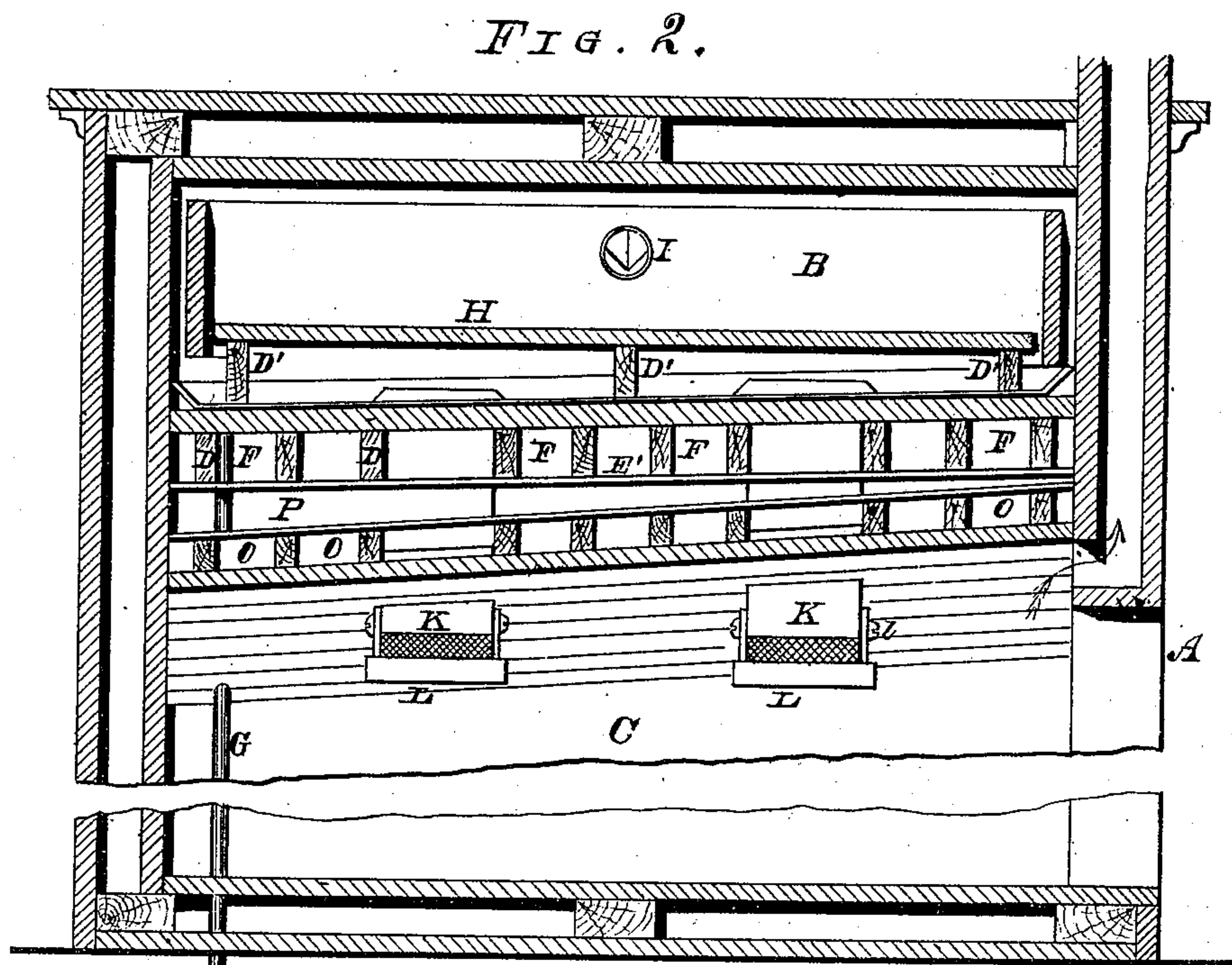
