(No Model.)

W. D. GRANT.

REFRIGERATOR.

No. 309,221. Patented Dec. 16, 1884.

Fig. 1.

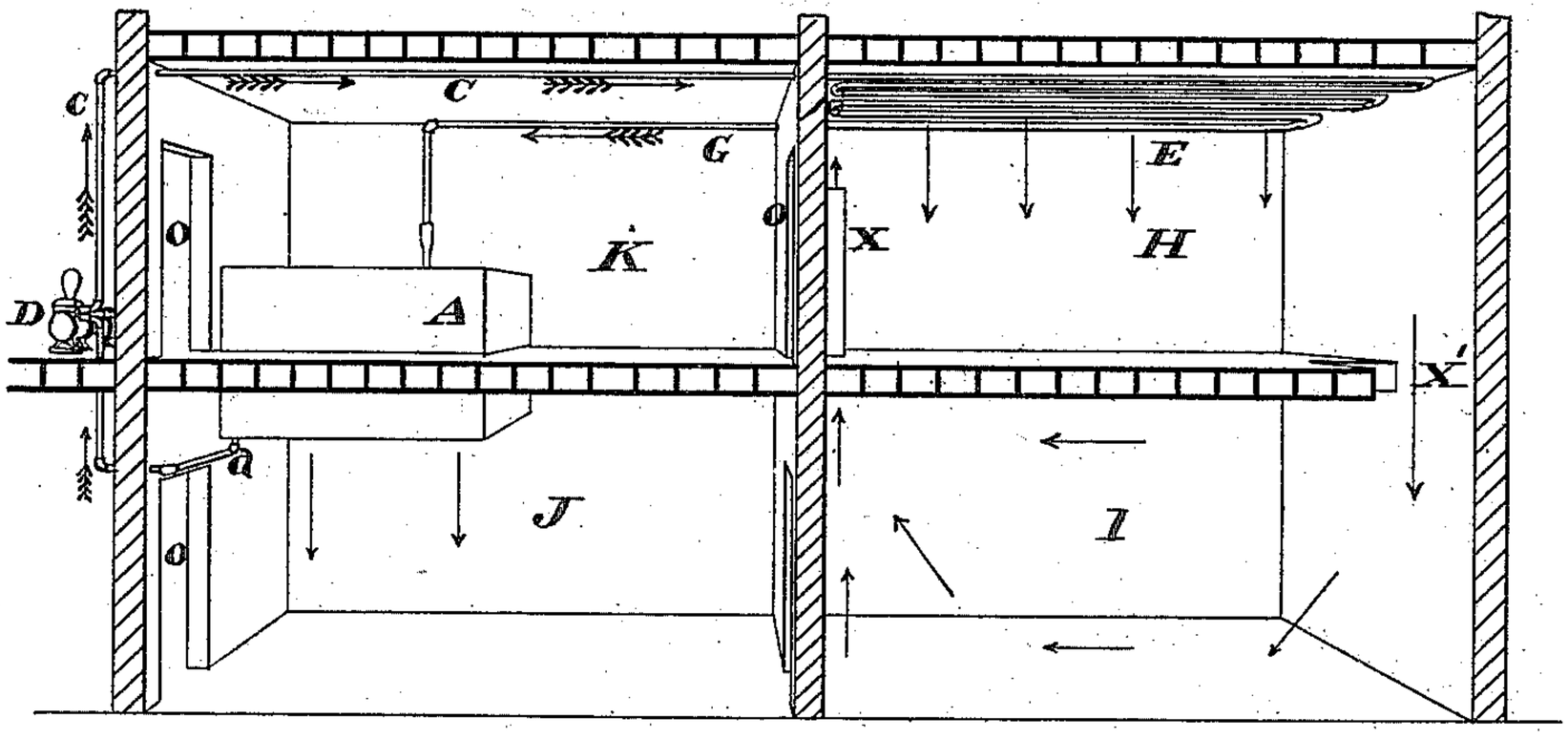
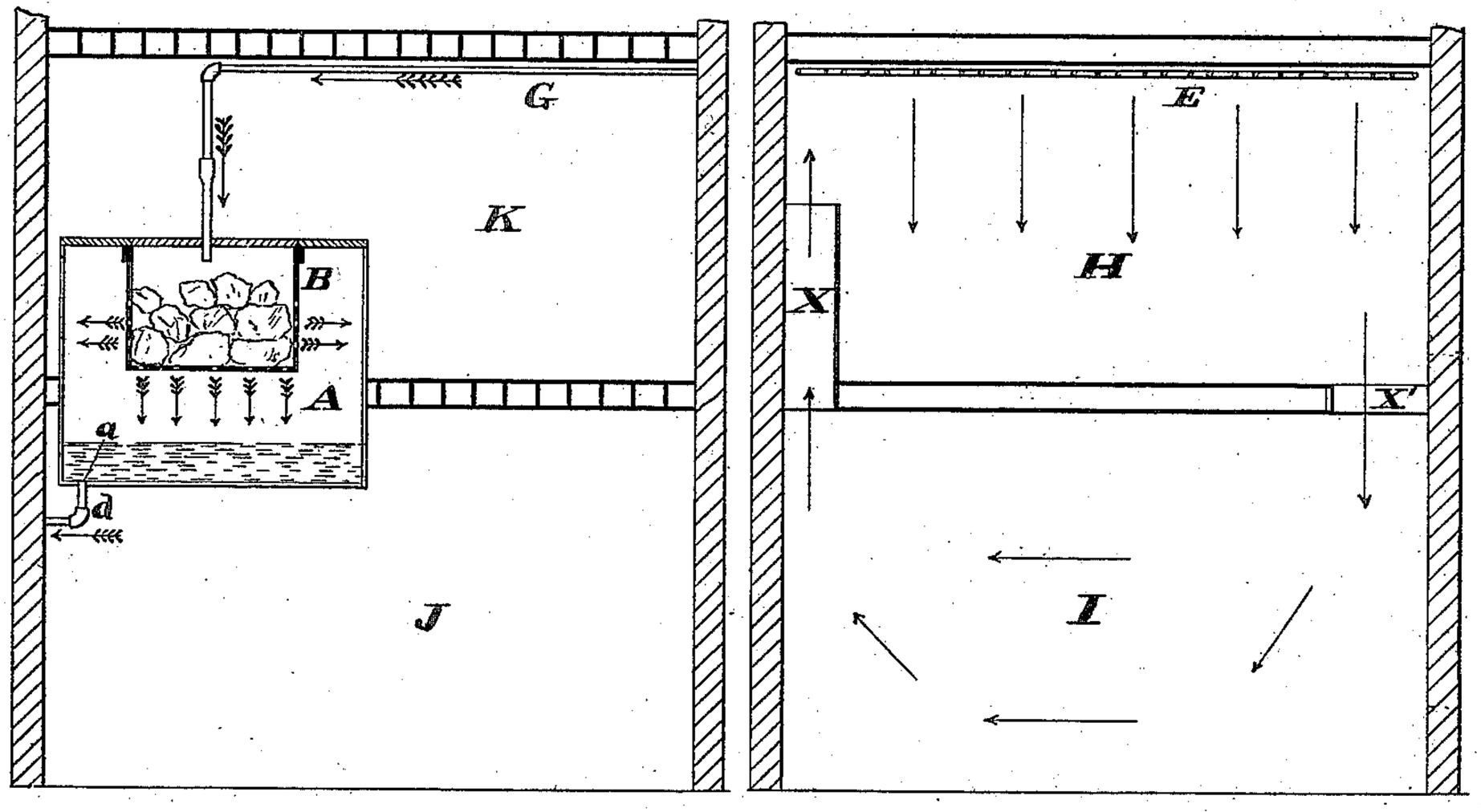


