

CHARLES F. PIKE'S 3 Sheets--Sheet 1.
 Apparatus for Cooling and Preserving.
 No. 120,667. Patented Nov. 7, 1871.

FIG 1

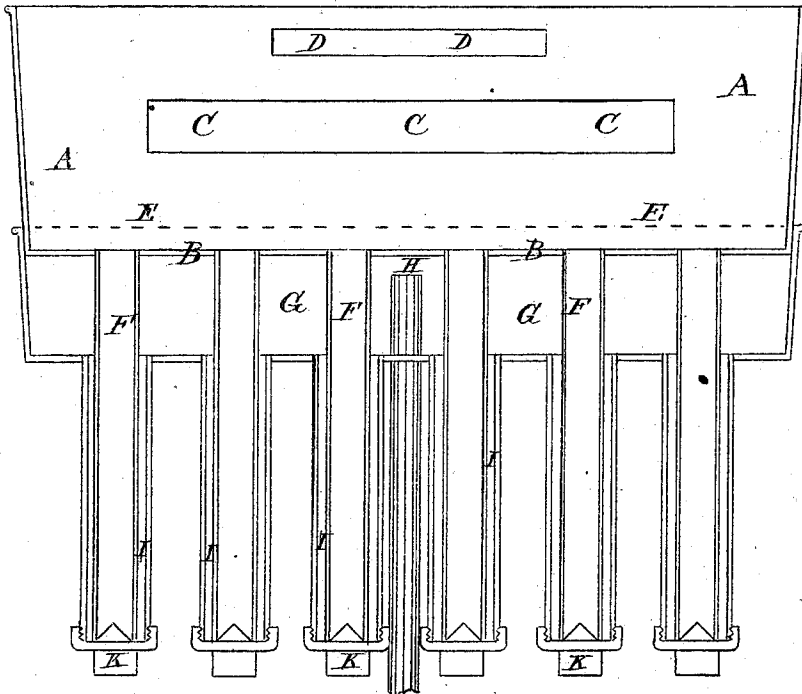
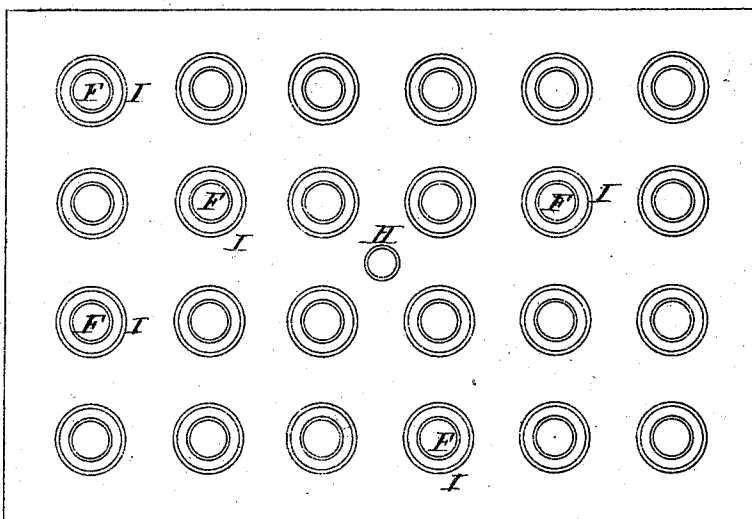


FIG 2



WITNESSES.

INVENTOR.

