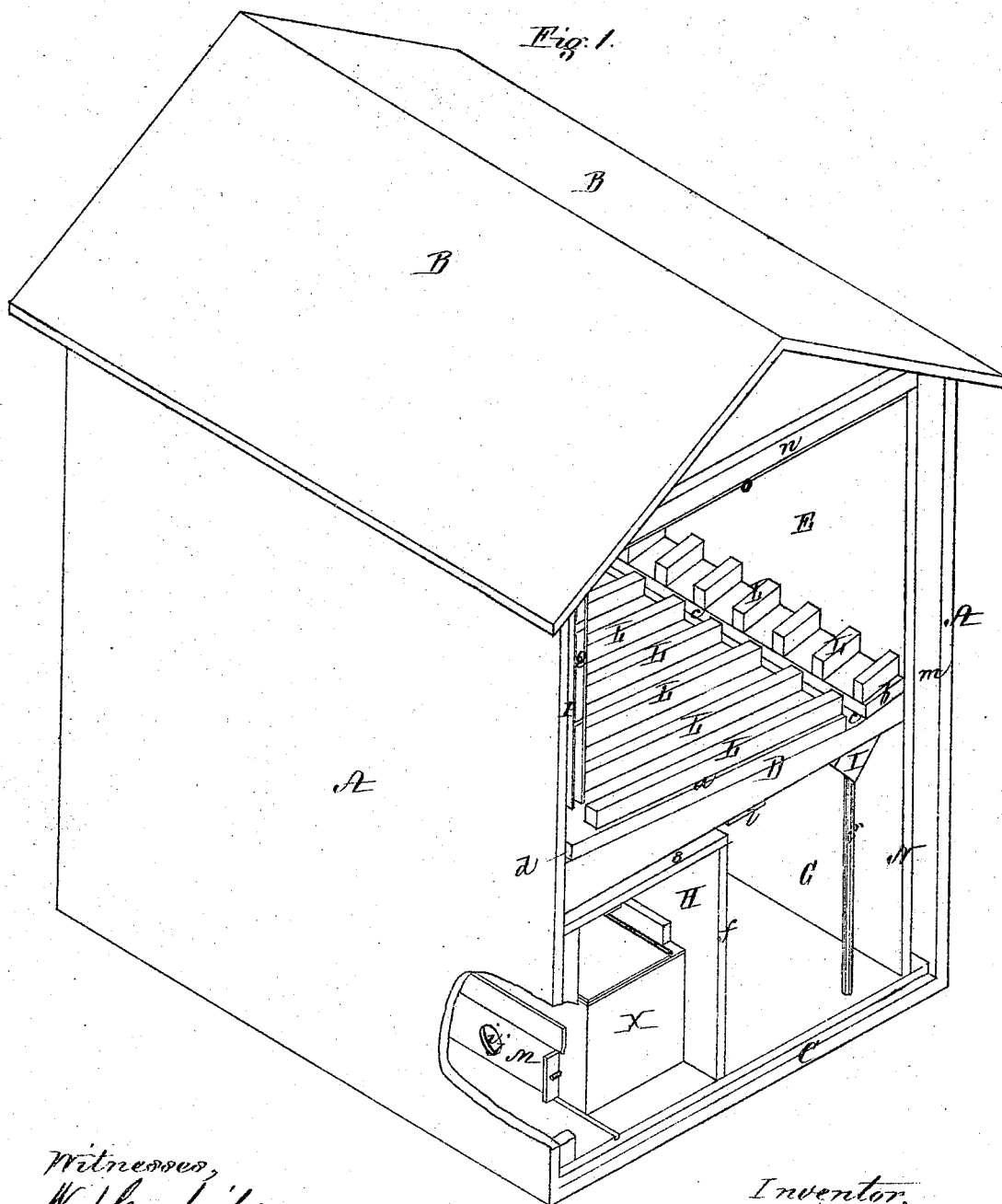


Sheet 1-3, Sheets.
H. A. Roberts' Ice House for curing and packing Beef and Pork:

118277

PATENTED AUG 22 1871



Witnesses,
W. J. Cambridge
L. E. Batchelder

Inventor,
Henry A. Roberts

Sheet 2. 3 Sheets.
H. A. Roberts' Ice House for curing and packing Beef and Pork:

118277

Fig. 2.