Fig. 2.

Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

WILLIAM D. GRANT, OF ST. LOUIS, MISSOURI.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 309,221, dated December 16, 1884.

Application filed September 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. GRANT, a citizen of the United States, and a resident of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Refrigerators, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, in which—

Figure 1 is a vertical longitudinal section through cooling-rooms, showing direction of travel of brine and circulation of air, with location of brine-tank and cooling-pipes; Fig. 2, a vertical longitudinal section through two cooling-rooms and brine-tank; Fig. 3, a vertical transverse section through two cooling-rooms, showing location of cooling-pipes and air-passages down and up, with the direction of air-current.

The different views of the drawings show in detail my preferable construction; and my invention is particularly adapted, as there shown, and it is of especial value in refrigerator-chambers used for the cooling of meats.

My invention, on account of its cheapness of construction and simplicity of operation, will be found of especial value to butchers, and in the preservation and pickling of meat, and it is readily adapted to use in hotels, where steam-power is generally found in use about the establishment.

My invention consists in a cooling-room, or a series of cooling-rooms, in which the air is rapidly reduced to a required temperature in the following-described manner: A water-tight tank, A, is provided with a removable perforated ice-box, B. This ice-box B is filled with ice and salt, and the cold brine—the product of this mixture—flows through the perforations in the ice-box B into tank A. There is a hole, *a*, in tank A, into which hole pipe *d* is inserted. This pipe *d* connects with a pump, D, and a pipe, C, leads from pump D to a coil of pipe, E, in the upper part of an air-tight chamber, H. This coil of pipe E extends along the top or ceiling of chamber H, and is connected, as stated, at one end with pipe C, and at the other end by a pipe, G, and this pipe G extends from the point where it connects with coil of pipe E to ice-box B.

The operation of my invention is as follows: Tank A being filled with brine by the action of the salt upon ice in ice-box B, or by the preferable means of first filling tank A with brine previously prepared and emptied into tank A, pump D is set in operation, and brine is drawn from tank A through hole *a* and pipe *d* up into pipe C, and through pipe C into coil of pipe E, and out from coil of pipe E through pipe G into ice-box B, where it is discharged, passing through ice and salt and the perforations in ice-box B into tank A, to be again drawn from tank A, and by the suction and force of pump D carried through the described line of piping. The result is that this cold brine flows in a continuous current by means of the construction herein described in the coil of piping in chamber H, and the brine is regenerated and kept at the same temperature by being forced in its circuit through the mixture of ice and salt in ice-box B. Tank A and ice-box B are preferably kept covered, to insure a greater degree of cold and to prevent wastage, and ice-box B can be removed at will from tank A, being detachably connected therewith. It is preferable, also, to inclose tank A in an air-tight chamber, as shown in Figs. 1 and 2, so as to prevent waste of ice and to keep the brine on its way to or in its exit from coil of pipe E at a more even temperature. The coil of piping being at top of cooling-chamber, as shown in chamber H of the drawings, when my device is in operation the cold air generated about the piping E will descend in and throughout the chamber, gradually reducing its temperature.

It is my preferable construction to make a series of cooling-chambers as shown in the drawings, which are marked H, I, J, and K, and which operate and are constructed in the following-described manner: The outside walls of chambers H, I, J, and K are preferably made of brick, and the inside walls of boards, and between the brick walls and the boards sawdust is compactly packed. The partitions between the several chambers are preferably made of boards lined with sawdust. Chamber H being the one in which the piping is situated, it will acquire the greatest degree of cold, and chamber H communicates with chamber I by openings X X′. (See Figs. 1 and 3.)

Opening X′ is simply an opening in floor of chamber H, leading into chamber I, through which the cold air in its natural descent enters chamber I, and circulating in chamber I cools it; but opening X projects up into chamber H nearly to the top thereof and in close proximity to the piping E. The result is that the cold air first generated in chamber H in its natural course of descent passes through opening X′ into lower chamber, I, circulates therein, and, becoming less cool, naturally ascends in the corner farthest from opening X′, which is the location of opening X, and, following the exterior of opening X, is carried nearly to the top of chamber H, where, coming in contact with the cold piping, it is recooled, and, descending, repeats its course through chambers H and I. The course of these currents in chambers H and I is shown by arrows in Figs. 1 and 3. Chambers J and K, being the chambers between which tank A is situated and through which brine-conduit pipes pass, being made air-tight, can also be used as refrigerator-chambers. In this construction chamber H, having piping E, will naturally be the one capable of the lowest temperature; but chambers I J K can be used to preserve substances in a cool condition, and chambers I, J, and K in this arrangement are especially valuable in the different stages of the pickling of meats.

O O O O are openings or doorways, which are closed when the chambers are in use by means of air-tight doors, made, preferably, of wood lined with sawdust.

I do not claim in a refrigerator-chamber any combination of piping and engine or fluid-forcing device to drive a cooling-fluid through said piping; but

What I claim is—

1. In a refrigerator-chamber, the combination of a brine-tank, A, a perforated ice-box, B, detachably connected therewith, a pipe, *d*, a pump, D, inlet-pipe C, piping E, and outlet-pipe G, substantially as described.

2. The combination of the refrigerator-chambers H and I, having openings or communications X X′, chambers J and K, and tank A, having ice-box B, pipe *d*, pump D, inlet-pipe C, piping E, and outlet-pipe G, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 9th day of September, 1884.

WILLIAM D. GRANT.

Witnesses:

PAUL BAKEWELL,

J. L. HORNSBY.