

(No Model.)

S. B. CLEMMENS.

Refrigerator.

No. 234,457.

Patented Nov. 16, 1880.

Fig. 1.

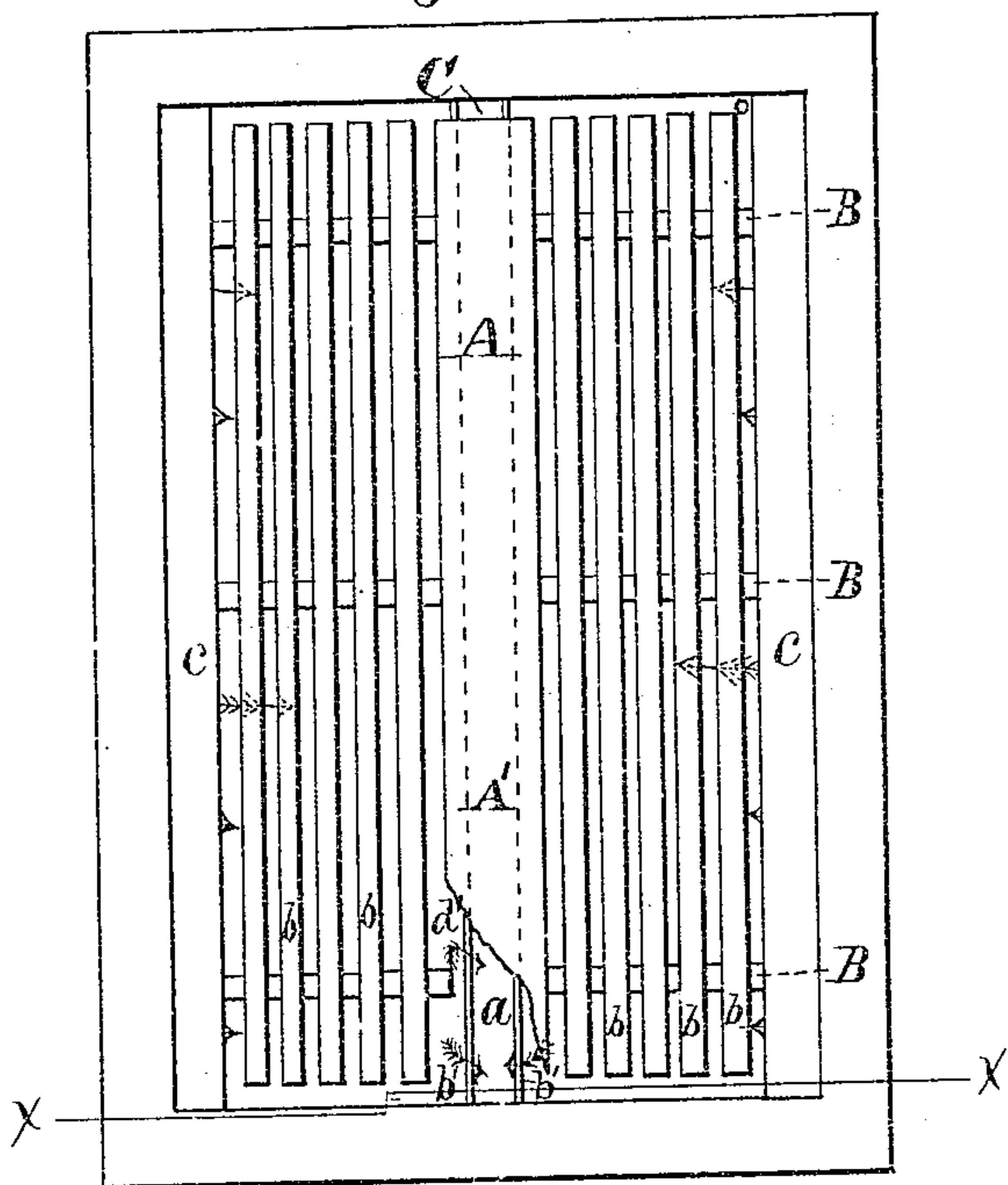


Fig. 2.

