

B. J. La Mothe.

Construction of Buildings.

No 71,185.

Patented Nov. 19. 1867.

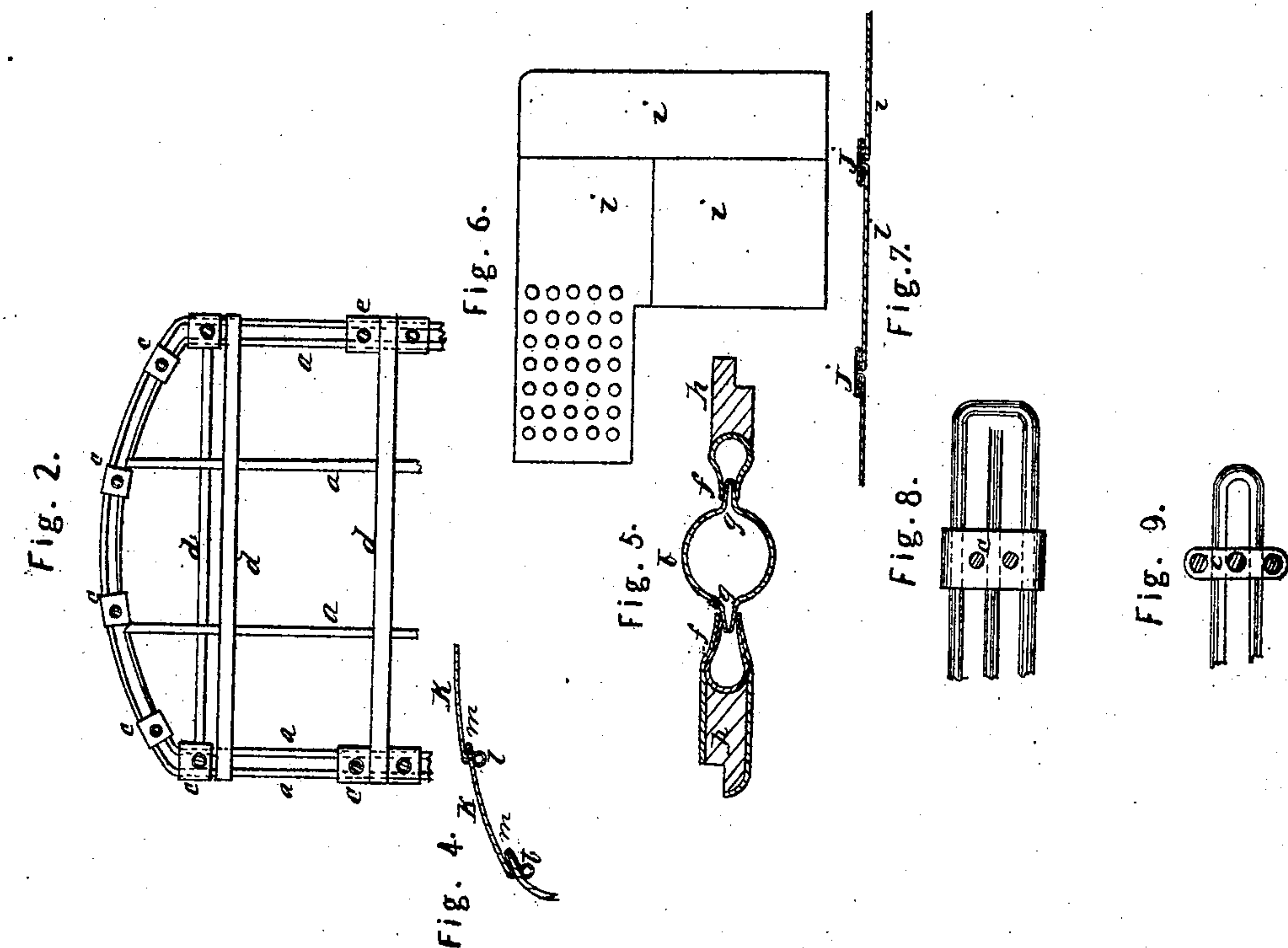
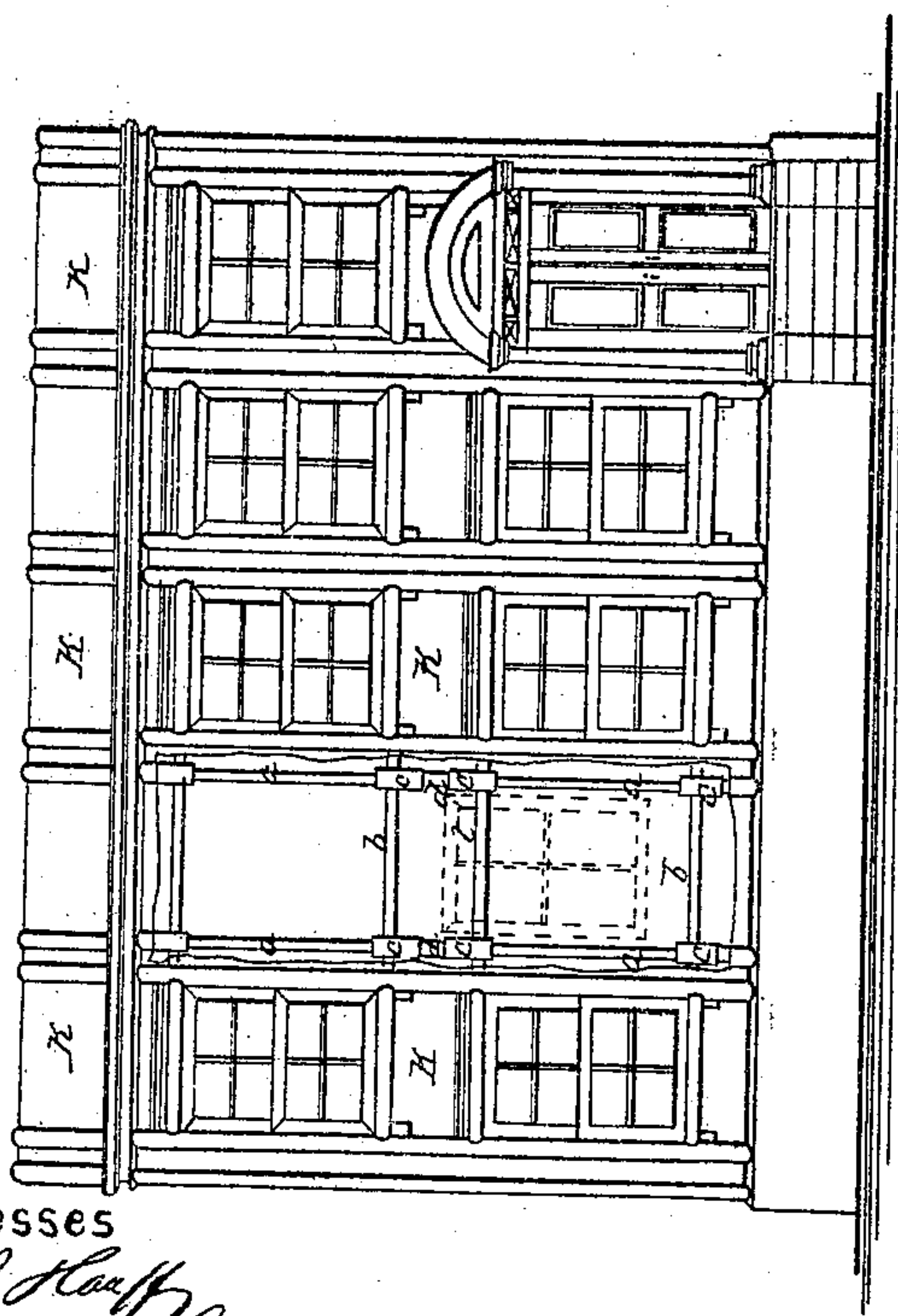


