

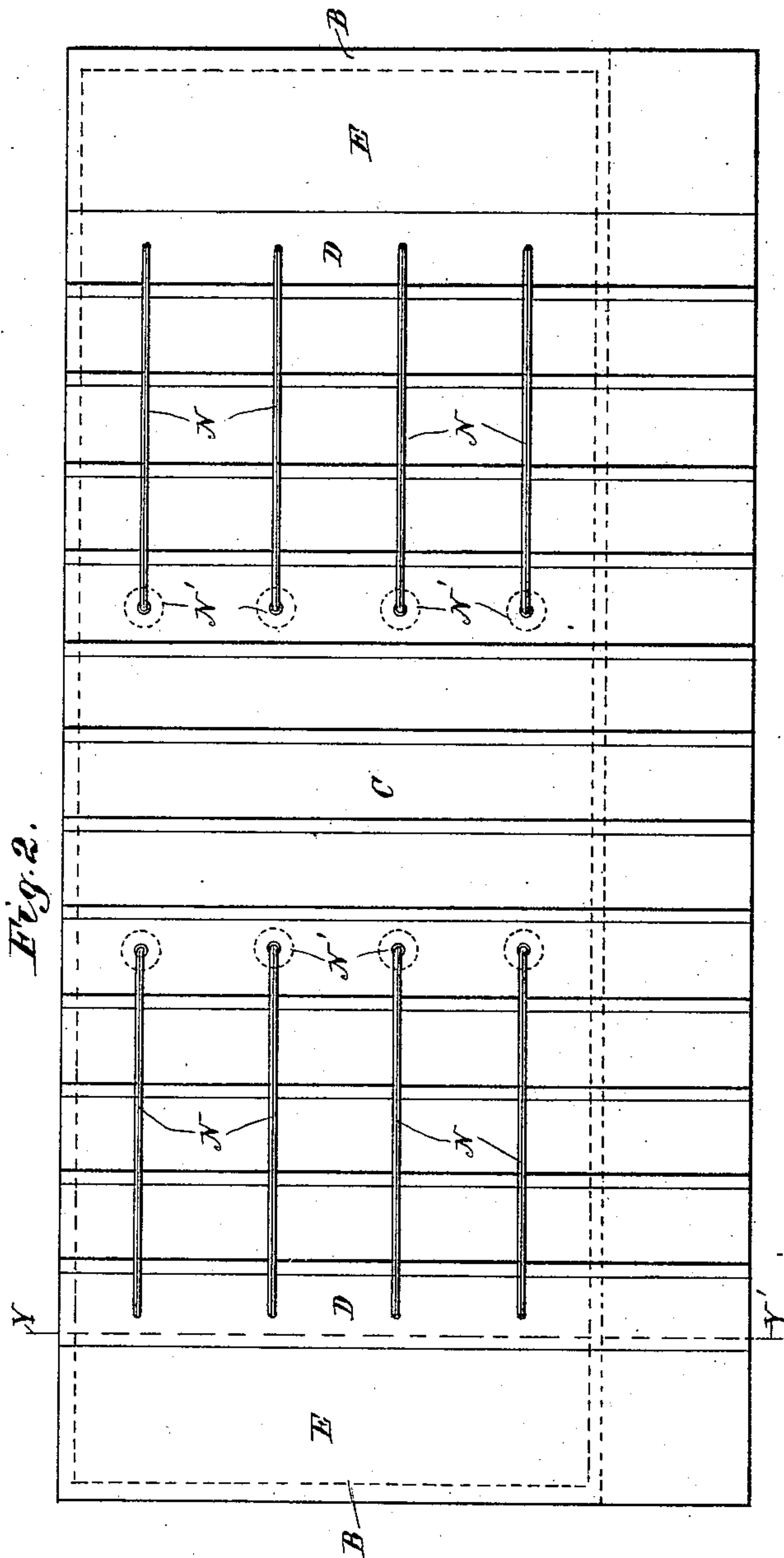
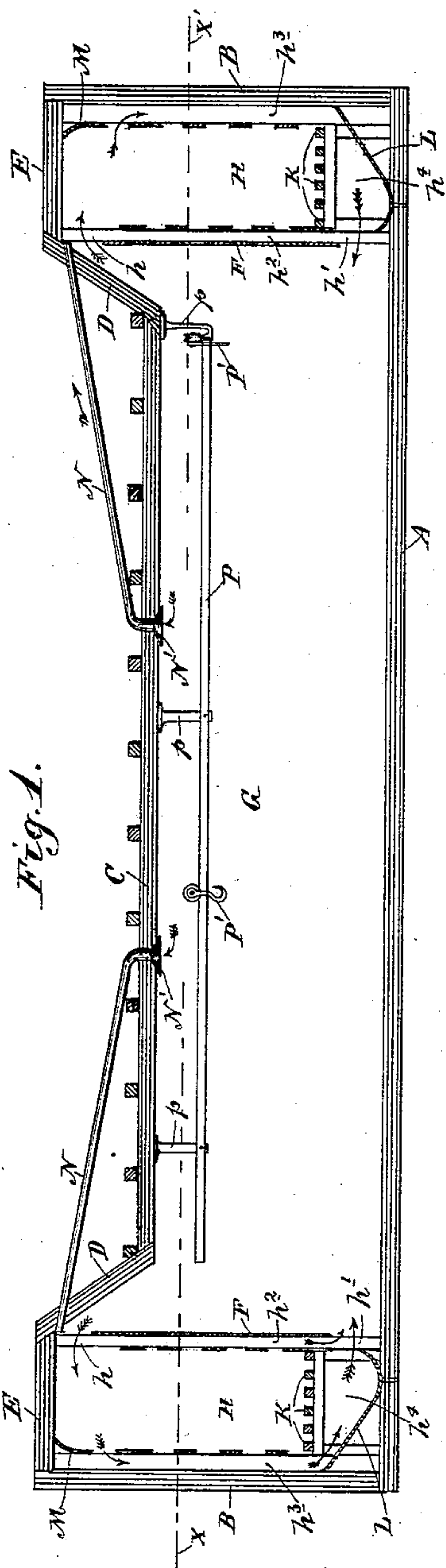
(No Model.)

