No. 708,992. Patented Sept. 16, 1902.

N. BOSMANN.

REFRIGERATOR.

(Application filed Nov. 29, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

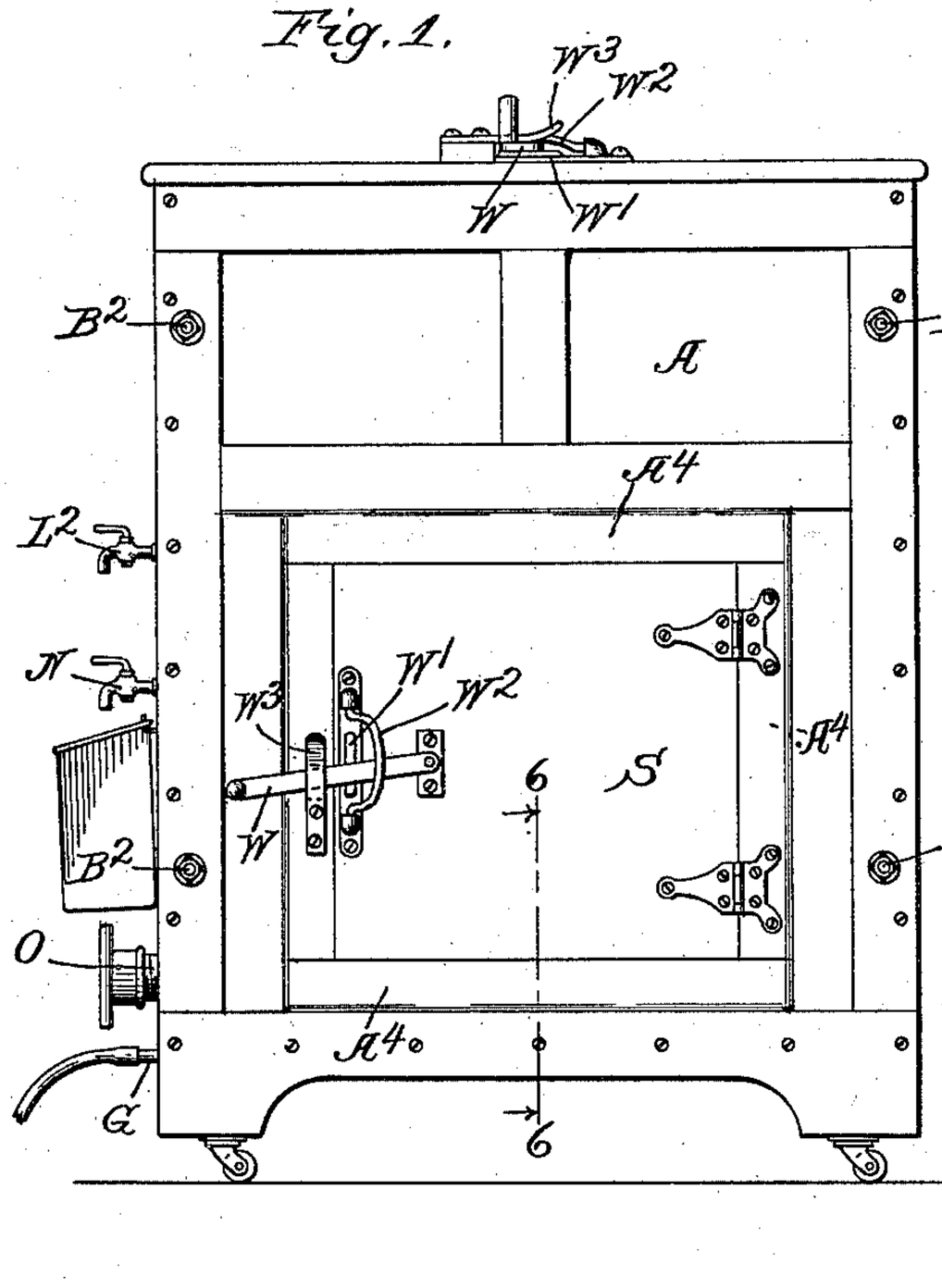


Fig. 3.

