(No Model.) 2 Sheets—Sheet 1.

B. D. STEVENS.

REFRIGERATOR.

No. 345,607. Patented July 13, 1886.

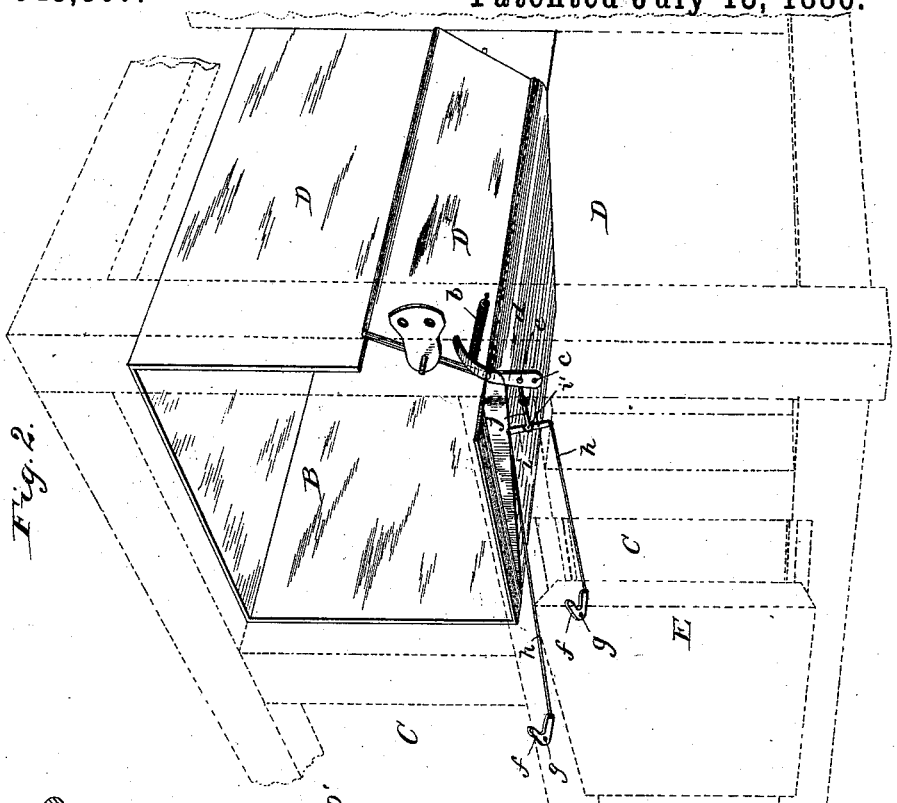

Fig. 2.

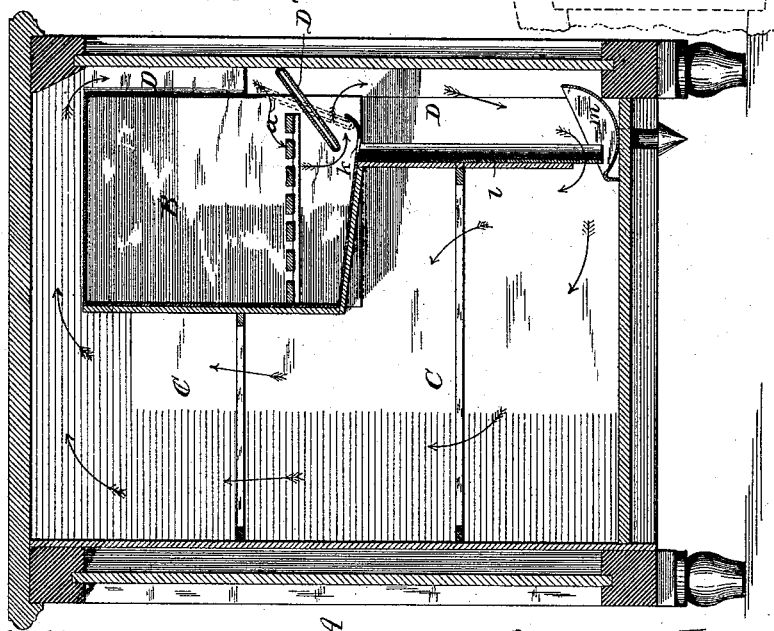

Fig. 1.

Witnesses:
H. N. Low
E. L. Dick

Inventor:
Benjamin D. Stevens
by Marcellus Bailey
his attorney

(No Model.) 2 Sheets—Sheet 2.

B. D. STEVENS.

REFRIGERATOR.

No. 345,607. Patented July 13, 1886.

