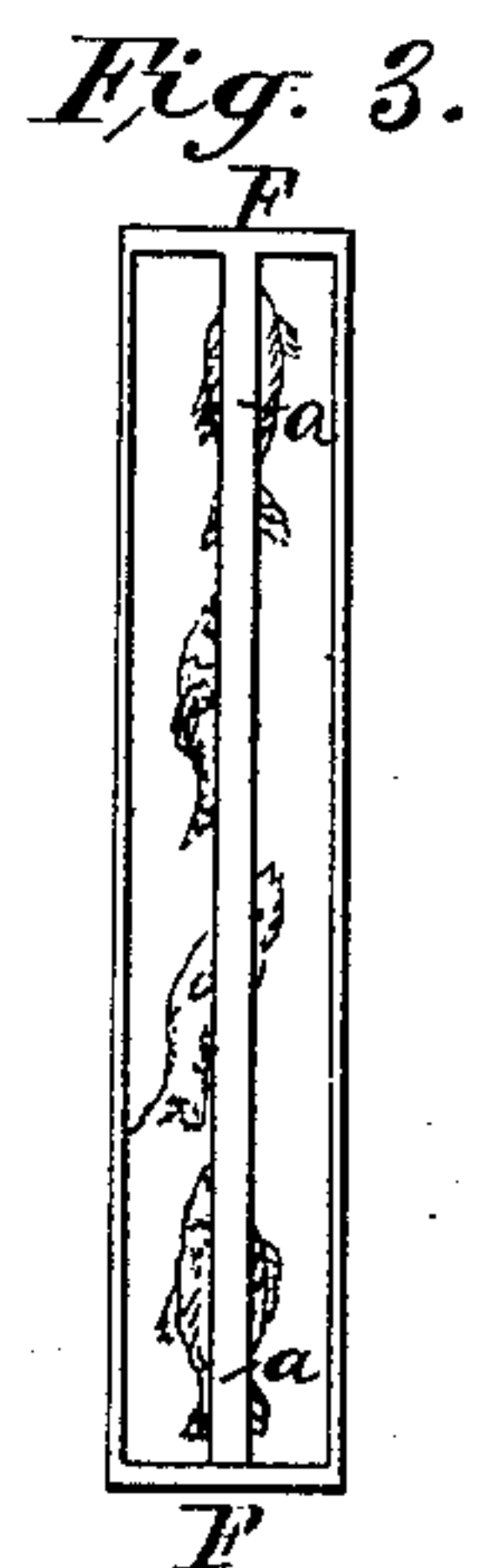
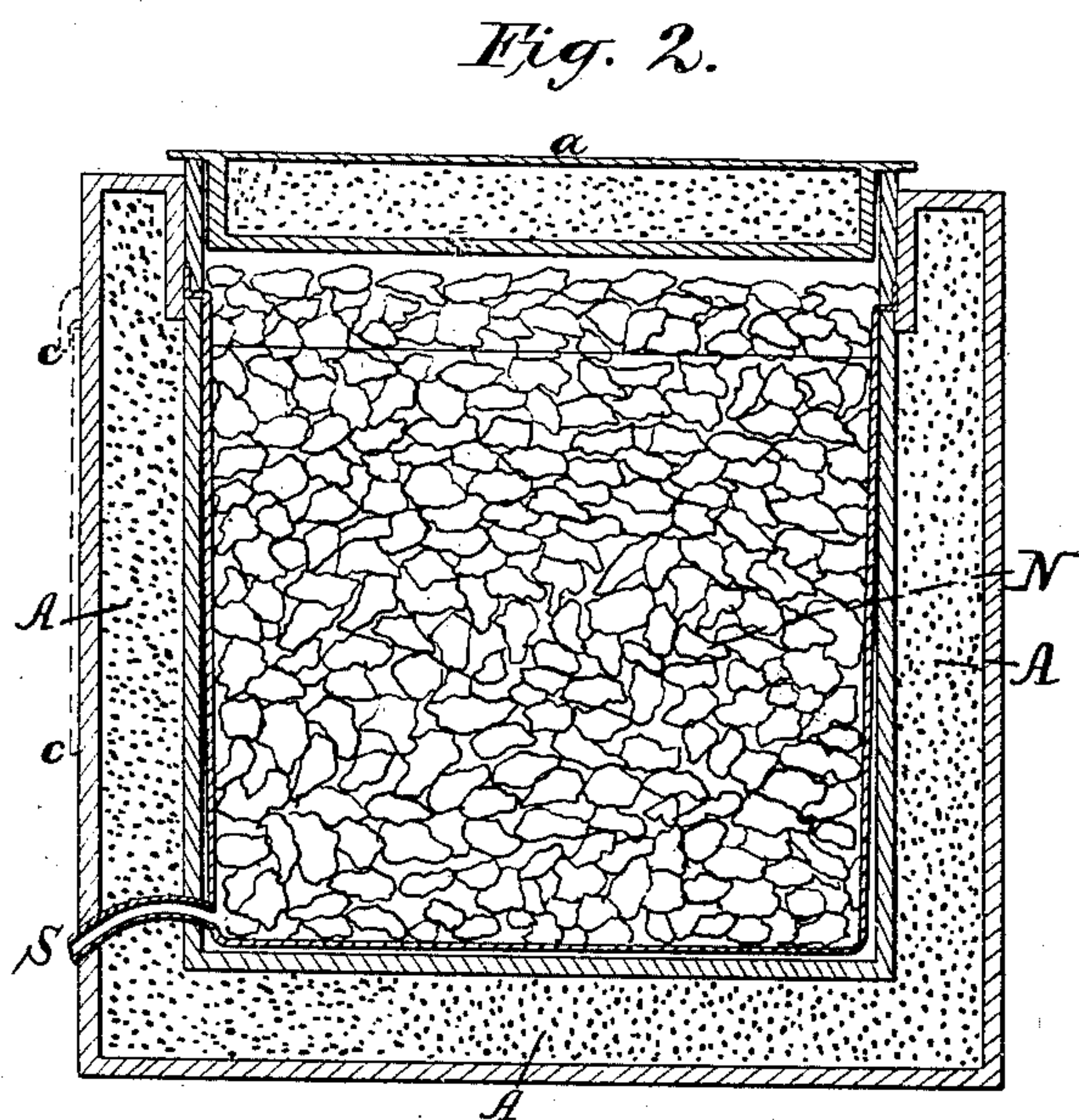
