J. BOSTWICK.

Refrigerator.

No. 216,935. Patented July 1, 1879.

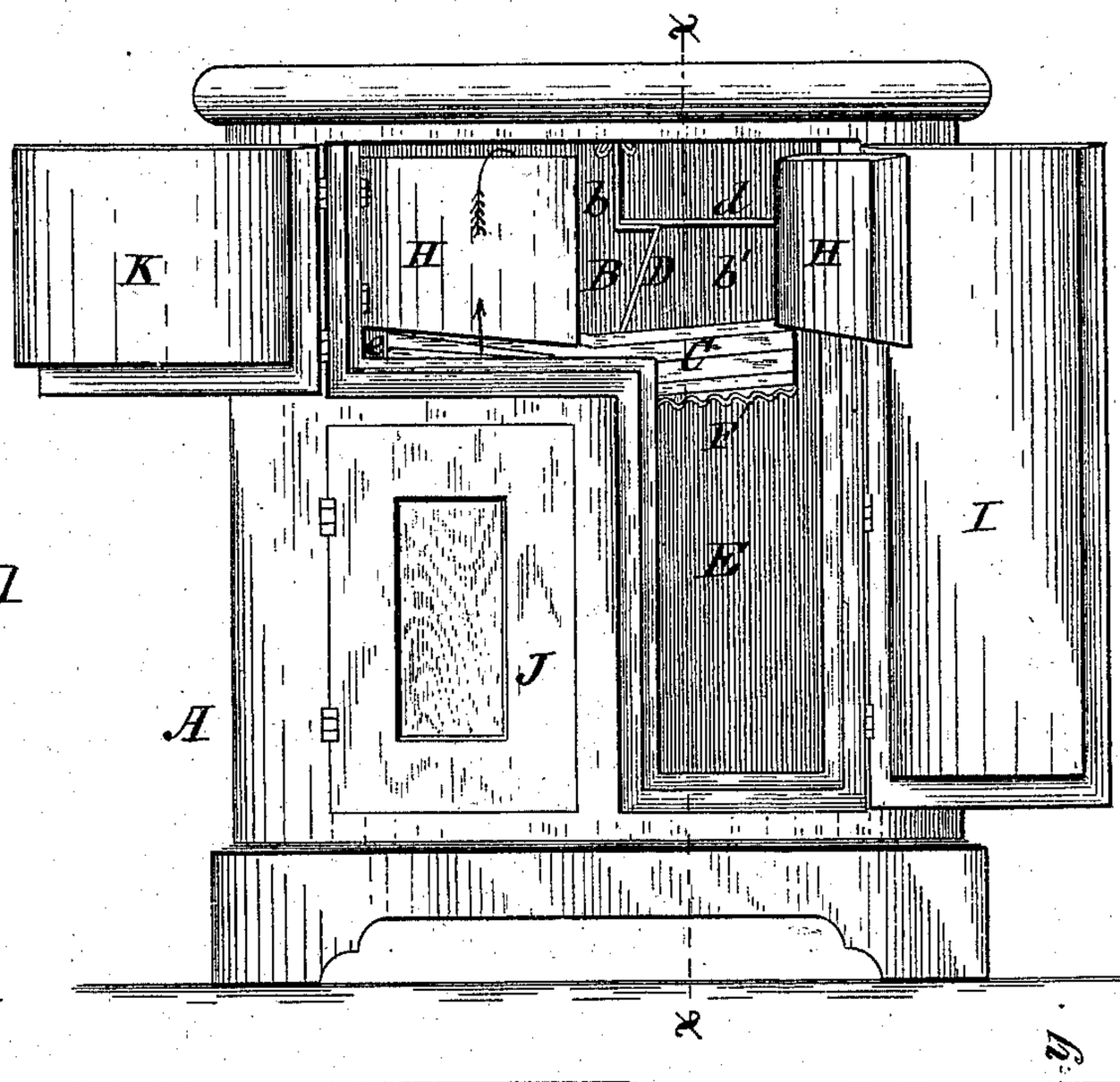


