L. B. WOOLFOLK

Refrigerator.

No. 168,441. Patented Oct. 5, 1875.

Fig. 1.

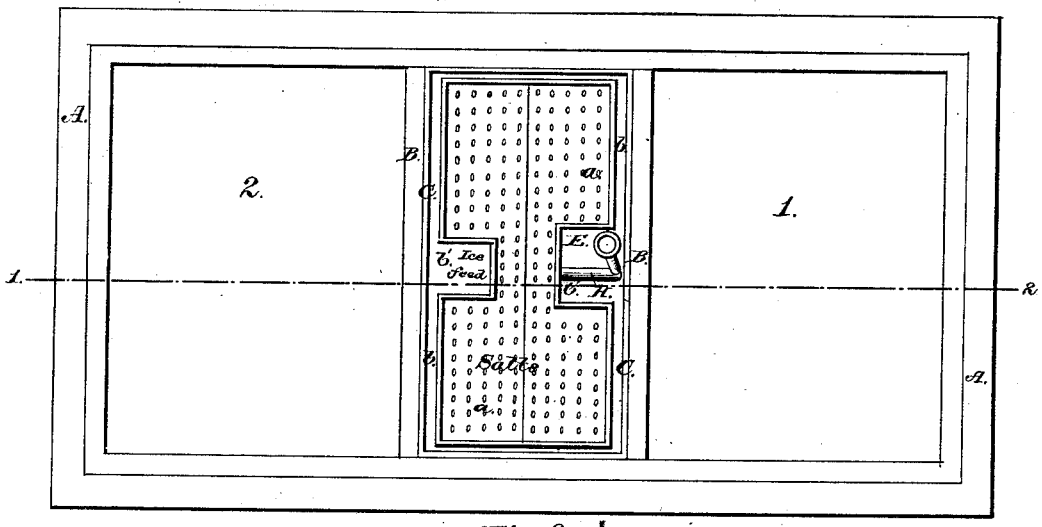


Fig. 2.

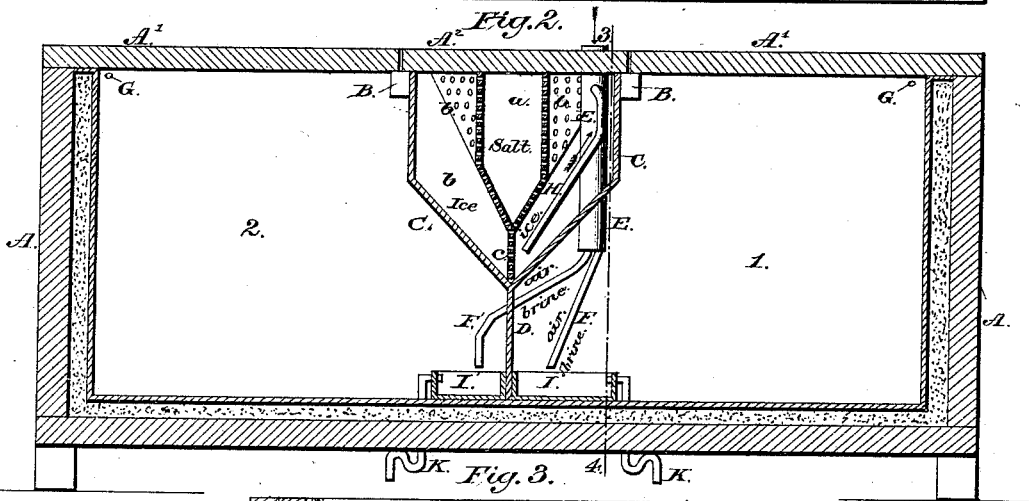
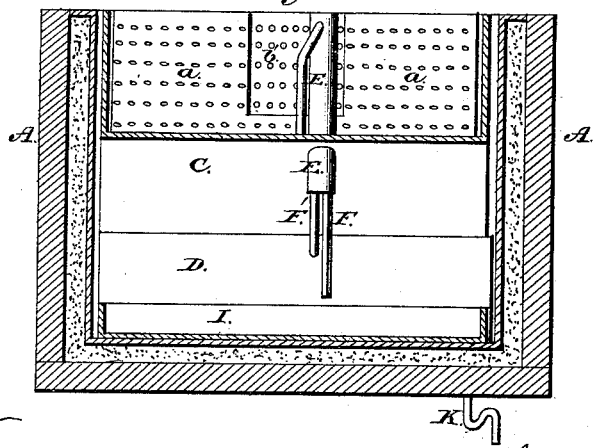


Fig. 3.



