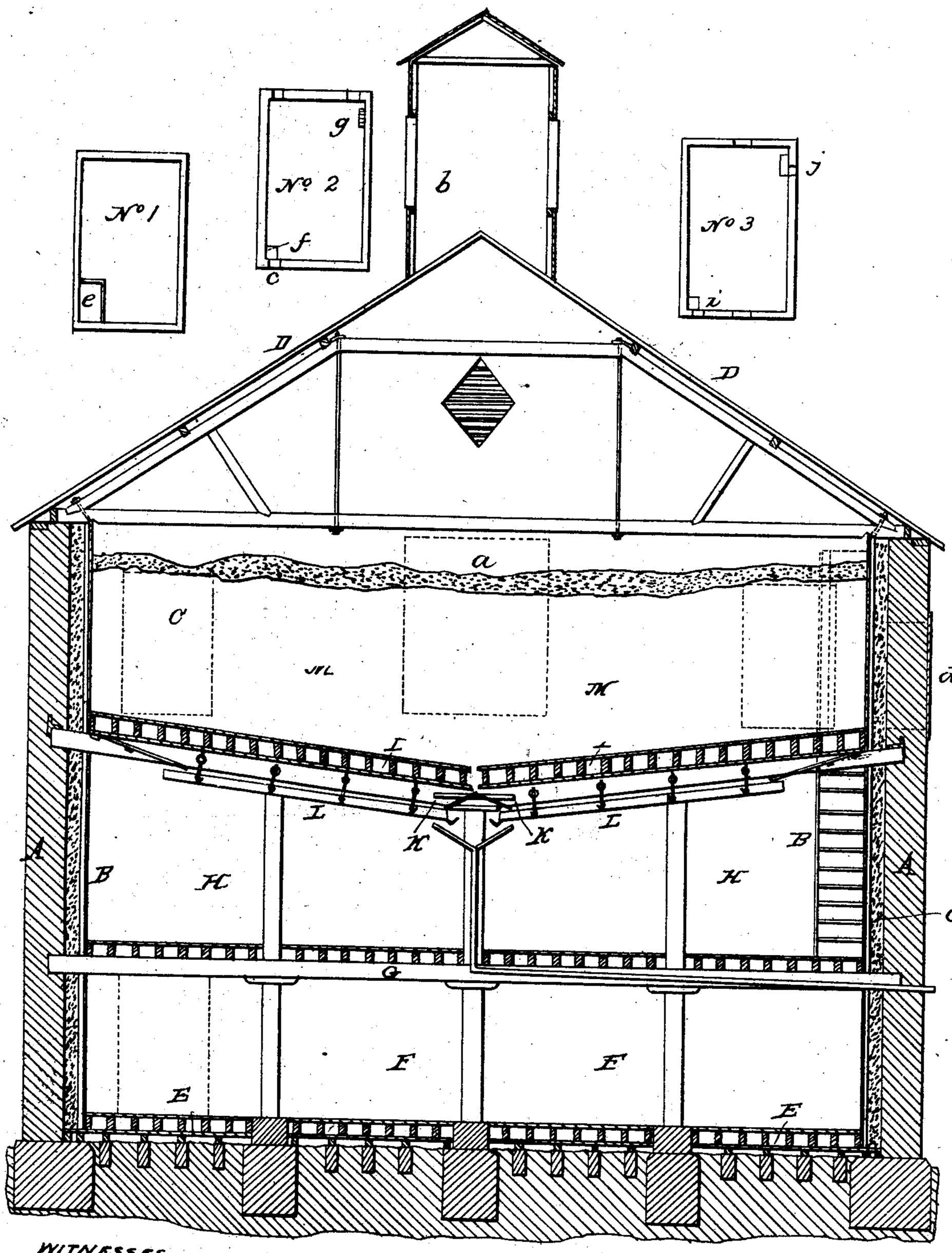
N. HELLINGS.

House for Preserving Fruit and other Articles.

No. 69,806. Patented Oct. 15, 1867.