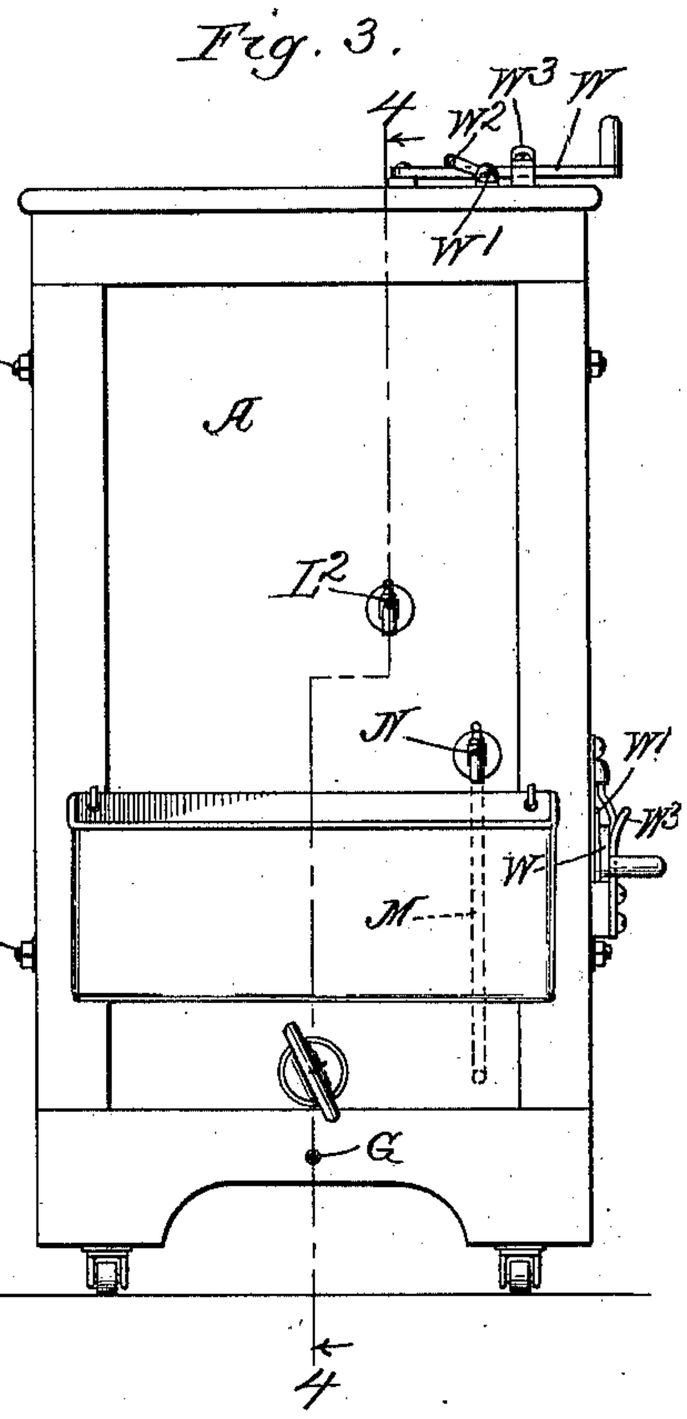


Fig. 2.

