No. 622,860. Patented Apr. 11, 1899.

P. MARTIN.

APPARATUS FOR FORMING ICE.

(Application filed Dec. 29, 1896.)

(No Model.)

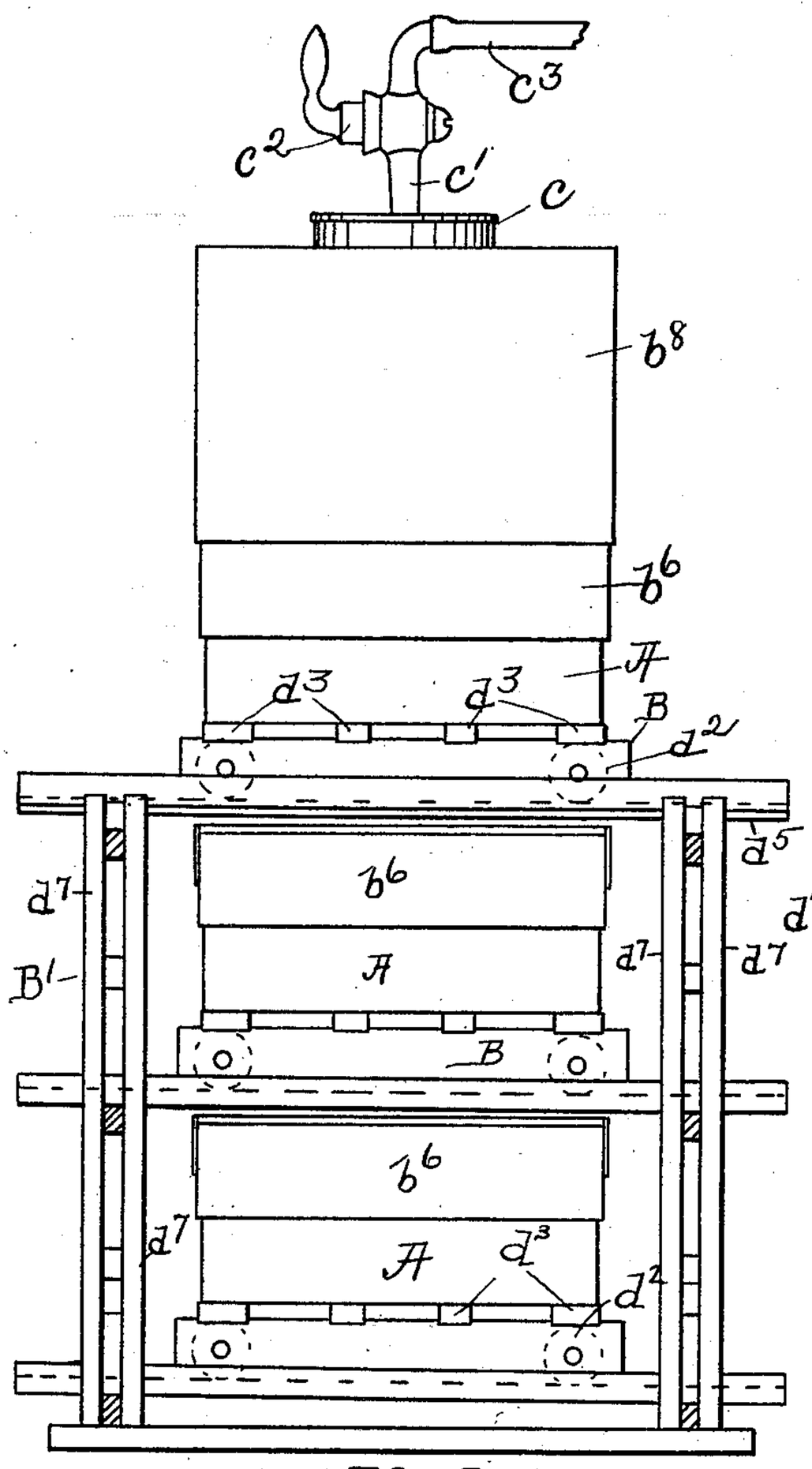

Fig. 1.