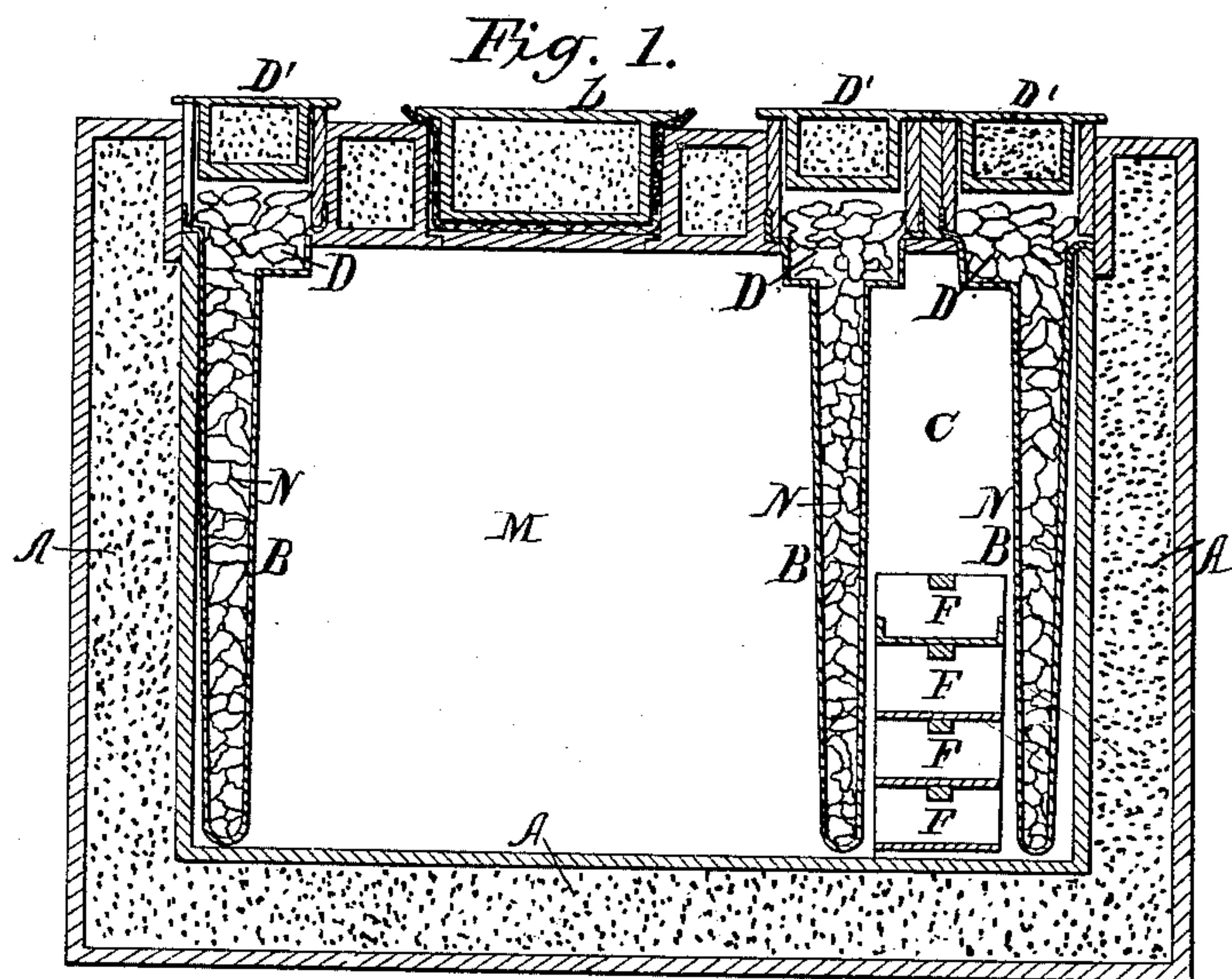