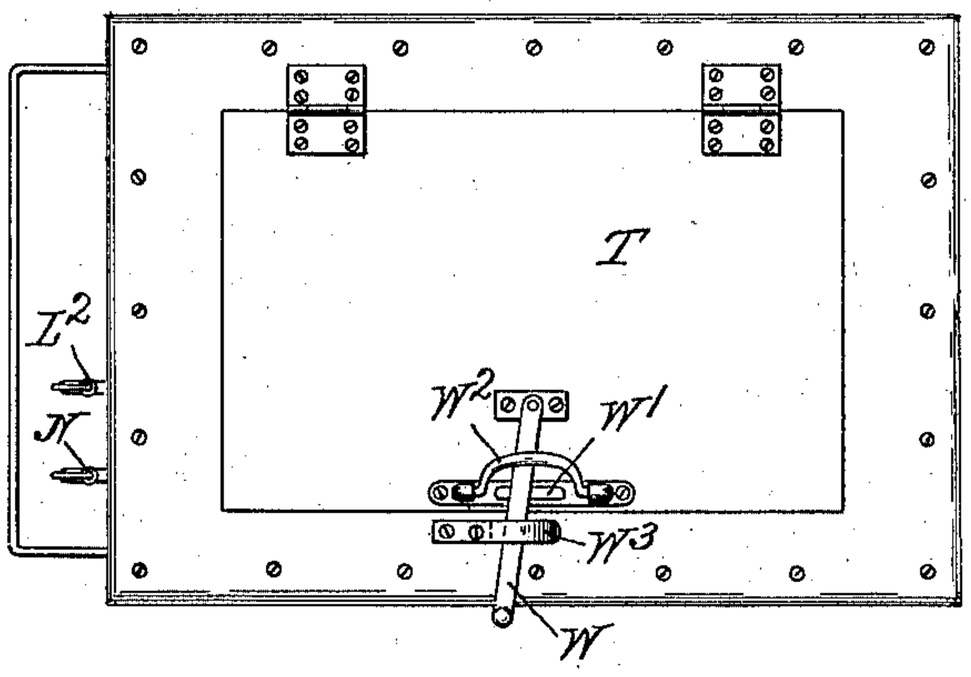
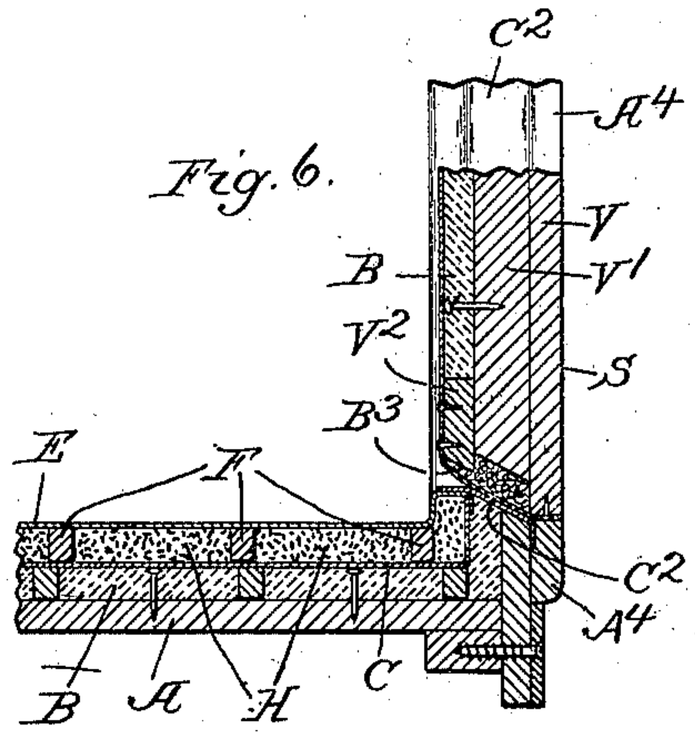


