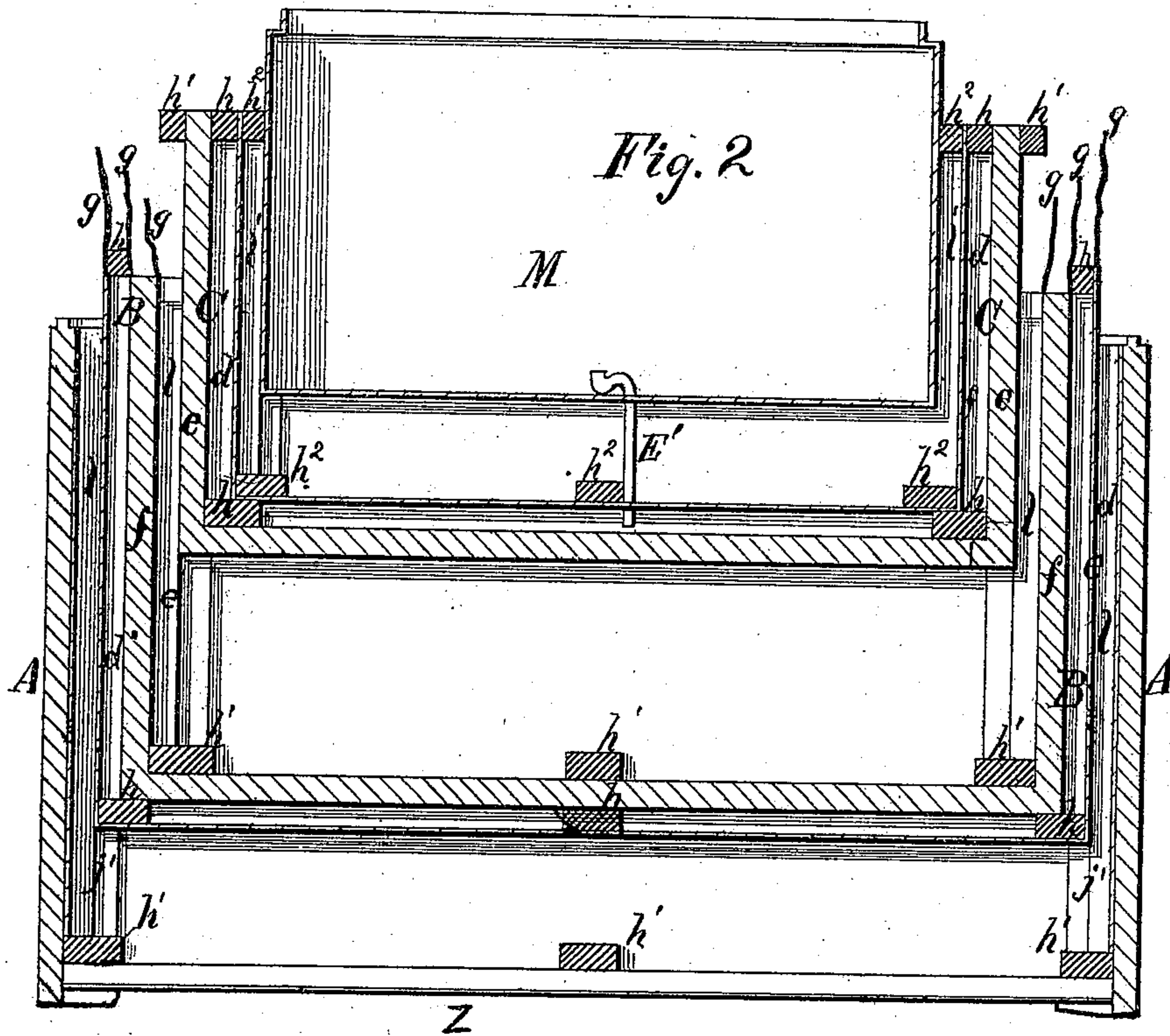
