J. W. STEWART.

REFRIGERATOR.

No. 186,376. Patented Jan. 16, 1877.

Fig. 1.

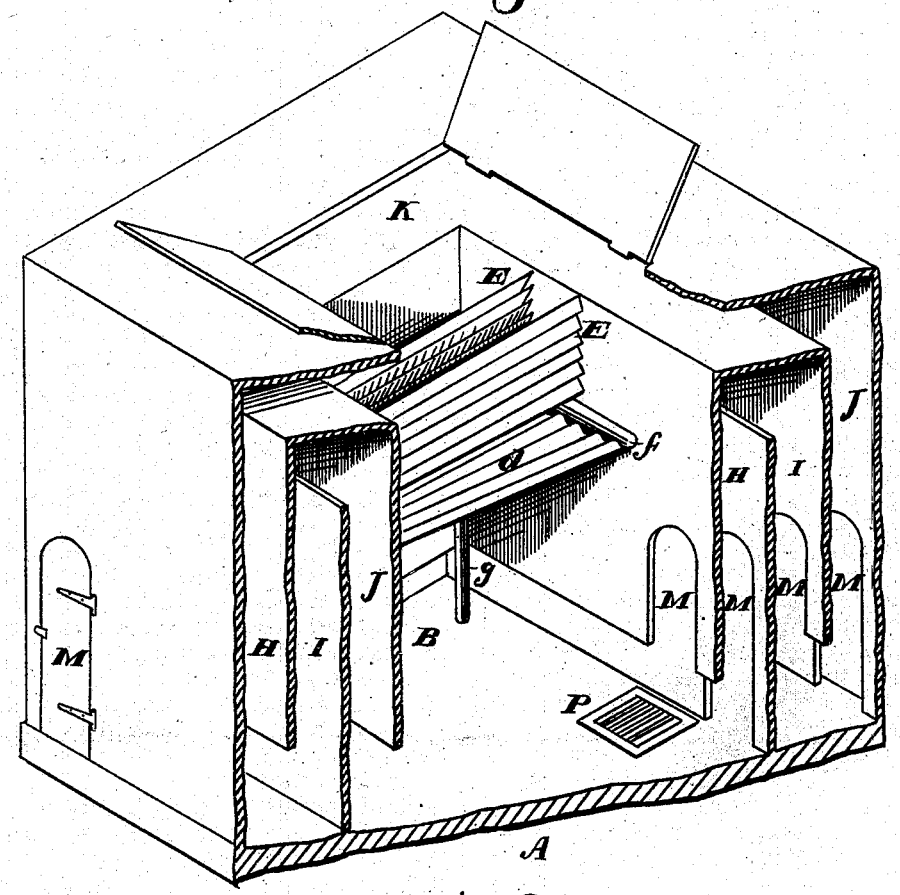
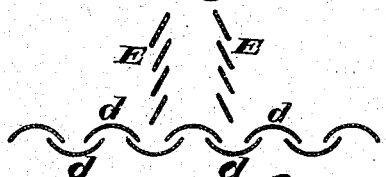


Fig. 2.



Witnesses

Geo. H. Strong

John Lee Bond

Inventor

John W. Stewart

by Dewey & Co

Attys

UNITED STATES PATENT OFFICE.

JOHN W. STEWART, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **186,376**, dated January 16, 1877; application filed June 21, 1876.

To all whom it may concern:

Be it known that I, JOHN W. STEWART, of San Francisco city and county, State of California, have invented certain new and useful Improvements in Refrigerators; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to certain improvements in the construction and arrangement of such structures as are used for storing and preserving by refrigeration such perishable articles as fruits, vegetables, meats, &c.

My improvement consists in the combination of an ice-chamber with a main refrigerating-chamber, and one or more surrounding chambers or passages, in such a manner that an automatic circulation of cold air will be maintained through the chambers and passages, the temperature of which will vary according to the distance the passage is situated from the main refrigerating-chamber, all as hereinafter described.