Fig. 6.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

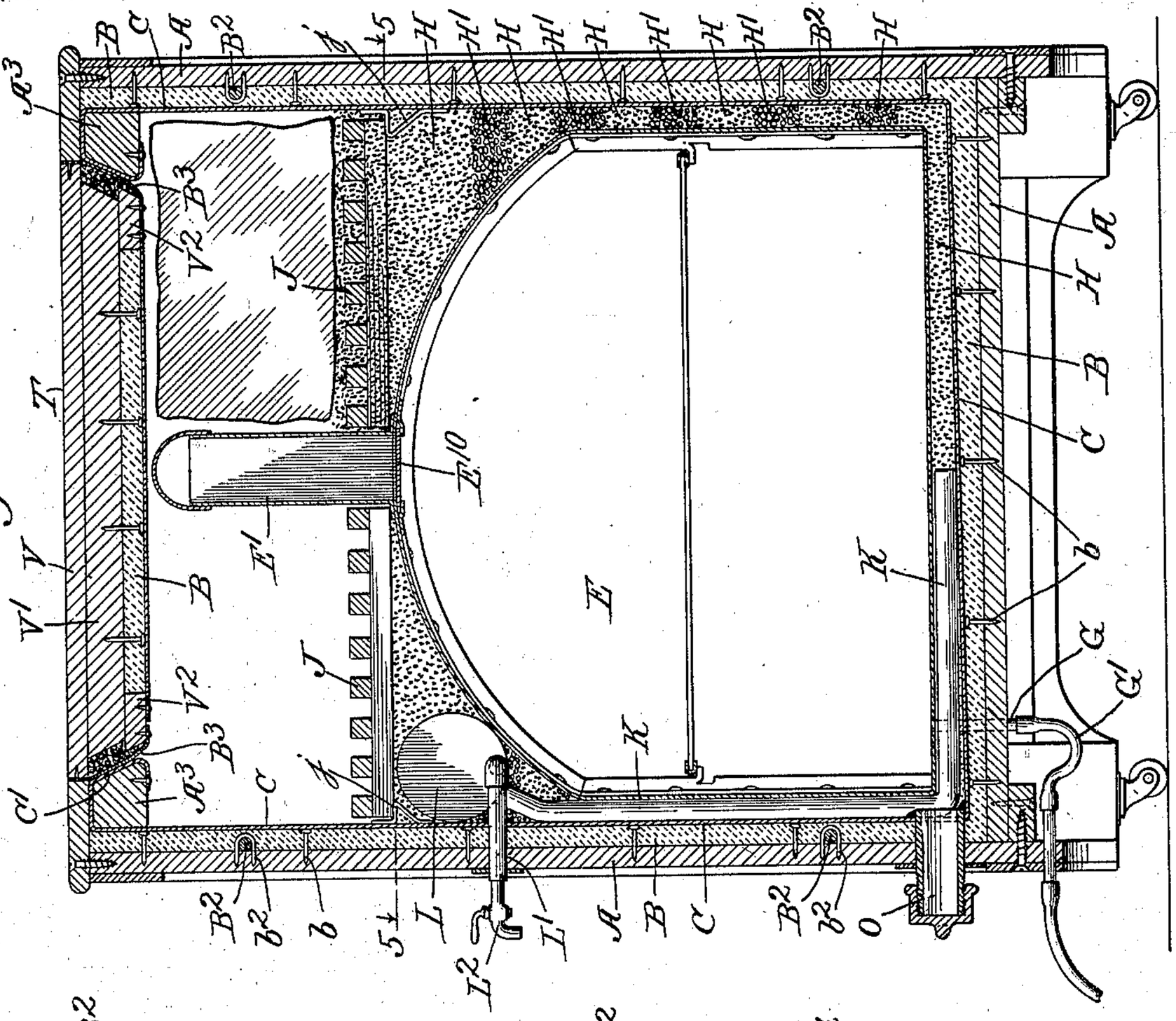
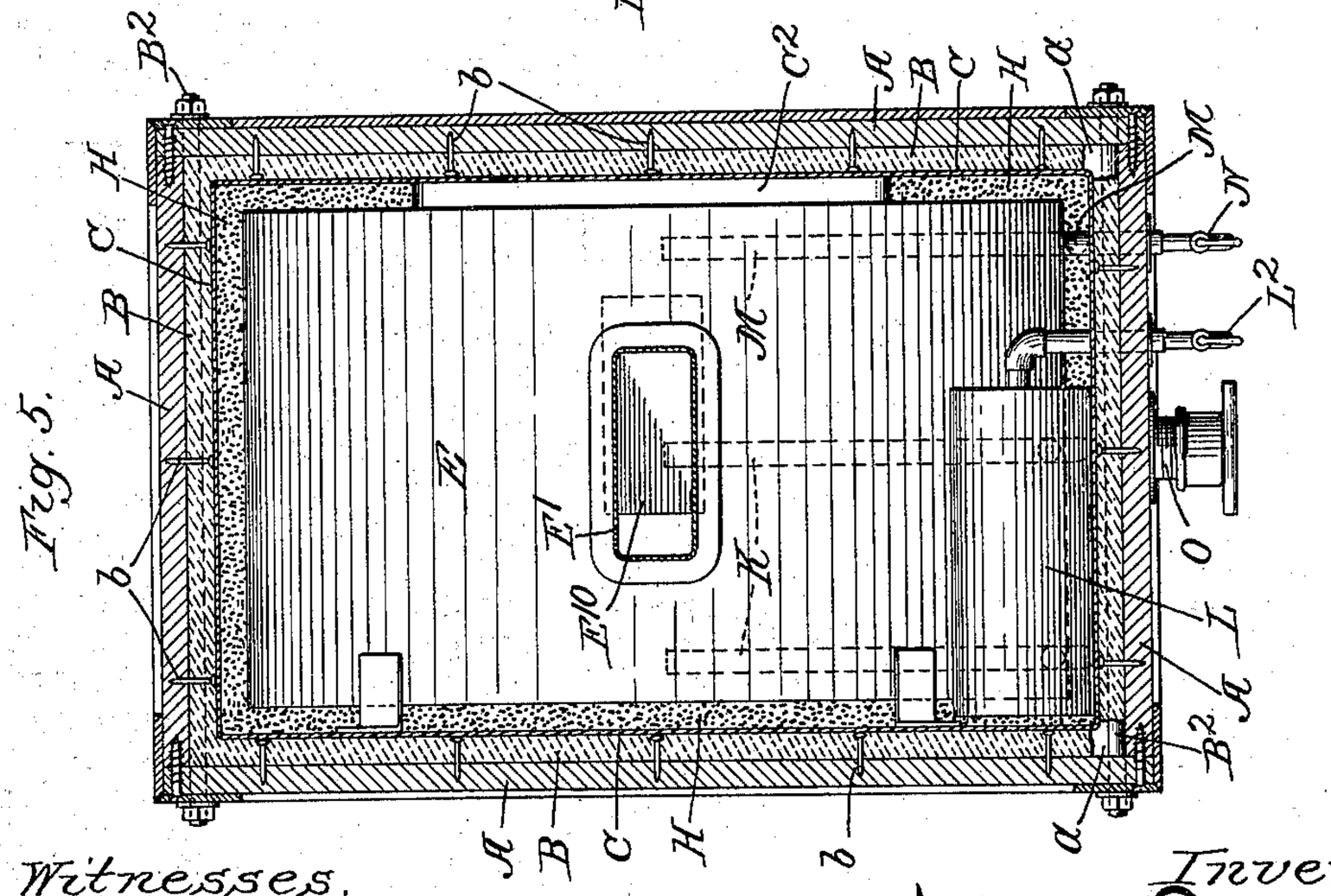


