

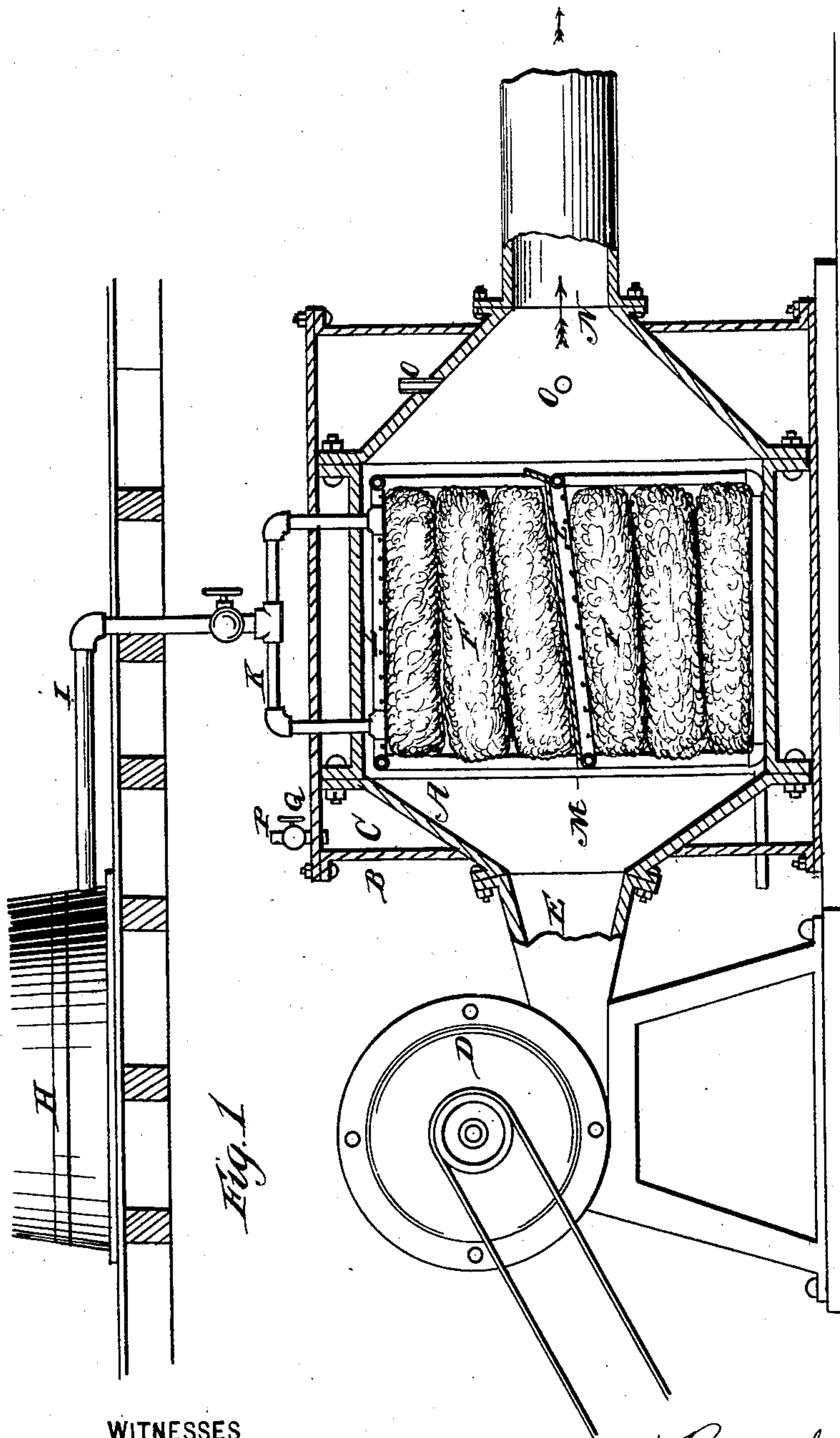
(No Model.)

2 Sheets—Sheet 1.

R. S. JENNINGS.  
AIR COOLING APPARATUS.

No. 246,013.

Patented Aug. 23, 1881.