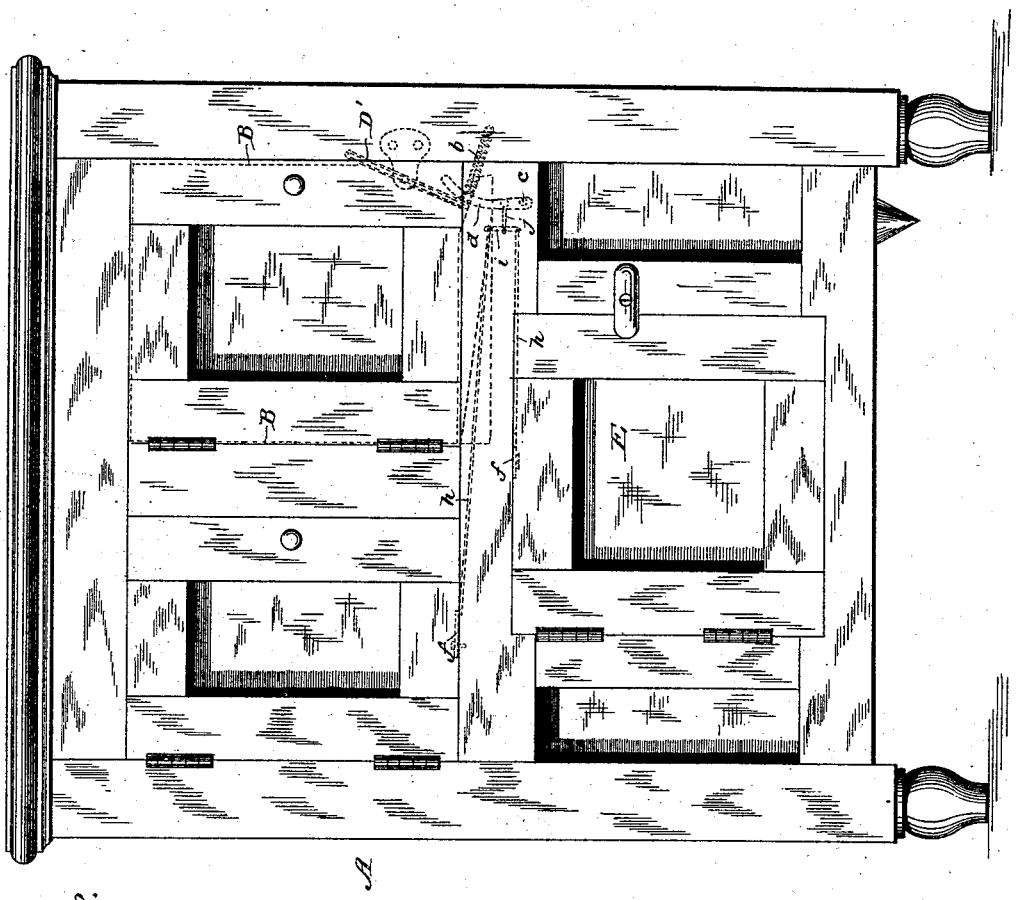

Fig. 3.

Witnesses:
N. N. Low
E. F. Dick

Inventor:
Benjamin D. Stevens
by Marcellus Bailey
his attorney

UNITED STATES PATENT OFFICE.

BENJAMIN D. STEVENS, OF BURLINGTON, VERMONT, ASSIGNOR OF THREE-FOURTHS TO THEODORE S. PECK, OF SAME PLACE.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 345,607, dated July 13, 1886.

Application filed February 19, 1886. Serial No. 192,576. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN D. STEVENS, of Burlington, in the State of Vermont, have invented certain new and useful Improvements in Refrigerators, of which the following is a specification.

My invention has relation to that class of refrigerators in which the ice or refrigerating chamber, the provision-chambers, and the passage or passages through which circulation is maintained are combined with a cut-off which, when any one of the provision-doors of the refrigerator is opened, automatically closes the ice or refrigerating chamber against the entrance of warm air, and which, on the other hand, when all of the doors are closed, opens, so as to permit circulation to be again established. In the arrangement that I have devised the air before entering the ice-chamber passes around it, so that when it does enter therein it has become considerably cooled, the result being that in practice a considerable saving of ice is effected. Furthermore, the air preferably enters the ice-chamber at nearly its lowest part, where the atmosphere is coldest, and after taking a circuitous course around the shutter or cut-off (which is located at that point in the ice-chamber) passes out from the chamber to descend to the provision-spaces of the refrigerator. The cut-off itself is arranged not in the air-circulating passages, but in the walls of the ice-chamber itself. It is so placed that when shut it closes the ice-chamber against the ingress of warm air or the egress of cold air, and when open directs the air-circulation into and through the ice-chamber.

The foregoing and other features of my improvements will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a refrigerator embodying my improvements. Fig. 2 is a perspective view of the shutter and its operating mechanism, the portions of the refrigerator adjacent to said parts being represented in dotted lines. Fig. 3 is a front view of the refrigerator.

