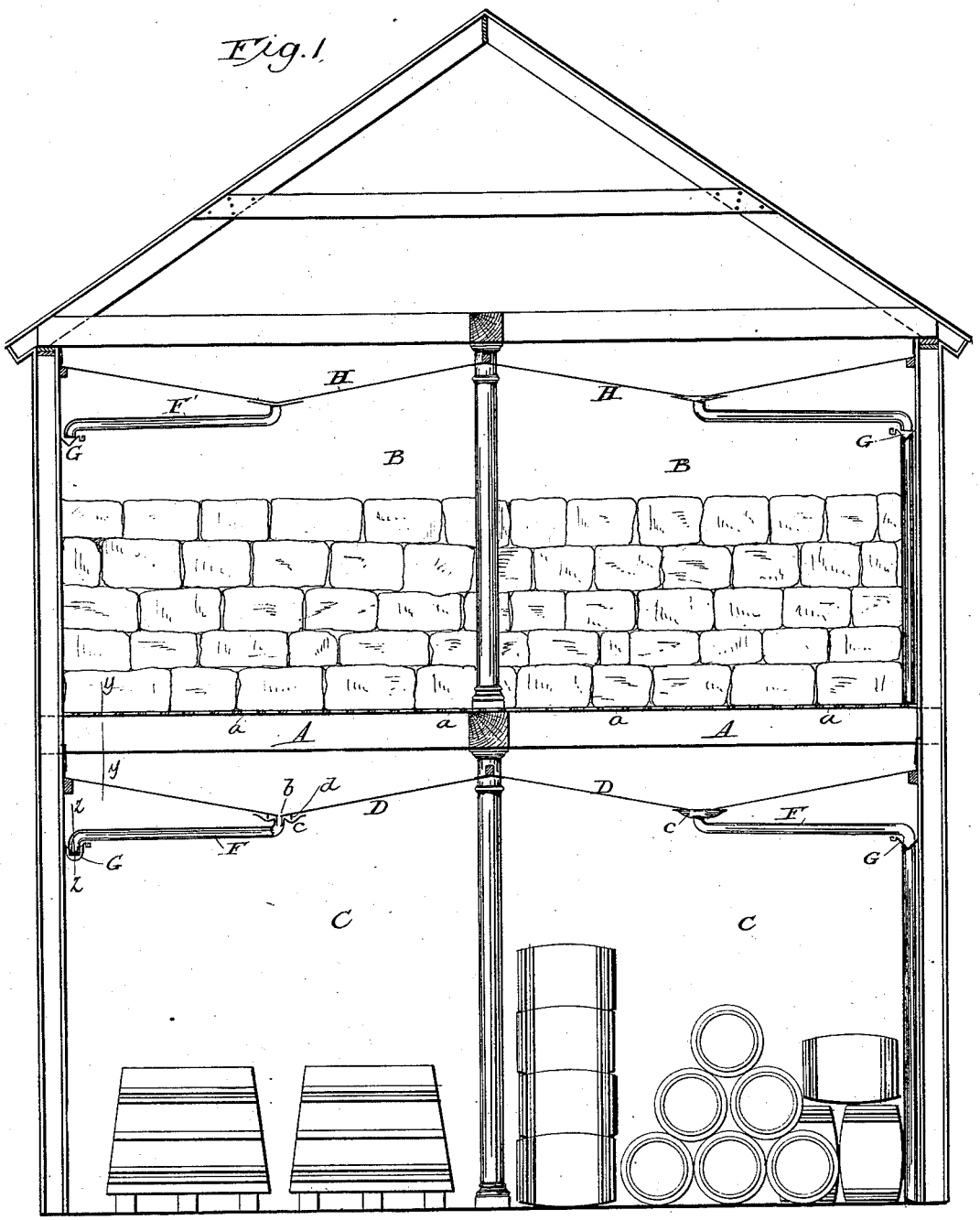
(No Model.) 2 Sheets—Sheet 1.

C. VOGEL.

REFRIGERATOR BUILDING.

No. 302,530. Patented July 22, 1884.