James Grinnell
Charles F. Pike
Charles Wilson

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FIG 1

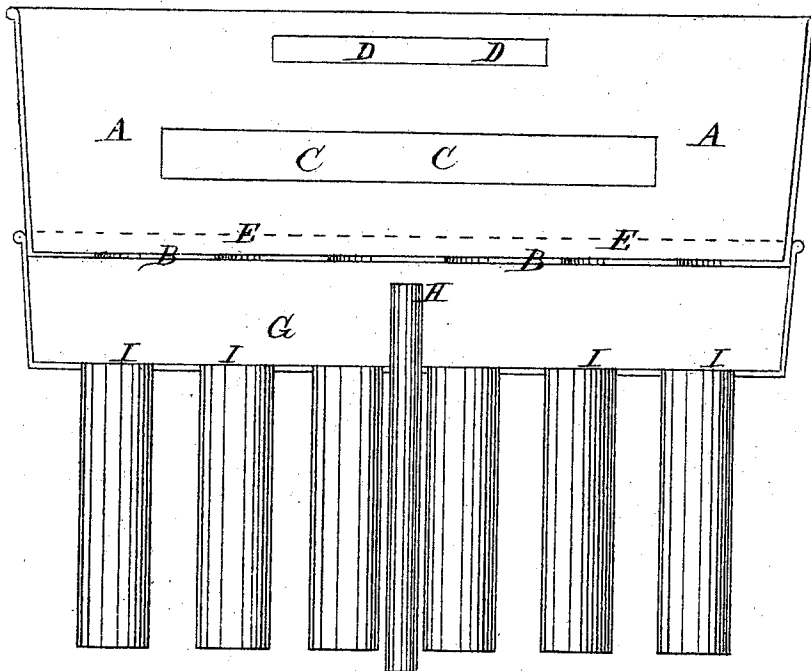
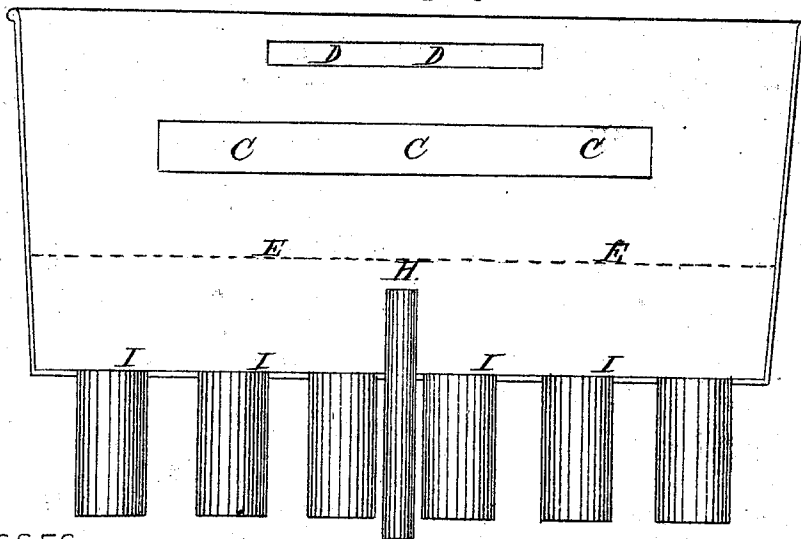


FIG 2



WITNESSES

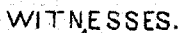
INVENTOR.

Amos Grinnell
Chas. Wilson *Charles F. Pike*

CHARLES F. PIKE'S

No. 120,667.

Patented Nov. 7, 1871.



WITNESSES.
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Chas C. Pierson

INVENTOR.

Charles F. Pike

UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN APPARATUS FOR COOLING AND PRESERVING.

Specification forming part of Letters Patent No. 120,667, dated November 7, 1871.

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, of the city and county of Providence and State of Rhode Island, have made a new and useful improvement in the construction of ice-chambers for preserving-houses, refrigerators, railroad cars, breweries, and other structures which are cooled by the use of ice; and I hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawing which forms a part of this specification.

In cooling by the use of ice it is usual to place the ice either in a part of the chamber to be cooled, so that the air therein comes in direct contact with the ice, or in a closed box. In the former case the air is only cooled as it passes over the ice; in the latter the cooling surface is limited to the surface of the ice-receptacle. When the ice is inclosed in a box, unless provision is made to carry off the water as the ice melts, it accumulates around the ice and soon melts it away. When the water is drawn off or removed as it melts it carries down with it much of the cooling effect.

The object of my invention is, first, to prevent the ice from melting, except as it is used in cooling the air; second, to present a large cooling surface to the air, so as to keep up a uniformly-low temperature in all parts of the chamber to be cooled; and third, to obtain all the cooling effect from the water or melted ice before it is drawn off or removed from the cooling-chamber. To this end the ice is placed in a suitable metal box or chest, on a latticed or perforated false bottom, so that the ice will not cover up the holes in the true bottom and prevent the water resulting from the melting of the ice from escaping. This false bottom is made preferably of wood, but may be of metal. The true bottom of the ice-box is perforated and has tubes inserted to carry off the waste-water. These tubes are surrounded by tubes of larger diameter, fitted on the lower end, with a cap and opening at the upper end, in a tank, which, for compactness, is placed just beneath the ice-box, but which may be placed in any convenient position lower than the bottom of the ice-box. The water descends the inner pipe from the ice-box, ascends the outer pipe, empties into the tank below the ice-box, and is carried off by a pipe fitted with a suitable trap at the end to prevent the entrance of hot or the exit of cold air, and rising above the bottom

