

(No Model.)

3 Sheets—Sheet 1.

J. FRENIER.
REFRIGERATOR.

No. 379,533.

Patented Mar. 13, 1888.

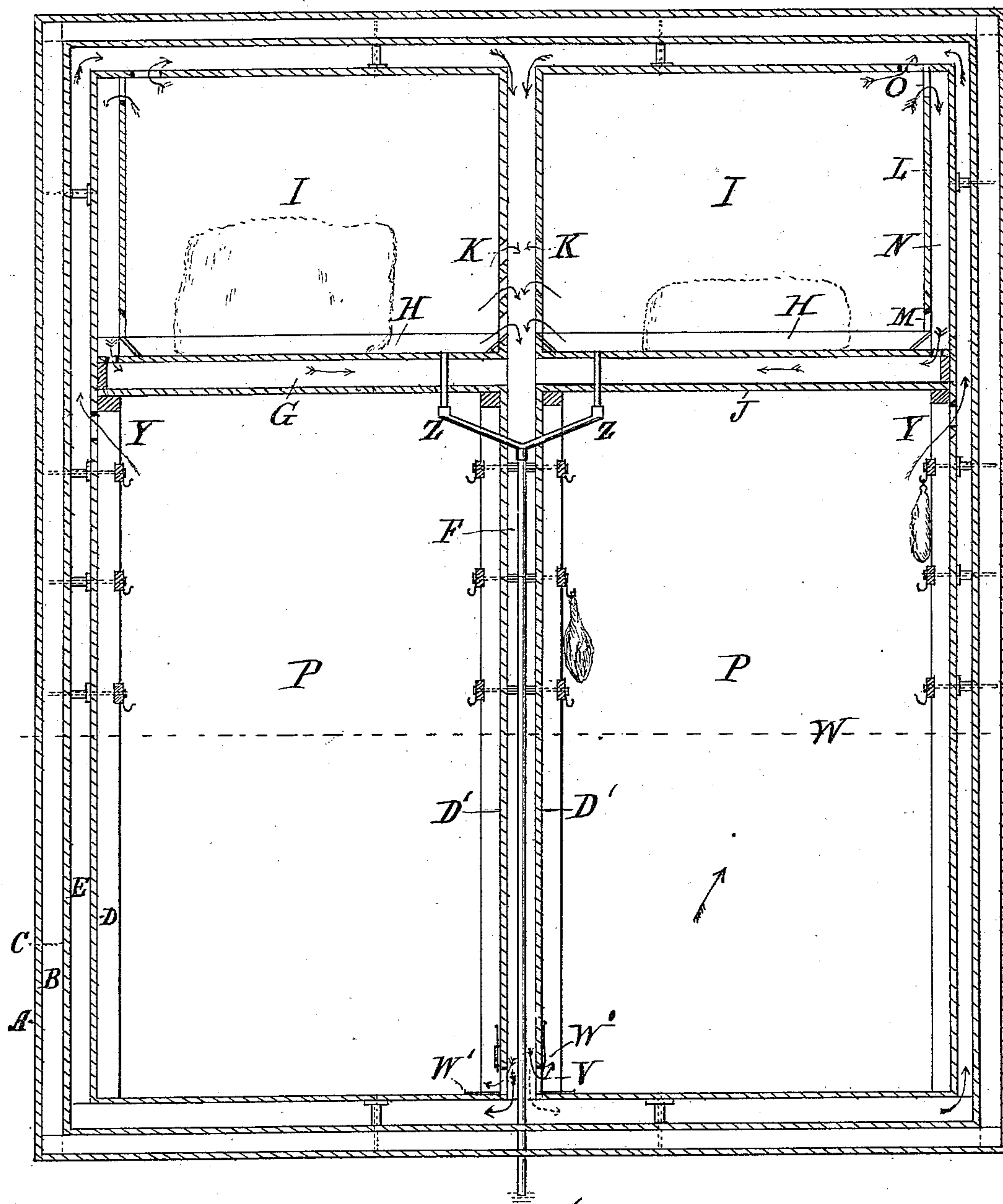


Fig. 1.

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Robt. S. Miller

INVENTOR:

Joseph Frener.

