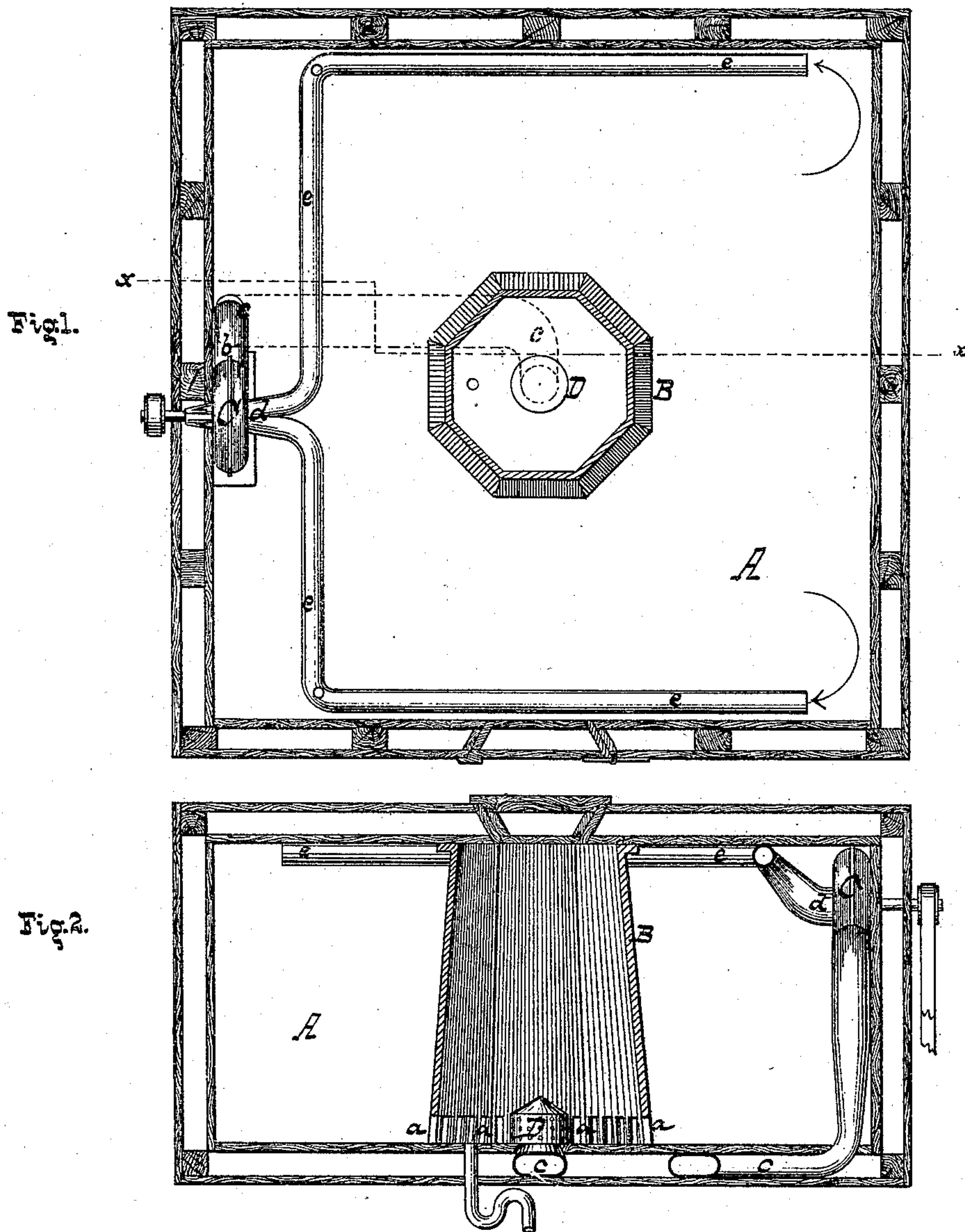


J. H. WICKES.
REFRIGERATOR.

No. 171,456.

Patented Dec. 21, 1875.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES H. WICKES, OF NEW YORK, N. Y.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **171,456**, dated December 21, 1875; application filed November 10, 1875.

To all whom it may concern:

Be it known that I, JAMES H. WICKES, of the city, county, and State of New York, have invented a new and useful Improvement in Refrigerators, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a sectional plan or top view. Fig. 2 is a vertical section in the plane *x x*, Fig. 1.

Similar letters indicate corresponding parts.

This invention consists in the combination, with a hermetically-closed provision-chamber, of an ice-reservoir located within said provision-chamber, and an air-distributor located within said reservoir, and an air-forcing and suction apparatus connected by suitable pipes with said distributor and the interior of the provision-chamber, for the purpose of providing for a perfect circulation of air through the ice-reservoir and provision-chamber, as hereinafter more fully set forth.

