

(No Model.)

T. B. ASHFORD.
REFRIGERATOR.

No. 513,860.

Patented Jan. 30, 1894.

Fig. 1.

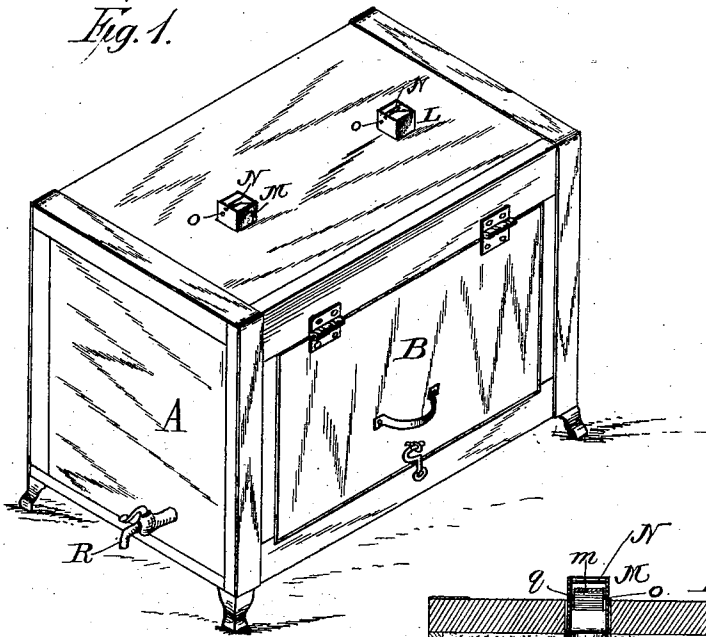


Fig. 2.

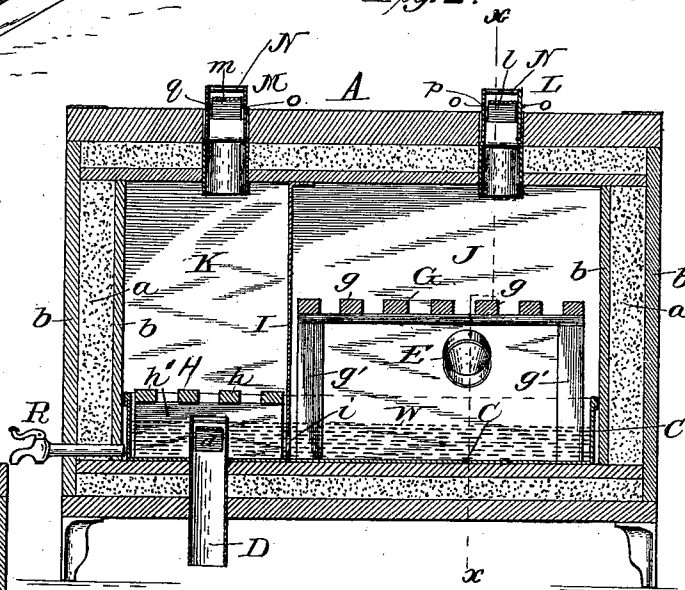


Fig. 3.

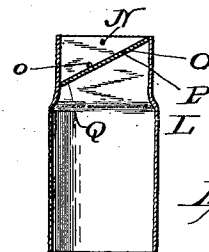
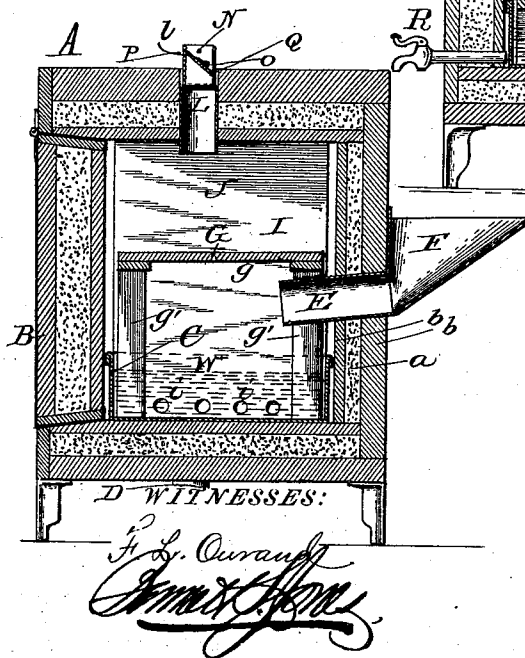


Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS B. ASHFORD, OF KINSTON, NORTH CAROLINA.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 513,860, dated January 30, 1894.