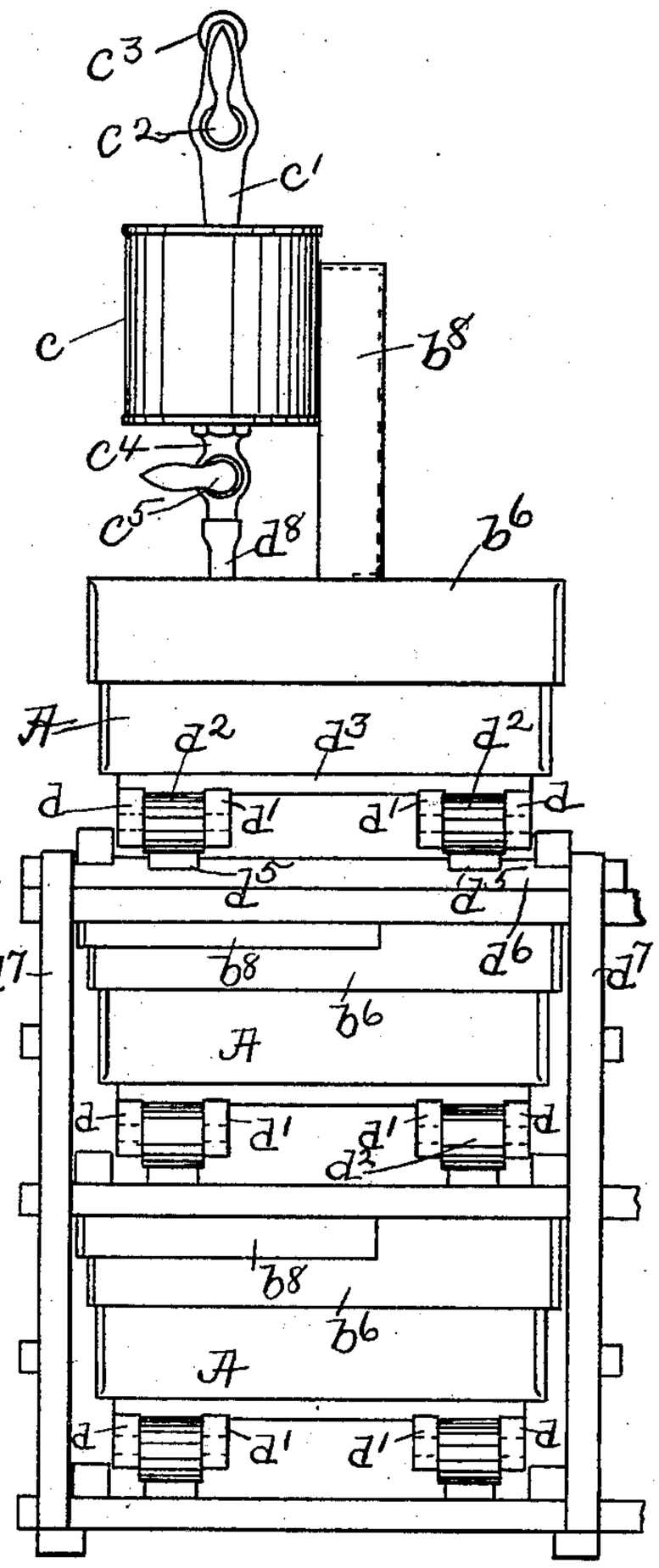

Fig. 2.