Fig. 1.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.
on z—z

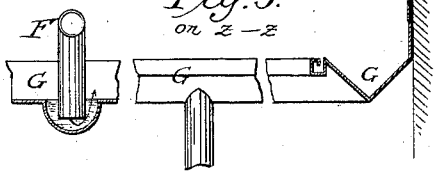


Fig. 2.

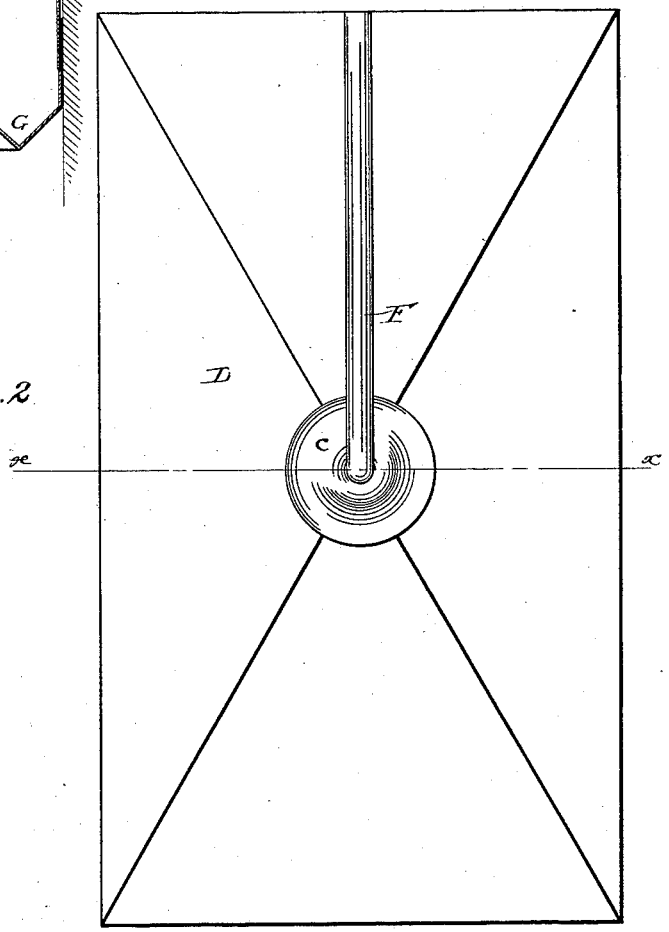


Fig. 4.
on y—y

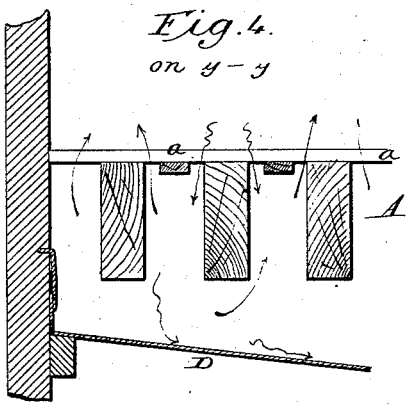
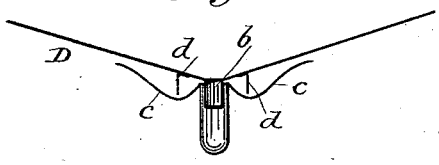


Fig. 3.



WITNESSES

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By his attorney.

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UNITED STATES PATENT OFFICE.

CHARLES VOGEL, OF ROCHESTER, NEW YORK.

REFRIGERATOR-BUILDING.

SPECIFICATION forming part of Letters Patent No. 302,530, dated July 22, 1884.

Application filed February 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES VOGEL, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Refrigerator-Buildings, of which the following is a specification.

This invention relates to that class of large refrigerators or ice-houses which are divided by horizontal floors into upper and lower chambers or compartments, the upper compartments being designed to receive the ice, and the lower compartment to receive the articles to be refrigerated.

The objects of the invention are to maintain a dry, pure atmosphere of low temperature in the refrigerating-compartment; to provide a simple means of collecting and carrying away the water which results from condensation of moisture on the interior surfaces of the house, so as to prevent the same from being deposited on the articles in the refrigerating-chamber or upon the ice; to construct the devices for thus collecting the moisture in such manner that they may be applied to existing houses without the necessity of removing the contents therefrom; to apply said collecting-surfaces in such manner that access may be had thereto and to all parts of the floor and ceiling for the purpose of washing and cleansing the same, as may be required.

