

No. 618,115.

Patented Jan. 24, 1899.

F. W. MERRILL.
DRY AIR FREEZER.

(Application filed July 23, 1897. Renewed Dec. 22, 1898.)

(No Model.)

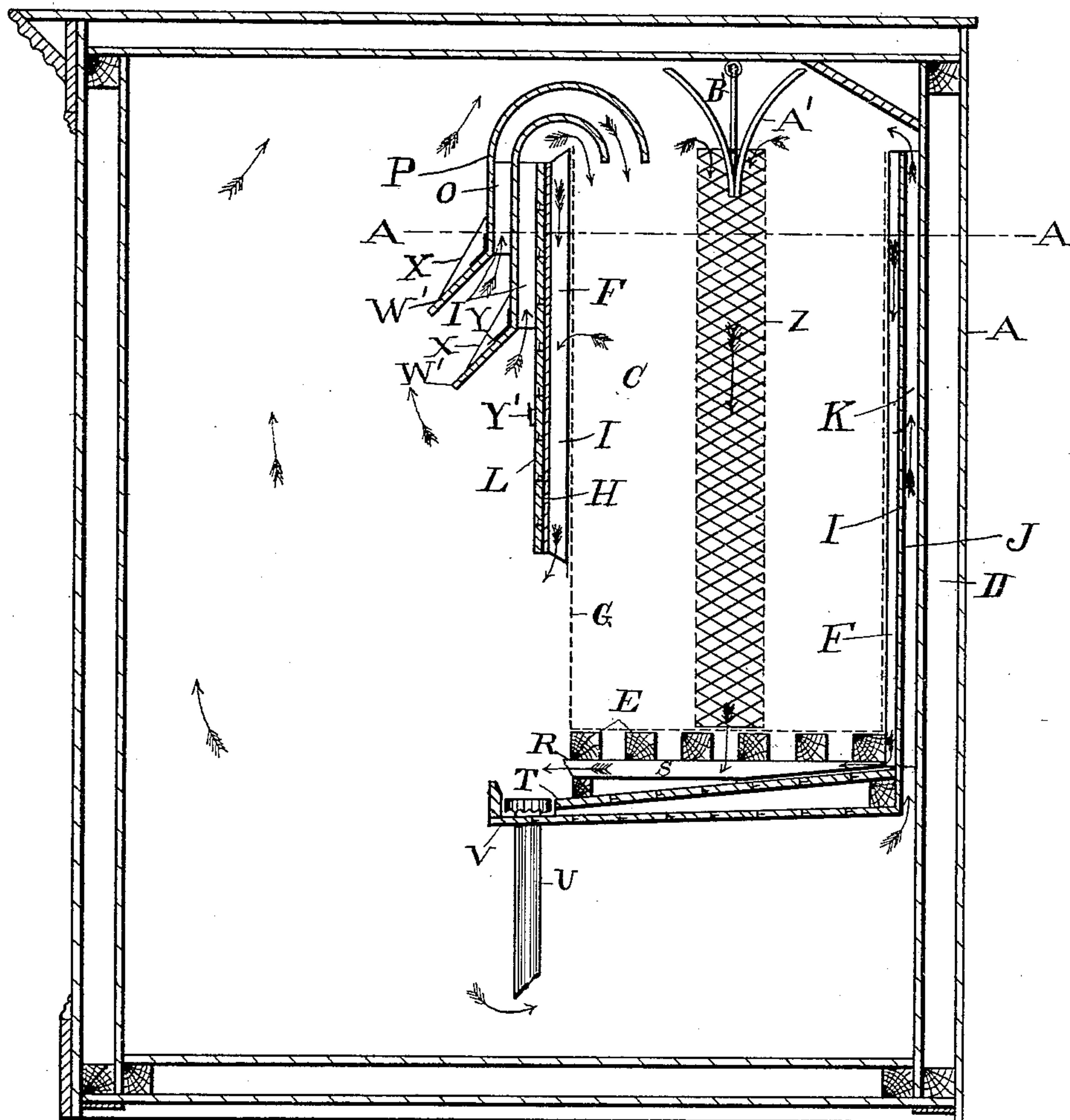


Fig. 1.