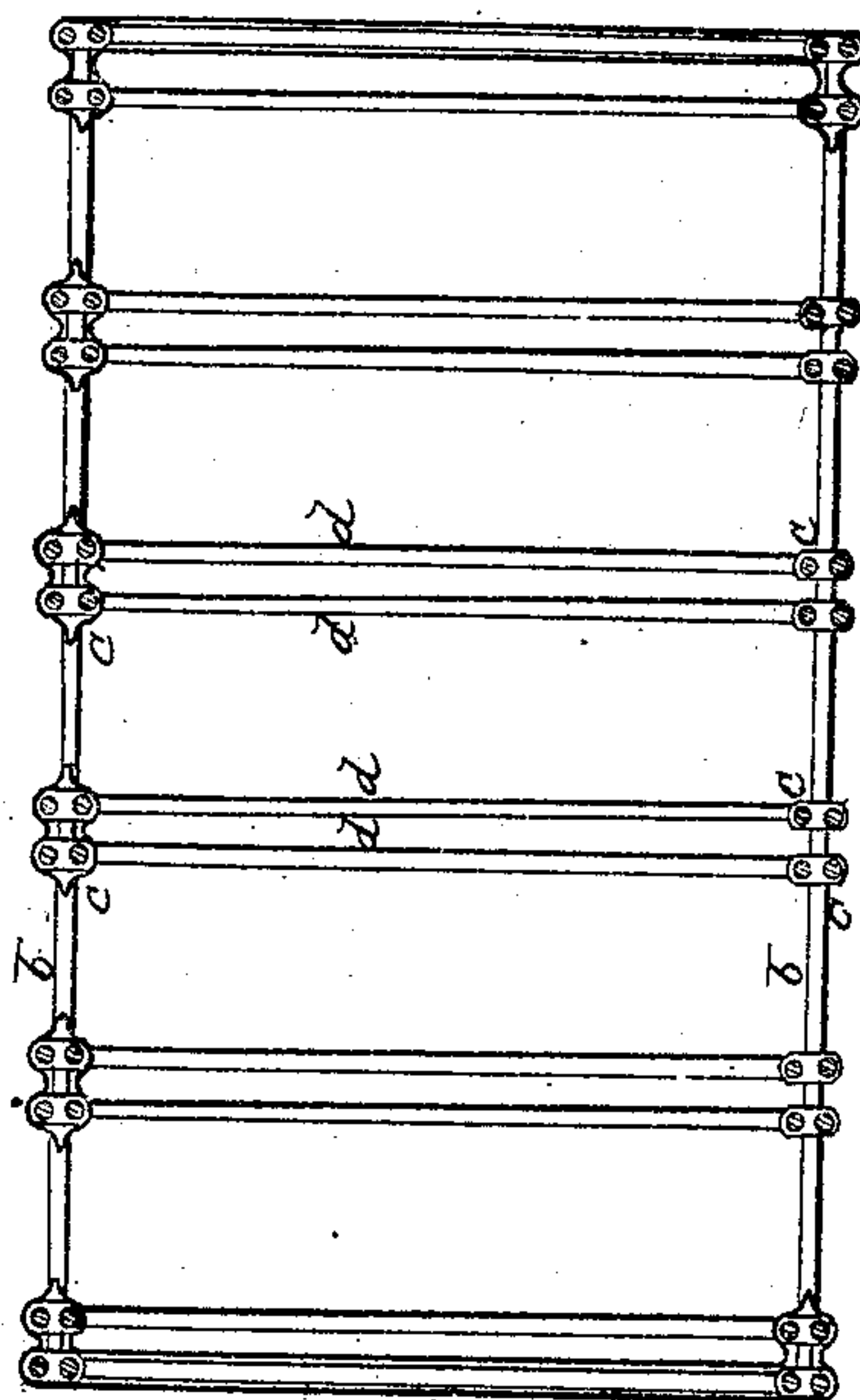
Fig. 1.