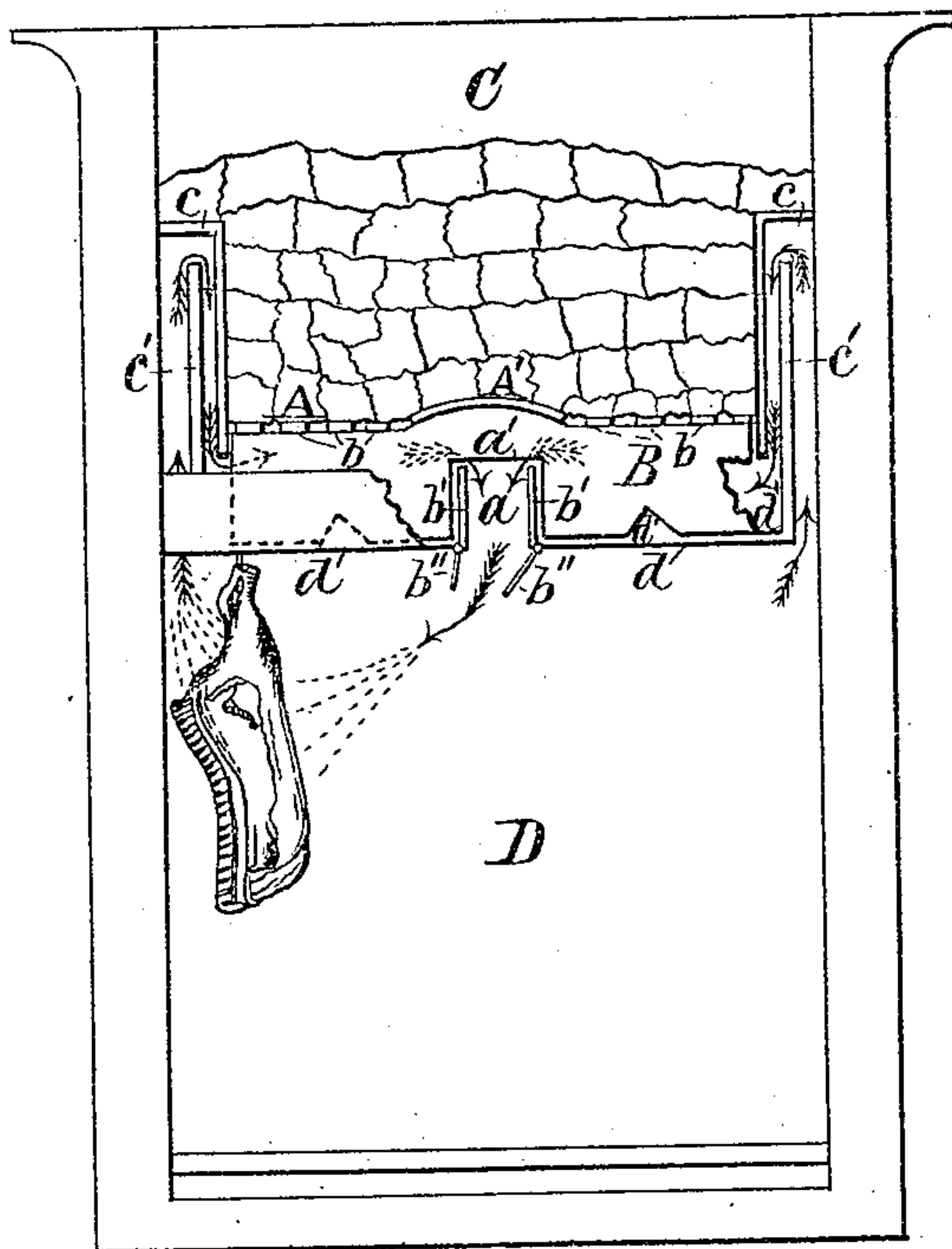


Fig. 3.

