

W. T. ALLEY.  
Refrigerator.

No. 217,504.

Patented July 15, 1879.

Fig. 1

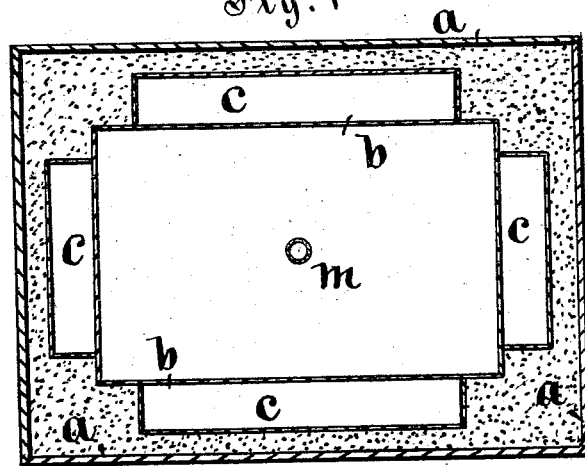
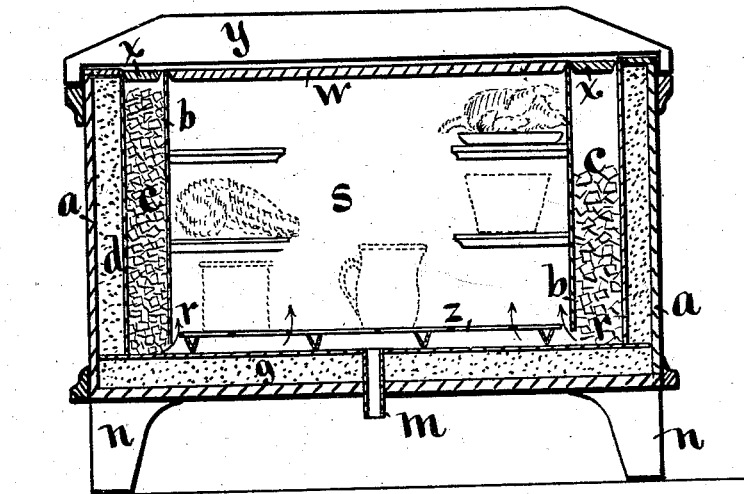


Fig. 2



Witnesses:

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*William T. Alley,*

*By Thomas G. Orwig,*  
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# UNITED STATES PATENT OFFICE.

WILLIAM THOMAS ALLEY, OF OTTUMWA, ASSIGNOR OF ONE-HALF HIS  
RIGHT TO JAMES A. TRIMBLE, OF KEOKUK, IOWA.

## IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **217,504**, dated July 15, 1879; application filed  
August 13, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM T. ALLEY, of Ottumwa, in the county of Wapello and State of Iowa, have invented an Improved Refrigerator, of which the following is a specification.

The object of my invention is to furnish an improved means of preserving animal and vegetable substances from fermentative disorganization during warm weather.

My invention relates to the manner of constructing a refrigerating box, case, or car within which it is designed to place and preserve animal and vegetable substances from fermentative disorganization by means of ice.

It consists in forming a series of independent ice-chambers in the permanent vertical walls, and connecting the ice-chambers with the central storage-chamber in such way that the entire series will co-operate in affecting the temperature of the storage-chamber, and that access can be gained to each chamber of the complete refrigerator without opening or affecting the operation of the other chambers, and in such a way that no air will enter or escape from the chambers when their covers are in place, and that the water produced by the consumption of the ice will pass from the ice-chambers and through the storage-chamber, to extract and carry off the latent heat of the contents of the storage-chamber, while a cold vapor will remain at rest in the storage-chamber, to prevent the ingress of warm air through the vent in its bottom, all as hereinafter fully set forth.

Figure 1 of my drawings is a top-plan view of my improved refrigerator. Fig. 2 is a longitudinal central elevation. Together they illustrate the construction and operation of my complete invention.

*a a* represent the vertical walls of a box, case, or car, which may vary in configuration and dimensions as desired. It is preferably made of wood and joined together in a common way, and supported by means of a skeleton-frame.