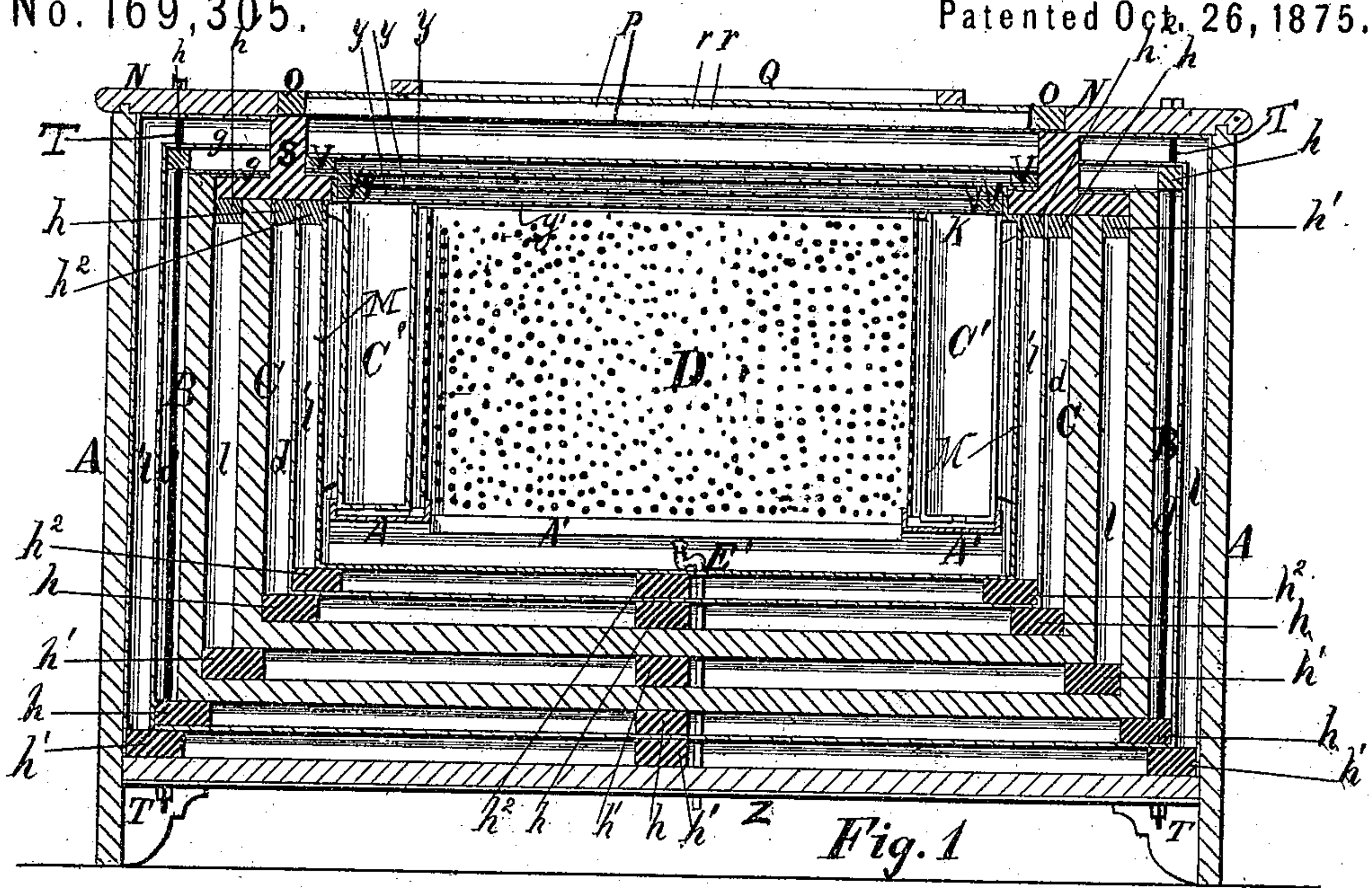