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UNITED STATES PATENT OFFICE.

LUCIEN B. WOOLFOLK, OF LEXINGTON, KENTUCKY.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **168,441**, dated October 5, 1875; application filed July 10, 1875.

To all whom it may concern:

Be it known that I, LUCIEN B. WOOLFOLK, of Lexington, in the county of Fayette and State of Kentucky, have invented a new and useful Improvement in Refrigerator-Boxes, of which the following is a specification:

My invention belongs to that class in which ice and salt placed in separate compartments of a refrigerating-vessel are employed for refrigeration.

My improvement consists, first, in constructing the refrigerating-vessel containing separate ice and salt compartments across the refrigerator-box at or near the center of its length, so as to have a compartment of the refrigerator-box on each side of the refrigerating-vessel; second, in constructing the salt-compartment in the longitudinal center of the refrigerating-vessel, so as to have the ice-compartment on each side of the salt-compartment, thus presenting the most extensive refrigerating-surface; third, in dividing the ice-compartment into two parts, having communication for the brine, but not for the ice, so as to keep the two compartments of the refrigerator-box at different temperatures, if desired; fourth, in constructing two recesses, one on each side of the salt-compartment, through which ice may be supplied to the refrigerating-vessel; and, fourth, in constructing a new and efficient apparatus for ventilating the refrigerator-box, and for carrying off the waste brine from the refrigerating-vessel.

Figure 1 is a plan with covers removed. Fig. 2 is a longitudinal vertical section taken through the line 1 2 of Fig. 1. Fig. 3 is a vertical section taken across the refrigerator-box in the line 3 4 of Fig. 2.

A is the refrigerator-box of the usual construction, having double walls, with a space between the box and metallic lining filled with some non-conducting material. A^1 A^1 are doors opening into the refrigerator. A^2 is a door covering the refrigerating-vessel. B B are cross-bars extending across the refrigerator-box A. C is the refrigerating-vessel constructed across the center of the refrigerator-box A, supported by the cross-bars B. The refrigerating-vessel C, together with the partition D, divides the refrigerator-box A into two separate compartments, 1 and 2, having no air communication with each other. The refrigerating-vessel C has two separate compartments, which contain, respectively, ice and salt. *a* is the salt-compartment, constructed (of woven-wire or perforated sheet metal) longitudinally in the middle of the refrigerating-vessel C, so as to have the ice-compartment *b* on each side of the salt-compartment. *b′* *b′* are recesses on each side of the salt-compartment *a*, through which ice is supplied to the ice-compartment of the refrigerating-vessel. *c* is a partition, constructed of woven wire or perforated sheet metal, extending down from the bottom of the salt-compartment *a* to the bottom of the refrigerating-vessel C. E is an air-tube for ventilating the refrigerator. F and F′ are small tubes, through which the air passes from the tube E to the bottom of the refrigerator-box A. The tube F′ passes through the partition D, in order to conduct cold air into compartment 2 of the refrigerator-box. G G are air-outlets in the side of the refrigerator-box A near the top, through which the air passes out of the refrigerator-box.

H is a waste-pipe conveying the brine from the bottom of the refrigerating-vessel C, where it is warmest, into the air-tube E, whence it passes, through the pipes F and F′, into the water-boxes I I′, which are soldered to the partition D, or otherwise secured in such a manner as to catch the moisture that flows down the partition. From the boxes I I′ the brine passes off from the refrigerator-box through the pipes K K′, which are curved so as to form a water-seal to prevent the escape of air.

In the accompanying drawings the doors of the refrigerator-box A are placed on top. This is the preferable arrangement, inasmuch as the cold air in the refrigerator-box is retained when the doors are opened, whereas when the doors are on the side the cold air in the refrigerator passes out by its greater specific gravity whenever the doors are opened. But my improvement is equally applicable to a refrigerator where the doors into the compartments 1 2 open at the side. The refrigerating-vessel C is placed across the middle of the refrigerator-box A, in order to divide the refrig-

erator-box A into two seperate compartments 1 and 2, having no air communication with each other, and capable of being kept at different temperatures.