Fig. 5.



Inventor.
Nicolas Bosmann,
by Burton Burton
His Attorneys.

UNITED STATES PATENT OFFICE.

NICOLAS BOSMANN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO EDWARD S. SLOCUM, OF CHICAGO, ILLINOIS.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 708,992, dated September 16, 1902.

Application filed November 29, 1901. Serial No. 83,977. (No model.)

To all whom it may concern:

Be it known that I, NICOLAS BOSMANN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Refrigerators, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved refrigerator or ice-box, adapted also to serve as a water-filter and having a greater efficiency in proportion to the amount of ice employed than former constructions.

It consists in the novel features of construction by which it is adapted to serve as a water-filter, and novel means for insulating it from exterior warmth and in other details of construction, which are set out in the claims.

In the drawings, Figure 1 is a front elevation of my improved refrigerator. Fig. 2 is a top plan of the same. Fig. 3 is a side elevation. Fig. 4 is a vertical section at the line 4 4 on Fig. 3. Fig. 5 is a horizontal section at the line 5 5 on Fig. 4. Fig. 6 is a detail vertical section at the line 6 6 on Fig. 2.

My improved ice-box or refrigerator comprises an outer inclosing wall A, which is interiorly plaster-coated, such plaster coating being generally indicated by the letter B, but having specific features otherwise specifically noted, as hereinafter described. This outer inclosing wall is further interiorly metal-lined throughout, the metal lining being denoted generally by the letter C, with specific features otherwise specifically denoted. The upper part of the space inclosed is designed for an ice-chamber, and the inclosing wall is provided with a top door or cover T, whose detail construction will be hereinafter more particularly described. Within the inclosing wall there is located a provision-chamber, which is preferably made of sheet metal. This chamber is spaced at the sides and bottom from the inner surface of the outer inclosing wall—that is, from the metal lining of said inclosing wall—its position being rendered definite and secure by the flanging of the metal around the door-opening made into it, so as to cause the flanges to reach through the door-opening in the outer inclosing wall, as hereinafter explained, and in addition spacing-strips F F F, &c., lodged upon the bottom of the metal lining of the outer casing, support said inner chamber positively in proper position. The upper side of the provision-chamber E is preferably cylindrically curved from side to side to prevent water of condensation from dripping from it onto the contents and to cause such water to flow over to the sides and down the latter to the bottom, where provision is made by means of a drain-pipe G for the escape of such water condensation through the trap G′, which prevents the entrance of exterior air by way of the pipe into the chamber. The entire space between the metal lining of the outer casing and the interior provision-chamber E is filled at the bottom with fine sand H H, which, in addition to the spacing-strips F, affords support for the chamber, while the spacing-strips prevent the sand from being packed or shifted by the weight of the chamber. The remaining space around the sides of the provision-chamber between the same and the metal lining of the outer casing or inclosing wall is filled with alternate layers of gravel H′ and sand H or any suitable filtering material, such as pulverized charcoal and the like, the alternate layers being preferably coarse and fine, as indicated in the drawings. This filtering material not only occupies the interspace around the sides, front, and rear, (except where the door intervenes,) but also is extended up over the curved top of the chamber E and may occupy a further space above the highest point of said chamber, completely inclosing the latter at the top, and be brought to a level surface above said chamber, constituting the floor of the ice-chamber, though whenever preferred for any purpose a rack J may be lodged on or embedded in such sand floor or otherwise supported in the ice-chamber, as by means of brackets *j j*, to take the weight of the ice off the sand floor. I have found, however, that the efficiency of the device in proportion to the amount of ice employed is greater when the ice rests directly upon the sand floor provided by the filtering material. For the purpose of ventilating the provision-

chamber a flue or ventilating-pipe E′ extends upward from it through the ice-chamber to a point which is designed to be above the level of the ice therein or above the possible level of any accumulation of water therein and is provided with a regulating valve or damper E^{10} at the low end, accessible within the chamber. The water of liquefaction from the ice drains through the filtering material around the provision-chamber E, and in the said filtering material are embedded pipes K K, which are extended horizontally under the provision-chamber and are open at some portion of their said horizontal extent. The mere end opening will usually be sufficient. These pipes extend up at one side of the provision-chamber and discharge into the water-receptacle L, embedded in the filtering sand or gravel above the provision-chamber, as best seen in Fig. 4. From this water-chamber a discharge-pipe L′ is extended outward through all the walls and provided with an exterior faucet L^2, through which the filtered water of liquefaction derived from the ice may be drawn off for use. It will be noticed that this construction causes the filtering material to be saturated with the water of liquefaction after enough ice is melted to thus saturate it, and the chamber E is therefore at all times inclosed in the water-saturated sand and gravel, which is approximately at the melting temperature, all the water which comes from the ice passing eventually to the bottom, because its only escape is from the bottom upward through the pipes. Since it may for some purposes be desirable occasionally to keep the upper portion of the sand comparatively dry, I provide an additional drainage-pipe M, which extends under the provision-chamber in the same manner as the pipes K K and up along one side, but emerges through the walls at a lower point than the water-chamber L. The faucet N during the discharge from this pipe may be left open whenever it is desired to maintain the water-level lower than the water-chamber. For the purpose of flushing out the filtering material when it is necessary to cleanse it and renew it I provide a flushing discharge-nipple O at one lower corner, suitably capped at the exterior end. By uncapping this nipple and discharging a flushing supply of water into the top of the refrigerator the sand and gravel or other filtering material may be washed out, and new material may be carried in by a moderate flow of water after recapping the nipple, the use of such moderate water-supply being to evenly distribute the filtering material over the bottom and in layers at the sides, as desired.

Certain details of construction are considered important. These will now be described.