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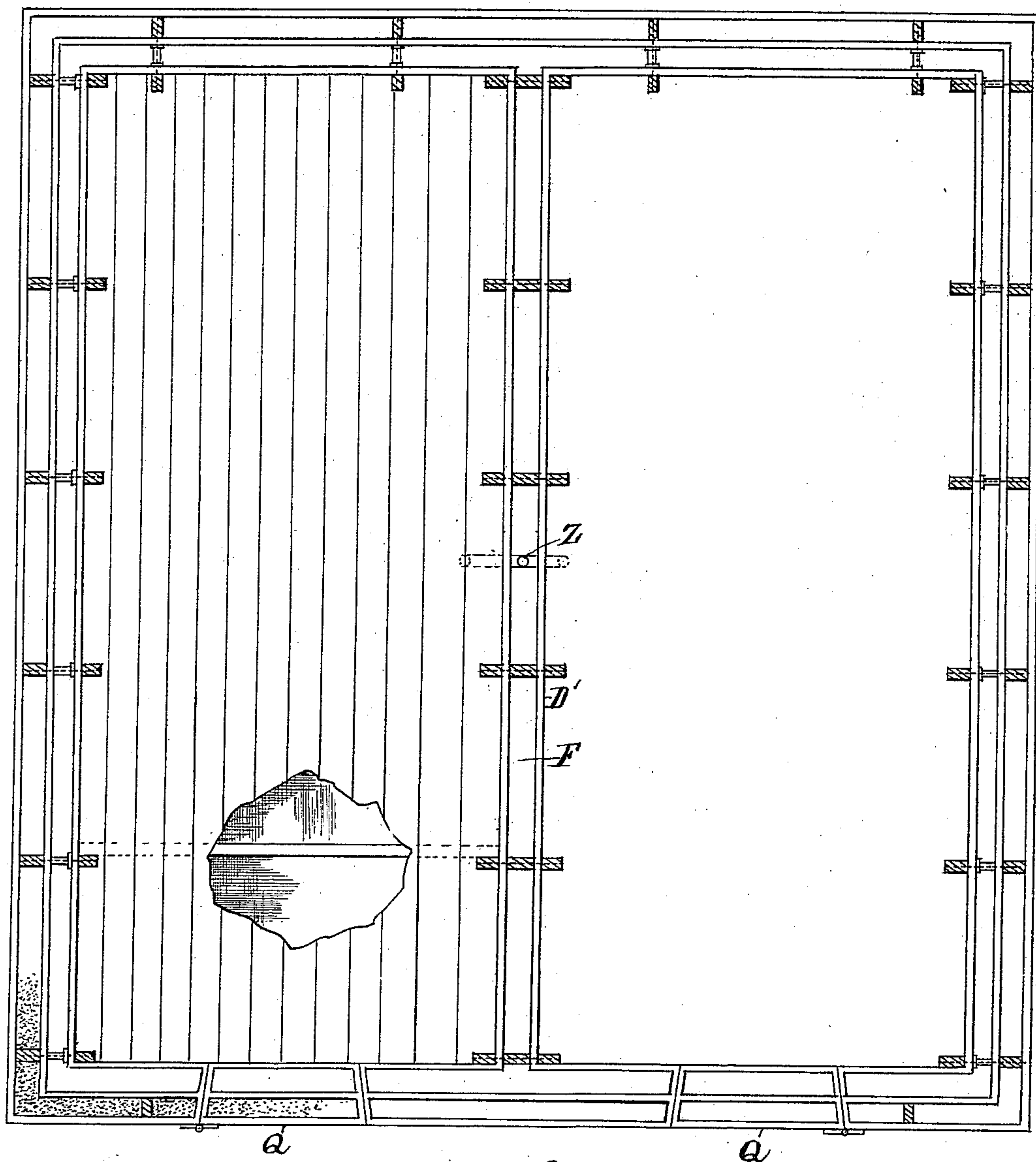