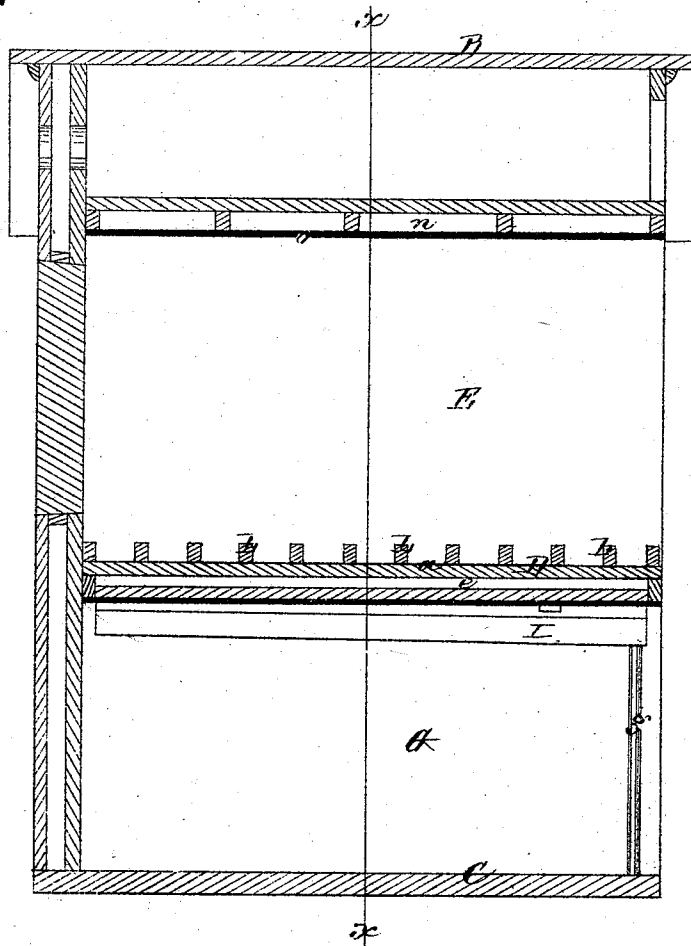
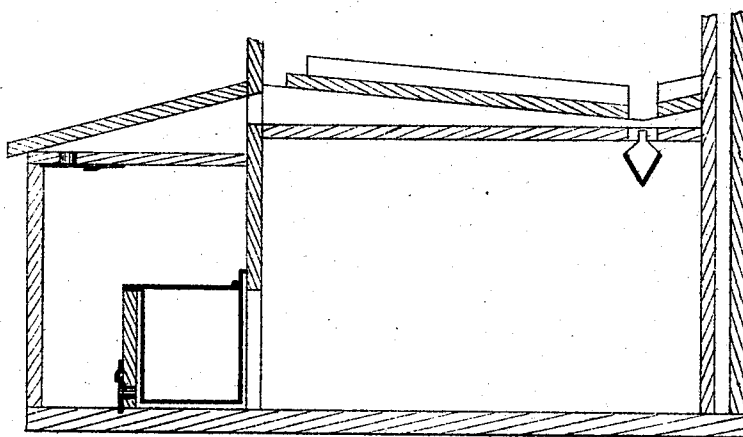


Fig. 4.