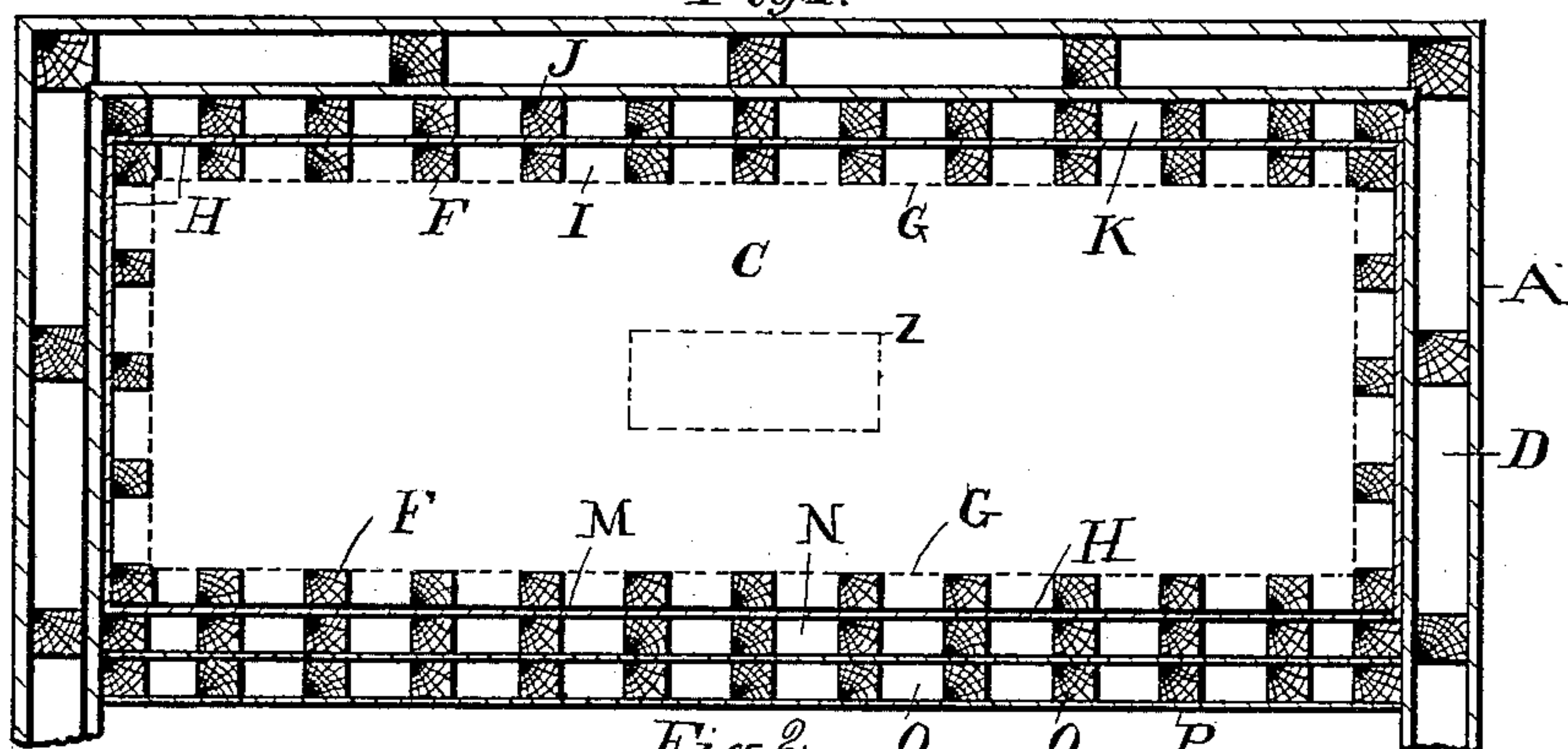


Fig. 2.

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UNITED STATES PATENT OFFICE.

FRANK W. MERRILL, OF SCARBOROUGH, MAINE, ASSIGNOR TO JOHN A. RAFTER, OF MONTREAL, CANADA, AND NATHAN S. V. HAMEL, OF PORTLAND, MAINE.

DRY-AIR FREEZER.

SPECIFICATION forming part of Letters Patent No. 618,115, dated January 24, 1899.

Application filed July 23, 1897. Renewed December 22, 1898. Serial No. 700,083. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. MERRILL, a citizen of the United States of America, residing at Scarborough, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Dry-Air Freezers; 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 improvements in dry-air freezers, and is designed to produce a very low dry temperature. This I accomplish by the novel construction and arrangement of the ice-bunker and the cold-air, warm-air, and force flues leading from the refrigerating-room to the bunker and from the bunker to the refrigerating-room, which construction I have illustrated in the drawings herewith accompanying, in which—

Figure 1 is a central vertical cross-sectional view of the ice-bunker, flues, and refrigerating-room; and Fig. 2 is a horizontal sectional view taken on line A A, Fig. 1, the pivoted flanges, the wooden lining, and a part of the refrigerating-room being omitted.