E. B. SMITH.  
Refrigerator.

No. 169,305.

Patented Oct. 26, 1875.



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INVENTOR.  
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By *Hill & Ellsworth*

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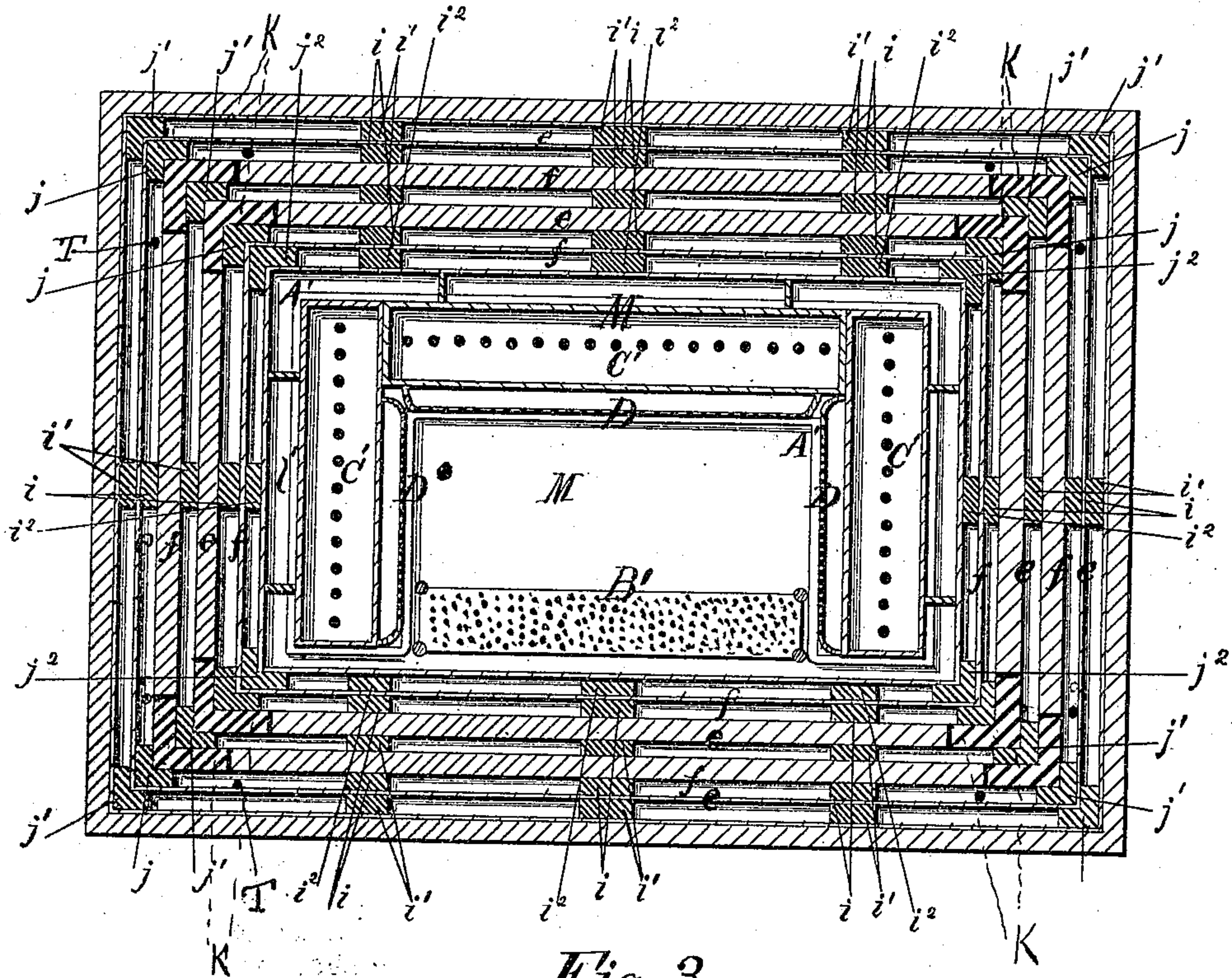


Fig. 3

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## IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **169,305**, dated October 26, 1875; application filed February 27, 1875.

*To all whom it may concern:*

I, EDGAR B. SMITH, of Albany, in the county of Albany and State of New York, have invented a new and Improved Refrigerator; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet 1, is a vertical longitudinal section of a refrigerator constructed in accordance with my invention. Fig. 2, Sheet 1, is a similar view, showing the top of the refrigerator removed, and the different cases partly drawn out. Fig. 3, Sheet 2, is a horizontal section.

Similar letters of reference in the drawings denote the same parts.