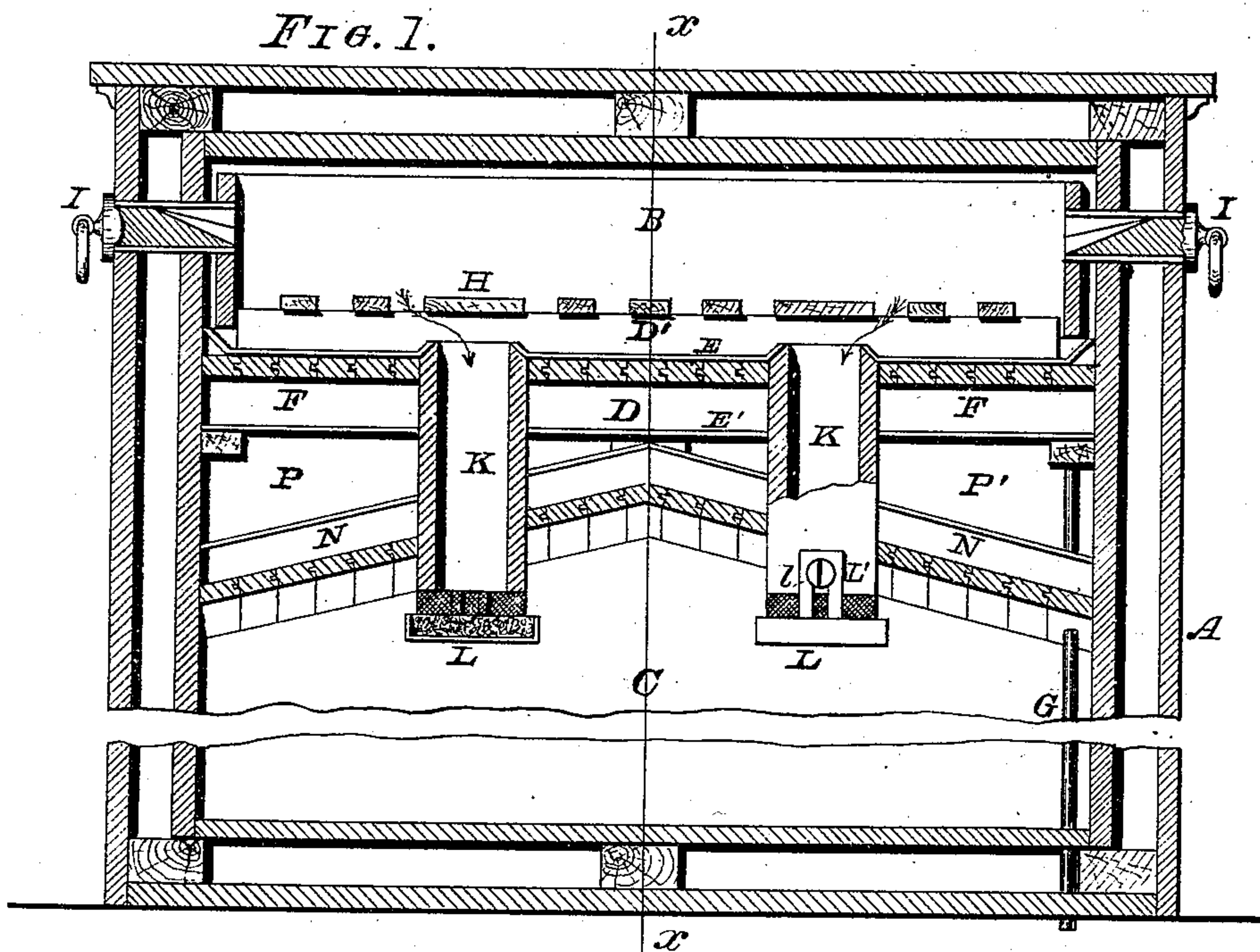