2 Sheets—Sheet 1.

W. SIMMS.
REFRIGERATOR.

No. 472,773.

Patented Apr. 12, 1892.



Witnesses.
A. H. Opsahl.
E. F. Elnore.

Inventor
William Simms
By his Attorney.
Jas. P. Williamson

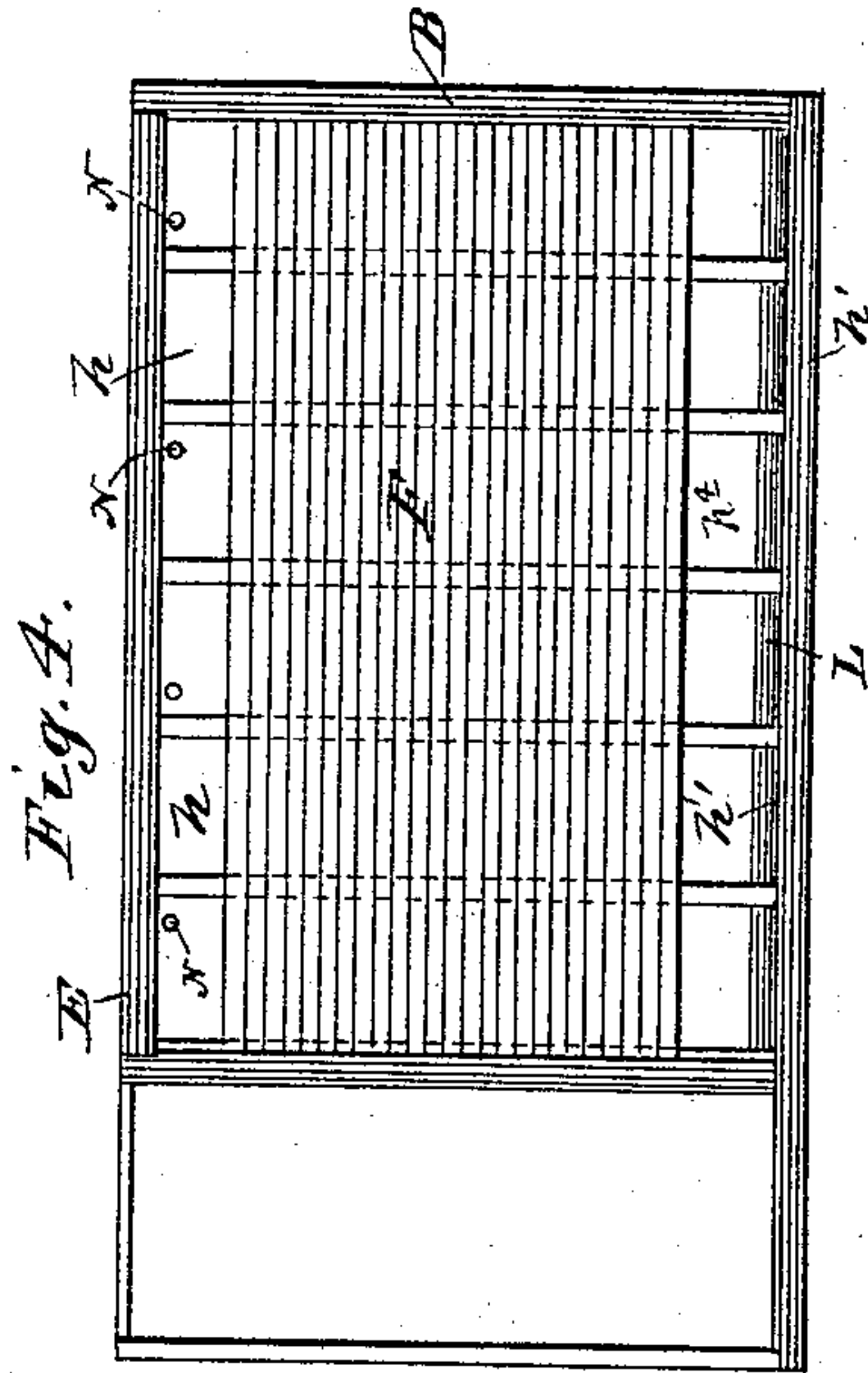
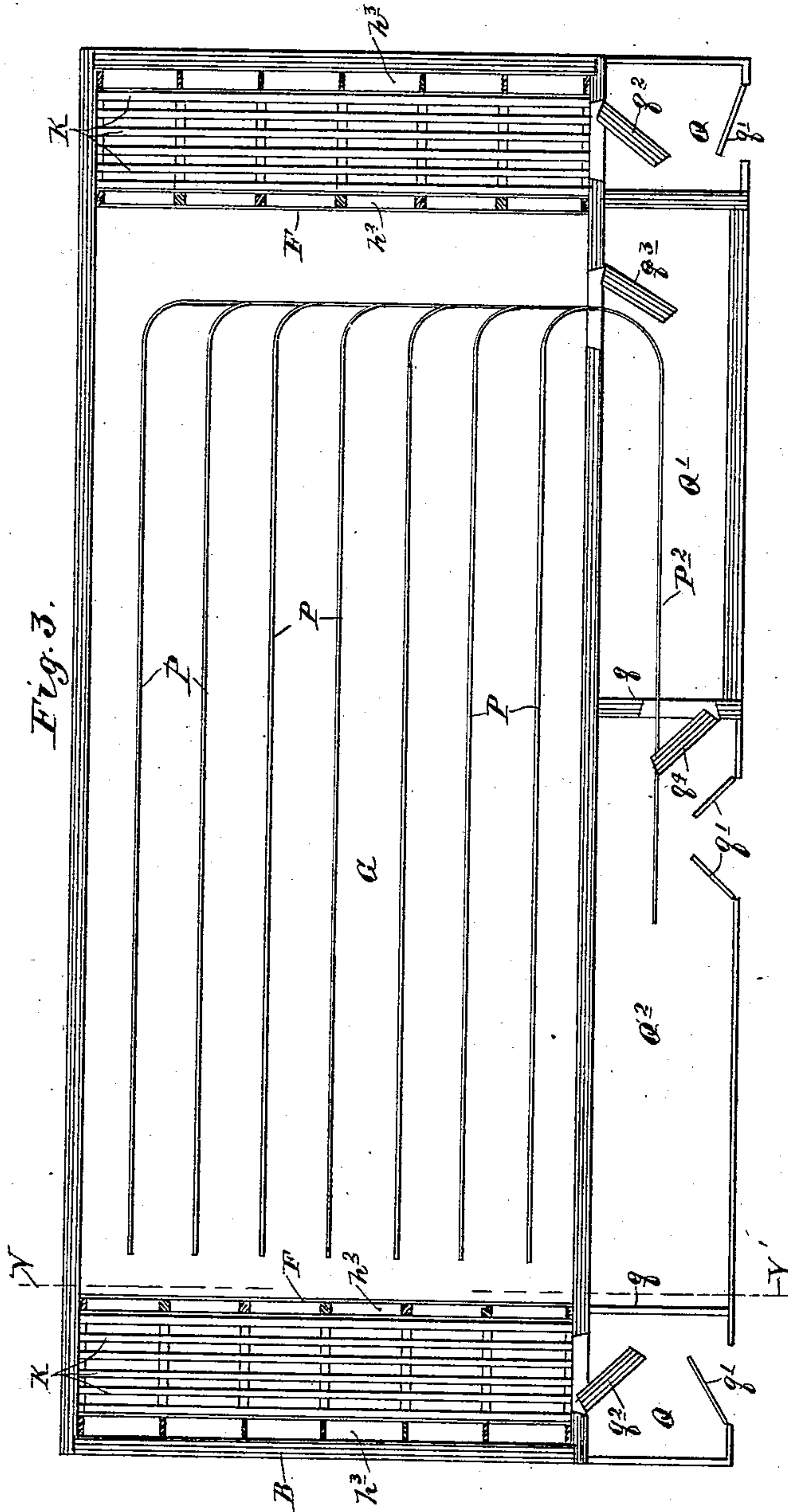
(No Model.)