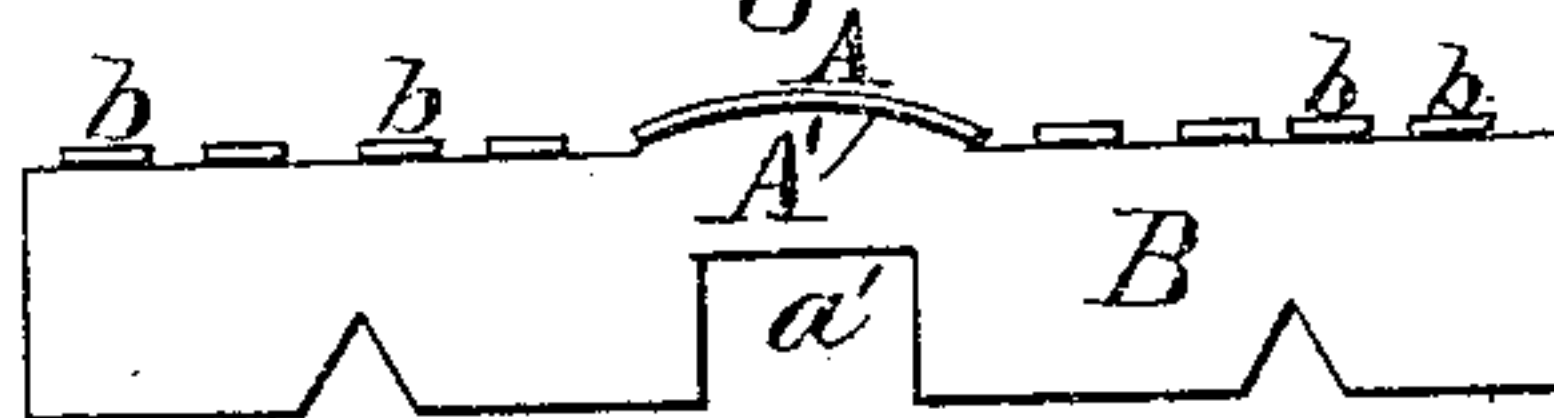
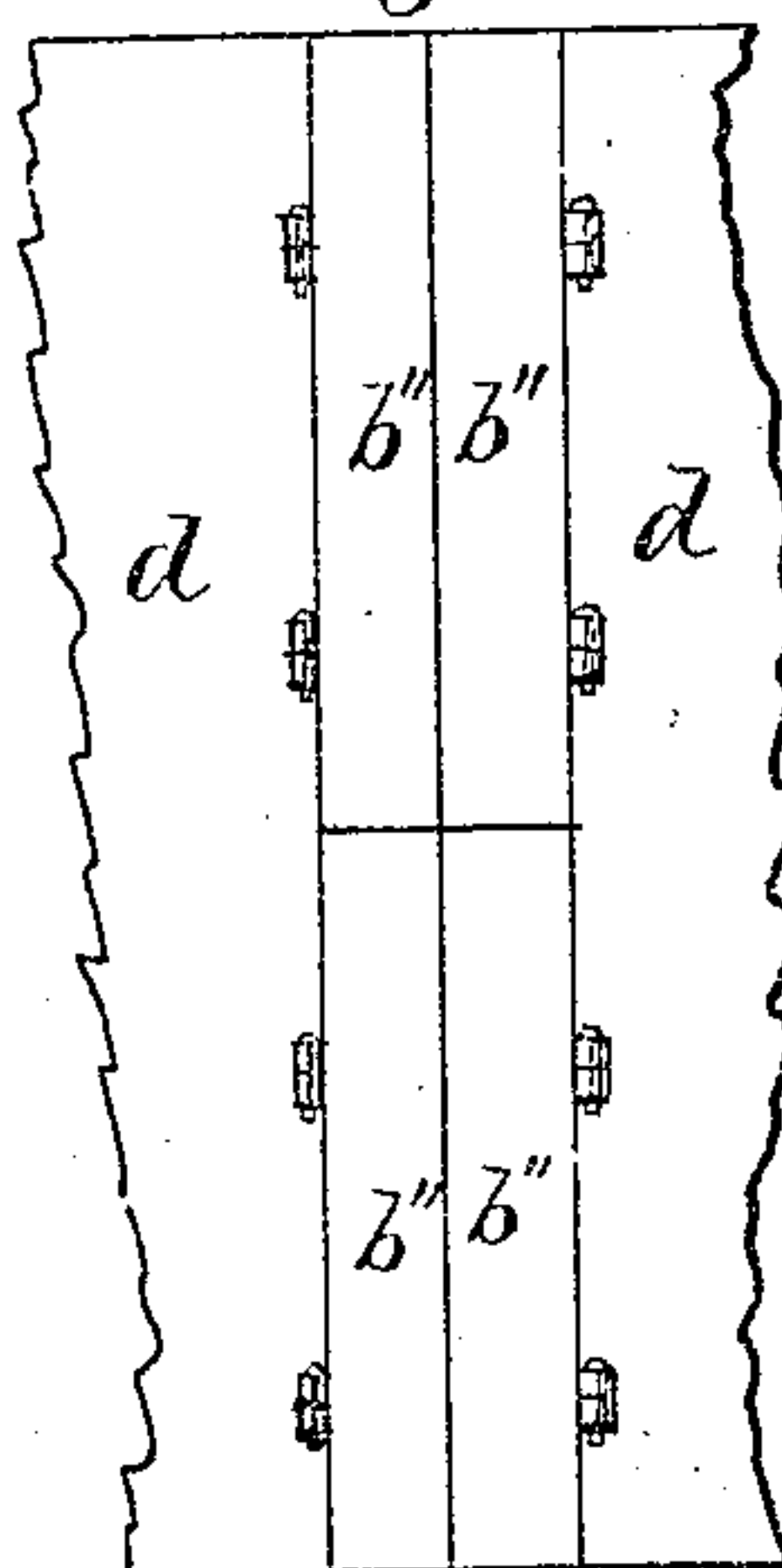