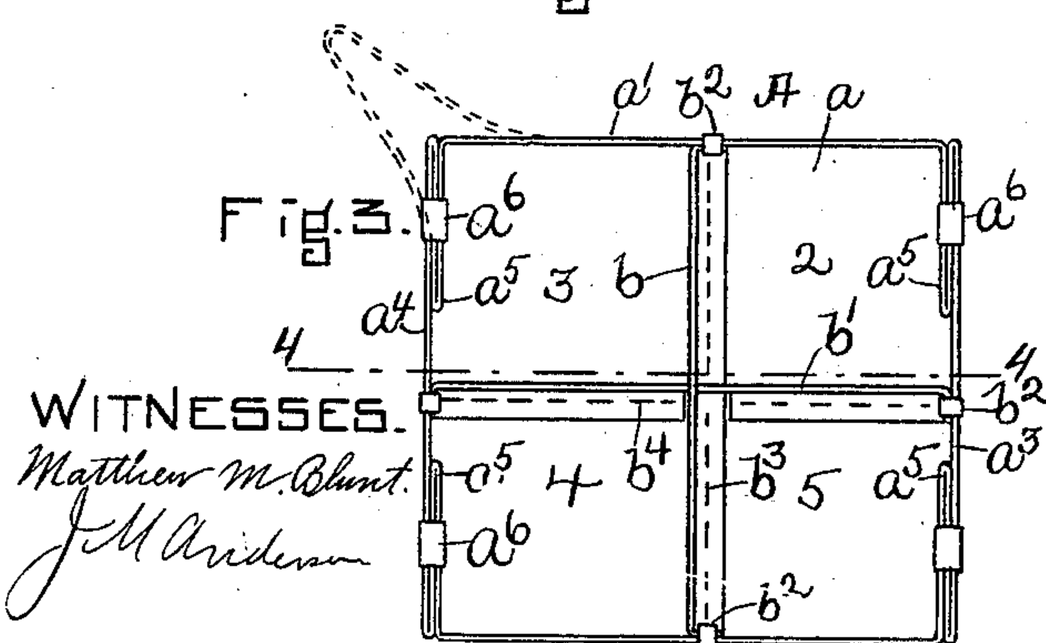

Fig. 3.

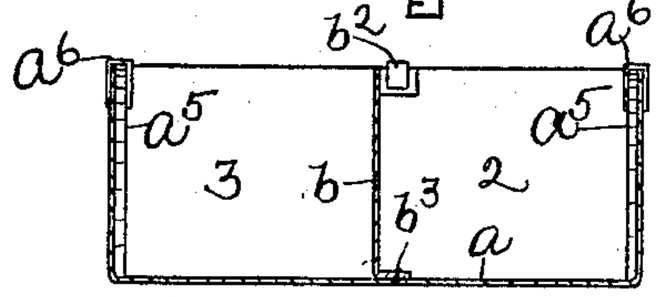

Fig. 4.

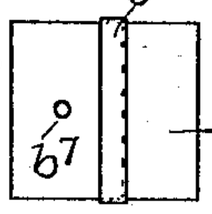

Fig. 5.

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UNITED STATES PATENT OFFICE.

PEARL MARTIN, OF MEDFORD, MASSACHUSETTS.

APPARATUS FOR FORMING ICE.

SPECIFICATION forming part of Letters Patent No. 622,860, dated April 11, 1899.

Application filed December 29, 1896. Serial No. 617,310. (No model.)

To all whom it may concern:

Be it known that I, PEARL MARTIN, residing in Medford, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Methods of and Apparatus for Forming Ice, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to a novel apparatus for the manufacture of natural ice whereby blocks or cakes of ice of convenient size for handling may be obtained substantially free from bacteria.

In accordance with this invention a measured quantity of pure water, preferably spring-water, but which may be filtered or sterilized, is run into a mold composed of textile material, preferably duck or canvas, having textile partitions forming chambers within the mold of a size and area it is desired each block of ice should possess. The mold is provided with a germ-proof removable top or cover having an inlet-opening for the water-supply pipe and provided with a valve normally covering the inlet-opening in the cover. The water to be frozen spreads itself over the bottom of the mold to the same depth in each compartment and is protected from germs contained in the air by the germ-proof nature of the mold and its cover or top.

To facilitate the removal of the blocks of ice from the molds, the latter are provided with inwardly-folded corners, which are normally retained together by suitable clips or fastening devices, and when the cakes of ice have been formed in the mold the individual cakes formed in the various compartments may be removed readily by removing the clips and enlarging the compartments of the mold by bending outward the inwardly-folded corners. In practice the molds may be supported upon a carriage having its upper surface level and its lower surface inclined and movable on a supporting frame or run located outside of and adjacent to a suitable storehouse. A number of carriages are designed to be used in connection with a single storehouse, so that a single attendant is enabled to fill and take care of a number of molds. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a side elevation of an ice-forming apparatus embodying this invention, the flap of the cover being shown as elevated to uncover the inlet-opening for the water; Fig. 2, an end elevation of the apparatus shown in Fig. 1, looking toward the right; Fig. 3, a top or plan view of the form of mold preferred by me with its cover removed; Fig. 4, a sectional view of the mold shown in Fig. 3 on the line 4 4; and Fig. 5, a detail, on a smaller scale, of the cover for the mold removed and the flap raised to show the water-inlet.

Referring to Figs. 3 and 4, A represents a mold of germ-proof material, such as duck or other like textile material, and which consists of the bottom a, the sides a' a^2, and ends a^3 a^4, having inwardly-folded portions or corners a^5, which are properly secured, as represented by the full lines in Fig. 3, by fastening devices or clips a^6.

The mold A is preferably subdivided by cross-partitions b b' into four compartments 2 3 4 5, which are preferably made of a size or area to form a cake of ice of the desired size and thickness. The transverse partitions b b' may and preferably will be made of textile material, such as duck, and for the best results the said partitions are detachably secured, as by clips b^2, to the sides and ends of the mold, the said partitions being secured to the bottom a of the mold in any suitable manner, and in the present instance represented as secured by rows of stitches b^3 b^4. The partitions b b' at the point of intersection are cut or split for a portion of their height or width and are also separated at their ends from the sides and end walls of the mold, so as to leave spaces through which the water admitted into one of the compartments or chambers may find its way into all the other compartments or chambers.