Witnesses

W. H. Hoff
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Fig 3.



Inventor

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BERNARD JOACHIM LA MOTHE, OF NEW YORK, N. Y.

Letters Patent No. 71,185, dated November 19, 1867; antedated November 13, 1867.

IMPROVEMENT IN CONSTRUCTION OF BUILDINGS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, BERNARD JOACHIM LA MOTHE, of No. 5 Wall street, of the city, county, and State of New York, have invented a new and useful improved Method of Constructing Houses and other Structures; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 is an elevation of a house made according to my invention, part of the frame being exposed to view.

Figure 2 is an elevation of a cross-section of the frame, a portion of the bottom part being broken away.

Figure 3 is a horizontal section of the frame.

Figure 4 is a detailed view of the joint which connects the plates of the roof of the building to each other.

Figure 5 is a horizontal section which shows the mode of making sliding-joints of windows and window-sashes.

Figure 6 is an elevation of a portion of the inner wall of a house.

Figure 7 is a section of a portion of the inner wall which explains the mode of making its joints.

Figures 8 and 9 are sections, at right angles to each other, of my improved joint.

Similar letters of reference indicate corresponding parts.

This invention relates to a new method of construction which is applicable to buildings or houses intended either for public or private purposes, and also to storehouses, warehouses, and the like, to bridges, and in general to all structures where a frame is employed. The invention embraces both the framing and the construction of the inner and outer walls and roof, and the window-casings or joints.