The plaster coating on the inner surface of the outer wall should be from one to two inches thick, and for the purpose of holding it securely on the wall I drive nails *b b* into the latter at enough points to give firm attachment to the plaster, which is afterward applied to the wall. In making large refrigerators it may be found more convenient to apply the plaster to the several walls before they are assembled in the completed box, and for the purpose of facilitating assembling and firmly uniting the several walls I secure to them horizontal tie rods or bolts B^2 B^2, using staples b^2 for that purpose, before the plaster is applied, so that these rods are embedded in the plaster, their ends only protruding, as may be necessary for the purpose of effecting the junctions for which they are intended at the corners, where the planks of the inclosing walls A are joined together in any secure and workmanlike manner. When this method of plastering the walls before they are assembled in the box is employed, I prefer to leave a small portion at the margins of the walls where they are to be joined uncovered, so that when they are assembled there shall be a cavity extending along each angle of the box, said cavities thus running into each other at the corners of the box, as seen at *a* in Fig. 5, where the plaster filling is omitted for the purpose of showing the cavity. When the box is assembled, I pour liquid plaster-of-paris into these corner-cavities, causing them all to be filled with one continuous mass of plaster, which also joins itself integrally into the adjacent rough edges of the plaster coating previously applied, so that when thus completed the plaster coating is integral throughout and besides has filled all the fine crevices in the angles and corner-joints, curing any air-leaks which might otherwise exist at such joints. The metal lining C, applied inside the plaster coating is made continuous, the corners and angles being soldered up before it is inserted into the box within the plaster coating. At the top and around the door-opening this lining is folded inward as flanges C′ and C^2 about the edges, respectively, of the openings through the outer inclosing wall, which form stops for the cover and door, respectively. It will be understood, of course, that the metal lining is apertured for pipes which lead out through it, suitably-soldered joints being made at the junctions of such pipes with the lining. At the opening for the top cover a molding A^3 is employed, forming the marginal edge of the opening and stop for the cover, and the flange C′ of the metal lining is wrapped about this molding, as seen in Fig. 4, the edge of the enwrapping flange being on the inner side of the molding. The edges of the openings for the door S and cover T which form the stops for these parts are beveled outwardly, as seen in Figs. 4 and 6, and said door and cover, the inner surfaces of which are provided with a plaster coat and an inner metallic lining like the rest of the wall of the box, are formed at their edges, which are to seat on the stop edges of the openings, in a manner which will now be described. The outer board V is formed with square edges fitting the opening in the molding A^4, which

forms the margin of the aperture. Inside of this outer board V there is secured a heavier planking V′, whose dimensions as to the surface next to the outer board are less than the corresponding dimensions of said board, so that there is left all around the plank an angular space, and said planking is inwardly beveled at the edge at an angle corresponding substantially to the bevel of the stop edge of the opening. Onto the inner surface of this planking V′ marginal molding-strips V^2 are applied, whose edges slightly overhang the angular space formed between the outer board V and the planking V′, as seen in Fig. 4 and Fig. 6, the edge of the molding-strip, however, not protruding so far beyond the inner edge of the planking as do the edges of the outer board beyond the outer edges of the planking.

B^3 is a strip of canvas or a like material tacked onto the edge of the outer board V, the width extending across the cavity formed between it and the beveled planking, the inner edge of the canvas being tacked onto the inner surface of the molding-strip V^2. The space thus inclosed by the canvas is stuffed with hair or other like material adapted to produce a yielding cushion, such cushion thereby being formed extending all around the beveled periphery of the door or cover. The normal condition of the cushion when thus stuffed is somewhat convex outward, so that when the door or cover is hinged to one edge of the opening and swung inward to close the latter the bulging surface of the cushion strikes the bevel of the stop edge before the door is entirely closed, and when sufficient pressure is applied to complete the closing the cushion is crowded into all the corners of the opening and effects a thoroughly-tight closure. I prefer to make the cushion sufficiently firm—that is, to stuff it so hard that considerable force shall be necessary to close the door or cover, and in order that it may be thus closed without too great effort I provide a latch especially adapted to operate in handling to force the door or cover perfectly home to the beveled seat of the molding A^3. This latch W, pivoted to the door, is provided with a wearing-plate W′, also secured to the door, which serves also as the base-plate for the handle W^2, by which the door may be operated in opening it. On the door-casing there is a hook W^3, whose upper end is curved outward, as seen in Fig. 2, and both this hook and the latch are somewhat elastic, so that when the door is closed far enough to bring the cushion in contact with the seat, but not to seat them tightly, the latch being swung down behind the hook and becoming engaged behind its outer curved end retains the door closed, and by being pushed down farther past the curved end into position shown in Fig. 1 said curved end operates as a cam, and the door is thereby crowded tightly into its seat.