J. J. ROSS.
REFRIGERATOR.

No. 181,210.

Patented Aug. 15, 1876.



WITNESSES:
Frank Hirsch.
J. P. Stark.

INVENTOR
Jas. J. Ross.
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UNITED STATES PATENT OFFICE.

JAMES J. ROSS, OF BUFFALO, NEW YORK.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. 181,210, dated August 15, 1876; application filed April 22, 1876.

To all whom it may concern:

Be it known that I, JAMES J. ROSS, of the city of Buffalo, in the county of Erie and State of New York, have invented a Refrigerator, of which the following is a specification:

The object of my invention is the production of a refrigerator that shall be perfectly ventilated, dry, and under easy control, and preserve a given quantity of a perishable substance with the least expenditure of ice. To this end it consists in the arrangement, with an upper ice-chamber and lower preserving-compartment, of a series of pendent cold-air-supply ducts connecting said chambers, said pendent ducts being provided with adjustable caps and drip-pans on their lower extremity, containing a moisture-absorbing substance and surrounded by a screen of either gauze or cloth to absorb and retain any moisture the passing cold air may contain. The ice-chamber is separated from the preserving-chamber by three dead-air spaces, produced by a series of joists covered on one side with matched boards and on the opposite side with rosin-sized or other water-proof material, whereby the interior of said preserving-chamber is kept perfectly dry. This preserving-chamber is constructed with a double-inclined ceiling rising toward the front wall of the refrigerator, and provided with an escape-flue in its highest point, to conduct the warm air and obnoxious gases from said preserving-chamber to the exterior of the same. The air is supplied to the ice-chamber through a graduated register or ventilator, so that a predetermined and fixed supply of air can be admitted to said ice-chamber. By this arrangement a perfectly ventilated and dry preserving-chamber is obtained, and the articles or substances to be preserved are kept at a very low temperature, with but a small expenditure of the refrigerating substance.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I shall proceed to describe its particulars of construction, and thereby refer to the annexed sheets of drawings, which make a part of this specification, and illustrate my invention more fully.

In these drawings, Figure 1 is a transverse sectional elevation. Fig. 2 is a longitudinal sectional elevation in line *xx* of Fig. 1.

Like letters of reference indicate corresponding parts in the various figures.

A is the refrigerator proper, consisting of a rectangular structure of suitable material, having double walls, and the intervening space filled with a good non-conducting substance of heat, such as powdered charcoal, sawdust, &c. The interior of this structure is divided into an upper and lower compartment, B and C, respectively, of which the former and smallest is the ice and the latter the preserving chamber. These two chambers are separated by two floors, the upper one consisting of a series of transverse joists, D, placed a suitable distance apart and tightly covered with matched boards E on the upper side and with a water-proof material, E', such as rosin-sized paper, &c., on the lower side, the space between said coverings F being a dead-air space directly underneath the ice-chamber.

The floor of this chamber is decked with a water-tight sheeting of either galvanized iron, zinc, or the like, whose edges are bent upwardly on their junction with the walls of said chamber. This floor inclines slightly toward one corner, and has an escape or waste pipe, G, in its lowest point, leading to the exterior of the structure, to convey the water resulting from the melting of the ice, and from condensation, to the outside. This ice is stored upon a rack, H, consisting of a number of slats fastened to transverse sleepers of different height, so as to bring this ice-rack into a horizontal position, the flooring upon which it rests being inclined, as heretofore described. Two or more of these slats are considerably wider than the rest of them, for the purpose hereinafter to be described.

I I are two air-supply regulating-plugs in the ice-chamber B. They consist each of a cylindrical plug having a tapering V-shaped gutter, and sliding in a corresponding tube. This plug, by being drawn out of or pushed into said tube, varies the size of the inlet-openings accordingly. Other arrangements, however, may be resorted to, such as registers, &c., to obtain the desired result.

The ice-chamber is connected with the preserving-chamber by means of a series of pendent ducts, K, arranged near and on both sides of the longitudinal center line of said

chamber, and passing through the ice-chamber floor and preserving-chamber ceiling a distance into the latter. The water-tight sheeting of the ice-chamber is bent upwardly around these ducts, to prevent the water thereon to enter, and the wide slats of the ice-rack are placed directly over these ducts, to prevent the drippings from said rack to drop into these ducts. The lower extremity of the ducts K are provided with caps L, of a pan-like construction, containing a water-absorbing substance—such as sponge, or the like—and suspended therefrom by means of the slotted bars L', provided with the binding-screws l, or similar means of adjustment. The space between these pans and the lower extremity of the ducts is covered with a flexible filtering substance or material, like very fine gauze, cloth, &c., to prevent the exit of moisture from the ducts which is absorbed by the substance within said pans.

The purpose of making the pans L adjustable is to regulate the size of exit-openings and supply of cold air, which may be increased, or diminished, or shut off altogether, by manipulating said pans.