In this example of my invention I have employed metallic bars and rods in making the frame, some of them being tubular; but the principle of construction is also applicable to other kinds of material. I prefer, however, to adhere to the tubular form whenever it can be retained, on account of the superior lightness and strength obtained from that form.

Among the advantages sought after and attained by my invention are rapidity of execution in constructing a house or other structure; also the preservation of the material in its full strength by avoiding the use of bolts or rivets, or braces, and thereby making it unnecessary to perforate the beams or rods of the framing.

By my method of constructing a frame, I obtain great strength at all points, and preserve the full natural strength of the materials at the angles, corners, and joints throughout the whole structure, instead of weakening them at these points as by the ordinary mode of constructing frames.

The details of construction are varied according to the shape, size, or character of the structure to be made, the principle of construction being still the same.

I lay a suitable foundation of stone, or stone and iron, and upon such foundation place vertical columns *a a*, which I prefer should be tubular. The horizontal beams *d*, also hollow, may be oval in their cross-section, and are laid upon the foundation at such places, and in such a manner, that the vertical columns shall penetrate them. The vertical columns also enter holes made for them in the foundation, resting either on their ends or on shoulders, as may be preferred. The vertical columns *a* are in two series, an inner one and an outer one, and at or near the places where the floors or ceilings are located, said columns go through strong blocks *e*, which act like ties to the different parts of the frame.

The series of vertical columns *a* is crossed at the places of the floors or ceilings, or at both places, by horizontal wall-rods or tubes *b*, which go through the tie-blocks *e*, and tend to prevent said blocks from any vertical movement in the frame; the vertical columns also preventing the tie-blocks from horizontal movements. The floor-beams *d* are so arranged whenever they occur, that the vertical columns go through their ends, as seen in fig. 2, and their ends are moreover situated between the upper and lower tie-blocks *e e*, as shown in said fig. 2, or when only one tie-block is used, as in the upper floor of the frame, shown in fig. 2, the beam is penetrated by the vertical columns, and rests on shoulders formed on said columns.

The horizontal wall-rods *b* are placed in the walls of the structure, at such intervals as are necessary to give strength to the frame, and to insure against any lateral displacement of the vertical columns. The vertical columns of the front or rear walls are in this example made continuous, so as to extend over the top of the structure, being bent at top to the shape required for the roof. Whenever the vertical columns go through the

tie-blocks they may be made with shoulders on which the lower side of said blocks may rest. The vertical columns can also be made in sections that shall reach only from one tie-block to the next, being made partially to penetrate the blocks, and, if desirable, the joints between them being made with shoulders which sustain the superincumbent weight.

The sectional view, fig. 2, shows the cross-sections of the horizontal wall-rods *b*, where they go through the tie-blocks *c*, the rods *b* being placed also in the roof, so as to connect those portions of the columns or tubes *a* which there form the rafters of the structure.

By means of this method of constructing a frame, I provide against injury or weakness from expansion or contraction of the different parts, because each portion of the framing is free to contract or expand in any direction without disturbing the other portions.

In figs. 8 and 9 I have shown in front and edge view a tie-block through which go solid rods instead of tubes, the principle of making the joint where the rods intersect being the same as above explained.

In fig. 1 I have shown a front elevation of a house made according to my invention, its outer wall being also shown. Said outer wall is composed of sheet metal, which is secured to the rods, bars, or columns of the frame in the manner shown in fig. 7, which is a sectional view of portions of three of the plates or sheets *k* of the wall. The lower sides of the outside plates of the roof, and of the other outside plates of the structure, are bent backwards and inwards, as shown at *m*, fig. 4, the edge *l* itself being bent over and made to clasp one of the tubes or rods *b*, and by that means connect the plates securely to the frame. The other edges, except the upper ones, can be also bent in like manner and clasped around the tubes or columns *a*. Into the grooves of the loop *m* of said plates or sheets I insert the upper edges of the next lower sheet in plate *k*, so as to make a perfectly protected water and air-tight joint. It is evident that this mode of joining contiguous sheets or plates of the wall can be applied to all parts of the wall, whatever may be the direction in which the plates may extend.

