C. L. RIKER.

MANUFACTURE OF ICE.

No. 191,256. Patented May 29, 1877.

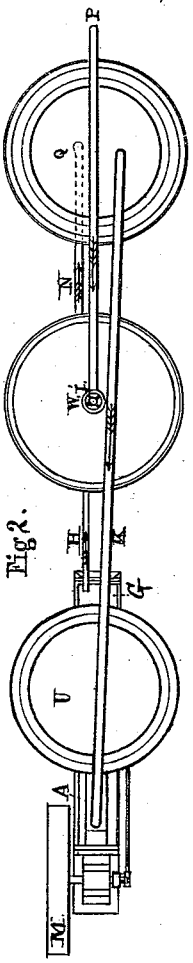


Fig 2.

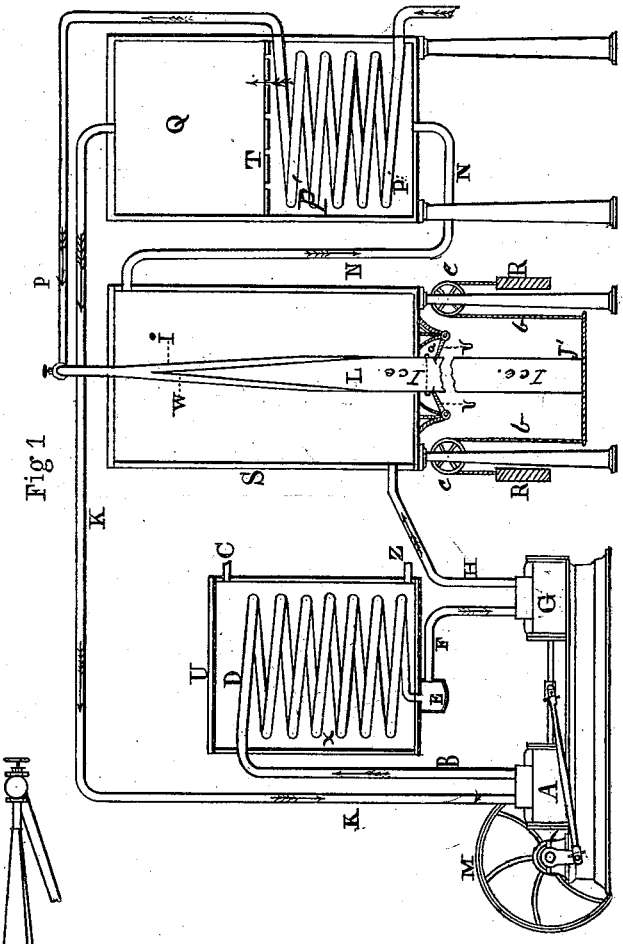
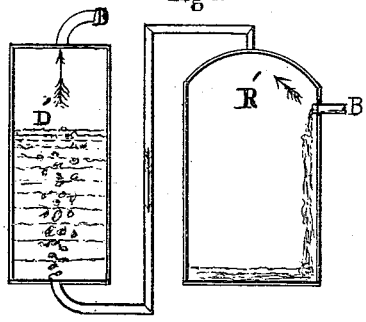


Fig 1

Fig 4



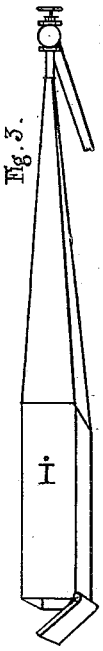


Fig 3.

Witness

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UNITED STATES PATENT OFFICE.

CARROLL L. RIKER, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MANUFACTURE OF ICE.

Specification forming part of Letters Patent No. **191,256**, dated May 29, 1877; application filed February 19, 1876.

To all whom it may concern:

Be it known that I, CARROLL L. RIKER, of the city, county, and State of New York, have invented certain new and useful Machines for the Manufacture of Ice; and I hereby declare the same to be fully, clearly, and exactly described as follows:

The invention consists, first, in a novel combination of parts constituting an ice-machine for use by what is known as the air process; second, in a novel form of the ice-mold and manner of applying and using the same; third, in an apparatus for utilizing the exhaust air from the machine, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 represents a longitudinal vertical section of my device; Fig. 2, a plan view of the same; Fig. 3, a view of the ice-mold; Fig. 4, a sectional view of a device which may be used for cooling and drying the air.

