

T. L. RANKIN.
ICE-MACHINE.

No. 175,498.

Patented March 28, 1876.

Fig. 1.

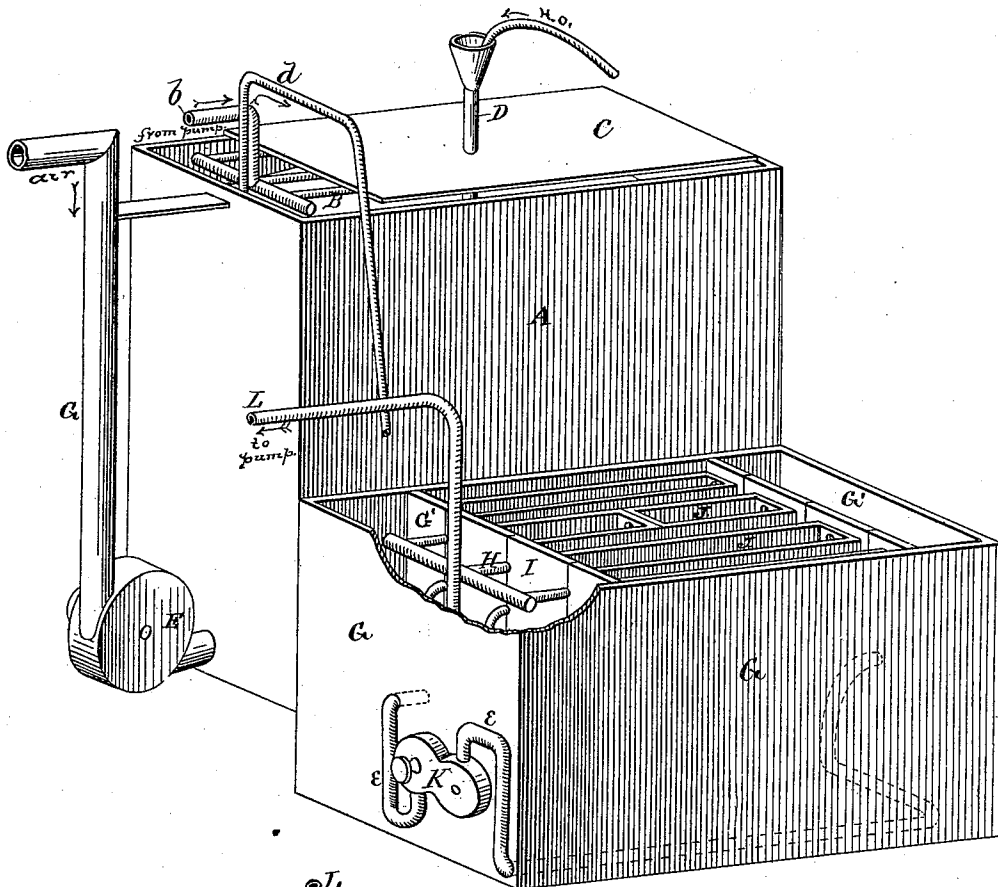
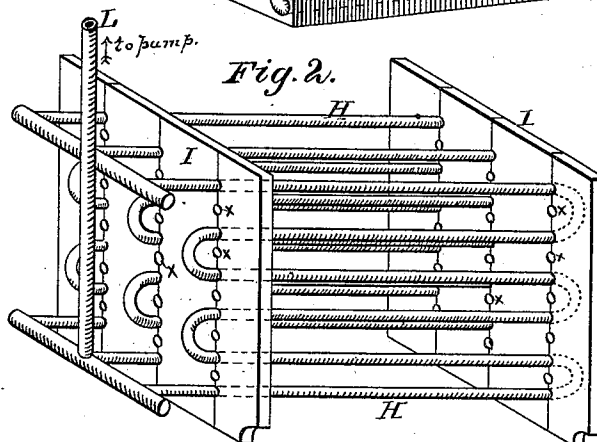


Fig. 2.