The preserving-chamber C is provided with a triple-inclined ceiling, consisting of a series of rafters, N, covered on their lower side with matched stuff, and on their upper side with a water-proof material similar to the ice-chamber floor, thus producing a series of dead-air spaces, O, between said matched stuff and water-proof covering, and two large dead-air compartments, P P', between the preserving-chamber ceiling and the ice-chamber floor.

By this construction these two chambers are separated by three dead-air spaces, and therefore securely guard against any condensation of moisture upon the walls, and produce a perfectly dry preserving-chamber.

As heretofore stated the ceiling of the preserving-chamber C is triple-inclined or sloping toward both sides and the rear of the structure. This arrangement will cause the ascending warmer stratum to move forward toward the front wall, which is provided with an escape-flue, Q, commencing at the highest point of the preserving-chamber to carry away this warm air and obnoxious gases, which may be led either outside the structure or outside of the building within which it is erected.

To protect the walls of the ice-chamber, and to prevent the condensed water from running down these walls, the ice-chamber is lined with a wainscoting, placed some distance from said walls.

The operation of my improved refrigerator is as follows: The air entering the ice-chamber, through the graduated plugs, is thoroughly cooled in this chamber while passing over the ice contained therein, and passes through the ice-rack and ducts K into the refrigerator or preserving-chamber, depositing any moisture it may contain within the pans

L attached to said ducts. These ducts are located near and on both sides of the longitudinal center-line of the compartments, and as far away from the articles to be preserved as is consistent with the construction and size of the apparatus. These substances are generally carcasses or large pieces of meat hung upon hooks around the inner sides of the preserving-chamber, and to prevent any deposition of moisture upon them I have located these ducts, as described. On account of their particular location and number, with the exit-openings in the highest point of the preserving-chamber, a perfect diffusion of the cold air is attained, and, as a consequence, a more even temperature, while the possibility of deposition of moisture is removed. Such would not be the case were the exit-openings only a few in number, and in close proximity to such substances to be preserved. The cold air, in descending, displaces the warmer air in the preserving-chamber, and causes this to rise and to escape through the flue in the highest point of said preserving-chamber. When this chamber is emptied of its contents or refilled the caps L are pushed up against the ducts K to close the exit, and the plugs I pushed in to close the ingress-opening of the air. By this means the ice-chamber is completely isolated, and will preserve its contents for a long time with but little waste.

If more than one preserving-chamber are desired to be refrigerated from the same ice-chamber I shall construct a series of these preserving-chambers one above the other, and lead a corresponding number of the ducts K into these various chambers.

Having thus fully described my invention, I desire to secure to me by Letters Patent—

1. The combination, in a refrigerator, with an ice and a preserving chamber, of a series of dead-air spaces separating said chamber, substantially as described, for the object stated.

2. The combination, with the ice-chamber B and preserving-chamber C, of the double partitions composed of the joists and rafters covered on one side with matched stuff, and on the opposite side with a layer of a water-proof material, whereby said chambers are separated by three dead-air spaces, substantially as described.

3. A refrigerator, provided with pendent ducts, which lead the cold air from the ice-chamber to the preserving-chamber, arranged along both sides of the central line of the ceiling of the preserving-chamber, as and for the purpose set forth.

4. The combination, with the ducts K, of the adjustable pans L, provided with a water-absorbing substance, and jointed to the said ducts by a flexible filtering substance or material, substantially as described, for the use and purpose set forth.

5. In a refrigerator, a preserving-chamber, having its ceiling arranged to slope from the center toward both longitudinal sides, and

rising from the rear toward the front wall, and provided with an exit-opening in the highest point of said chamber, substantially as described, for the purpose set forth.

6. The combination, with the ice-chamber B, of the graduated ventilators I, ducts K, and the caps L, constructed and arranged substantially as described, for the purpose of controlling the ingress and egress of air to

and from said ice-chamber, substantially as described.

In testimony whereof I have hereto set my hand this 14th day of April, 1876, in the presence of two subscribing witnesses.

JAMES J. ROSS.

Witnesses:

MICHAEL J. STARK,
FRANK HIRSCH.