The salt-compartment *a* is placed longitudinally in the middle of the refrigerating-vessel C, for the following advantageous results obtained by the arrangement: First, the ice-compartment exercises the refrigerating force, and by this arrangement it is placed in contact with the sides of the refrigerating-vessel, and thus the greatest refrigerating-surface is exposed, and the highest efficiency of the apparatus is secured. Second, by placing the ice on both sides of the salt receptacle, the compartments 1 2 of the refrigerator-box A are both kept equally cold; but when the ice is placed only on one side of the salt-compartment *a*, it is prevented from passing beneath the salt-compartment to the other side by the partition *c*, and the compartment of the refrigerator-box adjacent to the ice will be kept at a temperature below the freezing-point, while the other compartment of the refrigerator-box having no ice in the refrigerating-vessel adjacent to it, will be kept at a moderately cool temperature by the brine in the refrigerating-vessel.

The construction of the recesses *b'*, one on each side of the salt-compartment, presents decided advantages. It is important to have the space between the salt-compartment *a* and the side of the refrigerating-vessel C as narrow as is practicable, inasmuch as this construction both economizes ice and increases the refrigerating activity. The cold of the ice-compartment is dependent upon the saturation of the brine with salt, so that it may melt the ice at a low temperature. The narrower the space for the ice-compartment, the more readily does the salt in the salt-compartment saturate the brine. But this construction is attended with inconvenience in supplying the ice to the ice-compartment. The recesses *b'* are constructed to obviate this inconvenience. Large lumps of ice may be supplied through them to the ice-compartment in its wider part below, and as they melt and grow smaller the lumps of ice will rise into the smaller space at the top of the ice-compartment.

The ventilating apparatus acts in the following manner: The air in the tube E is chilled by the cold of the brine in the refrigerating-vessel C, and sinks through the tubes F and F' down to the bottom of the refrigerator-box A, the air displaced by its entrance passing off through the air-outlets G G. The excessive cold of the brine in the refrigerating-vessel C causes the air in the tube E to precipitate its moisture upon the sides of the tube, where it freezes into ice. The ice is prevented from accumulating by the brine which escapes through the waste-pipe H into the air-tube E, and keeps the ice in the tube melted.

By means of this ventilating apparatus the air that passes into the refrigerator is in great measure deprived of its moisture. A great part of the moisture it retains will be deposited upon the sides of the refrigerating-vessel C, which are sloped down to a point, so that the moisture precipitated upon it will run down into the boxes I I'.

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

1. The combination of the refrigerator-box A, compartments 1 and 2, refrigerating-vessel C, salt-compartment *a*, ice-compartment *b*, recesses *b'*, partition *c*, air-tube E, air-tubes F F', air-outlets G, partition D, waste-pipe H, water-boxes I I', and escape-pipes K K', substantially as described.

2. The combination, with the refrigerator-box A, of the refrigerating-vessel C, (containing salt-compartment *a* and ice-compartment *b*,) and having partition-flange D, and extending across the refrigerator-box at or near the center, for the purpose of dividing it into two compartments, 1 and 2, substantially as and for the purposes described.

3. The combination, with the refrigerating-vessel C, of the salt-compartment *a*, longitudinally in the middle, and extending from end to end of vessel C, for the purpose of exposing the largest refrigerating-surface of the ice-compartment, substantially as set forth.

4. The combination of the salt-compartment *a*, having recesses *b' b'*, and ice-compartment *b*, for the purpose of supplying ice to the refrigerating-vessel, substantially as set forth.

5. The partition *c*, in combination with the refrigerating-vessel C, having the salt-compartment *a* and the ice-compartment *b*, the refrigerator-box A having compartments 1 2, for the purpose of preventing the ice placed on one side of the salt-compartment from passing to the other, and thus securing a different temperature in the compartments 1 2, substantially as set forth.

6. The combination of the air-tube E, air-tubes F F', and air-outlets G G, with the refrigerating-vessel C, having salt-compartment *a* and ice-compartment *b*, and the refrigerator-box A, having compartments 1 and 2, in the manner and for the purpose set forth.

7. The combination, with the refrigerator-box A, refrigerating-vessel C, having salt-compartment *a* and ice-compartment *b* of the waste-pipe H, tube E, tubes F F', water-boxes I, and waste-pipes K, in the manner and for the purpose set forth.

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Witnesses:
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