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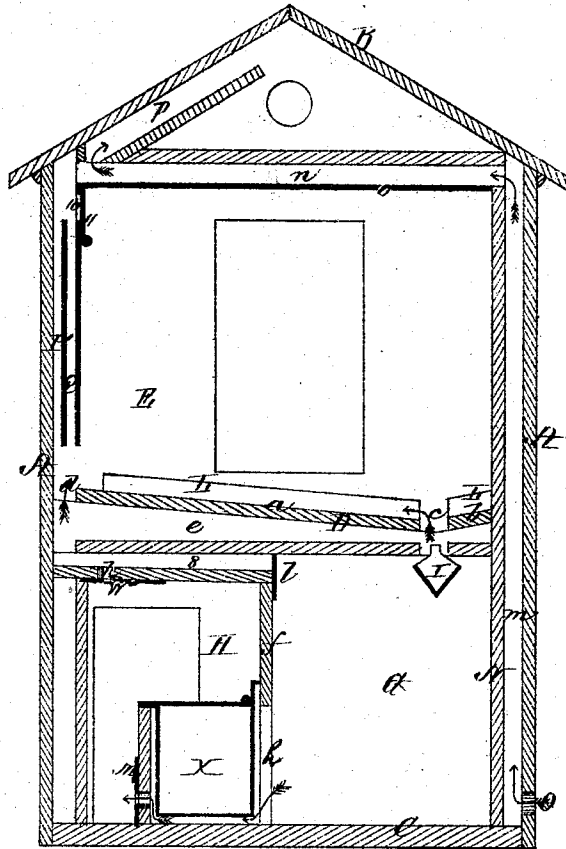
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Sheet 3 - 3 Sheets.

H. A. Roberts Ice House for curing and packing beef and Pork:

118277

Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY A. ROBERTS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ICE-HOUSES FOR PACKING AND CURING MEATS.

Specification forming part of Letters Patent No. 118,277, dated August 22, 1871.

To all whom it may concern:

Be it known that I, HENRY A. ROBERTS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Ice-House for Curing and Packing Beef and Pork, and for other purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view, representing the construction of the interior of my improved ice-house. Fig. 2 is a longitudinal section through the same. Fig. 3 is a transverse section on the line *xx* of Fig. 2; Fig. 4, modification to be referred to.

In the operation of curing and packing beef, pork, &c., it is highly essential to the preservation of the meats that they be properly conditioned, or, in other words, that the animal heat be extracted as rapidly as possible immediately after being killed, preparatory to curing, or salting and packing.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawing, *A A* represent the sides of an ice-house of my improved construction; *B*, its roof; *C*, its lower floor; and *D*, the floor of the ice-chamber or receptacle *E* above it. The floor *D* is composed of two portions, *a b*, inclined toward each other, and separated by a longitudinal opening, *c*, extending down through the ceiling of a chill-room, *G*, in which the fresh meat, immediately after being killed, is placed, in order that it may be properly conditioned, or have the animal heat removed therefrom in a manner presently to be explained. The portion *a* of the floor of the ice-chamber does not abut against the inside of the upright wall *A*, a space, *d*, being left, which communicates with an opening or flue, *e*, between the portion *a* of the floor *D* and the ceiling of the lower floor *C*, the flue *e* extending into the longitudinal opening *c* to the "fresh-chilling" chamber *G*, which is separated by a suitable partition, *f*, from a compartment, *H*, in which the meats, after being properly chilled, are salted or cured. The ceiling or top of the curing-compartment is of a height somewhat less than that of the chilling-chamber *G*, which extends horizontally along to a point at a

distance from the upright wall *A* equal to that of the outer end of the portion *a* of the ice-floor from said wall, by which construction a flue, *8*, is formed, and a continuous circulation of dry cold air is maintained around and through the meat, and the animal heat extracted therefrom as required, the moisture produced by the contact of the cool dry air with the animal heat being absorbed and carried up into the space *d* and under and around the base of the ice, where it becomes condensed and flows with the melted ice down the inclined portion *a* of the floor into a trough, *I*, which is also inclined down to one end, where a pipe, *g*, conducts the melted water and water of condensation away from the building. The saline vapors of the curing or salting-chamber *H* are effectually prevented from entering the chilling-chamber by means of the partition *f*, the cold dry air from the chilling-chamber entering an opening, *h*, in the back of the vats or tanks *X* containing the brine, and passing around and under it, whereby the meats, while being salted, are kept in a cool state, as required. The current of cold air is increased by the current of water from the melted ice running down the inclined floor *D*, the water flowing into the trough *I* and the air continuing to circulate through the flues and openings previously described. *L L* is a series of parallel inclined strips for the ice to rest on, by which arrangement the amount of cooling-surface is increased and a passage formed under the melting ice for the air to circulate freely. In the event of a considerable quantity of meat being left in the curing-room and no time remains to cure it, to avoid the labor and inconvenience of carrying it back to the chilling-room to keep it in a cold state till the following day, I resort to the following plan: In the outer casing of the front of the brine-vats is formed a series of apertures, *i*, over which slides a plate, *M*, provided with apertures *j*, similar to those *i*, by which means the cool air, after passing through the chill-room, may enter the curing-room and extract the animal heat from the meat hung up therein, the moisture arising from the animal heat being carried by the cool current up through a series of passages, *k*, (controlled by a plate, *W*,) in the ceiling of the curing-room, and into the flue *8* to the inclined floor under the ice, where the vapors are condensed and flow down

