(No Model.)

J. ROHLEDER.

WATER COOLER.

No. 553,318. Patented Jan. 21, 1896.

Fig. 1

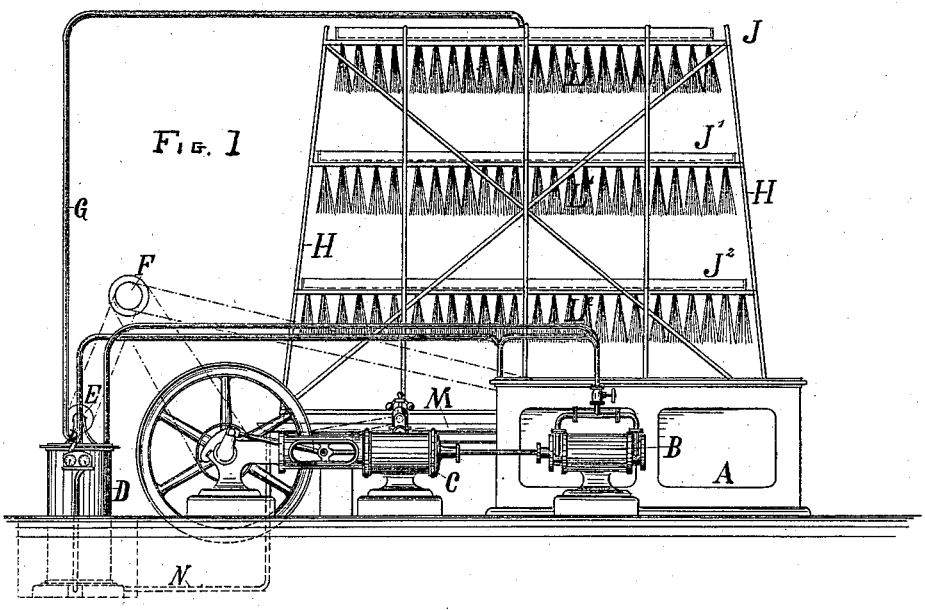


Fig. 2

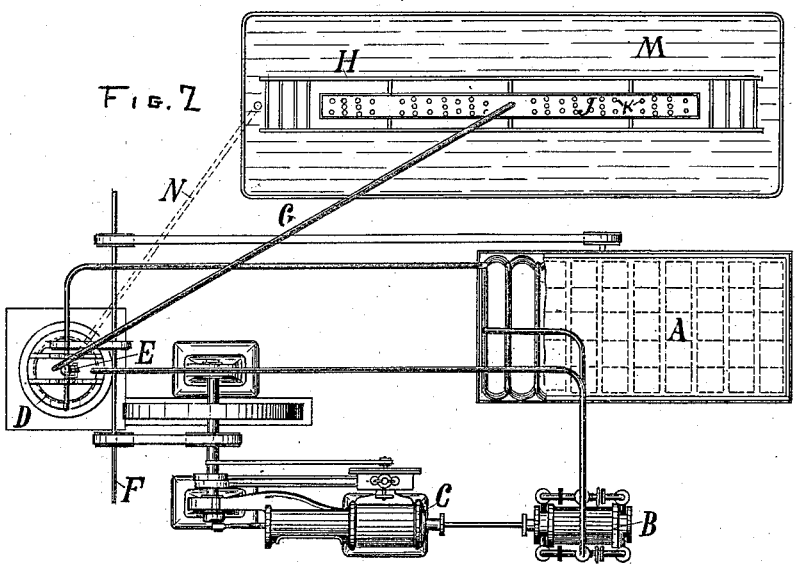
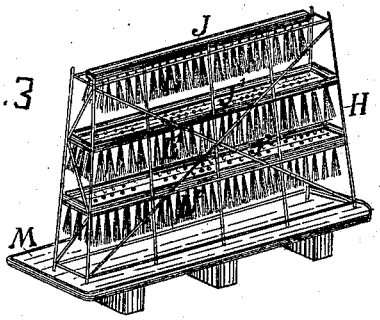


Fig. 3



Witnesses.