WITNESSES  
*Robert Everett*  
*John G. Page*

INVENTOR  
*Ralph S. Jennings*  
*Gilmore, Smith & Co.*  
ATTORNEYS

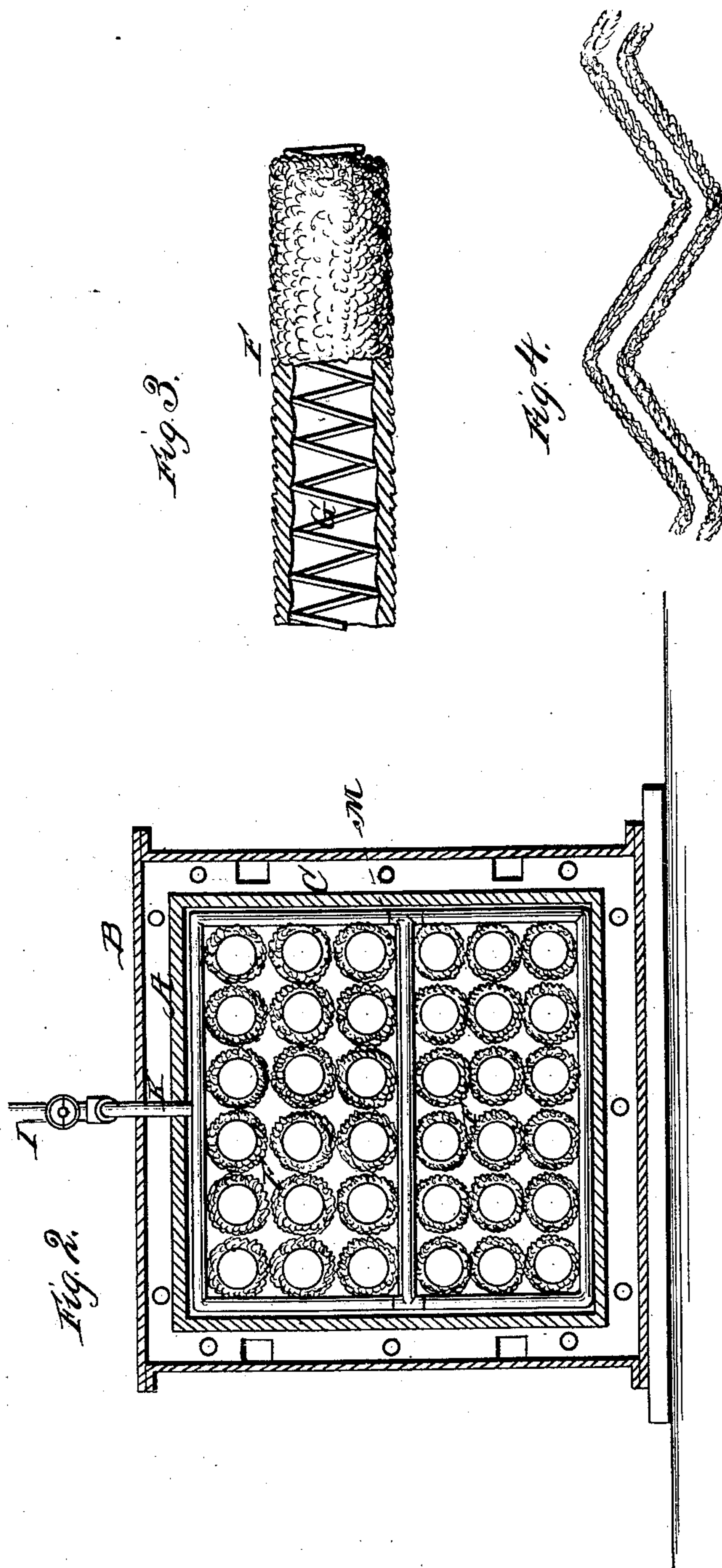
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# UNITED STATES PATENT OFFICE.

RALPH S. JENNINGS, OF BALTIMORE, MARYLAND.

## AIR-COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 246,013, dated August 23, 1881.

Application filed July 28, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, RALPH S. JENNINGS, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Refrigeration; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal section of my refrigerator. Fig. 2 is a transverse sectional view of the same. Fig. 3 is a detail view, and Fig. 4 is a view of a modification.

My invention relates to a new and improved apparatus for cooling air for refrigerating purposes; and it consists in passing air over the surfaces of some dampened fabric, whereby the air will become refrigerated, as hereinafter fully explained.

In carrying out my invention or discovery various expedients may be adopted for dampening the fabric and for directing the air upon or causing it to pass over the same, so that when the air has been sufficiently refrigerated it may be conducted to localities at various distances from the refrigerating apparatus for numerous purposes.