Fig. 2

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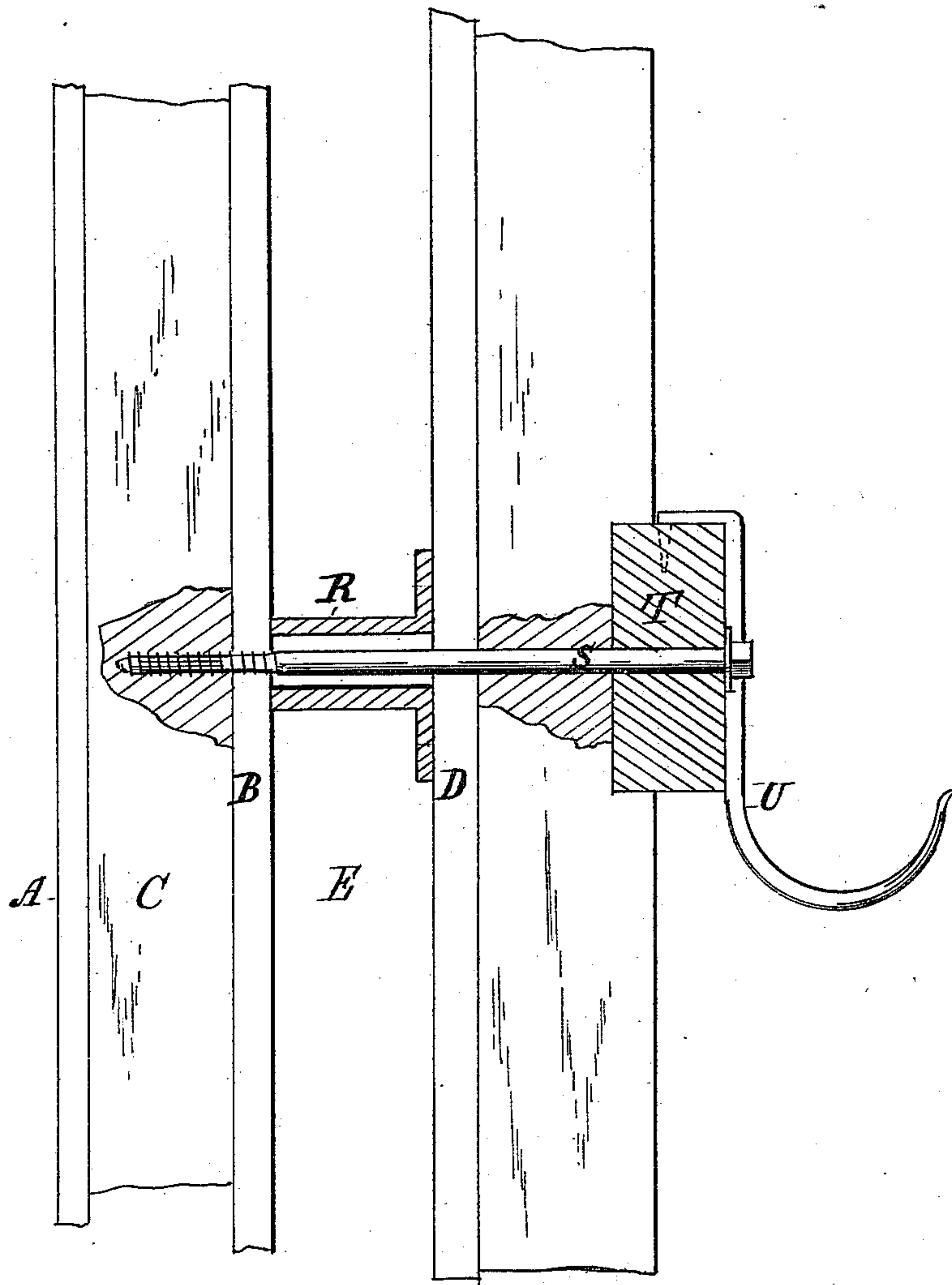


Fig. 3.