To this end it consists in supplemental ceilings and conductors applied as described, wholly independent of the ordinary floors and ceilings.

Referring to the accompanying drawings, Figure 1 represents a vertical section through a refrigerator-building having my improvements embodied therein. Fig. 2 is a bottom plan view of one of my ceiling-panels for collecting the moisture, and the pipe and trap connected therewith. Fig. 3 is a cross-section on the line *x x* of Fig. 2, the panel being shown, however, in the position in which it stands when in use. Fig. 4 is a cross-section on the line *y y* of Fig. 1, showing clearly the construction of the main or ice-supporting floor and of the arrangement of the collector thereunder. Fig. 5 is a section on the line *z z*, Fig. 1, showing the manner in which the conducting-pipes are trapped at their outer ends.

Referring to Fig. 1 of the drawings, it will be seen that it represents a building of two stories in height divided by a horizontal floor, A, into an upper ice-chamber, B, and a lower refrigerating-chamber, C. The walls, roof, and lower floor of this building may be constructed in any ordinary or approved manner.

The floor A, which is designed to give support to the ice in large quantities, may be constructed in any manner which will admit of the air circulating through the same and of the water passing downward. In practice I ordinarily construct this floor of a series of joists arranged parallel with each other, as in ordinary buildings, and as represented in Figs. 1 and 4, placing upon these joists removable wooden gratings *a*.

Immediately below the floor A, and wholly independent thereof, I arrange within the refrigerating-chamber C a sheet-metal ceiling, D, extending the entire width and length of the chamber, and serving to entirely close communication between the two compartments. This ceiling D is constructed in the form of large panels or sections, such as represented in Figs. 1 and 2, preferably of a rectangular form, and each inclining downward from its edges to a single point at the center, at which it is provided with an outlet neck or tube, *b*. The panels are sustained in position by being attached to the walls and to intermediate supports of any suitable character. The water resulting from the melting of the ice descends through the floor, and is received on the upper sides of the panels, which deliver it through the necks or tubes *b*. These necks are preferably located at the center of the panels; but they may be located at other points, if preferred, provided only that the panels descend thereto from all sides.

For the purpose of carrying off the water delivered through the necks *b* they are introduced loosely into the ends of pipes F, which are extended thence to gutters or conductors G, located at the sides of the building, or in other convenient positions, and arranged to deliver into a drain or other receptacle. The necks *b* are fitted loosely within the mouths of the pipes F, for a reason which will be presently explained.

To prevent air from passing between the pipes and necks, and through the latter from

one compartment to the other, I provide each pipe with an annular groove or flange, *c*, having in its upper surface a depression adapted to retain the body of water therein. I also provide each panel on the under side with a dependent annular flange, *d*, adapted to extend downward and remain at all times immersed in the water contained in the mouth of the pipe, this arrangement constituting a water seal.

In order to prevent the circulation of air between the two compartments it is also necessary to seal the outer end of the conducting-pipes F, as otherwise the air would pass through the same from one chamber to the other. This may be done in any suitable manner. A simple arrangement for the purpose is that represented in Figs. 1 and 5, the trough or gutter G being provided with water-retaining pockets, into which the delivery ends of the water-conducting pipes F are inserted, as shown, the end of the pipe remaining constantly immersed in the water.

In the operation of the apparatus the reduction of temperature in the lower compartment would be accompanied by the deposition of moisture on the under side of the metal ceilings D. Owing to the inclination of these surfaces, the moisture on each ceiling will flow downward on the under side of the same to the lowest point, and will be deposited in the mouth *c* of the conducting-pipes F.

From the foregoing it will be perceived that the conductors F serve not only to carry away the water which results from the melting of the ice in the upper chamber, but also to carry off the moisture resulting from condensation in the lower chamber. It will be further noticed that the flanged mouths of the conductors F serve both as a means of sealing communication between the two chambers and of collecting and retaining the water of condensation from the lower chamber.

In the practical operation of houses of this general character it is found that wooden floors and gratings absorb, and also that there accumulates on their external surfaces, impurities and foreign matters of many kinds deposited from the ice. As ordinarily constructed it is practically impossible to effect the thorough cleansing of all the surfaces.