Application filed September 16, 1893. Serial No. 485,643. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. ASHFORD, a citizen of the United States, and a resident of Kinston, in the county of Lenoir and State of North Carolina, have invented certain new and useful Improvements in Refrigerators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved refrigerator. Fig. 2 is a longitudinal sectional view of the same, on a vertical plane through the middle. Fig. 3 is a transverse sectional view on the vertical plane indicated by the broken line marked $x-x$ in Fig. 2; and Fig. 4 is a detail view of one of the automatic air-valves.

Like letters of reference designate corresponding parts in all the figures.

My invention relates to refrigerators for household or general use, or for use in stores, warehouses, markets, and other places where food products of a perishable nature are stored or kept for sale; and it consists in the improved construction and combination of parts of a refrigerator adapted to be used with cold water as the cooling medium instead of ice, substantially as will hereinafter be more fully described and claimed.

On the accompanying drawings, the letter A denotes the exterior double casing of the refrigerator box; said casing being made in any of the approved forms; preferably consisting of a double wall, $b\ b$, the space a between which is tightly packed with sawdust. On one side of the box A is a hinged door B fitting air-tight and also made with double walls, with an intermediate packing of sawdust.

The bottom of the refrigerator box is occupied, its entire length and width, by a shallow open top metal tank C, provided with an overflow pipe D having an automatic valve d ; and this tank or pan C may be filled with cold water through a pipe E inserted slantingly through the rear wall (or one of the sides) of the box, and provided on the outside with a funnel F, which is permanently fastened to

box A and forms a fixture of the same. The pan C is removable for cleaning, or any other purpose desired.

Placed within the flat tank C, at one end of the same, is a raised platform G, composed of a series of parallel slats g forming an open floor resting upon four uprights g' , one in each corner, and alongside of this is a similar but lower platform H, made in the same manner by parallel slats or narrow boards h , resting upon short parallel supports h' . The two open bottom platforms G and H are thus, it will be seen, immediately above the cooling medium or water, shown at W, in tank C, and are separated from each other by the transverse vertical wall or partition I, by means of which the interior of the refrigerator is divided up into two parallel chambers or compartments J and K, each provided with its appropriate open bottom platform G, and H. Near the bottom of the transverse partition I is one or more openings i , so that the water may circulate freely in tank C between the two compartments J and K. Each of these compartments communicates with the exterior through a short vertical pipe, L and M, which passes through the double packed roof or top A' of the refrigerator box, and is provided with its appropriate automatic air-valve, shown respectively, at l and m . These automatic valves are of the same construction, as valve d , in the overflow pipe D, and their purpose is to enable any warm air that unavoidably enters the refrigerator every time door B is opened, to escape, yet at the same time preventing atmospheric air from the outside to enter the refrigerator through the exhaust pipes L M and overflow pipe D, which is accomplished in the following manner, reference being had to the enlarged detail view Fig. 4, in which I have shown the construction of the pipe L; but as all three pipes, with their appropriate valves, are of precisely the same construction, a description of one of them will answer for all. As will be observed from this figure, the pipe is square in cross section, and has inserted through opposite sides, near its top, a transverse rod N, which forms a stop for the hinged automatic flap-valve O. The latter is also of square form to fit the pipe, and has two pin-
tles or short trunnions, $o\ o$, projecting from