*b b* represent an inner wall, preferably made of sheet-zinc, that is secured to the frame-work and base of the outer wall, *a a*.

*c c* represent ice-chambers formed contiguous

to the inner wall, *b*, and between the walls *a* and *b*. They are preferably made of sheet metal and permanently fixed between the walls *a* and *b*.

*d d* are vacant spaces surrounding three sides of each of the ice-chambers *c*. These spaces are designed to be filled with charcoal or some other suitable non-conducting material.

*g* represents a double-walled bottom, also filled with charcoal. *m* is an eduction-tube fixed in the bottom *g*. *n n* represent feet to support the complete refrigerator.

*r r* represent a series of perforations in the bottom edge of each side of the inner wall, *b*, by means of which the ice-chambers *c* are connected with the central storage-chamber, *s*.

*w* is a double-walled air-tight movable cover, closing the top of the storage-chamber *s*. *x x* are movable air-tight covers closing the tops of the ice-chambers *c*.

By means of the independent movable air-tight covers upon the independent ice-chambers connected with the central storage-chamber, each chamber in the complete refrigerator can be opened separately without affecting the operation of any of the chambers that remain closed, and consequently access can be gained to each ice-chamber consecutively, while all the other chambers remain closed. Therefore all the ice-chambers may be refilled without opening the storage-chamber, and the storage-chamber may be opened and closed at pleasure to put in and take out articles, as desired, without opening any of the ice-chambers.

*y* is a movable cover extending over the entire top. It rests upon a shoulder or molding formed around the top of the outside wall. *z* is a removable and perforated bottom, supported upon suitable feet or cleats in the bottom of the storage-chamber *s*, in such a manner as to allow water to pass underneath and cold vapor around and through it, to envelop the substances stored upon shelves above it, as indicated by figures in broken lines.

In the practical operation of my invention I simply fill the series of ice-chambers with broken ice and then close their tops air-tight. Cold vapor and melted ice will then pass continuously into the central storage-chamber until the ice is consumed. The water or melted

ice will pass from the storage-chamber through the eduction-tube in its bottom, and in so doing will extract and carry off the warm air that may be in the storage-chamber, and also the latent heat existing in the articles stored in said chamber for preservation. The temperature of the air in the storage-chamber will thus become changed by the melting of the ice in the series of ice-chambers connected therewith, and an equal temperature will be produced in all the chambers. The cold air thus produced in the storage-chamber will constantly press downward and prevent warm air from rising and entering through the eduction-tube in its bottom, which tube is the only vent in the entire refrigerator. As long as ice remains in the ice-chambers the temperature in the storage-chamber will be practically the same as in the ice-chambers, and cold enough to congeal and preserve perishable animal and vegetable substances placed in the storage-chamber.

I am aware that a series of ice-chambers has been placed in the storage-chamber of a refrigerator (but not in the double wall) in such a manner that access could be gained to the ice-chambers without opening the cover of the storage-chamber, but not without allowing air to circulate in the storage-chamber.

By my manner of forming the ice-chambers within the walls of a refrigerator I entirely disconnect them at their tops from the storage-

chamber, and thereby prevent the circulation of air in the chambers and concentrate the products of the ice, cold vapor, and water into the central storage-chamber, to expel warm air and extract and carry off the latent heat of the articles stored therein by the natural downward pressure of the cold vapor and water and the escape of the water.

I do not claim a refrigerator having ice-receptacles arranged at the sides of the preserving-chamber, the same being supported by a frame-work resting on the floor of the refrigerator, being aware that such construction is not new.

I claim—

The described refrigerator, having double walls, a central provision-chamber, ice-chambers on all its sides, whose inner walls are raised above the bottom of the provision-chamber, such ice and provision chambers being closed air-tight at the top, a single eduction-pipe in the bottom, and an elevated perforated shelf, all constructed and arranged so that the drip-water from the ice-chambers shall flow through the refrigerator under such perforated shelf, for the purpose of lowering the temperature in the provision-chamber, as set forth.

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Witnesses:

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