

H. W. McKNIGHT.
Refrigerators.

No. 147,957.

Patented Feb. 24, 1874.

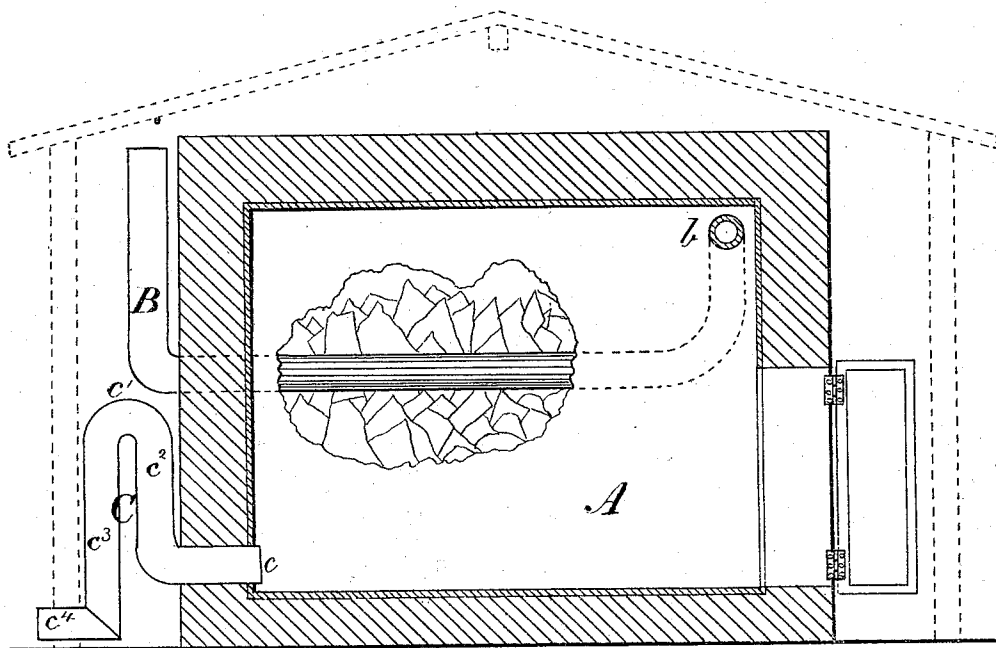


Fig 1.

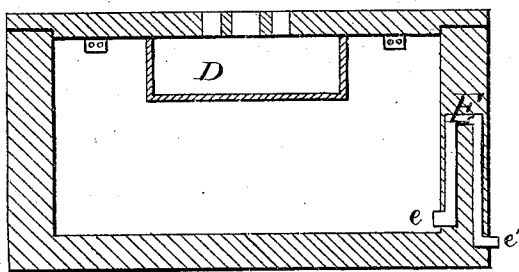


Fig 2.

WITNESSES

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HARVEY W. MCKNIGHT, OF EASTON, PENNSYLVANIA.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **147,957**, dated February 24, 1874; application filed January 7, 1874.

To all whom it may concern:

Be it known that I, HARVEY W. MCKNIGHT, of Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Refrigerators and Preserving-Houses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a vertical section of my invention. Fig. 2 is a vertical section of a modification.

My invention has for its object to produce a constant circulation or current of cold air in and through refrigerators and preserving-houses without the employment of a fan or blower.

The nature of my invention consists in the peculiar arrangement and construction of parts, as hereinafter fully described, having reference particularly to the employment of induction and eduction pipes, the former being packed in ice, and discharging their contents into the preserving-chamber near the top thereof, and the latter being of siphon shape, having internal communication with said chamber near its floor.

In Fig. 1 of the drawing is illustrated a building to which my improvements are applied, A being the preserving chamber or chambers therein. B represents the induction pipe or pipes, made in any suitable form, straight, coiled, or otherwise, and surrounded by ice or other cooling substance. This pipe (or pipes) makes its entrance to the chamber A at *b*, at or near the top or ceiling of said chamber, into which its cooled contents are discharged. C is the eduction pipe or pipes, of siphon form, and communicating with the chamber A at or near the floor of said chamber, as shown at *c*. *c*¹ represents the apex; *c*², the short, and *c*³ the long leg of the siphon, terminating in a bend, *c*⁴.

The operation of the apparatus is as follows: The air cooled in the pipe B makes its

way into the chamber A, falling therein, and filling the siphon C, which (on a well-known philosophical principle) at once discharges its contents into the lighter, because warmer, atmosphere outside, thereby producing a vacuum in said chamber, which must be and is filled by cold air from the pipe B.

The operation continues as long as the air in the siphon is colder than the outside atmosphere, and a constant circulation or current is thus kept up within the preserving-chamber.

The operation of the siphon is aided by the weight of the volume of cold and heavy air inside the chamber, which, being admitted at the top, in its fall expels the lighter air through the only exit—viz., the siphon or eduction pipe.

The rapidity of the current depends upon the length of the long leg of the siphon, or the capacity of its discharge-orifice, and the temperature of the outer air; hence the circulation may be controlled by elongating or contracting the long leg of the siphon, or by contracting or expanding the diameter of its nozzle or discharge-orifice.

I have described the improvements above applied to a preserving-house; and when thus applied, the outer end of the induction-pipe should terminate within the house, though not, of course, within the preserving-chamber, so as to avoid taking the hot air outside, that within being usually many degrees cooler.

The house and preserving-chamber, either or both, may be packed with ice; or ice or other cooling substance may be placed around the induction-pipes B only.

The above improvements may also be applied to refrigerators and ice-chests, and a modification may be substituted, as follows: Inside and just below the lid will be placed a pan or other receptacle for ice. (Shown at D in Fig. 2.) The air passes through a hole in the lid to this pan, is cooled by the ice thereon, and falls down in the chest, filling the siphon E, and making its exit, as above described. The siphon-pipe, in this case, will be arranged in the walls of the refrigerator or chest, communicating, by suitable openings *e* *e'*, with the

preserving-compartment and outside atmosphere, respectively.

What I claim as my invention is—

In combination with a cooling-chamber receiving cold air at or near the top, a siphon-education-pipe having its longer leg adjustable, substantially as described, so that the circulation may be regulated, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of January, 1874.

HARVEY W. McKNIGHT.

Witnesses:

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