2 Sheets—Sheet 1.

E. P. LORCH.

Apparatus for Making Ice.

No. 207,290. Patented Aug. 20, 1878.

Fig. 1.

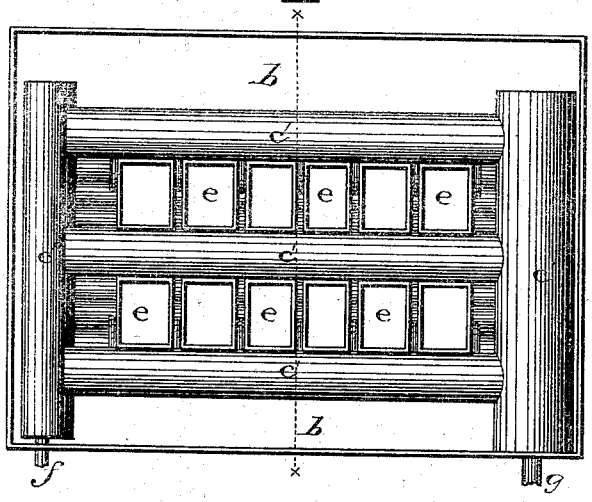
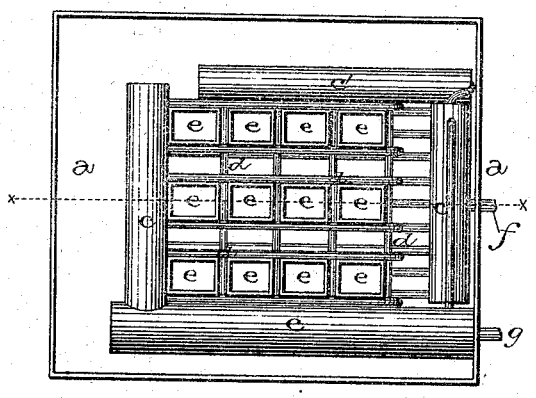


Fig. 2.



Witnesses.

J. W. Garnier.
H. L. D. Maines.

Inventor.
E. P. Lorch.
per
J. A. Lehmann,
Atty.

2 Sheets—Sheet 2.

E. P. LORCH.

Apparatus for Making Ice.

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Fig. 3.

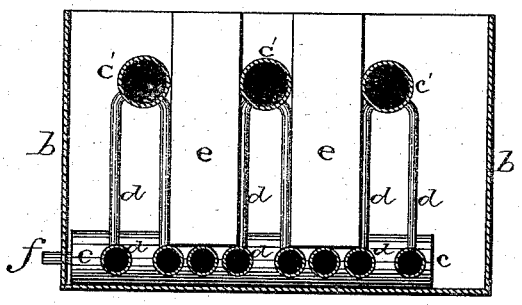
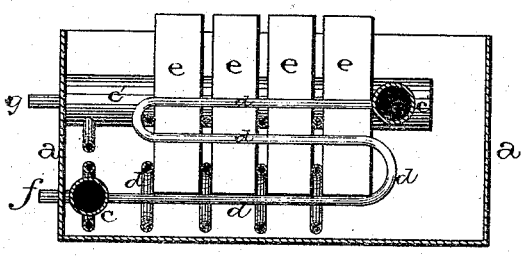


Fig. 4.



Witnesses.

J. W. Garner

W. L. O. Haines

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per

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UNITED STATES PATENT OFFICE.

ERNEST P. LORCH, OF NEW BERNE, NORTH CAROLINA.

IMPROVEMENT IN APPARATUS FOR MAKING ICE.

Specification forming part of Letters Patent No. **207,290**, dated August 20, 1878; application filed May 17, 1878.

To all whom it may concern:

Be it known that I, ERNEST P. LORCH, of New Berne, in the county of Craven and State of North Carolina, have invented certain new and useful Improvements in Ice-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in ice-machines; and it consists in the peculiar construction and arrangement of certain parts of an ice-machine, as will be more fully described hereinafter.

The accompanying drawings illustrate my invention, of which Figures 1 and 2 are plan views, and Figs. 3 and 4 are views in section through the line *x x*.

Corresponding letters indicate corresponding parts of my invention.

a and *b* represent reservoirs of any suitable shape or construction, containing racks or coils of pipes and tubing. In reservoir *a* these racks are arranged so that pipes *c c* form two lower sides of a parallelogram, from which any number of small tubes, *d d*, pass in several loops or convolutions at right angles to each other and open into pipes *c' c'*, which form the upper sides of the parallelogram. The arrangement of these tubes is horizontal, and their convolutions form rectangular spaces at regular intervals, in which are inserted the movable water-tanks *e e*. *f* represents an ingress-tube, through which a volatile liquid enters pipes *c c*, and *g* is an exit-tube, by which the vaporized liquid leaves the pipes after having traversed all the intermediate convolutions of the tubing.

The arrangement of the pipes, tubes, and water-tanks in reservoir *b* is precisely similar, with the exception that the pipes *c' c* are arranged in parallel sets or tiers above and below, and the communicating tubes *d d* are arranged in vertical rows between them in such wise as to leave rectangular spaces for the water-tanks *e e*. The ingress-tube *f* and exit-tube *g* are placed at each end of the coil of tubes and pipes, as shown, and similarly to those in reservoir *a*.

The operation of my invention is as follows: The tanks *e e* are filled with water and the space within the reservoir is filled with a suitable non-congealable fluid completely surrounding the pipes, tubes, and water-pans. A volatile liquid is forced into the coil or rack *c* through the ingress-tube *f*, where it volatilizes, and the vapor circulating through the coil abstracts great quantities of caloric from the non-congealable fluid and from the water-tanks *e e*, with which the coil is everywhere in contact. After circulating through the coil the vapor is drawn off by a pump attached to the exit-tube *g* and conveyed to any suitable condensing apparatus. The circulation is kept up until the water in the pans has been frozen into a solid mass.

These systems of arranging the pipes in the reservoirs permit a more perfect and complete contact of the water-pans and non-congealable liquid with the heat-abstracting surfaces.

The system in reservoir *a* is especially adapted to cooling air by leading the air-pipes alternately with the vaporizing-tubes through the spaces occupied by the water-pans, and thereby receiving the full benefit of their cooling action.

I am aware that a series of pipes have been arranged in a tank of non-congealable fluid in connection with pumps and vacuum-chambers, and that the volatile fluid has been forced in the upper pipes and allowed to run down into the lower ones, and this I disclaim.

Having thus described my invention, I claim—

The combination of a tank filled with non-congealable fluid with a series of pipes, *c*, arranged in the bottom thereof, a second series, *c'*, arranged in the top, and the connecting-pipes *d*, arranged so as to form racks for the water-pans *e*, which are surrounded on all sides by the said pipes, the volatile fluid being forced into the lower series of pipes, *c*, and drawn off in the form of vapor from the upper series, *c'*, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 11th day of May, 1878.

ERNEST P. LORCH. [L. S.]

Witnesses:

ROSWELL MILLS,

ETHELBUR HABLE.