Fig 1

Fig 3

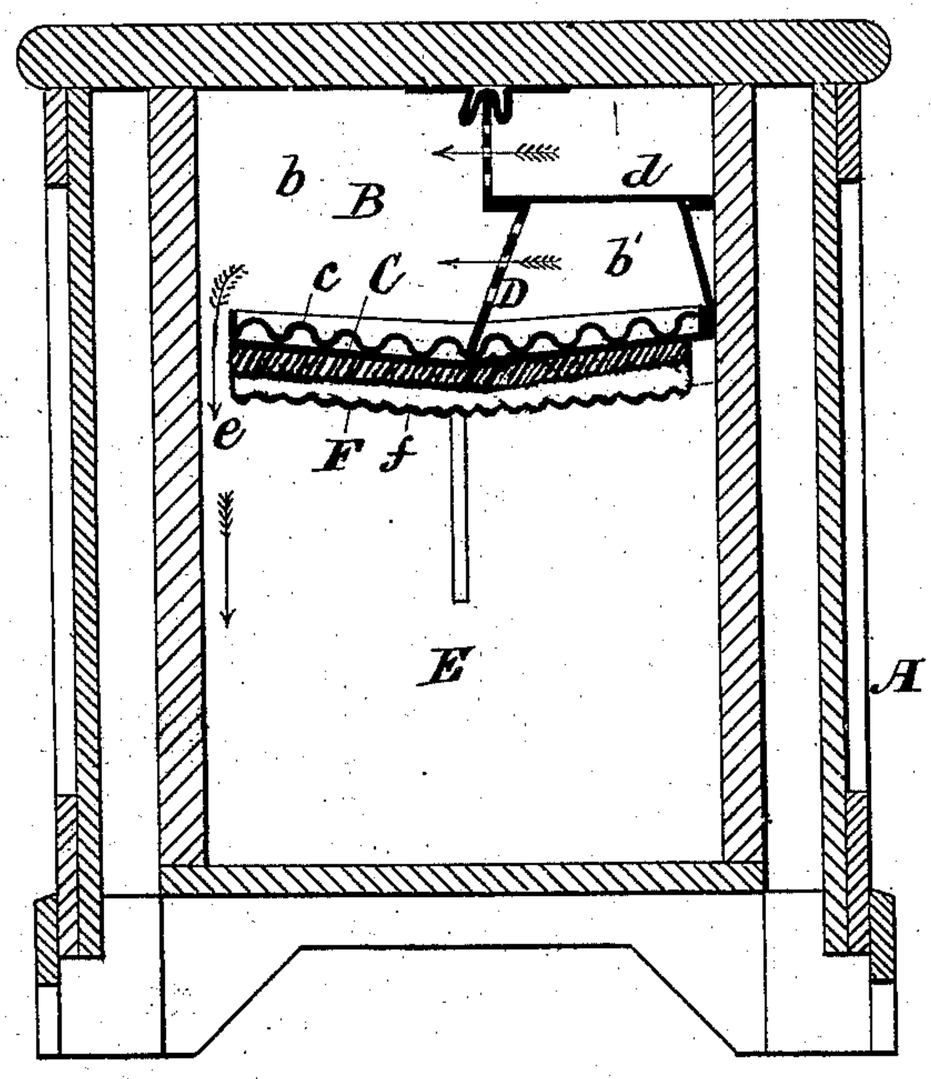
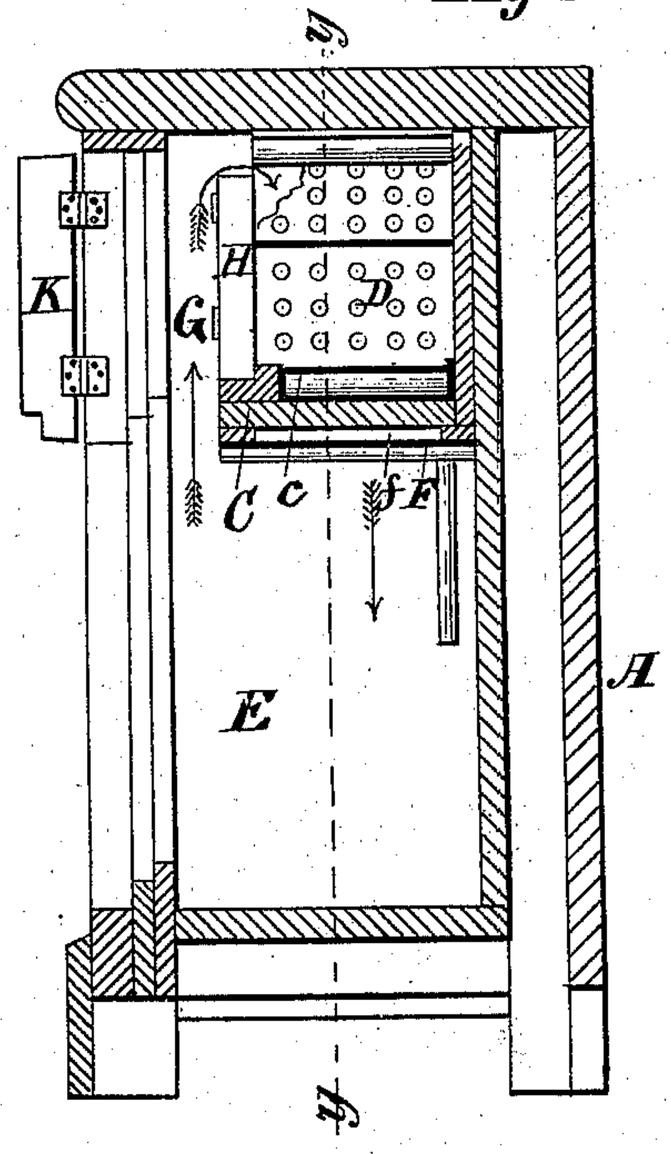