Fig. 4.



Attest.

B. A. Omsbee

J. H. Penfield

Inventor.

Samuel B. Clemmens,

By B. C. Converse, Atty.

UNITED STATES PATENT OFFICE.

SAMUEL B. CLEMMENS, OF SPRINGFIELD, OHIO.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 234,457, dated November 16, 1880.

Application filed June 3, 1880. (No model.)

To all whom it may concern :

Be it known that I, SAMUEL B. CLEMMENS, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Refrigerator-Houses, of which the following is a specification.

My invention relates to improvements in refrigerator-houses in which the ice-chamber is located over the cold-air chamber or preserving-room; and it consists, first, in an air-tight ice-chamber—*i. e.*, in having that portion above the ice air-tight until the ice is melted down to the bottom layer; second, in constructing the air-flues so that the air from the meat-room shall not touch the ice at all, but shall pass up the sides of the ice-chamber, and, returning downward, pass under the ice, whereby the air-currents are greatly cooled before again re-entering the preserving-room or cold-air chamber below, the temperature of these air-currents being reduced to a degree equal to that obtained in refrigerator-houses in which the air-currents are carried over the ice and in contact therewith, while the consumption of ice is materially lessened, the difference in the two classes of refrigerator-houses in the quantity of ice consumed being nearly two to one. This saving of ice is the main object of my improvement. To attain this more completely the effluent air-flues are extended up some distance on each of the two sides of the ice-chamber and doubled inwardly upon each other, having a central partition extending nearly to the top, around which the air-current is conducted upward outside of said partition, and thence returned downward inside of the same, between it and the inner wall of the ice-chamber, to a point below the ice rack or floor, and thence under it to the middle opening, where it re-enters the preserving-room, being directed toward either side at will by valves hung opposite to each other in pairs for that purpose. By this method of constructing the air-flues leading to the ice-chamber the air is conducted directly upward from the warm meats, and is gradually cooled down in its passage upward and downward until its temperature is lowered almost to the freezing-point when it reaches the opening under the ice-floor. The cooling process is further accelerated by the cold water from the ice-bed drip-

ping through the air-currents as they pass under it.

Figure 1 shows a plan view of the ice-chamber in my improved refrigerator-house. Fig. 2 is a sectional elevation, the front end of the entire house being removed to show the interior. Fig. 3 is an end view of the slatted ice-rack or open floor. Fig. 4 is a view of the under side of the middle section of the bottom of the ice-chamber, showing its two pairs of valves or doors closed.