E. PIPER.
Refrigerator.

No. 78,606.

Patented June 2, 1868.



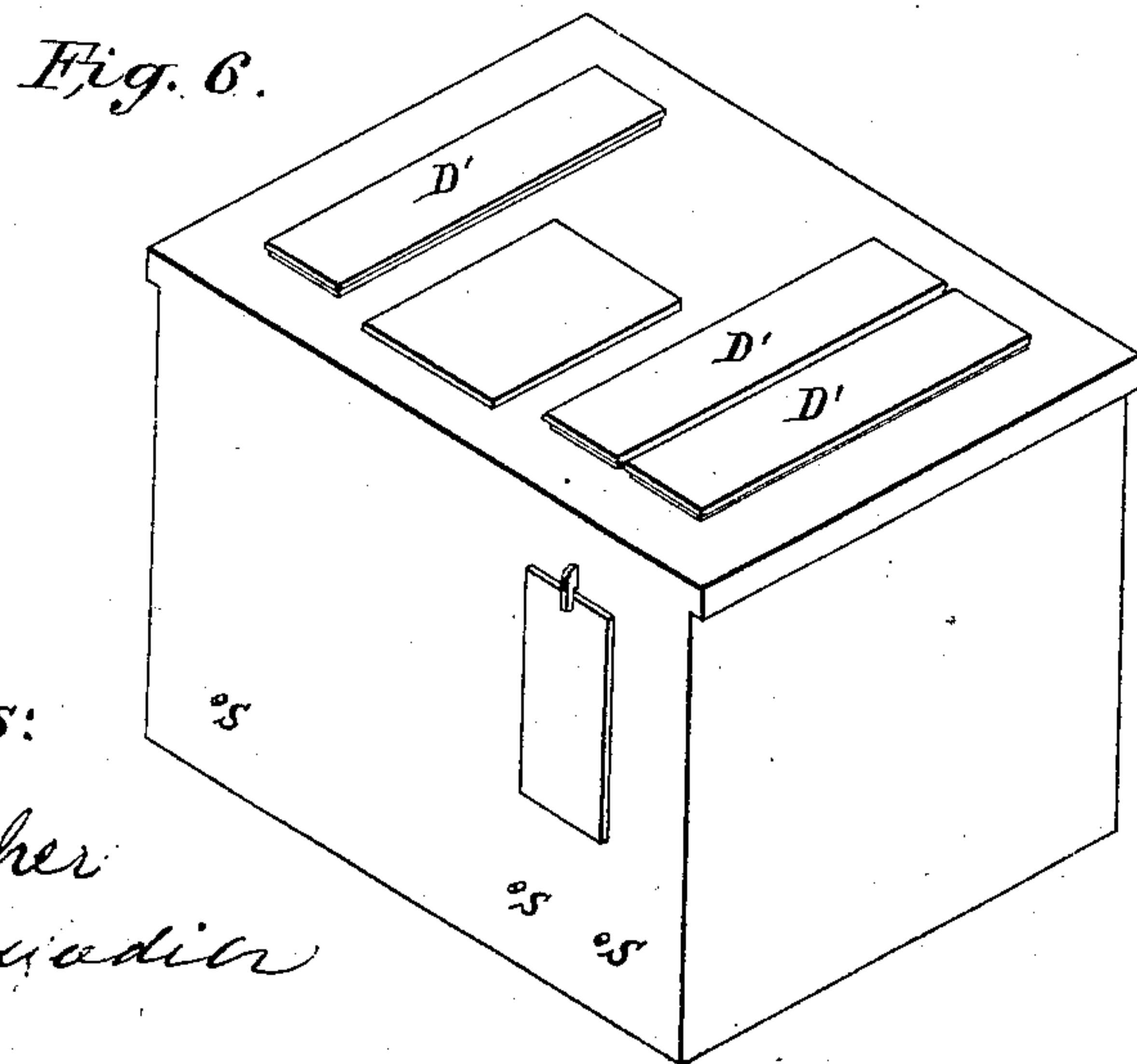
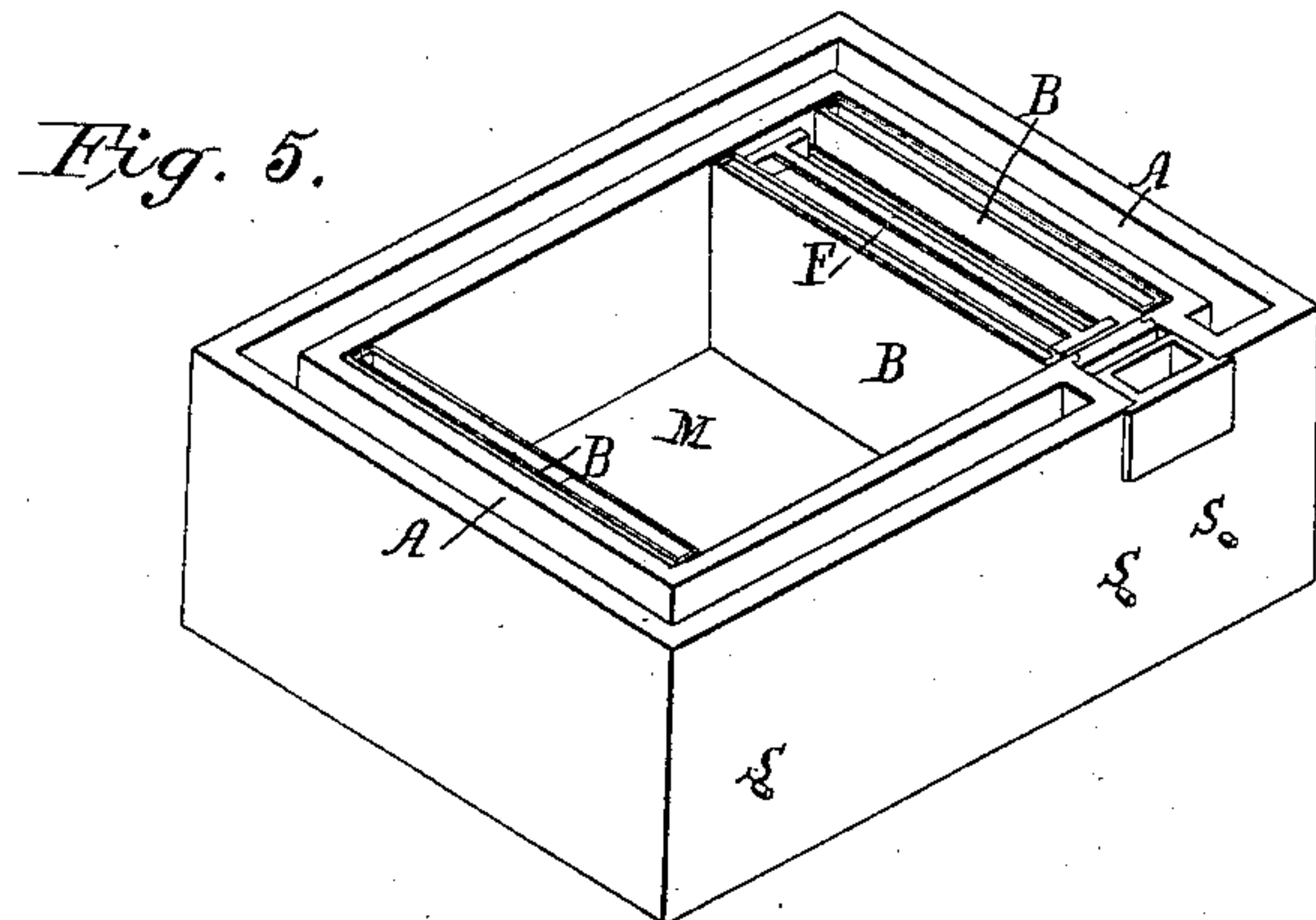