In construction, my device consists of an air-compressing engine, A, and expanding-engine G. From the engine A the compressed, and thereby highly-heated, air is conducted, by means of a tube, B, to the coil D, which latter is immersed in a bath of some cooling medium in the tank U.

In its passage through the coil D the air is cooled, and deposits its moisture, which is caught in the vessel E. The cold, and now dry, compressed air passes through the pipe F to the expanding-engine G, and from it, by means of the pipe H, to the freezing-chamber S.

The freezing-chamber consists of an apartment whose walls are suitably packed with some non-conducting material, and contain a number of the freezing-molds I I.

The molds are constructed of metal, preferably of copper, and may be greased on the inner side in order to facilitate the egress of the ice. They are cylindrical or prismatic in shape for a part of their length, and then taper nearly to a point. It is not essential that the taper should be uniform, as a hemisperical or hemi-ellipsoidal shape for the tapering portion of the mold will answer. The molds are suitably closed at the larger ends. From the freezing-chamber the air passes through the pipe N into the chamber P′, in which is placed the coil P.

The water to be frozen is passed through the coil P and pipe P, which is a continuation of the coil, to the mold I. The air as it passes from the freezing-chamber is still very cold, and this cold is utilized to cool the feed-water for freezing.

In cooling this water the air takes up its heat and passes through the perforated floor T into the chamber Q, in which are placed any meats, fruits, or other articles intended to be desiccated. The air thus introduced is peculiarly adapted for desiccation, being itself perfectly dry or nearly so. It may be heated, if desired, to increase its desiccating powers, by passage through any heating medium.

From the chamber Q the air is returned to the condensing-engine to be used over again.

If desired, the air in the cylinder of the compressing-engine may be cooled by a spray or jet of cold water, in which case I prefer to further cool the air before allowing it to enter the coil D, by passing it into a chamber, R′, Fig. 4, where the water is allowed to separate, and thence through any cooling medium, D′, such as cold water, ice, or ice and salt, to the coil D. To attach this device to the machine any convenient means may be adopted. The pipe leading from the condensing-cylinder to the coil D may be broken, the end nearest the cylinder being attached to the vessel R′ by an ordinary hose-coupling, or a right and left nut, the other end being similarly attached to the outlet-pipe of the cooling-chamber D′.

In operation, the mold I is gradually filled with water, which is frozen by means of the cold air in the chamber S. As soon as the mold is filled with ice it is opened, and the prism of ice allowed to rest upon the floor J, which is suspended by means of chains *b b*, which pass over pulleys *c c*, and have counterpoises R R attached to their ends. To prevent leakage around the prism of ice a rubber gasket, *a*, is passed around it and pressed up against the bottom of the mold.

It will be seen that, as the prism of ice descends in the mold, a narrow space is left between the ice and the mold, which, being filled with water, presents a large surface to the cold, and the film of water speedily freezes.

The prisms of ice are cut off by means of saws, and to prevent the descent of the ice in

the mold small catches *v v* are forced into the side of the prism. When the portions of the prism which have been cut off are removed, the table J is again allowed to rise, the catches are removed, and the prism again rests upon the floor.

It is obvious that the molds may be placed in any other position, especially inverted, in which case, instead of the floor J, grapples, provided with suitable means for lifting the ice, may be used.

Should the prism of ice stick fast in the mold, means may be applied for forcing in the feed water under pressure in order to release it.

I attach special importance to the peculiar construction of the mold I, as shown. The prism or cylinder of ice fits closely to the prismatic or cylindrical portion of the mold, and practically closes it until the tapering portion of the ice is drawn down to the mouth of the mold.

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

1. The method herein described of continuously forming a prism or cylinder of ice of any desired length, the same consisting in withdrawing the frozen mass gradually from the open end of the mold of an ice-machine, and gradually filling the space thereby left empty with water to be frozen, substantially as described.

2. The combination of the chamber S, mold I, and floor J, as set forth.

3. In combination with the mold I, the catches *v v*, substantially as described.

4. The mold I, having a cylindrical or prismatic portion and a tapering portion, as and for the purpose set forth.

5. The method herein described of releasing the ice from the molds, the same consisting in forcing in the feed-water under pressure, substantially as described.

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Witnesses:
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