As a present means of practically demonstrating my invention, I have shown a compartment with a system of pipes formed with perforations, through which the water will be ejected in jets upon the surfaces of the fabric to be dampened. The supply pipe or pipes for this system of perforated pipes are arranged so as to conduct water to them from any suitably-arranged reservoir, or from the hydrant-pipes, or from any convenient source of supply. As an effective way of exposing the wet or saturated material to the passing current of air, I provide a number of tubes covered with some fabric, by preference that which possesses the greatest absorbent quality, and arrange these within the generating-chamber.

The tubes around which the fabric is arranged are preferably skeleton-tubes, so that both surfaces of the surrounding tube of fabric will be exposed to the currents of air. These tubes may be made in any suitable way, either

by spirally-coiled wire, perforated or skeleton tubes, or in any way so that the largest possible surface of the fabric will be exposed to the action of the air.

The tubes arranged within the generating-compartment are separated at certain points by partition-plates. This arrangement is provided to prevent the water which is ejected from the perforated tubes at the top of the compartment from percolating to the bottom thereof, since the water in saturating and dripping from the fabric-tubes will gradually become warmer than upon its first entrance into the generating-chamber. The partitions collect such drippings at certain stages and conduct the water off. For each partition an additional series of perforated pipes will be employed to eject water upon the tubes below it.

The air will be driven into the generating-chamber from a suitable blower, and will be expelled or conducted from the generating-chamber through a suitable nozzle. The casing of the generating-chamber will be surrounded by a jacket or casing, with an air-space between the two, and cooled air will be educted from the generating-chamber out through short pipes leading from its front end or the nozzle into the aforesaid air-space between the generating-chamber and its surrounding casing. Pipes will lead from this space through the jacket into the open air, so as to induce a current through the space between the casing and jacket, thus maintaining the casing of the generating-chamber at a suitably low degree of temperature.

It may here be observed that sheets of fabric may be disposed within the generating-chamber and saturated or wet by jets of water with good results, and that any absorbent material other than fabric might be employed. By experiment I have found that cotton terry is a highly desirable material for this purpose.

Suitable drain-pipes will be employed for draining off the water from the generating-compartment.

In introducing the air into the generating-compartment and passing it over the surfaces of the saturated fabric the reduction of the temperature will be rapid. Heated air driven into the generating-chamber will be brought to a low temperature, and it has been found



that the air passed through the generator can be brought to a low degree of temperature by saturating the fabric with warm or heated water. The lowest degree of temperature will, however, be produced by the use of cool or cold water, the degree of cold being largely dependent upon the area of the saturated surface presented to the current of air.

The apparatus may be enlarged to any desired degree, or a series of such apparatus may be employed.

Among the main uses of my invention will be the supplying of cool air to halls, ships' holds, refrigerators for meats and other perishable articles, and for all purposes where cool or cold air is required, and also for making ice.

It may be observed that well-water will have a temperature highly suitable for the purposes of my invention, and hence it will be desirable to pump it up into a reservoir; also, the tubes herein shown may be diamond-shaped in cross-section or of other preferable configuration.

Referring by letter to the drawings, A designates the refrigerating-compartment. B is the surrounding jacket, and C the air-space between the two. D is the blower, and E the inlet to the refrigerating-chamber. F are the tubes of fabric, which are upon spirals G. H designates a reservoir, and I a pipe leading from the reservoir to the branch pipes K, which connect with the perforated pipes L, arranged

within the refrigerating-chamber. M is a partition within the generator, although, as stated, more than one partition may be employed. N is the nozzle or outlet from the refrigerating-chamber, and O O the pipes leading from the nozzle M into the air-space, the arrows showing the direction of the currents. P designates one of the outlet-pipes through the jacket on that end nearest the blower.

As shown, the partition within the refrigerating-chamber inclines down toward the inlet, so that the collected water will be carried off. The pipes leading from the jacket will have valves Q, as herein shown.

What I claim, and desire to secure by Letters Patent, is—

In an apparatus for cooling air, the combination of the refrigerating-chamber A, cooling-tubes F, air-forcing apparatus D, and jacket C, communicating with the generator by openings O, and the eduction N, all constructed and arranged to operate substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

RALPH S. JENNINGS.

Witnesses:

ROBERT EVERETT,  
JAMES J. SHEEHY.