In constructing my house I ordinarily leave between the ceiling D and the under side of the floor A a sufficient space to admit of the attendant entering the same. This fact, in connection with the removal of the gratings, admits of all the interior surfaces being thoroughly washed and cleansed. The reduced temperature in the upper or ice chamber is accompanied in practice by a condensation on the ceilings of said chamber. To prevent the moisture thus deposited from dripping upon the ice beneath, which is for various reasons objectionable, I provide the upper chamber, immediately below its ceiling-joists or below the rafters, with a supplemental or secondary ceiling, H, constructed of sheet metal, in the same manner as the ceiling D of the lower compartment above described, except that this ceiling is not necessarily provided with openings or water-tubes, the moisture, if any, which is deposited on the upper side being disposed of through a drain-pipe or otherwise without being introduced into the chamber below. Beneath each of the ceiling-panels H, I arrange a conducting-pipe, F′, having at one end a flaring mouth to receive the moisture deposited from the ceiling, and having its opposite end arranged to deliver into a conducting-spout or gutter, by which the water is carried away.

I am aware that an ice-supporting floor has been provided with a sheet-metal ceiling or lining applied to the upper edges of the joists and bent downward between them, and to such construction I lay no claim.

It will be perceived that a ceiling applied in accordance with my plan may be constructed more cheaply and with less metal than one made as above described; that my system of construction, unlike the other, permits the air to circulate freely on all sides of the floor-joists, whereby decay is prevented; and that, unlike the arrangement mentioned, my ceiling serves to receive and retain the moisture which may be collected on and fall from the joists.

I am also aware that refrigerators or refrigerator-buildings have been provided with sheet-metal ceilings to receive and carry off the water resulting from the dissolution of the ice, special provision being made, however, to permit the passage of air through the base or floor from one compartment to the other.

It will be observed that under my construction the ceiling is applied in such manner as to effectually prevent the passage of air between the chambers.

Having thus described my invention, what I claim is—

1. In an ice-house or refrigerator having the upper and lower chambers and the intermediate grated floor, the sheet-metal ceiling D, provided with the water-discharge necks at their lowest point, and the conducting-pipes F, provided with expanded mouths and connected with the necks by a fluid seal, substantially as described, whereby said pipes are caused to discharge the water from the upper chamber and the moisture of condensation from the lower chamber, at the same time preventing the passage of air from one chamber to the other.

2. In an ice-house, the sheet-metal ceiling D, inclined downward to an outlet-neck, *b*, thereon, and provided with a depending flange, *d*, surrounding said neck, in combination with the pipe F, loosely encircling the neck *b*, and provided with a flange or groove, *c*, extended loosely beneath and around the flange *d*.

3. In an ice-house having the upper and

lower chambers and the intermediate ceiling, D, isolating the chambers from each other and inclining downward to an outlet-neck, *d*, the horizontal conductor-trough G and the pipe F, having at one end a fluid-sealed connection with the trough, and at the opposite end an expanded mouth and a fluid-sealed connection with a neck opening through the ceiling, whereby the water resulting from the melting of the ice above the ceiling, and also the water resulting from condensation on the under side of the ceiling and on the surface of the pipe F, is delivered into the conductor.

4. In a refrigerator or ice-house, the combination, with upper and lower chambers, of intermediate floor-joists, a removable grating applied thereto to sustain the ice, and a sheet-metal ceiling arranged beneath said joists, and at such distance therefrom as to admit of an attendant passing between the joists and the ceiling.

5. In an ice-house having the upper ice-chamber and the lower refrigerating-chamber, the ice-supporting floor and the ceiling beneath said floor, composed of rectangular sheet-metal panels depressed from the four sides toward a central point, and provided at said point with an outlet neck or pipe having a fluid seal.

6. In an ice-house, floor-joists A, extending across the same from side to side, and serving to divide the same into upper and lower compartments, in combination with a removable grating applied thereto, and a sheet-metal ceiling, D, suspended beneath the joists and wholly independent thereof, said ceiling being adapted, as described, to completely isolate the two chambers from each other, being provided also with delivery-pipes at depressed points therein.

CHARLES VOGEL.

Witnesses:
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F. S. ROGERS.