My invention has for its object to provide an improved refrigerator for general use. To this end the invention consists, first, in a nest of paper cases contained within an exterior case or cabinet, and provided with dead-air spaces between their proximate walls; secondly, in the construction of the several paper cases, by which they are each adapted for removal from the others; thirdly, in the means employed to form the air-spaces between the several cases; fourthly, in the method of closing the tops of the air-spaces under the cover of the refrigerator; fifthly, in the construction of the cover to the refrigerator and the cover to the interior ice-box; sixthly, in the construction of the provision-chamber and ice-boxes.

In the accompanying drawings, A is the outside case or cabinet, constructed of wood, in any suitable manner, and lined with thick paper, rendered impervious to moisture by being saturated or coated with a compound of red lead and paraffine-wax. B is the outer, and C the inner, paper case, each composed of a thick and a thin paper box, open at the top, and of such relative sizes that, when one is placed within the other, a dead-air space, *d*, shall be formed between them. The case B is made with its outer box *e* of thin paper, and its inner box *f* of very thick paper, preferably molded directly from the pulp, and about one inch in thickness, more or less. In

the case C this order is reversed—the outer box being the thickest. The boxes composing each case are secured together, and spaced from each other, by means of the horizontal top and bottom strips *h*. The vertical strips *i* and the angular corner-strips *j* are made from paper, or molded from paper-pulp, in the form shown.

In constructing the cases, I make the thick boxes or walls of each in five pieces or plates—to wit, two end pieces, two side pieces, and one bottom piece—and, in fitting these together in the form of a box, I employ four angular corner-pieces, K, made of corresponding thick paper, and placed in an upright position, against which the ends of the side and end pieces are abutted, and held by an interior and exterior sheet or layer of paper coated with the compound of red lead and paraffine-wax. The walls are then set upon the bottom piece, to which they are secured in a similar manner, the compound possessing sufficient adhesiveness to unite all the joints, and form thereby a perfect box.

The thin box or wall of each case is formed by first sticking the spacing-strips *h i j* to the outside or inside of the thick walls, accordingly as case B or C is being made, and then carrying a sheet or layer of paper all around the box against the spacing-strips, securing it thereto with the above-named compound. By this construction the various paper parts of the refrigerator can be packed in small compass for shipment, and set up after reaching their destination. The paper lining and covering sheets of the thick walls, as well as that composing the outer wall or box, extend above the top of the case, as shown at *g*, Fig. 2, for a purpose to be presently described. The case B is made a little smaller than the interior of the cabinet A, so that when placed therein a dead-air space, *l*, shall be formed between them, and the case C is made smaller than the case B, for the formation between them of a similar air-space, *l*. Horizontal strips *h*<sup>1</sup>, vertical strips *i*<sup>1</sup>, and angular corner-strips *j*<sup>1</sup>, all made of thick paper, serve to preserve the form of the air-spaces *l*, and hold the paper cases properly in place. They may or may not be secured by



the adhesive compound; but, to render all the parts perfectly tight, I prefer that they should be so secured. The upper horizontal strips  $h^1$  are secured to the top of the inner case C, and are carried with it, as shown in Fig. 2. M is the metallic ice-chest, placed within the inner paper case C. It is made a little smaller than the case, so that a dead-air space,  $l'$ , shall be formed between them.  $h^2$   $i^2$   $j^2$  are the strips for this space, constructed and applied in the same manner as the strips already described, the top strips  $h^2$  being secured to the top of the case C, so as to be carried therewith. The inner case C is of less depth than the enclosing-cabinet, so that when the three are fitted together there shall be a space between their tops and the refrigerator-cover. N is the top of the refrigerator, lined upon the under side with a sheet of paper coated with the adhesive water-proof compound, and cut out at the center for the reception of a hinged cover. The cover, which is hinged to one edge of the opening in the top N, is formed of a rectangular wooden frame, O, closed at the top by a wooden panel, Q, and at the bottom by a sheet, P, of paper, thus producing a dead-air space,  $r$ , within the cover, as shown in Fig. 1. The space between the frame of the cover and the top of the inner case C is closed by a rectangular frame, S, formed with a base-plate to rest upon the top of the case, as shown in Fig. 1. This frame is made of paper or paper-pulp, and coated with the water-proof adhesive compound. The outer edge of its flange lies in contact with the inner wall of the outer case B, and its inner edge in contact with the contracted upper edge of the ice-chest. After the frame S has been placed in position, the inner paper coverings  $g$  of the case B are bent over upon the flange, and the outer covering  $g$  is bent over the strip  $h$ , so that its end shall lie against the upright part of the frame, as shown in Fig. 1. The parts are fastened together by the application of the adhesive water-proof compound, and form additional dead-air spaces under the cover of the refrigerator. The cases are held within the cabinet by long screw-bolts T passing down through the top, and through the upper and lower strips of each case, to the under side of the cabinet, where they receive the holding-nuts U, as shown. By unscrewing the nuts the bolts may be pulled out for the removal of the cases when necessary or desirable.

