T. & C. C. CORNES.

REFRIGERATOR.

No. 175,823. Patented April 11, 1876.

Fig. 1.

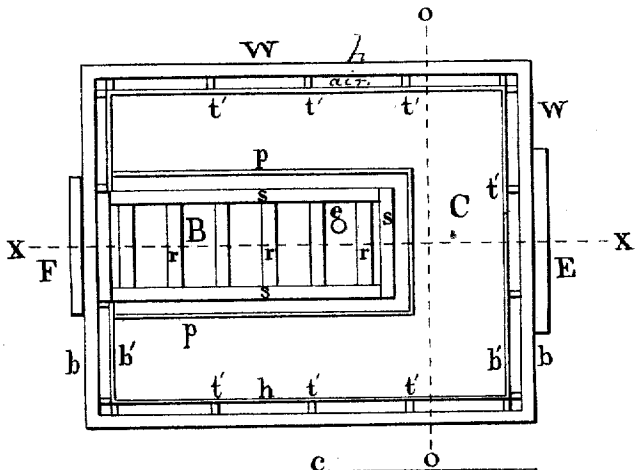


Fig. 2.

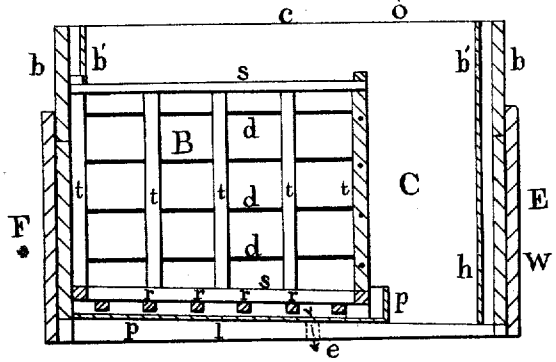
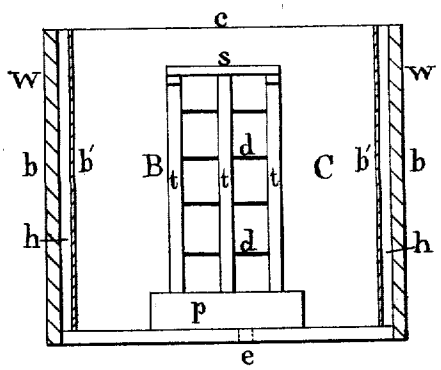


Fig. 3.



Witnesses;
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UNITED STATES PATENT OFFICE.

THOMAS CORNES AND CHARLES C. CORNES, OF BROCKPORT, NEW YORK.

IMPROVEMENT IN REFRIGERATORS.

Specification forming part of Letters Patent No. **175,823**, dated April 11, 1876; application filed February 23, 1876.

To all whom it may concern:

Be it known that we, THOMAS CORNES and CHARLES C. CORNES, respectively, of the village of Brockport, in the town of Sweden, county of Monroe and State of New York, have invented certain new and useful Improvements in Refrigerators; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, sufficient to enable those skilled in the art to which it appertains to understand, construct, and make use of the invention, reference being had to the drawings accompanying this specification, and to the figures and letters of reference marked thereon, wherein like letters refer to like parts throughout the specification, and on which—

Figure 1 represents a plan of the refrigerator. Fig. 2 represents a vertical longitudinal section of the same through the line *x x*. Fig. 3 represents a transverse vertical section through the line *o o*.

Our improvements belong to that class of refrigerators used principally by butchers and for meat-markets, but are equally adapted to preserve all kinds of fruits and vegetables, either for grocers or private families.

The object of our improvement in refrigerators is, first, by constructing hollow instead of, as ordinarily, filled in walls; secondly, by centrally locating and building the ice-crib directly on and from the floor upward, instead of, as before, a stilted ice-box adjoining the ceiling; and, thirdly, by a door in the rear outside wall of the refrigerator-chamber, to feed the ice-receptacle directly from the outside of the same, in a more convenient and cheaper manner than heretofore.

Our improvements in refrigerators consist, first, in an ordinarily-constructed apartment of wood or other material of preferred dimensions, provided with a floor, ceiling, and hollow studded walls, which are finished, as preferred, with either vertical or horizontal boarding, a front entrance-door, also a rear door to the ice-crib; secondly, in the construction and configuration of the crib, and its location in the chamber, which crib, with the chamber, fixtures, and mode of operating the same will now be described.

In the drawings, C represents the refrigerator-chamber of preferred dimensions, but about ten feet by twelve, for the floor, by about eight to ten feet high, will do for a dealer, while for private use they are smaller, and require a construction to suit their size.

The walls W are built of studding *t' t'*, which studding is sheathed on both the out and inside of the same, with either horizontally or vertically nailed on tongued and grooved boarding *b b'*, and leaving vacant spaces *h h* between the studding and the two sheathed sides, while *c c* show the under face of the overhead ceiling. E shows the front entrance-door extending to the floor, opening outward, and shutting against the outside boarding *b;* and F is the rear door, making an opening directly into the crib B, extending to the floor, and also opening outward.