Referring to the accompanying drawings, let A represent a house, room, car, or other structure in which it is intended to place perishable articles for preservation. Inside of this structure is a central compartment, B, the sides of which extend upward to near the top of the house or room A, while their lower ends are perforated or cut away, as shown, so as to provide a passage underneath them. Inside of this chamber, and near its upper end, I construct an inclined floor or horizontal partition, which is made of alternate concave and convex plates or boards *d d'*. These plates are placed so that their edges overlap, as shown at Fig. 2, and a space being left between the overlapping edges, for the purpose hereinafter described. This floor divides the compartment B into an upper and lower compartment, the upper compartment forming the ice chest or chamber, while the lower compartment forms the main refrigerating-chamber. The ice-chest is again divided vertically by two partitions, E E, which are placed at a short distance apart near the middle of the chamber. These partitions are made of slats placed at an angle, so as to overlap each other. The spaces on each side of the partitions E E serve to contain the ice, while the space between the partitions admits the air into and through the ice. The concave plates which form the lower portion of the floor connect with a side gutter, *f*, at their lower ends, and this side gutter is connected with a vertical spout, *g*, which leads down through the floor of the room. The ice rests upon the inverted or convex plates, so that the water which results from the melting of the ice is caught by the concave plates and conveyed to the gutter *f*, and through the gutter *f* and spout *g* to the outside of the buildings.

The air which enters the chamber can pass freely down through the ice, and through the spaces between the overlapped edges of the plates into the lower compartment, while the inclined slats which form the vertical partitions both admit the air into the body of the ice, and direct the water of condensation into the troughs or gutters.

Outside and on each side of the compartment B I construct other upright compartments or passages, H I S, parallel and concentric with each other. In constructing the partitions which form these parallel and concentric passages, I leave a space at the top and bottom, alternately, of each partition, while the upper end of the extreme outside passage connects with the space above the passages and with the ice-chamber.

Above the ice-chamber is a door or hatchway, K, through which the ice is lowered into the ice-chamber, and through which a fresh supply of air can be introduced into the structure when desired. It will therefore be evident that the cold air in the central chamber will pass into the concentric passages alternately above and below, while the warm air in the outside passages will pass overhead to the ice-chamber, thus establishing a uniform and natural circulation throughout the passages. It will also be evident that the farther the air progresses from the central chamber, its temperature will be correspondingly increased, so that I obtain several distinct passages, each of which has a distinct temperature, the coldest point being in the center, in the compartment B.

In each partition I make a doorway, and close it with a door, M, so that the opening of a door, when a person enters the refrigerator structure, will not admit a rush of outside air to disturb the relative temperature in the passages; but the air in the extreme outside passage, being the nearest to the temperature of the outside atmosphere, will be but slightly affected by the inrush of air when the outside door is opened, if the other doors are closed, and so from one passage to the other the successive opening of the doors will not affect the process of atmospheric circulation.

Another advantage which I obtain by this concentric arrangement of air-passages, by which I produce a continuous amount of air, and the consequent varieties of temperature, is, that I can suspend fruits, &c., in the passages, and thus accommodate them to their most natural temperature.

I have discovered that certain fruits, such as oranges and lemons, will not keep when exposed to too low a temperature. I therefore am able to combine in the single structure the elements of a refrigerating process adapted to all varieties and kinds of perishable articles.

P represents a grate, which I can apply underneath either of the compartments, below which the air-current will pass, and upon which I place such articles as cannot be easily suspended in the passage-ways.

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

1. The refrigerating-chamber B, having the ice-chamber above it, and surrounded by two or more concentric parallel passages, H I S, which connect with each other alternately above and below, and the extreme outer one of which connects with the ice-chamber and central compartment by an overhead passage, whereby I am able to establish an automatic and natural circulation of atmosphere, and provide separate compartments and passages, each of which has a separate and distinct temperature, substantially as and for the purpose described.

2. A refrigerator provided with an ice-chamber, separated from the refrigerating-chamber by a partition made of alternate concave and convex plates, arranged to overlap each other and form air-passages between their overlapped edges, and having the ice-chamber separated into two or more compartments by double walls E, which are constructed of slats placed angularly one above another, so as to admit air into and through the body of ice, and thence through the floor in the refrigerating-chamber below, substantially as and for the purpose described.

3. In a refrigerator constructed as described, the compartments or passages H I S, parallel and concentric with each other, and provided with the doors M in each partition, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand and seal.

JOHN W. STEWART. [L. S.]

Witnesses:

GEO. H. STRONG,

OLWYN T. STACY.