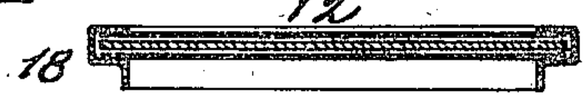


Fig. 6.



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MANUFACTURE OF ICE.

961,839. Specification of Letters Patent. Patented June 21, 1910.

Application filed May 6, 1909. Serial No. 494,208.

To all whom it may concern:

Be it known that I, ARTHUR H. BUCKLEY, a citizen of the United States, and residing at Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements to be Used in Connection with the Manufacture of Ice; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying drawing, with the reference characters marked thereon, which forms also a part of this specification.

This invention relates to improvements to be used in connection with the manufacture of artificial ice.

In the most usual method of manufacture, the water to be changed into ice, is contained in cans which are surrounded by a refrigerating agent. After the water in them has been frozen, the ice in form of a block is removed from the can. In another form, water is caused to lie against a cooled surface by which it is frozen, the resulting ice being in form of a large sheet, also called plate-ice. These pieces of ice are quite heavy, the ice blocks produced in cans weighing from 300 to 600 pounds, while plate-ice weighs twice and more times as much. Reduction of these large pieces becomes necessary to facilitate their handling when distributed to the trade. For such purpose these larger pieces are subdivided in two or more smaller parts in which form the ice may be more readily handled, moved and loaded upon delivery wagons etc. Various devices are used for such purpose to cut up and otherwise to subdivide these blocks. Heat is used in connection with some of these devices, the ice being thawed apart. This manipulation requires time and is accompanied with loss of ice. I have discovered that without yielding the advantage of freezing larger bodies of water at once, blocks of smaller sizes may nevertheless be obtained at the same time by supporting in a certain manner a medium of certain material in the water which prevents this latter from freezing into a solid one piece-block.

In the following specification and particularly pointed out in the claims at the end thereof, will be found a full description of my invention, together with its manner of use, parts and construction, which latter is also illustrated in the accompanying drawing, in which:—

Figure 1, shows in perspective view one of the customary freezing-cans used in ice manufacturing plants to hold the water to be frozen. Fig. 2, is a side-view of this can showing how the same is tilted to an inclined position to release the ice-block contained therein. Fig. 3, illustrates in perspective view an implement used in connection with my invention. Figs. 4 and 5, are intermediate portions of enlarged cross sections of a can as shown in Fig. 1, the invention being shown in modified form in each figure. Fig. 6, illustrates another form of my invention in an enlarged cross-section.

Where block-ice is manufactured, box-shaped cans are used, which are open at one of their ends to admit the water and to permit removal of the ice after the water is frozen. The walls of these cans toward the other end opposite the open end draw in somewhat, giving the can a taper to cause the ice to leave the same more freely. This closed end which constitutes the bottom of the can is usually of rectangular shape as shown at 8 in the drawing.

9 are the wider sides and 10 are the narrower sides of the can. In two of the opposite sides, usually the wider ones, there are opposite openings 11, which permit application of the attaching means of a suitable hoisting apparatus whereby the can is lifted after the water therein is frozen and manipulated thereafter to obtain the ice-block therefrom. This manipulation consists of depositing the can upon a device called ice-dump, and of tilting it thereby to a position as shown in Fig. 2, whereafter, heat having been applied in a suitable manner, the ice is quickly released and slides out of the can. The manufacture of plate-ice differs at this point somewhat the ice which has formed being lifted out of the water which remains unfrozen, means like rods with eyes, permitting connection of hoisting apparatus to be made, having been frozen in with the ice. In either case the blocks or plates produced by either of these methods are too large to be handled conveniently and they are at once sub-divided as before alluded to, by any of the various means provided for the purpose.

By freezing in with the ice, a suitable

medium which prevents the water from freezing into one continuous solid block, the aforesaid sub-division may be already obtained while the ice is forming so that no further manipulation for this purpose becomes necessary after the ice has been removed from the container in which it has been formed.