A is the body of the refrigerator, which contains the ice-chamber B and provision space or chambers C, with passages D for the circulation of air, as indicated by the arrows. The ice-chamber is made of zinc or some metal, and the circulating-passages lead over its top and down its side, so that the warm air first comes in contact with these parts, and thus becomes considerably cooled before actually entering the ice-chamber. Near the lower right-hand corner of the ice-chamber is a side opening, *a*, which is controlled by the shutter or cut-off D', pivoted so that it can be moved to open or close, as desired. When open, (as indicated by full lines in Fig. 1,) it closes the direct exterior circulating-passages, D, so as to compel the descending air to enter the ice-chamber and pass in a circuitous course through the cold lower part of the chamber and around the shutter itself before it can again pass into the exterior passages, D. In other words, the shutter or cut-off, when open, forms a partition or barrier to pass beyond which the air must go around through the ice-chamber. On the other hand, when it is shut it opens the direct external passages, D, while it entirely closes the ice-chamber against communication with that passage, as indicated by dotted lines in Fig. 1. In order to cause this shutter or cut-off to close whenever any one of the provision-doors of the refrigerator is opened, and to again open only when all of said doors are closed, a variety of known means can be resorted to. One simple arrangement for the purpose is represented in the drawings. A spring, *b*, of any suitable kind, tends to move the shutter to and hold it in a position in which it closes the ice-chamber.

Pivoted at a suitable point, *c*, on the interior of the refrigerator is the push or opening lever *d*, whose bent free end bears against or is in contact with the shutter. This lever, if pulled to the left, will, as seen, move in a direction to force and hold open the shutter against the stress of spring *b*. To impart this movement to the lever at the appropriate time, it is connected at a point, *e*, to a wire, *h*, which leads to a bell-crank lever, *f*, pivoted at *g*, and having one of its arms connected to the wire and the other projecting so as to be struck and forced back by the door E (seen in dotted lines) when the latter is closed. The effect of this

movement of the bell-crank lever is to pull the opening-lever in a direction to open the shutter, and the latter is held in this position so long as the door is closed. When there is only one door E, but one wire *h* is required, and it may be connected directly to the opening-lever. Where, however, there are two doors, E, as in the refrigerator represented in the drawings, there must, as seen, be a wire, *h*, and an angle-lever, *f*, for each door, and the two wires must be connected, not directly to the opening-lever, but to opposite ends of an arm, *i*, pivoted at its middle at *i'* to a link, *j*, attached to the opening-lever. Under this arrangement the opening of either one of the doors will permit the shutter to close, and the shutter cannot again be opened until all of the doors are closed. The ice is supported upon a rack in the ice-chamber some little distance above the bottom of the latter, and the door of the ice-chamber extends below the rack, so that when the door is opened access can be had to the space beneath the rack for cleaning or other purposes. The bottom of the ice-chamber is inclined, as usual, and is provided, as customary, with the drip opening or tube *k*, which, below the bottom of the ice-chamber, continues in the form of a gutter or half-tube, *l*, to or near a trough, *m*, in the bottom of the refrigerator. From the trough leads the customary discharge-pipe, which on the exterior is provided with the ordinary trap to prevent entrance of air.

The advantage of using the half-tube in the place of a full-round tube is that there is less liability of the device being choked up by slime and refuse, which with the full-round tube sometimes happens with the result of causing the overflow of the refrigerator.

I have described my invention in connection with what is commercially known as a "refrigerator;" but I desire it to be understood that it can be applied to structures of larger size—such as cars, buildings, &c.—intended for refrigerating and cooling purposes, and I desire to be understood as including such applications in my claims.

What I claim herein as new and of my own invention is—

1. The combination of the ice-chamber, the provision chamber or chambers, the air-circulating passage, and the cut-off or shutter applied to an air-inlet in the ice-chamber, and arranged and operating, when open, to form a partition or barrier across the air-circulating passage, whereby the air is diverted into and through the ice-chamber, and when closed to shut off communication between the ice-chamber and said passage, substantially as and for the purposes hereinbefore set forth.

2. The combination of the ice and provision chambers, the air-circulating passage, the cut-off or shutter controlling the air-inlet in said ice-chamber, and arranged, when open, to form an air-deflecting partition across said passage, the provision-chamber door or doors, and means, substantially as described, whereby said shutter or cut-off is caused to open or close the inlet according as said doors are closed or open, substantially as hereinbefore set forth.

3. The combination of the provision and ice chambers and the air-inlet in the latter, the circulating-passage between them, passing over and around the exterior of the ice-chamber before reaching said air-inlet, and the automatically-operating shutter or cut-off controlling said inlet and forming, when open, an air-deflecting partition, substantially in the manner and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 11th day of February, 1886.

BENJAMIN D. STEVENS.

Witnesses:
A. R. ST. PETERS,
H. T. RUTTER.