The inner wall can be made by turning over in opposite directions the edges of contiguous metallic plates *i i*, (see fig. 7,) and binding the said edges together by means of sliding clamps *j j*, which are made with their vertical edges folded towards each other, and are applied to the plates *i* by sliding them downwards or upwards along the joints of said plates. This mode of making joints can also be applied to outer walls, the clamps being in that case on the inside. The face side of an inner wall so made is seen in fig. 6. The said inner wall can be left smooth, and can be painted to any desired shade of color, or, if a plastered wall is required, the metal plates *i i* can be punctured, as shown in fig. 6, the holes being punched from the inside face of the plates so as to bring the ragged edges of the holes on the face side of the wall. Over these jagged or rough-edged holes plaster can be applied in the same way as in applying plaster to a lathed wall. The outer walls may be perforated in like manner where a mastic or plaster surface is to be made thereon.

In a metallic building of this construction, it is desirable to provide means for holding window-sashes without expensive and elaborate devices.

Fig. 5 represents a horizontal section of portions of two window-sashes *h h*, whose edges are fitted to embrace and slide along the sides of the window-frame or casing. The vertical edges of the window-sashes *h* are provided with vertical grooves *f*, which can be made from metal plates, bent to the required shape, or in any other convenient way. These grooves embrace tongues *g* formed on the sides of the window-casings, or the tongues can be on the sashes and the grooves placed in the casings.

The casing *c*, shown in fig. 5, is supposed to be the central casing of a double window, and consists of a tubular column along two of whose sides are formed the said tongues *g*, that enter into the grooves *f* of the sashes, so as to guide the sashes in moving up or down, and form a tight joint. The sides of the columns or tubes *a*, or the metal sheets which may be employed as a covering or wall upon said columns, may be made with such tongues or grooves without providing separate tubular casings, as that shown at *e*, in fig. 5.

One of the advantages resulting from this invention is the portability of the houses or structures which are made according to my invention, the several parts, as well the walls as the framing, being easily taken down and removed and put together again without injury or derangement, there being no bolts or rivets used in the construction of the frame or the walls, and none of the wall-plates or other portions of the structure being soldered to each other, but all parts being so joined or connected as to be easily and quickly separated, when desired. When additional or unusual strength is required in the frame, I can obtain the same by placing one or more tubes or columns within a tube or column of larger diameter, and these are reduced in number for the upper stories according to the strength which is required.

The vertical tubes or columns which occur at the end or partition-walls can be in lengths equal to the height of the said walls, and can go through the horizontal beams *d* at the points of intersection, said tubes or columns having suitable shoulders on their exteriors to sustain the beams; or said vertical tubes or columns can be of the height only of single stories, being made to penetrate the said beams a little distance, or fitted to or against them in any other suitable manner.

In constructions where great strength is requisite, the number of tubes or rods in each vertical column, as well as the horizontal tubes or rods intersecting the vertical columns, can be multiplied, as may be desired. In the above case the tie-blocks correspond with the number of tubes or rods, both vertical or horizontal, which said blocks are intended to receive and connect.

The said tie-blocks may be of any shape or pattern desired, and the holes or recesses prepared in them for the reception of the vertical or horizontal connections may be varied in their angles or inclinations in accordance with the character of the structure or with the shape of its several parts. In certain cases a special tie-block for connecting the beams of the structure to the vertical columns may be made use of, particularly for portable houses or other structures, in which it is desirable to connect and disconnect the parts readily.

In this method of construction it will be seen that I do not depend for stability solely upon weight or vertical pressure or upon ordinary joints; but as I make my walls, floors, and roof-frames all intimately connected, the strength of the building is greatly enhanced over ordinary iron or metallic structures using the same amount of material, because I use the tensile strength of the material as well as its resistance to pressure to sustain itself and the load it carries.

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

1. The blocks *c* applied at the intersections of the rods or tubes that form the frame of the structure, and having holes passing into or through them in different directions for the reception of the rods or tubes, substantially as set forth.

2. The double fold at one edge of the plate *k*, as at *m*, fig. 4, and the bent or turned edge *l*, for receiving the edge of the next plate, and for connecting the plate with the rods or tubes of the structure, respectively, substantially as set forth.

3. I claim the sliding clamp *j* of sheet metal, with its edges folded towards each other, in combination with the plates *i* folded over at their edges and receiving the clamp *j*, substantially as set forth.

4. I also claim the method, substantially as shown in fig. 5, of fitting the sides of window-sashes and window-casings.

B. J. LA MOTHE.

Witnesses:

G. BERG,

W. HAUFF.