My invention consists of supporting within the water to be frozen and in a certain manner and by certain means, one or more dividing partitions or diaphragms 12 which, while in no way interfering with the freezing of the water, prevent nevertheless the formation of a solid, continuous block. Instead the tenacity of the block at the particular place or places is so reduced that no cutting manipulation is required to cause it to come apart along the lines of intended subdivision. As a matter of fact, the block usually falls apart on leaving the can as indicated in Fig. 2. Obviously these diaphragms should be as thin as possible to prevent avoidable reduction of the capacity of the cans. Material in sheet-form is therefore used which by preference should be of a character which does not favor adherence to the ice and readily separates therefrom. In size such a sheet should be so fitted to the can that it may be readily placed in position and freely moves out with the ice. It should also by preference fit so loose as to permit any movement of the water which may take place during freezing. For this latter purpose, one or more openings are provided in the sheet as shown at 25.

Since material which is a good temperature-conductor favors formation of ice, sheets of such material (any sheet-metal) would cause ice to form over them and across the can, closing the openings in the sheet before the water below the sheet has frozen. This would interfere with the free movement, during freezing of the water so entrapped and cause distortion of the dividing-sheet, or of the can. To obviate this difficulty, material which does not favor such conditions is used. Such materials are wood, paste-board, celluloid, rubber and similar materials which do not readily conduct temperatures. Such materials require a protective coating to preserve them against moisture, for which purpose any material, not soluble in water, like varnish, paint, paraffin etc. may be used. Materials of that kind also prevent adherence to the ice and favor ready separation. Such a protecting coating may also be obtained by inclosing a sustaining sheet between sheets of protecting material, which latter may be sheets of oil-paper, or paraffin-paper as indicated in Fig. 6. Such a composite plate, or one of material having insufficient rigidity may be held to shape by a sustaining frame as shown at 18 in Fig. 6. These dividing-sheets are held in proper position by suitable means as straps 13, for instance engaging them at their edges and having hooks 14, to support them in the can. The frictional contact of spring-pressure is also sufficient, since these sheets are not subject to any influence tending to shift them, and their position becomes fixed as soon as the freezing process starts. Such means are shown in Figs. 4 and 5, where springs 15 are used at the edges of the sheet, which in Fig. 5 are attached to the inside of the can and in Fig. 4, they are attached to the sheet at the edges thereof as shown at 16. In either case they yield when the ice slides out.

Another form is shown in Fig. 3, where spring-actuated contact-pieces 17 are used, slidingly fitted into housings at the edges of the sheet and similar to a spring-catch or lock-bolt. These holding-means should be so located that none of them are on that side upon which the block rests while sliding out of the can (see Fig. 2). The cans are quite deep, varying from 5 to 8 feet for block ice and more for the containers in the case of plate ice. A suitable holding-implement is therefore required to place the dividing sheets in position. Such an implement is shown in Fig. 3, 19 being its shank which is of a length sufficient for the purpose. Means permitting temporary attachment of the sheets are provided at its lower end which may be in form of arms 21 and are adapted to engage with lugs 22 on the upper side of the partition. A brace 24 fitted to engage the upper edges of the sides of the can and which is attached to shank 19 determines the depth of insertion. A turn in proper direction by means of handle 23 serves to disengage the implement. Observe also Fig. 4.

For larger containers, particularly plate-ice, provision may also be made for vertical division. In plate-ice, due regard must be had in devising shape and size of these dividing sheets, to clear any means as for instance the lifter-rods referred to before which are frozen into the ice and whereby the same is raised out of the water.

Having described my invention, I claim as new:

1. In the manufacture of artificial ice, the combination of a sheet-metal container adapted to hold water to be frozen, a dividing sheet which serves to sub-divide the ice by being frozen into the same and means at the edges thereof to detachably support the sheet in the container which holds the water to be frozen to produce the ice.

2. In the manufacture of artificial ice, the combination of a container which holds the water out of which the ice is formed, a sheet to divide the ice horizontally adapted to be supported in this can and below the water

therein and means at the edges of the same to hold it temporarily in horizontal position within the container.

3. In the manufacture of artificial ice, the combination of a container which holds the water out of which the ice is to be formed, a dividing sheet, means to hold the same in position below the water and an implement adapted to detachably engage this sheet and serving to place the same in position.

4. In the manufacture of artificial ice, the combination of a box-shaped can to hold the water to be frozen, said can having opposite narrow and opposite wider sides, a rectangular sheet to separate the ice horizontally and being of dimensions equal to the interior dimensions of the can at the height where said sheet is located and means to detachably hold this sheet in the particular position within the can where the ice is to be divided, said means being provided exclusively on the long edges of the sheet.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ARTHUR H. BUCKLEY.

Witnesses:

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T. LE BEAU.