The mold A is provided with a cover b^6, (see Figs. 1 and 2,) which fits down over the mold, so as to practically close the same air-tight, and the cover b^6 is provided in its top surface with a water-inlet b^7, (see Fig. 5,) which during the process of freezing is closed

or covered by a flap-valve b^8 of textile material, which may be sewed or otherwise secured to the cover b^6.

The mold A in accordance with this invention is adapted to have admitted into it a predetermined quantity of water, which quantity is less than the capacity of the mold and preferably such quantity as will fill the mold to the depth of about one inch. This quantity of water, which may and preferably will be spring-water or filtered or sterilized water, is supplied to the mold through a measuring device or apparatus, herein shown as consisting of a closed vessel c, provided with an inlet-pipe c', having a cock or valve c^2, and which inlet-pipe is designed to be connected by a hose or other pipe c^3 with a tank or other suitable source of supply, (not herein shown,) and the vessel c is provided with an outlet-pipe c^4, having a cock or valve c^5 and adapted to be inserted into the mold through the opening b^7 in the cover b^6. The cock or valve c^2 is open when the cock or valve c^5 is closed, so that the measuring vessel c may be filled with a predetermined quantity of water, and when so filled the cock or valve c^2 is closed and the cock or valve c^5 opened, and the predetermined amount of water in the measuring vessel c will flow into the mold A and cover the bottom of the same, preferably to the depth of about one inch. This quantity of water is exposed to the cold of the atmosphere until frozen, and when frozen a second predetermined amount or quantity of water may be admitted into the mold A to form a second layer of ice. In this manner the mold A becomes filled with ice composed of successive layers welded or united as one body.

The measuring device and the mold A may be used alone for isolated plants; but when it is desired to manufacture ice on a large or commercial scale I prefer to employ a series of molds A, herein shown as three in number, but which may be of any desired number, each mold being supported upon a carriage B, comprising, as herein shown, two sets of side frames $d\ d'$, forming bearings for antifriction-rollers d^2, the said side frames supporting a platform or top frame composed of cross-bars d^3. The side frames $d\ d'$ of the carriage are made level on their upper side, so that the platform d^3 may be level to keep the bottom of the mold A level, and thereby insure the building up of the cake of ice in layers of uniform thickness, and to facilitate the removal of the carriage, with its mold, from the staging or frame B' the side frames $d\ d'$ of the carriage are inclined or tapered on their under side, so that the carriages may run with the least possible amount of labor or power down the tracks or ways d^5, which are secured to cross beams or bars d^6, fastened to upright side pieces d^7 of the staging B'. The outlet-pipe c^4 for the measuring vessel c may and preferably will have attached to it a hose or other flexible pipe d^8, which may be made of sufficient length to enable it to be used to fill any of the molds A, supported by the framework or staging, so that as soon as one mold—as, for instance, the top mold—has been supplied with a predetermined amount of water the operator can close the flap or valve b^8 of this mold and then carry the flexible hose or pipe d^8 to the mold next below the top mold, and so on. In this manner one workman can attend to the filling of a large number of molds. The measuring apparatus or vessel c is designed in practice to be of such size that it can be readily handled by the operator.

By means of the inwardly-folded corners a^5 of the mold each chamber or compartment of the mold may be enlarged by turning outward the inwardly-folded corner, as represented by the dotted lines in Fig. 3, so that the cake of ice in any compartment may be readily removed.

To prevent rain or snow water from penetrating into the mold from the outside when the apparatus is exposed to the air in the process of freezing, which rain and snow water are liable to contain germs and would, therefore, contaminate the pure ice in the mold, the outside of the textile mold may and preferably will be rendered waterproof by a thin coating of shellac or other suitable material.

I claim—

1. A mold for forming ice composed of textile material having a bottom, and sides provided with inwardly-folded corners, and partitions of textile material secured in said mold, substantially as described.

2. A mold for forming ice composed of textile material having a bottom, and sides provided with inwardly-folded corners, partitions of textile material secured in said mold, a cover for said mold having an inlet-opening, and a flap or valve secured to said cover to close said inlet, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PEARL MARTIN.

Witnesses:
JAS. H. CHURCHILL,
J. MURPHY.