In the drawing, the letter A designates a refrigerating room or provision-chamber, which is, as far as practicable, hermetically closed against the external air, and which may be protected against the influence of the external temperature by double walls or other suitable means. Within this provision-chamber, either in the center or near one of its sides, is situated the ice-reservoir B, which may be either square, circular, or polygonal in its cross-section, and which, in the example shown in the drawing, is sloping inward slightly from the bottom to the top, but which may be made of uniform width throughout. Said reservoir is made perfectly tight to within a short distance of its bottom, where it is provided with a number of openings, *a*, extending around its circumference. In the interior of the provision-chamber A is mounted an air-forcing and suction apparatus, C, which, in the example shown in the drawing, consists of a fan-blower; but, for such fan-blower, a double-acting air-pump, or any other equivalent apparatus, may be substituted. The air-discharge spout *b* of the apparatus C connects with a pipe, *c*, that descends beneath the false bottom of the provision-chamber, and the mouth of which rises up into an air-distributor, D, situated within and near the bot-

tom of the ice-reservoir B. The suction-spout *d* of the apparatus C connects with a system of pipes, *e*, which are situated in the top part of the provision-chamber, being open at their ends, so that when the air-forcing and suction apparatus is set in motion the air from the upper part of the provision-chamber is sucked in through the pipes *e*, and then forced, through the pipe *c* and the air-distributor D, into the bottom part of the ice-reservoir, where the same is cooled by coming in contact with the ice, and whence the cooled air escapes through the openings *a* into the provision-chamber. The air-distributor consists of a foraminous box, of metal or other suitable material, which is preferably situated in the center of the ice-reservoir, close to its bottom. The position of the distributor and its proximity to the bottom may, however, be varied.

From this description it will be seen that by means of the air-forcing and suction apparatus a constant circulation of air takes place through the provision-chamber, the pipes *e* and *c*, through the air-distributor, and through the bottom part of the ice-reservoir. The air which is injected into the ice-reservoir is evenly distributed by means of the air-distributor, and as it escapes from the air-distributor it comes in intimate contact with the lower layer of ice in the ice-reservoir, whereby the same is cooled, and at the same time, by coming in contact with the ice, it is deprived of moisture, and of bad odors with which the same may have become contaminated on its passage through the provision-chamber. The purified and cooled air, after having permeated the provision-chamber, is then sucked in by the apparatus C and again returned to the ice-reservoir.

By this arrangement the air, in its passage through the ice-reservoir, is prevented from cutting channels through the ice, since the ice, as it melts in the bottom part of the reservoir, is immediately replaced by a fresh supply from above. The condition of the air remains uniform, since it comes in contact always with an unvarying area of ice, and no portion of the ice is wasted, inasmuch as only a small portion of ice at a time is subjected to the melting process, and that as fast as it is needed. In this respect my system resembles a base-

burning stove, where the coal is most economically consumed, and the difficulty is overcome which is experienced when the current of air is passed through the ice-reservoir with a fixed inlet and outlet, said difficulty being that the air cuts a passage through the ice, through which it passes without being cooled to any great extent. The sloping of the sides inward of the ice-chamber is to prevent the ice from bridging or becoming wedged in its movement downward. The ice-reservoir is provided with a closely-fitting cover, through which the ice can be introduced; or, if said reservoir is situated close to one side of the provision-chamber, it may be charged by means of a chute. In filling, no pieces of ice should be put in of greater thickness than about one-fifth the diameter of the ice-reservoir.

If the ice-reservoir is located in the center of the provision-chamber, said chamber may be divided in different compartments, separated by partitions converging toward the center, and one column of ice can thus be used for refrigerating several separate rooms. The thoroughness with which the ice absorbs all impurities by this system of contact with air makes it possible to have the air from fish-rooms, meat-rooms, and fruit-rooms all commingled in the same ice-box, without carrying back any odor in its return.

The air-forcing and suction apparatus C, instead of being situated outside the ice-reservoir, might be placed beneath the air-distributor D, in which case it would be made in the

form of a horizontal fan, which would suck in the air at its center from the top part of the provision-chamber, and drive said air out through the air-distributor and the openings *a* in the bottom part of the ice-reservoir. The ice-water is drawn off through a trap in the usual manner.

It is obvious that my base-melting system is applicable to refrigerator-cars as well as to refrigerator-rooms.

I do not claim as my invention an inlet-pipe taking air from the upper part of the closed chamber with a forcing apparatus and an ice-reservoir having an outlet or outlets at its bottom, for drawing air from the top of the closed chamber and forcing it through the ice and out at the bottom of the ice-chamber.

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

The combination of the hermetically-closed chamber A, ice-reservoir B, communicating with the same and located within it, the air-distributor D within said ice-reservoir, and the tubes *c* and *e*, leading from the fan C, and communicating, respectively, with the ice-reservoir and provision-chamber, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 5th day of November, 1875.

JAMES H. WICKES. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.