of the tank. By this means the water loses none of its cooling effect by being drawn off as soon as formed. The tank may be fitted with a faucet, and the water used to drink; or if not sufficiently cold already it will require a much smaller quantity of ice to cool it enough. The descending tubes may be omitted and the water allowed to trickle through the bottom of the ice-box into the tank, and, after filling the tubes and the tank to the level of the waste-pipe, to escape. The pipes descending from the tank will always be filled with cold water, as the water from ice, by reason of its greater specific gravity, will sink, driving off the warmer water, now of no use, by the waste-pipe. The ice-box and tank may be combined in one, and a rack placed across for the ice to rest on above the level of the water. A waste-pipe alone may be also used, descending directly from the ice-box, and bent or coiled so as to offer a large surface for the cooling of air, and then ascending nearly to the bottom of the ice-box and passing off through a suitable trap. The ice-box is provided with two sets of openings, one above for the warm air to enter from the provision-chamber, and one below for the cooled air to descend into the provision-chamber. By this arrangement there is a larger surface of cold metal always exposed to the air, and the water resulting from the melting of the ice is not permitted to leave the chamber till it has had its complete cooling effect upon the air.

The following description will enable any one skilled in the art to make and use my invention.

In the drawing, Figure 1, Plate 1, represents my invention. A is the ice-box; D D D and C C C, the upper and lower openings for the passage of air. B is the bottom of the box, perforated, and having attached tubes F F F. These tubes have a piece of this shape $\wedge$ cut out, as shown in the drawing, so as to allow the passage of water from the pipes F F F to the pipes I I I; or they may end a sufficient distance above the cap K for the same purpose. I I I are pipes surrounding the pipes F F F, and connecting with tank G. K K K are caps fitting over the ends of the pipes I I I; these are fitted with screw-threads so as to be removed for the cleaning of the pipes. H is a pipe rising above the bottom of the tank G, and fitted at the end with any suitable trap. The dotted lines E E show the position of the false bottom of the ice-box.

Fig. 2, Plate 1, shows the bottom of the tank G,

looking from above, the letters corresponding to those in Fig. 1. The ice is placed on the false bottom E in the ice-box A. The water as it forms passes through the perforations or lattice of this false bottom to the bottom B of the box. From this it passes down the pipes F F F and up the pipes I I I into the tank G. This tank gradually fills until the water reaches to the top of pipe H, by which it passes off. The pipe H, by which it passes, has on its end (not shown) any suitable device for preventing the entrance of hot and exit of cold air. On first putting the ice into the ice-box it is better to fill the tubes F F and I I with cold water, and also the device on the end of the waste-pipe H, so that the exterior warm air may be excluded. The ice-box, tank, ascending and descending tubes, and waste-pipe may be of any convenient shape and size. The waste-pipe should rise about one and a half inch above the bottom of the tank. The descending and ascending tubes may be of any convenient length, depending on the quantity of air to be cooled and the quantity of water flowing through them.

Fig. 1, Plate 2, represents a modification of my invention. In this the descending tubes F F are omitted, and the water from the ice passes directly through the bottom D of the ice-box into the tank, the cold water sinks to the bottom of the tubes I I, and the warmer surface water passes off by the waste-pipe H. The other letters represent the same parts as in Plate 1. In Fig. 2,

Plate 2, the ice-box and tank are combined, and the ice is placed on a false bottom, E E. The other letters the same as in Plate 1.

Plate 3 represents another modification of my invention. The waste-water passes off from the ice-box by a pipe, F, which is coiled or bent so as to offer a large cooling surface. It then ascends nearly to the level of the bottom B of the ice-box, and, descending, empties into the pan L placed at the bottom of the chamber to be cooled, from which it passes off by a trap or suitable device, P, outside of the chamber.

My invention may be manufactured either stationary or movable, so as to be applied to any cooling-chamber already constructed.

I do not limit myself to the exact arrangement of parts, nor to the size of the several devices used to carry out my invention, since these may be greatly varied, according to the special use to which the invention is to be applied.

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

The cooling apparatus herein described, consisting of an ice-receptacle, in combination with a series of metal tubes, so as to utilize both the direct cooling effect of the ice and of the water which results from the melting of the ice.

CHARLES F. PIKE.

Witnesses:

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(58)