into the trough I, the connection between the flue 8 and the top of the chill-room being closed by a swinging door, *l*, during this operation. The apertures *i* in the front of the brine-vats are closed by the plate M, and the passages *k* in the ceiling of the curing-room are also closed when the operators are there at work, thus shutting off the cold draught which would otherwise be maintained. The tops of the brine-vats are closed by suitable covers while the meat is being cured, to prevent the saline vapors from rising and being carried into contact with the ice, thus preserving it a much longer time than would otherwise be the case. Inside one of the upright walls A, parallel thereto, and at a short distance therefrom, is placed a partition or casing, N, forming an upright flue, *m*, which communicates with a horizontal flue, *n*, at its top, and extending over the ceiling *o* of the ice-chamber E, thence leading into a flue, *p*, under one of the slant sides of the roof B. O O is a series of circular holes through the bottom of the outer wall A, and opening into the vertical flue *m*. The ceiling *o* of the ice-chamber consists of a sheet or strip of fibrous or porous material, upon which collects the moisture arising from the ice, and the dry air flowing up the flue *m* comes in contact with the ceiling *o* and absorbs the moisture therefrom. The currents of air thus charged with watery vapors pass under and against the roof, which in summer is made warm by the heat of the sun, and the moisture is rapidly evaporated, thereby preventing the undue decay of the roof and the consumption of the ice from the drops which would fall from the fibrous ceiling were there no internal circulation of dry air around and in contact with it. In winter the circulation of air is reversed, the direction of the current of cold air being from the flue *p* into the flue *n*, and down the flue *m* out of the holes O O in the bottom of the side wall A. During excessively warm weather, if the amount of the internal circulation of the air is not sufficient to overcome or take up the dampness of the elements of animal heat accumulated in the chilling-chambers, I adopt the following plan to remedy the difficulty: P' is an ascending-flue and Q is a descending-flue, parallel to and communicating with each other, by which additional velocity is imparted to the currents of air in their circuit under the ice, and through the chilling-

chamber and flues, and a low dry temperature is insured as, required. When the temperature is to be cooled rapidly I direct the air from the ascending-flue through a longitudinal opening, 10, controlled by a valve, 11, Fig. 3, at its top; by which means a large volume of air is made to impinge down upon the top of the ice, thus producing the desired result.

I find it highly important to the success of the operations that the curing or salting or packing of the meats be done in a room separated or apart from the fresh-chilling chamber; but instead of placing the curing and packing-chamber in the same building, underneath the ice-chamber, an addition or L to the main building may be constructed for this purpose, as seen in Fig. 4.

It will be seen from the foregoing that the air is denser and colder in the ice-chamber than in the room beneath, where the freshly-killed meats are hung up, and the cold air in descending thereinto displaces the warmer air in the chill-room and starts into motion all the air within it, compelling it to join in a general current through the flues, and under or at the base of the ice, and absorbing the moisture arising from the animal heat of the meats, this moisture being condensed by contact with the ice and running off into the trough in common with the melted ice. By the application of this process of internal circulation all impurities, exhalations, and odors are removed from the meats, and the entire atmosphere in the chilling-room is kept perfectly sweet and fresh, as required.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A chill-room, G, and a curing or packing-room, H, when separated by a partition, and constructed with the flues and air-passages, as herein shown and described.

2. The ceiling of an ice-chamber, E, composed of an absorbing and evaporating material, in combination with a continuous flue for creating a draught over and upon it, substantially as and for the purpose set forth.

Witness my hand this 29th day of March, A. D. 1871.

HENRY A. ROBERTS.

Witnesses:

N. W. STEARNS,

L. E. BATCHELLER.