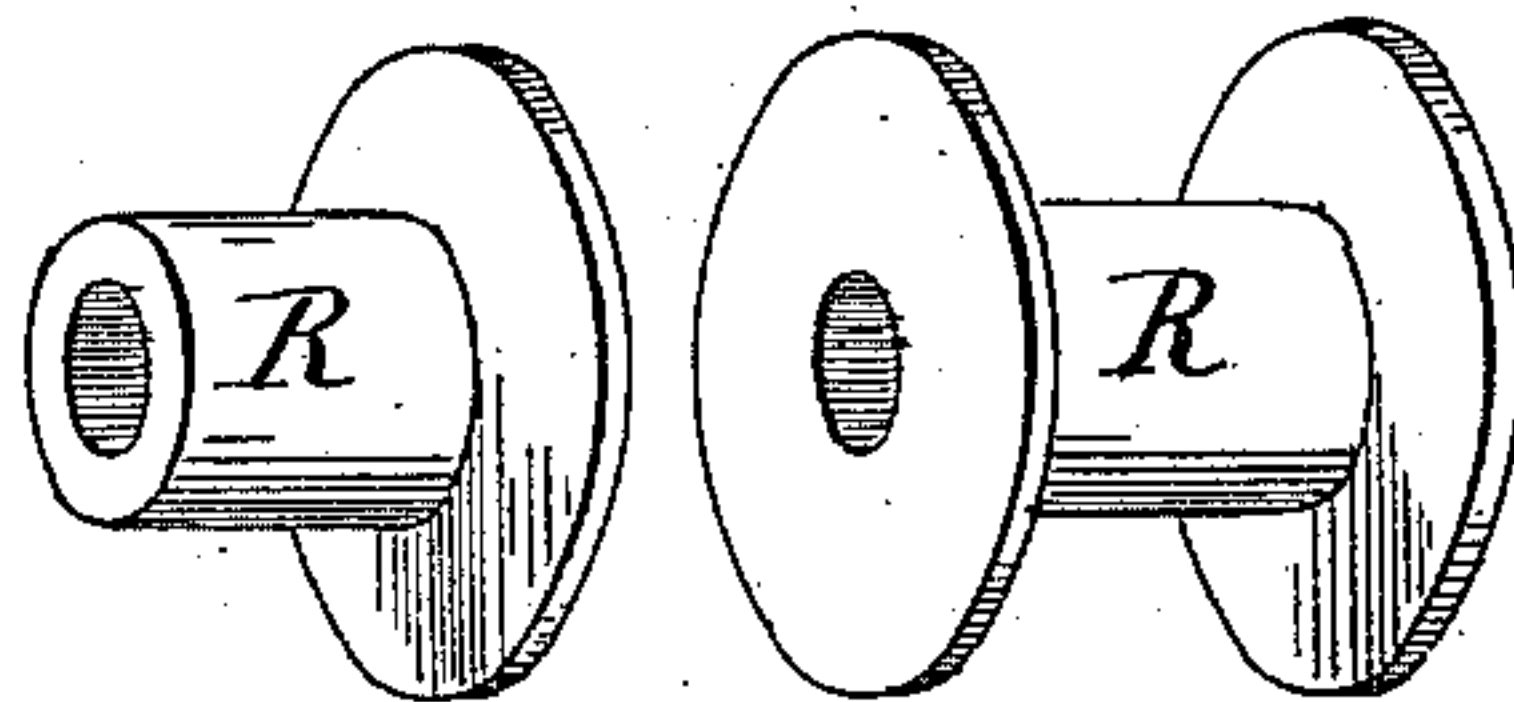


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOSEPH FRENIER, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO
EDWIN W. JEWELL, OF SAME PLACE.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 379,533, dated March 13, 1888.

Application filed May 16, 1887. Serial No. 238,381. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FRENIER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful
5 Improvement in Refrigerators, which improvement is fully set forth in the following specification and accompanying drawings, in which—

10 Figure 1 is a vertical sectional view of my refrigerator or cooling-room. Fig. 2 is a horizontal sectional view through line W, Fig. 1. Fig. 3 is a vertical enlarged detail section of one of the walls, and Fig. 4 a perspective
15 view of the arm or stud in the wall-flue.

20 The object of my invention is to construct a refrigerator or cooling-room; and it consists of the following features: first, the peculiar manner of constructing the outer walls of the refrigerator, in connection with the bottom
25 and top thereof, so that an air chamber or space will be provided on all sides; second, in having a central air-duct connecting at both its upper and lower ends with these outer
30 chambers; third, in having approximately in the middle a horizontal chamber, air-duct, or division connecting with the central vertical duct; and, fourth, the peculiar manner of constructing the several parts, so as to make a
35 strong and cheap refrigerator and one easily constructed by an ordinary mechanic, all of which will now be fully set forth in detail.

40 In the accompanying drawings, the outer casing or body of the room or refrigerator is represented by A, which may be either of wood or metal. Within this and at a suitable distance from this outer shell is a shell, B, either of wood or metal, having between the
45 two a space, C, for the usual packing material, such as is used in refrigerators. On the inside of this inner shell, B, is another shell or wall, D, providing a duct or chamber, E, around the entire refrigerator, sides, top, and
50 bottom.

As shown more fully in Fig. 2, F is a central vertical duct or chamber which extends
45 entirely across the refrigerator, the inner shells D' of which form the walls for this partition-duct. This duct communicates with the duct in the top and bottom.