opposite sides and in alignment with each other, so as to form two wings or flaps, P and Q, of uneven width; flap P being the larger, (i. e. wider) of the two. The trunnions *o o* are hung in bearings, *p p* in opposite sides of the pipe, below and to one side of the horizontal transverse top-rod N; in other words: the valve O is hung eccentrically within the mouth of the pipe. The larger flap P is of such width that when the valve is closed, as shown in full line in Fig. 4, it will abut or impinge obliquely against two sides of the pipe, in which position the valve will entirely close the mouth of the same; remaining normally in this (closed) position by the gravity of the large flap P, which overbalances the weight of the opposite smaller flap or wing Q; but if there is any sudden blast or pressure against the valve from the under side, due to the sudden closing or slamming of the door, the blast of air will momentarily blow flap P in an upward direction, until it is arrested by the stop N, thus opening the valve and permitting the air to escape, as indicated by the arrow. The moment the pressure ceases, however, the valve will again close itself automatically, due to the weight of the large flap P. The valves *d, l, and m*, (all of which are constructed precisely like the valve O just described) work sufficiently loose in their respective pipes C, L and M to afford constant ventilation to the refrigerator and permit the animal heat from meat placed in the refrigerator to escape. With this object in view, the flaps P and Q do not touch the sides or walls of the square mouth of the air pipe, but a very narrow open space is left, as shown at *p* and *q*, so that there will always be formed an outlet for the air contained within the refrigerator box, even when the valves are closed. In this manner I provide for continuous ventilation, preventing the air within the refrigerator from becoming "dead" or stale, and drawing off the warm air and odors appertaining to freshly slaughtered and warm meat placed in the refrigerator.

It will be seen that each of the compartments J and K has its separate air-pipe and automatic valve; and where there are more than two chambers or compartments in the refrigerator, each chamber is provided with an air-pipe and valve of the described construction. By this arrangement I provide means for letting out any air that enters the refrigerator by the opening of the door of the same, which is of the greatest importance, because if this warm air is permitted to remain in the refrigerator, it will to a large extent neutralize the effects of the cooling medium; but by my arrangement of air-pipes and automatic valves, provision is made for the instantaneous escape of this air by the mere act of closing the door through which it has found ingress, because in closing or slamming the

hinged door rapidly, the air will be forced inwardly and upwardly, as indicated by the small arrows, so as to escape through the pipes in the roof of the refrigerator by momentarily opening their valves. The moment these currents of air cease, however, the several valves will instantly and automatically fall to by gravity, and close themselves airtight.

The articles to be kept in the refrigerator are placed, in suitable vessels, upon the platforms G and H; and the tank C is kept always full of cool water, which is supplied through the feed-pipe E and its funnel F. When the water in the tank becomes warm, it is drawn off through the faucet or spigot R, and a fresh supply is poured into the tank through the feed-pipe.

It will be obvious that instead of supporting the frames G and H upon legs or supports, as shown on the drawings, either one or both of these frames may be suspended within the refrigerator by means of cords or chains, either fastened at one end in the corners of the respective frames and at the other ends in the roof of the refrigerator box; or they may depend from said roof or top, like loops or swings, and the frames placed between them so as to be suspended from the roof like a swing. This arrangement saves the room otherwise occupied by the legs or standards which support the frames on the bottom of the refrigerator, within the cold-water pan, so as to give more space and afford an unobstructed flow and circulation of the cooling-medium.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a refrigerator, the combination with the box or casing having hinged door B, and automatic valves in its upper part, of the open top removable tank C located in said casing, the raised platform, the overflow pipe D, the feed pipe E and funnel F, substantially as described.

2. In a refrigerator, the combination with the casing A, having hinged door B, air exhaust pipes L and M, provided with automatic valves, the overflow pipe D and funnel F, of the open top removable pan located in said casing, the vertical partition with its lower edge resting on the bottom of said pan and provided with perforations and the platforms having supports resting in the pan, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

THOMAS B. ASHFORD.

Witnesses;

A. J. PHILLIPS,
E. S. PITTMAN.