In said drawings, A represents the outside casing, B the refrigerating-room, and C the ice-bunker. The outside casing may be of any convenient construction, preferably provided with insulating-spaces D, which may be merely a dead-air space or filled with some material not a conductor of heat. The ice-bunker consists of a suitable bottom, which may be a series of ice-supporting bars E and upright studding F. The inside of the upright studding and the bottom is covered with a continuous lining of wire-netting G and the outside by a continuous sheet of metal H. The spaces between said studding form cold-air flues I, the cold air passing outwardly through the meshes of the netting into the flues and thence into the cold-air chamber at the front directly into the chamber and at the side and rear under the bottom of the bunker and thence into the chamber, as indicated by arrows in Fig. 1. At the back there is a second row of studding J separating the metal lining from the rear wall of the refrigerating-

room and forming between said lining and said wall a series of warm-arm flues K, leading from a point beneath the ice-chamber to the top thereof. At the front, secured to the metal lining H, is a wooden lining L, said metal lining, taken in connection with the wooden lining, serving to prevent the ice-bunker from sweating on the outside. The wooden lining may, if desired, without affecting the principle of my invention extend to the top of the ice-bunker. Outside of the metallic lining H and wooden lining L is a second series of studding M and sheathing W, forming what I have called "force-flues" N, which lead from the refrigerating-room upwardly to a point above the bunker and thence curving over and terminating above the top of the ice-bunker. Outside of said last-named flues may be arranged another set of studding O and another metal sheathing P, forming a second series of force-flues Q. Still other force-flues may be employed, if desired. The sills which form the bottom of the ice-bunker rest on transverse timbers R, leaving air-passages S therebetween, as indicated by arrows in Fig. 1, for the passage of the cold air out into the refrigerating-chamber. Beneath the ice-bunker is a drip-pan T of any desired construction, which is preferably inclined and has at its lowest point a suitable waste-pipe and trap V.

To direct the warm air into the force-flue, I sometimes turn the lower portions of the metal sheathing W' and B'' outwardly, as seen in Fig. 1, and said parts W' may be secured to the main portion by a hinge Y' and provided with means for holding it open, as cords X, secured to the main portion and swinging portion, respectively, or other convenient means.

Y' is a button for holding the lower portion W' closed.

To increase still further the efficiency of my dry-air freezer, I arrange one or more cold-air supplemental flues Z in the ice-bunker, at a point at or near the center. These flues extend entirely through the ice-bunker and rest upon the wire-netting or sills thereof at the bottom. At the top the flue may be provided with flaring hoods A', adapted to di-

rect the warm air over the top of the ice-bunker down into the tube. The tube itself may be suspended to the ceiling of the refrigeration-chamber by means of a cord B'.

5 The directions of the air-currents in these supplemental flues are as indicated by the arrows therein.

In operation the bunker is filled with ice, and the air cooled by contact therewith tends
10 to descend, and passing through the wire-netting into the cold-air flues descends therein and passes out into the cold-air chamber. At the same time the warm air passes up through the warm-air flues and force-flues,
15 which in turn is cooled by contact with the ice or cold-air flues and descends and again passes into the refrigerating-chamber, thus establishing a constant circulation of air. The warm-air flue communicating with the
20 space under the bunker insures a circulation of cold dry air.

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

1. In a dry-air freezer, a suitable chamber,
25 an ice-bunker located therein and formed by a series of vertical studs, a wire-netting covering the interior of said studs and the bottom of the bunker, a metal sheathing covering the outside of said studding, cold-air flues
30 between the netting and sheathing, warm-air flues between the back of the containing-case and said sheathing and force-flues arranged at the front of the bunker curved at the top and overhanging the top of the bunker,
35 substantially as described.

2. In a dry-air freezer, a suitable chamber, an ice-bunker located therein and formed by a series of vertical studs, a wire-netting covering the interior of said studs and the bottom of the bunker, a metal sheathing on the
40 outside of said studding, cold-air flues between the netting and sheathing, warm-air flues between the back of the containing-case and said metal sheathing and force-flues arranged at the front of the bunker curved at
45 the top and overhanging the top of the bunker and means for regulating the size of the lower end of the force-flues, substantially as described.

3. In a dry-air freezer, a suitable chamber,
50 an ice-bunker located therein and formed by a series of vertical studs, a wire-netting covering the interior of said studs and the bottom of the bunker, a metal sheathing covering the outside of said studding, cold-air flues
55 between the netting and sheathing, warm-air flues between the back of the containing-case and said metal sheathing, force-flues arranged at the front of the bunker and supplemental cold-air flues adapted to be suspended to
60 the top of the chamber and to extend down through the ice-bunker at or near the center thereof, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 20th day of
65 July, A. D. 1897.

FRANK W. MERRILL.

Witnesses:

NATHAN CLIFFORD,
WILLIAM HENRY CLIFFORD, Jr.