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N. HELLINGS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED HOUSE FOR PRESERVING FRUITS AND OTHER ARTICLES.

Specification forming part of Letters Patent No. **69,806,** dated October 15, 1867.

Be it known that I, N. HELLINGS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Fruit-House, or house for preserving fruits, vegetables, meats, and all like articles of a perishable nature, by maintaining a permanent low temperature, with a pure and dry atmosphere, in a large and easily-accessible place of storage; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention is a house of large capacity, but the essential principles of which can be applied to a building of like construction of any less capacity, constructed as follows:

First. A strong wall of stone, or of bricks and mortar, twenty-seven inches thick, and of any dimensions up to eighty feet for the sides of the building, and fifty feet for the width, and thirty-five feet high, the said outer walls being represented by A A on the accompanying diagram.

Second. Inner walls, B B, of studding, boarded close on both sides, and forming together a thickness not less than six inches, placed at a distance of twelve inches, or separated from the outer wall by a space of twelve inches, C C, which space is closely filled with sawdust, or a similar non-conducting material, the space between the studding and between the two faces of the inner wall being vacant, and being about three inches.

Third. The building is covered with an ordinary wooden and shingled roof, strongly framed, D D, and placed at the usual angles of inclination.

Fourth. The entrance to the building is through a door at the level of the lower floor, closing air-tight, and opening into an ante-room large enough to contain seventy-five barrels, which ante-room is purposely kept at a higher temperature than the storage-rooms, and in which fruits or other articles may remain for a time preparatory to removal to the interior or to the external air.

Fifth. The principal or lower floor of the building is a strong floor of wooden joists and plank, E E, resting on cross-walls of masonry, which rise two feet from the surface of the earth, and between which walls and joists the intervening spaces of two feet in depth are vacant. Upon this lower section of the floor joists are laid, rising eighteen inches, and on these joists the floor of thick boards is placed, which is the true floor of the first or lower storage-room, the space between these floors, of eighteen inches, being closely packed with sawdust or a similar non-conducting material. This double lower floor is represented in the diagram by E E, and the storage-room above it by F F.

Sixth. Strong wooden posts, twelve inches square, rising from lines or points coincident with the cross-walls beneath, support, at a height of eight feet in the clear, the floor G G′ of a second great storage-room, H H. This second floor is made of strong wooden girders, on which joists are laid, with a cover of boards, but it is not packed with any non-conducting material. Above this second floor wooden posts rise, in the manner described, a height of eight feet in the clear in the center, and eleven feet at the sides of the building, to a heavy double ice-floor, I I of the diagram, which ice-floor is made of heavy wooden girders, laid at an angle of ten or twelve degrees inclination from the sides toward the center of the building, securely fastened by iron straps and bolts at the center, on which girders joists, rising eighteen inches, are laid, and on these joists a water-tight sheet-iron floor is laid to receive the ice. This sheet-iron is cut at the center by an opening three inches wide, extending the entire length of the building, except about twelve inches at each end, where the floor is complete, to prevent the drainage from wetting the wall, through which opening the drainage from melted ice passes, falling first on a fixture in the form of a double-pitched roof, K K, four feet wide in all, or two feet for each pitch, which fixture is covered with copper, and fitted in sections between the girders. The spaces between the joists of this ice-floor are left unfilled.

From this narrow roof-shaped fixture the drainage falls upon each side upon a drip-floor, L L, the larger sections or parts of which are suspended by iron hooks at a distance of about ten inches beneath the timbers or girders of

the ice-floor, other and smaller sections at each side of the building being fastened to and between the girders, and placed at a greater angle, to drain any water they may receive upon the large sections, suspended as before described. All parts of this drip-floor are of yellow pine, well painted and water-tight. At the inner and lower edges of this drip-floor the water falls into troughs or conductors, of copper, which empty into copper pipes, by which the water is conveyed to the level of the second floor and out at the sides of the building.

Above and upon the ice-floor is the ice-chamber M M, occupying all the upper area of the building, and into which, through an elevated door, (outlined in red on the cross-section diagram, and marked *a*,) ice is conveyed, filling it to a depth of twelve or thirteen feet. This ice, carefully packed down, is covered with sawdust to the depth of two feet.