I claim—

1. A refrigerator, comprising outer inclosing walls; an interior provision-chamber having its walls spaced from the outer inclosing walls; an ice-chamber within the inclosing walls above the provision-chamber, having its drainage into the interspace; a pipe leading from the bottom of the interspace opening therein to receive the filtered water, and extending upward in the lateral interspace, a water-chamber into which such pipe discharges; and a controlled discharge for such water-chamber.

2. A refrigerator comprising outer inclosing walls; an interior provision-chamber having its walls spaced from the outer inclosing walls; an ice-chamber within the inclosing walls above the provision-chamber, having its drainage into the interspace, said interspace being occupied with filtering material; a pipe leading from the bottom of the interspace embedded in said filtering material, and opening therein to receive the filtered water, and extending upward in the lateral interspace; a water-chamber into which such pipe discharges; and a controlled discharge for such water-chamber.

3. A refrigerator, comprising an outer inclosing wall; an interior provision-chamber having its walls spaced from the outer inclosing wall; filtering material occupying the interspace between the walls, and covering the interior chamber, said outer wall being extended upward above the provision-chamber to form a chamber for ice to be lodged upon the top of the filtering material, whereby the water of liquefaction from the ice filters downward about the provision-chamber; and a suitable discharge for the water of liquefaction at an elevated point; whereby the filtering material is saturated with the water.

4. A refrigerator comprising an outer inclosing wall; a metallic lining interior to such wall spaced therefrom; a plaster coating occupying the interspace between the outer wall and the metallic lining; an interior chamber having its walls spaced from the metallic lining; filtering material occupying the interspace; an ice-receptacle above the provision-chamber within the metallic lining, having its drainage into the interspace between the metallic lining and the provision-chamber; and means for permitting the discharge of the water of liquefaction from the upper part of the interspace, whereby the filtering material in such space may be kept saturated with the water of liquefaction.

5. A refrigerator, comprising outer inclosing walls, an interior provision-chamber having its walls spaced from the outer inclosing walls, an ice-chamber within the inclosing walls above the provision-chamber, means for forming air communication between the ice and provision chambers, the ice-chamber having its drainage into the interspace, a pipe leading from the bottom of the interspace opening therein to receive the filtered water, and extending upward in the lateral inter-

space, a water-chamber into which such pipe discharges, and a controlled discharge for said water-chamber.

6. A refrigerator, comprising outer inclosing walls, an interior plaster coating for said walls, and a metal casing or lining adjacent to the plaster coating, an interior provision-chamber having its walls spaced from the outer inclosing walls, an ice-chamber within the inclosing walls above the provision-chamber, the ice-chamber having its drainage into the interspace, a pipe leading from the bottom of the interspace opening therein to receive the filtered water, and extending upward in the lateral interspace, a water-chamber into which such pipe discharges, and a controlled discharge for said water-chamber.

7. A refrigerator, comprising outer inclosing walls having an interior plaster coating, a metal lining adjacent to said coating, an interior provision-chamber having its walls spaced from said outer walls, a filtering material arranged in said interspace, an ice-chamber within the inclosing walls above the provision-chamber, air-tight-fitting doors or covers for the ice and provision chambers, the said ice-chamber having its drainage into the interspace, a pipe leading from the bottom of the interspace opening therein to receive the filtered water, and extending upward in the lateral interspace, a water-chamber into which such pipe discharges, a controlled discharge for said water-chamber, and a flushing-pipe for cleaning the filtering material when desired.

In testimony whereof I hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 9th day of November, A. D. 1901.

NICOLAS BOSMANN.

In presence of—
CHAS. S. BURTON,
HAROLD WARNER.