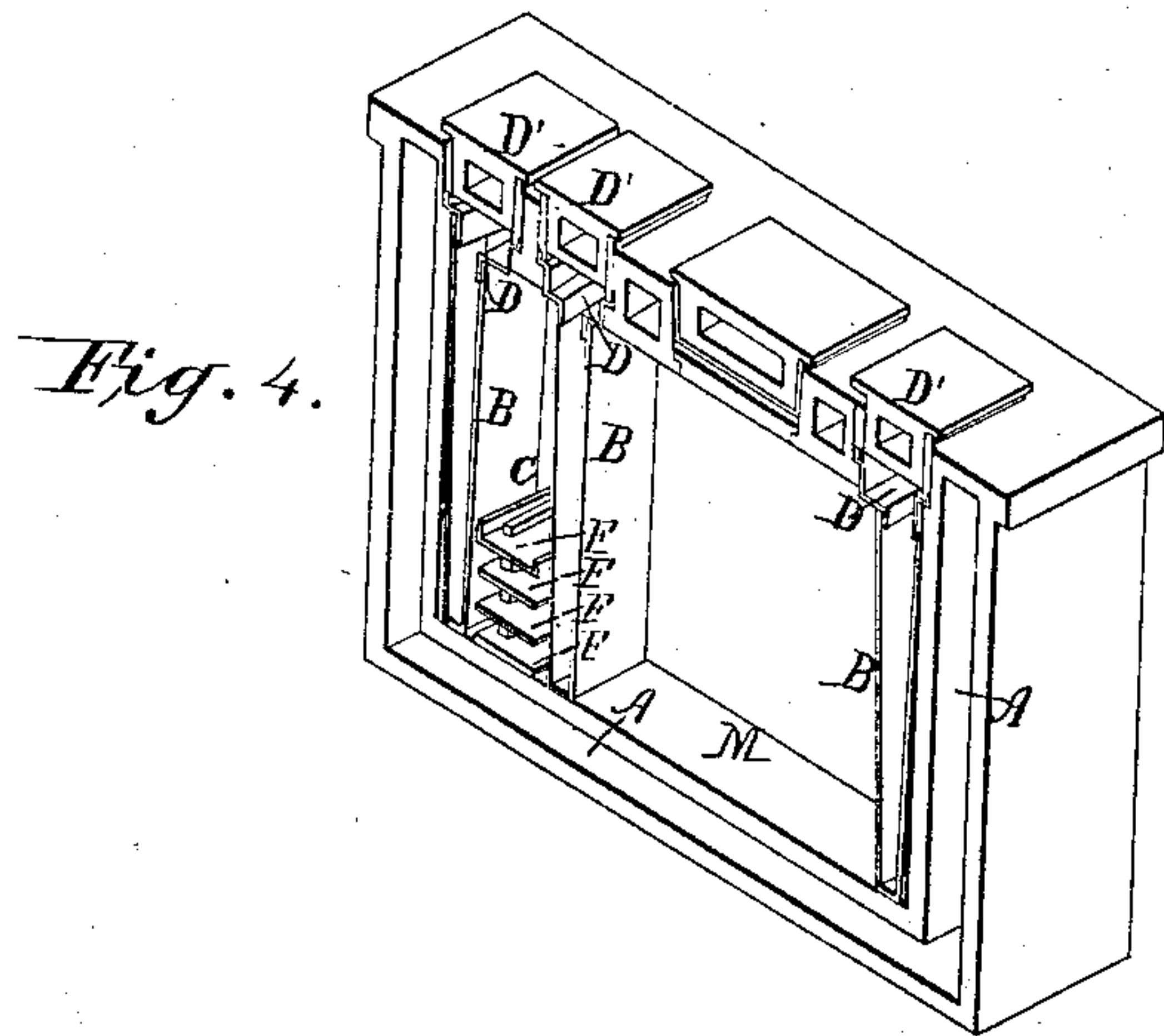
Witnesses:
Edward S. Cutler
Herbert T. Wittman