Fig 2



Witnesses

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JOSEPH BOSTWICK, OF MISHAWAKA, INDIANA.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **216,935,** dated July 1, 1879; application filed February 24, 1879.

To all whom it may concern:

Be it known that I, JOSEPH BOSTWICK, of Mishawaka, in the county of St. Joseph and State of Indiana, have invented a new and useful Improvement in Refrigerators, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a refrigerator embodying my improvements with the doors mostly thrown open; Fig. 2, a vertical section of the same, taken on the line *x x*, Fig. 1; and Fig. 3, a similar section thereof, taken on the line *y y*, Fig. 2.

My invention consists in arranging the inlet for cold air proceeding from the ice-chamber to the cooling-chamber about on a level with or above the exit-opening through which the warmed air escapes from the latter, and providing the cooling-chamber with a corrugated ceiling, which directs the warm air to the exit-flue.

It also consists in a peculiar construction of the under side of the ice-chamber bottom, whereby transverse channels are formed for conducting the warm air to the exit-opening.

In the drawings, A represents the main body or frame-work of the refrigerator, which is of the upright class, provided with doors in front, and in its general construction, so far as the exterior walls are concerned, is similar to many other refrigerators well known and in public use.

In the upper end of the refrigerator is the ice-chamber B, which extends entirely across the interior of the structure, being formed by a partition, C, which constitutes the bottom of the ice chamber or receptacle. This chamber B is also provided with a removable vertical partition, D, extending across the chamber and dividing it into two compartments when it is used.

The compartment *b* is the receptacle for the ice, and *b'*, on the other side of the partition, is for the reception of articles which it is desired to preserve in the refrigerator, and may be provided with one or more removable shelves, *d*.

It is thus evident that either the entire chamber B or a portion, *b*, thereof may be used as the ice-chamber, according to the quantity of ice it is desired to store at once.

Below the ice-chamber B is the cooling-chamber E, and an air-passage, *e*, at one end of the ice-chamber connects the latter with the cooling-chamber, and provides for the passage of cold air down into the latter from the former.

When the entire chamber B is used as the ice-receptacle, a similar air-passage, *e*, may be made at the other end thereof; but this may be covered or closed, when the movable partition is employed, by a removable cover; or it may be closed entirely and permanently, if desired; or the air-passage may be left open, and few holes made in the partition to permit the cold air to pass through from the ice-chamber over the provisions.

The bottom C of the ice-chamber is preferably made of wood, and inclined from each end toward the center, for the purpose of collecting the drip. It may have a metallic covering, *c*, on which the ice rests, and which may be corrugated; or a rack or other suitable support may be employed for this purpose.

On the under side of the bottom C is a corrugated or grooved plate, F, the channels or grooves in which are arranged transversely to the ice-chamber—that is, extend across from front to rear of the refrigerator. The channels or grooves in this plate F constitute conduits for the warm air and gases ascending in the cooling-chamber E, and their arrangement serves to conduct these warm and light vapors along the channels in the upper end of the cooling-chamber to the open space G in front of the ice-chamber, and between it and the outside of the refrigerator, which constitutes the exit or warm-air flue leading from the cooling-chamber back to the ice-chamber, as shown in Fig. 2 of the drawings. The warmer vapors are thus diverted from the cold-air flues, through which cold air flows from the ice-chamber to the cooling-chamber, and permits the exit of the warm air to be made on a level with, or even below, the inlet-opening by which the cold air enters the preserving-chamber.

