J. RING.

Cooling and Freezing Apparatus.

No. 206,135. **Patented July 16, 1878.**

FIG. 1.

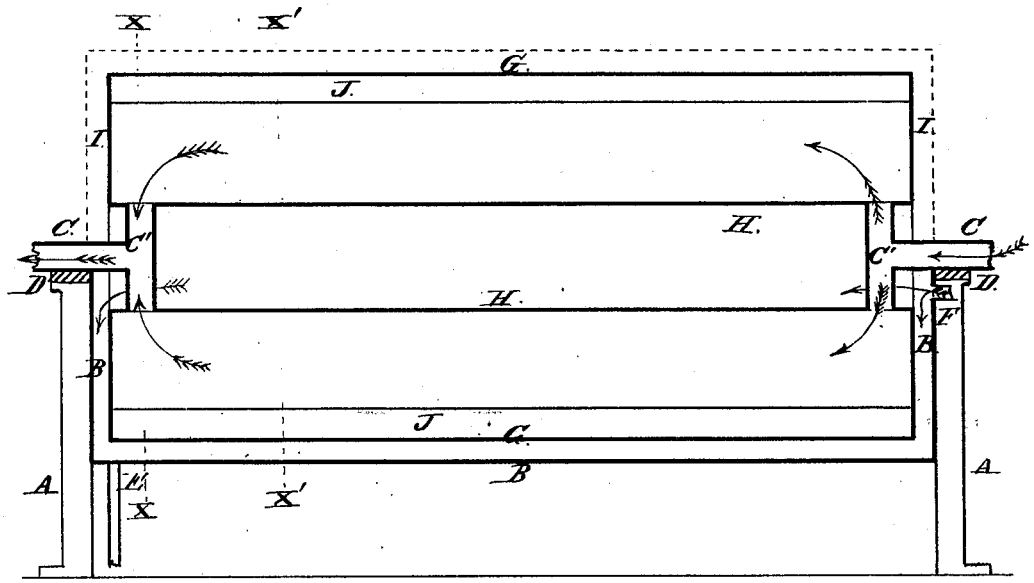


FIG. 2.

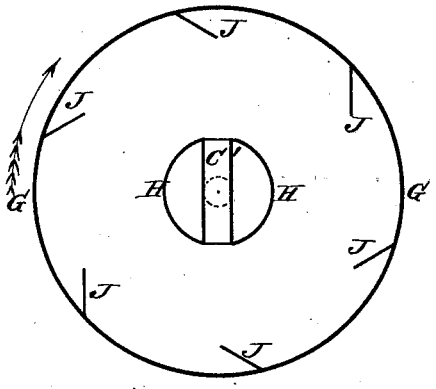
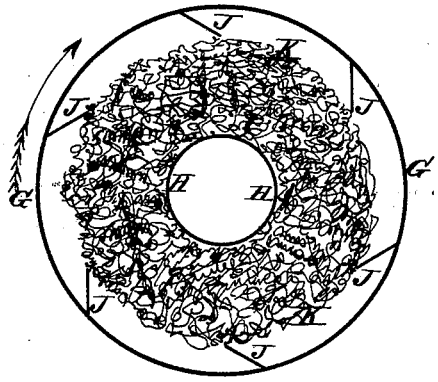


FIG. 3.



Witnesses:
Geo. H. Knight
Walter Allen

Inventor:
John Ring
By Knight Bros.
Attys.

UNITED STATES PATENT OFFICE.

JOHN RING, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN COOLING AND FREEZING APPARATUS.

Specification forming part of Letters Patent No. **206,135**, dated July 16, 1878; application filed May 28, 1878.

To all whom it may concern:

Be it known that I, JOHN RING, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Cooling and Freezing Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention is an improvement on that for which I filed application for patent on the 22d of April, 1878, and it applies to the cylinder containing the volatile liquid.

It consists in the construction of the vaporizing-cylinder with an annular chamber and tubular gudgeons, upon which the cylinder turns, which communicate with the annular chamber within the cylinder by cross-pipes.

The cylinder is provided with the lifting-troughs described in my aforesaid application, and is, in connection with a condenser, freezing-chamber, and trough, substantially as therein described.

In the drawings, Figure 1 is a vertical section axial to the cylinder and the gudgeon-connections. Fig. 2 is a transverse section of the cylinder at X X, and Fig. 3 is a similar section at X′ X′.

The legs of the trough B are shown at A. The bearings of the cylinder-gudgeons C are shown at D. The cylinder consists of an outer case, G, of a diameter somewhat less than the interior of the trough B, so as to turn easily therein and allow space for a sufficient quantity of the non-freezing liquid, (which flows from the bottom of the trough to the refrigerating-chamber through a pipe, E, and returns from said chamber to the upper part of the trough through a pipe, F.) The cylinder has an inner shell, H, concentric with the outer shell G, and connected with it by annular end plates I.

The lifting-troughs J are similar to those described in my aforesaid application and for a similar purpose—namely, to carry up the liquid as the cylinder rotates and pour it upon the packing K, so as to keep a continual drip from the packing, to assist the vaporization of the volatile liquid occupying the lower portion of the cylinder. The packing K consists of metallic strips, wires, or shavings so formed as to provide an open mass through which the liquid will descend and the vapor escape freely. The said packing, being of metal, serves also as an efficient conductor to convey caloric from the shells G and H, which take it from the non-freezable liquid to the interior of the annular chamber, where it is taken up and carried off in a latent state by the vaporization of the volatile liquid.

The metallic packing K, I prefer to make with ragged edges to assist the vaporization from them, as the vapor escapes more readily from such edges than from a smooth surface.

The gudgeons C, upon which the cylinder is supported, and upon which it turns, are connected with the interior of the cylinder by cross-pipes C′, whose ends open into the interior through the shell H, and the central parts of which are in communication with the bore of the gudgeons. The construction is such that the vapor flows out through the pipe C′ C at one end of the cylinder to the air-pump and condenser, and after being condensed and cooled is returned to the other end of the cylinder through the other gudgeon-pipe, C C′, as indicated by the arrows in Fig. 1.

The operation is as follows: The trough B contains non-freezable liquid to such a height that it will occupy the lower part of the central bore of the cylinder, so as to come in contact with the shell H as well as those G and I, and as the cylinder turns the heat is absorbed from the liquid by the cold metal of the cylinder in contact with it.

I claim as my invention—

The combination of the two concentric shells G H, lifting-troughs J, hollow gudgeons C C, cross-pipes C′ C′, and trough B, substantially as and for the purposes set forth.

JOHN RING.

Witnesses:

SAML. KNIGHT,

GEO. H. KNIGHT.