WITNESSES

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THOMAS L. RANKIN, OF EMPORIA, KANSAS.

IMPROVEMENT IN ICE-MACHINES.

Specification forming part of Letters Patent No. **175,498**, dated March 28, 1876; application filed March 4, 1876.

To all whom it may concern:

Be it known that I, THOS. L. RANKIN, of Emporia, in the county of Lyon, and in the State of Kansas, have invented certain new and useful Improvements in Ice-Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a condenser and an evaporator for ice-machines, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a perspective view of my condenser and evaporator. Fig. 2 shows the arrangement of the coils in the evaporator. Figs. 3 and 4 show the arrangement of coils in the condenser.

A represents a box of suitable dimensions, forming the case of the condenser, within which are arranged coils of gas-pipe, B, in inclined zigzag form, as shown in Fig. 3, with suitable cast-iron return-bends. These returns will be such a distance from each other and from the ends of the box that a man may pass up or down to get at any point to tighten any joint in case of leakage. Between the different layers or rows of pipe running from alternate ends are board floors, C C, to compel the air to pass the entire length of all the pipes. Through these floors passes a vertical pipe, D, provided with short hollow arms or nozzles *a a*. This pipe is placed in suitable bearings, and provided with a pulley for belt or cog connections, to cause the same to rotate and spray the water passing through it to all parts of the box over all the pipes. The floors C are sufficiently inclined to allow the water to pass off their outer ends.

E is a blower connected with the bottom of the condenser, and provided with a suction-flue, G, to bring the air from above the building, and blows through the spraying and falling water, causing a very great amount of evaporation upon the pipes, and all the sur-

faces are exposed, the air carrying out with it the latent heat the vapor required in forming.

b is the inlet from the liquefying-pump to the pipes B. The ordinary pressure and liquid gages are to be used on the condenser, with angle globe-valve at the elbow of the inlet-pipe *b*, and also one at the outlet-pipe *d*. This outlet-pipe *d* connects with the coils in the evaporator.

G is the evaporator-case, with coils H H within the same, connected with the pipe *d* from the condenser, and by the return suction-pipe L with the liquefying-pump. The coils H are put together by means of boards I I, arranged vertically, and of the same width as the distance required between the coils. These boards are formed into bulk-heads across the case or tank G, and bored with holes at their edges for the passage of the pipes, as shown in Fig. 2, and these bulk-heads form a chamber, G', at each end of the tank. In each bulk-head are bored other holes, *x*, the combined capacity of which should equal the capacity of the pump used for circulating the salt-water between the pans J, said pans being placed vertically between the coils, as shown.

K is a rotary pump placed at the end of the tank, and connected, by pipes *e e*, with both chambers G'. The water is drawn from one of said chambers by the pump, and returned immediately into the other chamber G', and discharged against the center of the end of the tank, so as to spread it to all parts of that chamber, from which it is drawn through and between the pans, taking up and giving off its cold to the fresh water to be frozen in the pans. The pump being equal to the capacity of the holes in the bulk-heads, and the passage-way open from end to end, it gives a very even distribution of the liquid and cold. The whole evaporator is to be covered and felted, as usual.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a condenser for ice-machines, a vertical rotating water-pipe, D, provided with a series of hollow arms or nozzles, *a*, for discharging the water in the form of spray, as and for the purposes herein set forth.

2. The combination of the pipes B, inclined floors C, and vertical rotating water-pipe D, with arms or nozzles *a*, substantially as and for the purposes herein set forth.

3. The combination of the blower E, rotating water-pipe D, with arms or nozzles *a*, the inclined floor C, and pipes B, all constructed and arranged substantially as and for the purposes herein set forth.

4. In an evaporator for ice-machines, the perforated bulk-heads I, with coils H arranged

in the tank G, to form end chambers G', and the pump K, connected with said chambers by pipes *e e*, all substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of February, 1876.

THOS. L. RANKIN.

Witnesses:

R. R. EVEREST,

S. M. WOODWARD.