The great storage-rooms F F and H H have, at the full size actually built and in use, a capacity for each of thirty thousand to forty thousand cubic feet, and they are ventilated by the combination described as follows, and shown in part by reference to the red-lined parts of the cross-section diagram and to the smaller horizontal sections of the margin.

First, an upper side entrance, on the north side of the building, opens on a space inclosed, six feet by four, through the ice, and through a hatch, opening upward, admits air downward into the storage-room H H. At the same time a hatch opening upward, at the northeast corner of the building, carries out through an inclosed ventilating-space, six feet square, passing through the ice-bed, a current of air equal to that admitted at the side-entrance door above described. The bad air, in this case, passes into the vacant area above the ice and out at the windows of the observatory *b;* but it may also, and when the conditions of the weather require it, be expelled at the eastern end entrance, *c*, or the northern side entrance, *d*. When no ventilation is required, and no foul air exists in the storage-rooms, the entrance-doors above described and the hatches are kept securely closed.

To better illustrate the ventilation through the several floors, horizontal sections are drawn on the margin of the diagram, Nos. 1, 2, and 3, representing, respectively, the first, second, and third floors.

In No. 1, *e* represents the space inclosed as an ante-room. At the foot of the doors opening from this ante-room to the storage-room and to the open air, movable sections of blocks are cut off, three inches high and the full length of each door, to permit the outward ventilation of carbonic-acid gas or other heavy air, which blocks are only moved when ventilation is necessary.

In No. 2, *f* represents a hatch, opening upward, at or above the ante-room; and *g* represents stairs descending from the floor above, at the other side of the building, and beneath the ventilating entrance-door on the north side.

In No. 3, *i* represents a hatch, six feet square, opening upward into an inclosed ventilating-space passing through the ice, and into which the end entrance-door, C, of the larger diagram, and *h* of the smaller diagrams, No. 2 and No. 3, may be opened from the outside, but which is usually kept closed, while foul air is passed upward through the hatch and ventilator. In No. 3, *j* represents the northern upper entrance-door, which is used chiefly to admit cold air for ventilation. This door opens on a space inclosed from the ice-chamber, six feet by five, with a hatch below, opening to the storage-room, and a close stair-case-door, through which access may be had upward to the area over the ice.

The great purpose and the end actually attained is to preserve the air of the storage-chambers pure, to maintain a temperature from 33° to 37° Fahrenheit, whatever quantity of fruits may be in store, and to prevent the deposit of moisture on any of the surfaces or walls, and also to prevent any dripping from the ceilings or ice-floor, or parts in contact with the ice.

The improvement and combination on which I claim a patent consists in—

1. The arrangement of the walls, floors, and ventilating apparatus, as above described; the use of wooden surfaces with non-conducting or poor conducting linings, or blank spaces, between all inner surfaces and the outer walls or the earth; the arrangement of ventilating-entrances at the level of the ice-floor, with hatches opening down to the storage-rooms and inclosed spaces to carry off bad air through the mass of ice upward, when it is light air, and downward out at the bottoms of the entrance-doors when it is carbonic-acid gas or like heavy air, as described above, the light air passing through the upper space above the ice, and thence out at the windows of the observatory.

2. And I claim the arrangement of the ice-floor, as described, the arrangement to prevent dripping from this floor, the open space between the joists on which the iron floor lies, the copper-covered narrow-pitched roof, to receive water from the melting ice, and the suspended drip-floor, on which this water falls before passing off in the drainage-troughs.

3. And I claim the combination of all these parts and devices, as making up a whole, all parts of which are essential to the preservation of the pure air, and at the necessary low temperature, and free from any excess of moisture, or any deposit of moisture on the floors, walls, or any part of the storage-chambers.

Philadelphia, Pennsylvania, August 24, 1867.

N. HELLINGS.

Witnesses:
GEORGE KERN,
LORIN BLODGET.