The ice-chest is also provided with a cover set into its top, and constructed as follows: V is a thick rectangular frame of paper, large enough to fit upon the inner flange of the frame S, and covered upon both sides with a layer or sheet of paper. Two other paper frames, W, are secured to its under side, and made of such size as to pass down within the flange of the frame S into the mouth of the ice-chest. The two smaller frames clamp a sheet of paper between them, and the bottom

of the lower one is covered by a sheet of metal,  $y'$ . (Shown in Fig. 1.) The cover thus built up contains three dead-air passages,  $y$   $y$   $y$ , to protect the contents of the ice-chest. The under side of the cabinet is covered with a sheet of thick paper, Z, to more completely protect it against the admission of dampness and heat, and this, as well as all the other paper parts of the refrigerator, is coated with the compound of red lead and paraffine-wax. By constructing the refrigerator with paper walls, built up with the dead-air spaces and rendered water-proof, as above described, the contents of the ice-chest are effectually protected against heat and cold, and preserved at a uniform temperature.

When used for dwelling-houses, or for purposes other than transportation, the ice-chest contains a flanged drip-pan, A', and a rack, B', of perforated shelves, to contain the articles for preservation. The drip-pan is a three-sided rectangular frame, and supports the central and two end upright ice-receptacles, C'. The bottoms of these receptacles are perforated, or their faces are provided with perforated shields D', removed therefrom to form narrow air-spaces. The vapors or gases arising from the articles to be refrigerated pass through the perforated shields, in contact with the faces of the receptacles containing ice, and are there condensed, and flow down into the drip-pan without dropping into the refrigerating-chamber. As the ice melts the water flows through the perforated bottoms of the receptacles into the drip-pans, and the contents of the latter are conducted out of the refrigerator by a goose-neck pipe, E'.

Having thus described my invention, what I claim is—

1. A refrigerator having its walls composed of a nest of paper cases, contained within an exterior cabinet, and provided with dead-air spaces between them, substantially as described, for the purpose specified.

2. The paper cases B C, each composed of a thick and a thin wall of paper, having a dead-air space between them, substantially as described.

3. The paper cases B C, constructed in several parts, as described, which are secured together by thin paper and an adhesive water-proof compound, for the purposes specified.

4. The several spacing-strips of the cases, constructed from paper or paper-pulp, and coated with an adhesive water-proof compound, substantially as described, for the purpose specified.

5. The combination of the rectangular frame S with the paper cases B C, substantially as described, for the purpose specified.

6. The method of forming dead-air spaces under the cover of the refrigerator by carrying the paper extensions  $g$  of the cases B C over and in contact with the frame S, substantially as described.

7. The rectangular frame S, composed of paper or paper-pulp, and coated with an ad-



hesive water-proof compound, substantially as described.

8. The cover of the refrigerator, composed of a wooden frame, closed at the top by a frame of wood, and at the bottom by a sheet of paper, so as to produce the interior air-space *r*, substantially as described, for the purpose specified.

9. The cover of the ice-chest, constructed of paper frames V W, a series of paper partitions, and a bottom of sheet metal, all arranged to form the dead-air spaces *y*, substantially as described, for the purpose specified.

10. The improvement in the construction of

refrigerators, consisting of the coating of the paper parts, as specified, with the water-proof adhesive compound, for the purposes set forth.

11. The upright ice-receptacles, constructed with perforated bottoms and perforated shields upon their faces, substantially as described, for the purpose specified.

12. The arrangement of the ice-receptacles within the dripping-pan, substantially as shown and described.

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Witnesses:

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