50 Near the top of the room or chamber, as

shown in Fig. 1, is a horizontal duct, G, communicating with the vertical duct F. The
floors H of the chambers I, thus formed, serve as the wall on one side of the duct G, while
the shell J below forms the lower wall of the
55 duct. The ice-chambers I have openings K on the side next the duct F, communicating therewith, as shown in Fig. 1. The outer ends or sides of the ice-chambers have the walls L
60 located a short distance from the inner shell D, and the openings M are formed through this wall near the bottom, so that the cold air from the chamber I may flow into the chamber
65 N, thence through apertures in the floor H into the horizontal duct G, and thence to the vertical duct F. The walls L have also holes
70 or openings O through them near the top of the chamber I, which communicate with the chamber or duct N. There may also be openings in the ceiling of the chamber or chambers
75 I, to allow a flow of air into the space above said chamber or chambers.

When constructed and arranged in the manner here shown, the refrigerator will have two
80 rooms or chambers, P P, for the reception of meats, fruits, &c., and two smaller ice-chambers, I I, above. These chambers are surrounded with the air-spaces, as described, and all the chambers are made accessible by doors
85 Q Q, suitably located and of convenient size. It will now be in order to show the peculiar
manner in which I construct the body and partitions of the refrigerator or rooms.

Fig. 3 shows an enlarged sectional view of the entire wall of a refrigerator. In order to
85 make the chambers or air-ducts uniform all around each internal chamber, I prepare a hollow stud, R, two forms of which are shown in Fig. 4. These studs are interposed between
90 the walls B D at suitable points, and lag-screws S pass through these walls and through the studs R from the inside in order to hold all the walls firmly together in their relative positions.
95 In the lower chambers, P P, I prefer to have these lag-screws pass through the horizontal wall-cleats T, to which the meat-hooks U are attached, or to which shelves or brackets may be fastened.

I will now set forth the manner in which the refrigerator operates and describe the ad-
100

advantages gained by my invention. The lower
 chambers, P P, have openings V through the
 inner walls D' D' at the base, which form con-
 nections with the central vertical duct, F.
 5 These openings are each provided with cut-off
 gates W, so that the flow of air through these
 openings may be regulated. The inner shells,
 D of the chambers, near the ceiling J, have
 openings Y, which communicate with ducts
 10 E, that surround the entire refrigerator. The
 chambers I I are each provided with drip-
 pipes Z, which pass down through the central
 ducts, F, and terminate below the floor of the
 refrigerator in an ordinary cup-trap.
 15 W' represents a slide or cut-off at the lower
 end of the duct F.
 It will be observed that the ice-chambers
 have their cold-air outlets near their floors,
 and that all the cold air generated therein
 20 passes downward in the central duct, F, from
 whence it passes beneath the floors of the cham-
 bers P P to the ducts which surround the en-
 tire refrigerator, passing thence to the duct
 on top of the refrigerator and down again
 25 through the duct F. In order to create this
 current and to assist in producing a continu-
 ous circulation, the warm air within the cham-
 bers P is permitted to pass out through the
 openings Y, which, when it enters the sur-
 30 rounding duct, creates a current, a sufficient
 amount of cold air being supplied through
 the openings V at the bottom of the chambers.
 It has been customary to allow the cold air
 from the ice-chamber to enter the storing-
 35 chambers at the top; but I find that a much
 better circulation can be effected by supplying
 the cold air at the bottom, as shown. Again,
 in order to separate the cold wall of the ice-

chambers I as much as possible from contact
 with the outer or surrounding ducts, the wall 40
 L is introduced, thereby preventing the cold
 walls of the ice-chamber from reducing the
 temperature in the surrounding ducts.

It will be noted that the surrounding or ex-
 ternal atmosphere is entirely excluded from 45
 the refrigerator, excepting such as may enter
 the refrigerator when the door is open.

What I claim as new is—

In a refrigerator, the combination, with the
 outer casing, of provision-chambers and su- 50
 perimposed ice-chambers, the ice-chambers
 being separated from the provision-chambers
 by a horizontal air-space, the ice-chambers
 and the provision-chambers being separated
 by a vertical air-space in communication with 55
 the horizontal space, and all of said chambers
 being separated from the outer wall by a sur-
 rounding air-space continuous with said ver-
 tical air-space, the ice-chambers being pro-
 vided with openings through which commu- 60
 nication is established with said horizontal,
 vertical, and surrounding air-spaces, and each
 provision-chamber being provided with an
 opening near its floor, establishing communi-
 cation with said vertical air-space, and an 65
 opening near the ceiling establishing commu-
 nication with said surrounding air-space, for
 the purpose set forth.

In testimony that I claim the foregoing I
 have hereunto set my hand, this 11th day of 70
 March, 1887, in the presence of witnesses.

JOSEPH FRENIER.

Witnesses:

J. S. ZERBE,
 ROBERT RAMSEY.