2 Sheets—Sheet 2.

W. SIMMS.
REFRIGERATOR.

No. 472,773.

Patented Apr. 12, 1892.



Witnesses.

A. H. Opsahl.
E. F. Elmore.

Inventor.
William Simms
By his Attorney.
Jas. F. Williamson

UNITED STATES PATENT OFFICE.

WILLIAM SIMMS, OF MINNEAPOLIS, MINNESOTA.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 472,773, dated April 12, 1892.

Application filed August 27, 1891. Serial No. 403,868. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SIMMS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Refrigerators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to refrigerators or cold-storage structures. It is especially designed to meet the necessities of warehouse use, where storage-rooms of large capacity are required to preserve large quantities of meat and other articles. It is, however, equally serviceable in domestic use and is of general application in all the uses to which refrigerators may be applied.

The invention has for its object to provide a refrigerator of superior efficiency. To this end within a multiple-walled air-sealed case or box I provide separate ice and storage compartments constructed and arranged so that the ice-level may always be higher than the storage-level and so that the top of the storage compartment or compartments is in communication with the tops of the ice-compartments and so that the bottoms of the ice-compartments are in communication with the bottom zone of the storage-compartment. The effect of this arrangement is to produce a continuous circulation of the air in a constant direction from the upper zone of the storage-compartment to the top of the ice-compartments, and thence through the ice to the bottom of the ice-compartments and into the bottom zone of the storage-compartment, and inasmuch as the ice-level is always above the storage-level the temperature within the storage-zone may always be kept uniform.

In my preferred construction I locate the ice-receptacles at opposite sides or ends of the storage room or compartment, extend the same above the ceiling of the storage-room, provide outflow-pipes for the warm air, extended upward through the ceiling into contact with the outside atmosphere, with their delivery ends extended into and discharging into the tops of the ice-receptacles, and also construct the receptacles so that their lower portions or bottom sections are in open com-

munication with the floor-zone of the storage-compartment and so that their tops are in direct communication with the top zone of the storage-compartment. To permit the ice-receptacles to be extended above the main body of the ceiling of the storage-compartment, the connecting-section between that part of the ceiling over the ice-receptacles is set at an angle. The grating or bottom proper of the ice-receptacles is above the floor of the room, and under the same in the angle formed between the floor and the vertical wall of the structure is set a deflecting-plate for throwing the cold air directly outward into the floor-zone of the storage-compartment. With the exception of the openings at the tops and the bottoms the ice-receptacles are divided off from the storage-compartment by double walls, and a clear space is also left for the downward passage of the air at the back of the ice-crate.

Other details will appear in the following description and be particularly pointed out in the claims.

In the accompanying drawings I have shown a cold-storage room for warehouse use constructed in accordance with my invention, like letters referring to like parts throughout.

Figure 1 is a longitudinal vertical section from end to end of the room. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal section on the line X X' of Fig. 1, and Fig. 4 is a section on the line Y Y' of Figs. 2 and 3.

A B B are respectively the bottom and vertical walls of the room.

C D E is the ceiling of the same, of which C is the main portion or body of the ceiling, at a lower level than the other parts, E the part over the ice-compartment, at a considerably higher level than the parts C, and D the inclined connecting-section. These walls are all in multiple, with air-spaces between the same, as before stated. F are vertical partitions dividing off from the main body or storage-compartment G the ice-compartments H at the opposite ends of the room. The partitions F are continuous, but stop short of the ceiling and the floor of the room, so as to leave openings over the top and under the bottom of the partitions, as shown at *h* and *h'*.