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UNITED STATES PATENT OFFICE.

JACOB ROHLEDER, OF BARMEN, GERMANY.

WATER-COOLER.

SPECIFICATION forming part of Letters Patent No. 553,318, dated January 21, 1896.

Application filed December 10, 1892. Serial No. 454,769. (No model.)

To all whom it may concern:

Be it known that I, JACOB ROHLEDER, a subject of His Majesty the Emperor of Germany, residing at Barmen, in the Province of Rhenish Prussia, Germany, have invented certain new and useful improvements in cooling water without the use of mechanical means requiring driving-power, except for raising the water where no natural head or fall of water is at hand; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

I attain the object aimed at by merely raising the water by an ordinary pump, where not sufficient natural head of water is at hand, to a sort of a scaffold or stage of some fifteen to twenty feet high, and from this structure I cause the water to fall down finely divided in a spray like rain in single drops. When on its way part of it will be evaporated and the evaporating process withdrawing a certain amount of heat from the water so that the remainder will arrive at the bottom considerably cooled down, fit for cooling processes in the condensers of ice-machines, for instance, and for other cooling purposes. By raising the water and letting it fall down in the prescribed manner repeatedly the water may be cooled down very considerably, and this at a very little loss of water from evaporation and at comparatively small expense of power.

For the sake of better illustration I have shown on the accompanying drawings an arrangement for an ice-machine where my process is employed for cooling the water for the condenser.

Figure 1 is an elevation of the plant; Fig. 2, a top view. Fig. 3 shows a perspective view of the stage for the fagots. Fig. 4 shows the manner of fixing and arranging the fagots in the bottom of the vats.

A is the ice-box. B is the compressor. C is the steam-engine, and D is the condenser, all of known design and working.

By means of a pump E driven from the steam-engine by means of a counter-shaft F the water in the condenser is pumped through the pipe G up to the top of the scaffold or structure H. Here the water is taken up in a shallow tub or vat T, reaching over the whole length of the structure H and being provided with fine outlet-holes K at the bottom. From these the water is let into bundles of brushwood straw or such like material of fine sticks and spreading largely outward and reaching down to a certain depth. At the ends or points of these fagots L the water gathers in drops and falls down like rain in a second vat T′, cooling on its way, thence from the vat T′, at the bottom of which the second series of brushwood bundles is arranged in the same manner as before and the same process is repeated. The water is finely divided and falls down from the ends of the fagots L′ to be gathered in a third vat T^2, and so on, in a fourth series, as may be desired. Fig. 4 shows the manner how these fagots are fixed by merely striking and driving them firmly into the bottom of the vats, exactly like brushwood is bound to form a broom. Through the little open spaces between the single sticks the water trickles through and along the spreading branches, gathering in drops at the ends and falling down like rain.

At the foot of the structure there is a large gathering-basin M in which the cooled water is collected and led thence by a pipe N into the condenser D, where it does its work as cooling medium and is then raised up again by the pump E through the pipe G, as described above, to be used again. Only so much fresh water has to be added as has been evaporated. This is of great importance in dry seasons and in localities where water is scarce. In such places where a stream of water of sufficient fall is available and plenty of water the pump may be dispensed with, and the water then flows off at the top of the condenser.

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

The combination, in an apparatus for cooling water in the open air of a shallow vat T, the scaffold H supporting said vat, a pump E forcing the water to be cooled through a pipe G up into the vat T, a series of similar vats T′, T^2 arranged at certain distances below each other on the said scaffold and having like the vat T perforated bottoms, the brush wood

bundles (brooms) L, L', L^2 stuck into said perforations, whereby the water trickling through is caused to be finely divided and fall like a rain from vat to vat, and a collecting vat M at the bottom serving as a stand for the scaffold and for collecting the cooled water, the whole as shown and described.

Witness my hand this 17th day of November, 1892, at Barmen, Germany.

JACOB ROHLEDER.

Witnesses:
WM. ESSENWEIN,
RUDOLPH FRICKE.