Inventor:
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E. PIPER.
Refrigerator.

No. 78,606.

Patented June 2, 1868.



Witnesses:
Chas. F. Fleeper
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Inventor:
Enoch Piper

UNITED STATES PATENT OFFICE.

ENOCH PIPER, OF CAMDEN, MAINE.

IMPROVED REFRIGERATOR.

Specification forming part of Letters Patent No. 78,606, dated June 2, 1838.

To all whom it may concern:

Be it known that I, ENOCH PIPER, of Camden, in the county of Knox and State of Maine, have invented certain new and useful Improvements in Apparatus for Preserving Animal and Vegetable Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of my apparatus. Fig. 2 is a vertical cross-section. Fig. 3 shows one of the shelves. Figs. 4 and 5 are perspective sections, and Fig. 6 is a perspective elevation.

In the refrigeratory apparatus shown in the drawings, A A represent the walls of the chamber, to be made in the well-known way. *b* and *c* are close-fitting doors through this wall, leading into the chamber. B B B are deep narrow vessels to receive the freezing-mixture, two of which form inner walls to the main chamber, and the third forms a partition-wall which divides the main chamber into two chambers, M and C. D D D are receiving-pans, which fit into the tops of the vessels B B B, to receive the freezing-mixture and guide it into the vessels B. These pans have suitable covers D' D' D', and care should be taken that they fit loosely.

F F are shelves to receive the articles to be frozen, open at the sides and top, but having a standard at each end to support a bar, which serves to support the shelf above it. They are made of such a width that they can readily be packed in the freezing-chamber. S S are pipes to drain off the brine from the vessels.

The operation of this apparatus is as follows: The door *b* is closed, a cloth being put under it, if necessary, to make it fit closely. The vessels and receiving-pans are filled with the freezing-mixture. The articles to be frozen are placed upon the shelves F, which are then packed in the chamber C, the door of which is closed, a cloth being used, if necessary. The articles are left in the apparatus until frozen, the time varying with the articles and the size of the chamber. Care must be taken to keep the receptacles well supplied with the freezing-mixture. The frozen articles are then properly packed away, if to be kept for any considerable length of time, in the chamber, where

they will remain frozen as long as the vessels which form two of its walls are kept supplied with the freezing-mixture.