K are the ice-crates located between the

partitions F and the end walls of the room and spaced apart from the same for the free downward passage of the air, as shown at h^2 and h^3 . The bottom of the crate is above the level of the floor of the room, so as to leave a clear space under the same, as shown at h^4 , for the outward passage of the cold air through h' into the storage-compartment. The crates extend upward near to the top of the elevated section E of the ceiling, so that by keeping the same filled with ice the ice-level will always be above the storage-level. In the angle formed by the end and bottom walls A and B is placed a deflecting-plate L under the bottom of each of the ice-crates, and in the angle between the ceiling and the end walls of the crates may also be placed a curved deflecting-plate, as shown at M. In virtue of the deflecting-plate M the warm air must pass down through the ice, and in virtue of the plate L the cold air is thrown directly out into the storage-compartment.

N are the warm-air-outflow pipes, provided with enlarged mouth-pieces N' , located on the under side of the ceiling. These pipes pass out through the ceiling into the external air and thence back through the inclined section D of the ceiling into the tops of the ice-compartments.

P are track-rails suspended from the central ceiling C by hangers p , on which move the hooks or hangers P' for supporting the dressed meats or other articles to be preserved.

Q, Q' , and Q^2 are vestibule extensions or additions provided with separating-partitions q and doors q' . The vestibules Q at the ends of the ice-compartments afford access to the ice-crates by doors q^2 for the insertion of the ice, and the vestibules Q' and Q^2 afford access to the storage-room for placing the meats in position therein with the minimum disturbance of the circulation by means of the doors q^3 and q^4 .

P^2 is the track-rail extending from the entrance-vestibule Q^2 to the interior of the storage-compartment, where it is connected to all of the supporting-rails P.

The deflecting-plates under the ice-crates are turned upward at their outer ends and extended to the faces of the vertical partitions F, so as to form in their concave parts a drip-trough for conducting off the drip from the ice.

The operation of the particular parts has been stated in connection with the description of the same.

The general operation is obvious. In virtue of the construction and relation of the ice and storage compartments the circulation of the air is continuous and in a constant direction from the top of the storage-room into the tops of the ice-compartments, and thence through the ice into the bottom zone of the storage-room. The fact that the outflow-pipes N extend upward through the

ceiling into the outside air and thence to the tops of the ice-receptacles produces a forced circulation due to the higher temperature of the external atmosphere. The circulation is therefore always maintained and the air kept in motion. Owing to the fact that the storage-zone is so much below the top of the ice-crates the ice-level will always be maintained above the storage-level. The general effect of the construction is to maintain a uniform and low temperature throughout the storage-zone.

By actual usage on a large scale I have found that this construction will preserve meats for a comparatively long time with a great economy of ice. The great resulting advantage, however, is its reliability and efficiency to preserve the meats for a comparatively long time.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a refrigerator, the combination, with the storage-compartment, of the ice-compartments located at opposite extremities of the same and extended above the central part or body of the ceiling over the storage-compartment and warm-air-outflow pipes passing from the top of the storage-compartment through the said ceiling to the external air, and thence to the tops of the ice-compartments, substantially as and for the purpose set forth.

2. In a refrigerator, the combination, with a multiple-walled air-sealed room or chamber, of ice-receptacles located at opposite extremities of the room, extending above the storage-level, and closed from the storage-chamber, except at the top and bottom of the same, and outflow-pipes for the warm air passing through the ceiling of the room to the outside of the same and delivering into the tops of the ice-receptacles, substantially as described, whereby a forced circulation will be effected by the heat of the external atmosphere on the outside portion of said outflow-pipes.

3. The refrigerator, as described, comprising the walls A B, the ceiling C D E, the part C being at a lower level than the part E, the vertical partition F, dividing the room into the storage-compartment G and ice-compartments H, in communication therewith at h and h' , the ice-crates K, with air-circulating spaces h^2 , h^3 , and h^4 , the deflecting-plates L and M, and the outflow-pipes N N' , extending through the ceiling to the outside of the same and delivering into the tops of the ice-receptacles, all arranged and operating substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM SIMMS.

Witnesses:

EMMA F. ELMORE,

JAS. F. WILLIAMSON.