A is the ice floor or rack, which is constructed in the form of a rack having wide bridge-pieces B, so as to leave a deep air space or flue under the ice, between it and the ceiling of the preserving-room below. In the detail, Fig. 3, there is shown the end of the ice-rack A, with a large square notch, *a'*, in the middle of the bridge-piece B. This notch straddles over the upright flanges *b'*, which form the sides of the cold-air flue *a*, leading down into the meat-room D below.

To prevent any water from dripping down through the flue *a*, a segment-shaped plank or crown-piece, *A'*, is laid over it on the bottom of the rack, extending throughout its length. This also serves to deflect the air-currents passing up from the room D on either side, thence under the ice, and down in the direction of the arrows, as seen in Figs. 1 and 2. In the latter view the house is cut through line *x*, Fig. 1, to show the position of the air-flues and the direction of air-currents. It will be seen that these pass up through the flues *c* on the outside and return direct before reaching the top of the ice chamber C, being closed over a little more than half-way to the top, so that the partition *c'*, ceiling *d*, and upturned flanges *b'* (which form the sides of *a*) form together the division-line which separates the warm and cold air currents. No air coming in contact with the ice whatever except through the narrow spaces between the slats *b b* of the ice-rack, (on either side of *A'*), and then being impeded by the edges of these slats, it is really prevented from direct contact, so that there cannot be any waste of ice, as the current of air is cooled down by the time it reaches the chamber under the rack to a low degree, causing it to melt very little. To add to this depression of temperature, (which is generally

from 36° to 33° by the time it reaches flue *a*,) the water dripping from the ice must pass through the air-currents throughout the whole of the space *d'*, and as this space is of considerable depth the air-currents which are set in motion through the main influx-current (passing toward *a*) take up all the cold from the water-globules during their descent to the bottom of the ice-chamber or water-pan. To still further prevent the consumption of ice it can be covered over the top with woolen blankets and sawdust or any non-conducting substance, so as to wholly prevent any evaporation from the top, the principal object of my invention being to present to the air-currents no part of the ice except at the bottom, (and there but in a limited degree,) and to intensify the cold of the air-currents which pass to the preserving-room under it by placing the ice-rack (on which the ice rests) a considerable distance above the bottom of the chamber, so that they shall be further cooled by the water-drops passing through them, thus utilizing the water of evaporation for the process of refrigeration by direct contact with the air-currents while the former is in motion through the latter.

The flue *a* extends from front to rear of the ice-chamber, and its downwardly-opening valves *b'' b''* are divided into two pairs, one pair to each half of the flue-opening. They are hinged on each side of *a* and their inner edges close together in the center, as seen in the detail, Fig. 4, the object in constructing them in pairs being to close off one-half the cold-air currents from the preserving-room, when necessary, and also to direct, by deflection and reflection, the cold-air currents toward any point desired, as shown in Fig. 2, in which the

method of directing the cold-air current toward a quarter of beef is seen by the manner in which the opposite valve-doors, *b'' b''*, are inclined, and the direction of the arrow and dotted lines, which indicate the cold-air current.

I am aware that a slatted bottom to an ice-chamber is not new, as these slats have been used to protect the bottom of the chamber, which in small refrigerators is generally metal-lined; but placing a permanent rack some distance above the bottom of the ice-chamber, so as to form a large space between the bottom of the ice and the bottom of the ice-chamber, for the purpose of increasing the coldness of the air therein by the passage of the cold drops of water descending through it from the ice which rests upon said rack, I believe to be new.

I therefore claim as my improvement—

1. In refrigerator-houses, the combination of the elevated rack *A*, having the crown-piece *A'*, with the air-flue *a*, having upwardly-extended flanges *b' b'*, entering the ice-chamber to near the bottom of the rack, and a series of doors, *b'' b''*, hinged at their lower ends, so as to close toward and open from each other, substantially as specified.

2. In refrigerators, an ice-rack, *A*, having the crown-piece *A'*, slats *b*, wide bridge-pieces *B*, having notches *a'*, in combination with the influent air-flue *a*, having upturned sides or flanges *b'*, as and for the purpose hereinbefore set forth.

SAMUEL B. CLEMMENS.

Attest:

B. C. CONVERSE,
B. A. ORMSBEE.