In configuration the crib conforms to the configuration of the chamber in which it is located, and for the convenience of receiving ice directly into the crib, and disposing of the same, it is located contiguous to the outside wall W at the entrance of the door F. The ice-crib B is also a wood-frame structure, composed of horizontal bars *s*, vertical stanchions *t*, to the inside or outside of which stanchions one or both, as preferred, are, at suitable distances apart, attached horizontal iron slats *d*, which slats answer the double purpose of securing the crib against lateral pressure, and also for attaching thereto hooks, on which are hung meats or other articles.

For receiving any drip from melted ice and conducting the same to the waste-pipe *e*, is placed, under the crib, on an inclined base, *l*, a suitably-constructed drip-pan, *p*, and to provide suitable space for the escape of said drip, and sufficient air-circulation under the crib, the same is raised in the pan and above its bottom three to four inches, resting, at the same time, on the transverse sleepers *r*, while the body of the crib is supported on and by the main floor of the chamber.

While the configuration of the ice-crib conforms to that of the refrigerator-chamber, its dimensions are in the same proportion, or optionary to the designer, leaving room enough at the same time, between the crib and chamber-walls, for hanging articles to the sides of the crib, and for two persons to pass each

other besides. As the walls of the chamber are thin and hollow, and means for promoting interior circulation are communicated through them alone, instead of hanging meats on the inside chamber-walls they are hung in close proximity to the ice on the outside of the crib-walls, where, as there are only the iron slats, which are from twelve to eighteen inches apart, between the ice and hanging meats, they receive the greatest benefit therefrom. Inside opening and closing apertures, through the inside sheathing, to the hollow wall spaces *h*, regulate, as desired, the velocity of the interior currents.

The operation of our improvement is as follows: It is known that a dry cool atmosphere best preserves meat from putrefaction, and acting in accordance with laws, causing and controlling aerial currents it is apparent that this invention will produce that condition of the atmosphere, as will appear from the following statement: If there be a column of ice extending from floor to ceiling in the middle of a close chamber, and there be also surrounding this chamber atmospheric air, the temperature of which is above the temperature of the within ice column, then there will be in operation, to produce circulation of the inside air, four disturbing causes, viz: the first is due to condensation, taking place when the inside air first comes in contact with the said column of ice; and the second to the increased gravitation imparted to the air by reason of such condensation, causing the descent of this air to the base of the ice column, from which it spreads out to the walls of the chamber where it meets warmer air, causing, third, a rarefaction of the same; and the fourth is due to the ascension of this rarefied air in its seeking a stratum of its own density, in each of which disturbances air flows in to fill a vacuum formed by these currents, which last movements are other and secondary causes of disturbance. Now, all these causes, acting in unison, create in the open space within the chamber perpetual revolving air-currents, whose velocity is in proportion to the difference of temperature existing between the ice and walls of the chamber; but they continue to flow until the temperature at the walls is lowered to that of the ice column, when an equilibrium occurs, and the whole is motionless, in which condition it remains until another change of temperature produces another disturbance. As air, like water, purifies itself in running streams, so these inside currents purify the air in this refrigerator-chamber, keeping it pure and sweet.

It is evident, as the air contiguous to the ice is constantly near to the freezing-point, that in thin hollow walls sufficient heat is introduced through them to produce, with inside air, inside currents without apertures in the walls for admitting outside air, especially when there are openings, above described, for regulating the inside temperature. By these continued revolving currents all the inside air is brought in its turn in contact with the ice column, cooled, condensed, and moisture expelled, thus accomplishing the object of the production of a cool dry atmosphere. But in non-conducting walled refrigerators continuous streams of outside air are introduced to keep up inside circulation, which admits more moisture, thus thwarting the primary object, whereas by this improvement inside currents are produced by keeping the walls at a higher temperature than the ice by conducting walls.

Three objects are attained by this improvement, viz: first, increased velocity of inside currents; second, a more complete exclusion of outside dampness; and third, expulsion of dampness from the inside.

In extending the ice-column from floor to ceiling we supersede the need of stilted ice-receptacles, while flues, conduits, or pipes, for either induction or circulation of outside air, or condensing or rarefying inside air are done away with, and we disclaim all other refrigerators.

Having described our improvement in refrigerators, what we claim as our invention, and for which we pray that Letters Patent may be granted unto us, is—

An improved refrigerator, consisting of the double sheathed hollow walls W, having the entrance-door E and ice-feed door F, the ice-crib B resting on the transverse sleepers *r*, provided with the drip-pan *p*, which is supported on the inclined base *l*, and having the drip-pipe *e*, the horizontal bars *s*, stanchions *t*, and iron slats *d*, all arranged and constructed in the manner and for the purposes substantially as herein set forth.

In testimony whereof we have hereto in presence of two witnesses subscribed our names at Rochester, New York, this February 16, A. D. 1876.

THOMAS CORNES.
CHAS. C. CORNES.

Witnesses:
EDWIN R. GOODELL,
JAS. W. ADAMS.