The corrugated bottom F may be made either straight or inclined toward the center from the ends. In the former case the warm-air exit will be on a level with the cold-air inlet, and in the latter case will be, in some places, a little below the inlet-opening. The bottom F may be of metal, as described, or some other suitable material. It may even be made of

wood, in which case the channels may be formed by grooves in the bottom, or by a series of ribs or cleats fastened thereto.

Preferably an air-space, *f*, is left between the bottom C of the ice-chamber and the corrugated bottom F, which tends to prevent condensation on the latter; and in this case the parts may be so arranged as to make this space deepest near the center of its length, where the greatest risk of condensation occurs. This may be effected by inclining the two bottoms at a different angle, or making the upper one horizontal and the lower one inclined. This air-space *f* may, however, be dispensed with when the bottom proper of the ice-chamber is sufficient in itself to prevent chilling, and in either case the grooved bottom may also be made horizontal, instead of inclined, as shown in the drawings.

The ice-chamber B is closed in front by two doors, H, each of which closes one of the divisions of this chamber when the partition D is employed. Between these doors and the outside or outer doors of the structure, when closed, there is a space, G, which, as above stated, constitutes the warm-air flue for the passage of air back into the ice-chamber from the cooling-chamber, there being a space at the top of the doors H for the admission of this air into the ice-chamber, as indicated by arrows in the drawings.

The warm-air flue may be differently arranged, if desired; though I prefer to arrange it in front, as above described, for the reason that when the outer doors are opened the warm air that enters from the outside will have a tendency to pass directly to the ice-chamber, thereby causing a less disturbance in the temperature of the cooling-chamber than would otherwise occur.

At the front of the structure there are three doors—on one side a door, I, extending from top to bottom, and providing for admission to the cooling-chamber E, and the compartment *b'* of the upper or ice chamber, B; on the other side a door, J, extending only as high as the cooling-chamber, and opening into it only; and above it a third door, K, which permits admittance to the compartment *b* of the ice-chamber.

In the drawings the lower door, J, is represented as provided with a separate frame, so as to be entirely independent of the others. This is not absolutely necessary, however, though a preferable construction. A movable strip or jamb may also be arranged above this frame, between the doors I and K, instead of the construction represented in the drawings, where a meeting-joint is formed by the doors themselves, one overlapping the other. This jamb should be removable, so as to provide a clear space opening into the entire chamber B, whenever desired, for the introduction of ice, or any other purpose.

It is evident that the corrugated bottom for directing the warm-air current is not necessarily limited in its application to the refrigerator constructed in all respects like the one herein shown and described; but it may be employed with refrigerators of different construction and different arrangement of ice-chamber. It may be found desirable, in some instances, to leave a very narrow strip at the end of this corrugated bottom next to the cold-air flue perfectly plain, and also at both ends when there is a cold-air flue at each end of the ice-chamber.

In the refrigerator constructed as above described, the structure is equally well adapted for storing large or small quantities of ice, as may be desired, thereby enabling me to obtain the advantages and obviate the disadvantages attendant upon the use of either style alone. The grooved or corrugated air-conductor also permits such an arrangement of air-flues as is most convenient and economical of space; and the arrangement of the doors affords access to either of the compartments independently of the others, except in the case of the long door extending from top to bottom of the structure.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The cold-air flue or flues, in combination with the warm-air flue, the outlet of the latter being on substantially the same level as the inlet of the former into the cooling-chamber, and a grooved or corrugated ceiling for the cooling-chamber, the channels of which lead directly to the warm-air flue, whereby the warm air is prevented from entering the cold-air flue, and is conducted to its proper exit-flue, substantially as described.

2. The ice-chamber B, in combination with the cold-air flue *e* at the end or ends of the ice-chamber, opening into the cooling-chamber immediately at the ceiling thereof, the warm-air flue opening out of the cooling-chamber directly from the ceiling thereof and extending up on one side of the ice-chamber, and the corrugated plate F on the ceiling of the cooling-chamber, having its channels or corrugations arranged parallel to the cold-air flues, and perpendicular to, and leading into, the warm-air flue, substantially as and for the purposes set forth.

3. The wooden bottom C of the ice-chamber, in combination with the corrugated plate F, and forming the ceiling of the cooling-chamber, and arranged with an air-space, *f*, between it and the bottom C, substantially as and for the purposes set forth.

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Witnesses:
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