In the apparatus which I use for freezing and preserving salmon, the double walls form one long chamber, at each end of which is a vessel, B, and which is partitioned off by vessels B into chambers, some of them like the chamber M, which are used for storing the frozen fish, and others like the chamber C, for freezing them. The inner walls of this long chamber are lathed, and plastered with hydraulic cement. I have used gum-shellac, putting on several coats, but prefer hydraulic cement. I also paint the outside of the metallic vessels with a solution of gum-shellac, (mixed with lamp-black enough to make it black,) to prevent corrosion. I am also careful to make perfectly tight the partitions between the chambers.

All the dimensions of the storing-chambers are about six feet, of the freezing-chambers about one foot wide, the other dimensions being about six feet. The receptacles for the freezing-mixture that I use are made of galvanized iron, about three inches wide at the top, (at the base of the receiving-pans,) and two at the bottom. The vessels and receiving-pans are made in separate pieces, B and D, for cheapness of construction and convenience.

After the salmon are frozen, I pack them away in the larger chambers, first placing a layer of ice on the floors of these chambers and filling the interstices between the fish and the side walls of the chamber with ice.

My experience leads me to believe that the best temperature at which to keep the preserving-chamber is about 25° Fahrenheit, and I have found no advantage from keeping it lower. The mixture I use in the vessels forming the inner walls of this chamber consists of about one-eighth, in bulk, of salt and seven-eighths of ground ice.

In the freezing-chamber the temperature should be lower, and I use, in freezing salmon, a mixture of one-quarter, in bulk, of salt and three-quarters of ice. Care should be taken not to use too large a proportion of salt, as it will precipitate and clog the drain-pipes.

Before packing the fish I also coat them with ice by dipping them into water or into gum-water. I prefer the best gum-arabic.

This, however, need not be here described, as it is a matter well known to those skilled in the art, having been the subject of other patents obtained by me, dated March 17, 1861, and August 5, 1862.

This invention is an improvement upon the apparatus described in the last of my said patents; and consists, first, in using, as one or more of the inner walls of a refrigeratory apparatus, vessels made of thin metal to receive the freezing mixture. I have described the best method known to me of embodying this part of my invention.

The second part of my invention consists in a new construction of the receptacle for the freezing-mixture—viz., a deep narrow vessel, made of thin metal, the upper part to act as a receiving-pan and to guide the mixture into the lower part. The form shown I consider the best method of embodying this part of my invention; but the walls of the vessel may be parallel, or even a little farther apart at the bottom than at the top, and yet answer. The vessel should be as narrow as possible—that is to say, just wide enough to hold the proper quantity of the mixture and not so wide as to take up too much room, and thus lessen the capacity of the chamber, and also require more than is necessary of the freezing-mixture. The proportions I have given I consider the most suitable. This construction is an improvement upon that shown in my patent of August 5, 1862, as it is much more readily freed

from the moisture which collects and freezes upon it, and distributes the freezing-mixture more evenly.

The third part of my invention consists in the employment of shelves having a bottom piece, two end pieces, and a bar across the top in the freezing-chamber, the bottom of the shelf being narrow enough to fit loosely in the chamber. I prefer a metallic bottom to these shelves, though wood is cheaper, and will answer.

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

1. A refrigeratory apparatus one or more of the inner walls of which are deep narrow vessels of thin metal, to receive the freezing-mixture, substantially as described.

2. The employment, in a refrigeratory apparatus, of one or more receptacles, B D, for the freezing-mixture, constructed of thin metal, in the form and proportions substantially as shown and described, to serve as partitions between the sides, as constructed.

3. The combination of shelves F F, open at the sides and top, and having a bar across the top, substantially as described, with a refrigeratory chamber, C, formed substantially as described.

ENOCH PIPER.

Witnesses:

CHAS. F. SLEEPER,
J. E. MAYNADIER.