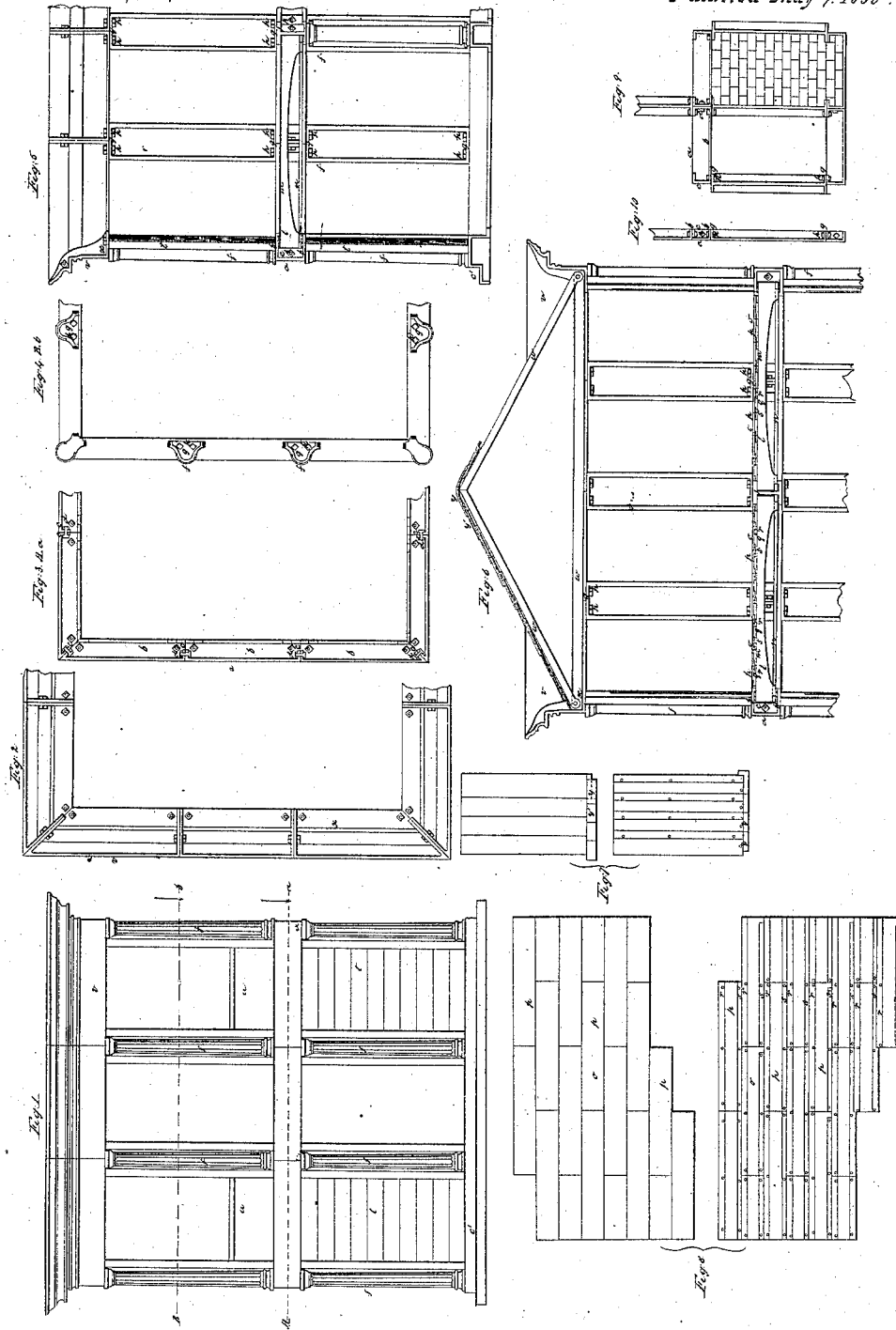


J. Bogardus,
Iron Structure.

Nº 7,337.

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UNITED STATES PATENT OFFICE.

JAMES BOGARDUS, OF NEW YORK, N. Y.

CONSTRUCTION OF THE FRAME, ROOF, AND FLOOR OF IRON BUILDINGS.

Specification of Letters Patent No. 7,337, dated May 7, 1850.

To all whom it may concern:

Be it known that I, JAMES BOGARDUS, of the city, county, and State of New York, have invented certain new and useful Improvements in the Method of Constructing Iron Houses, and that the following is a full, clear, and exact description of my invention of the principle or character which distinguishes it from all other things before known and of the method of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of the frame of a house on my improved plan, Fig. 2, part of a top view with the roof removed, Figs. 3 and 4, horizontal sections taken at the lines A, a, and B, b, of Fig. 1, Fig. 5 a vertical section, Fig. 6, a like section with the roof and floors, Figs. 7, and 8, plan and bottom views of the roof and floors, and Figs. 9 and 10, elevation and cross section on a smaller scale of a separation wall or partition.

The same letters indicate like parts in all the figures.

The first part of my invention consists in making the horizontal beams, which form the horizontal parts of the frame-work, in sections cast with flanches through which longitudinal bolts pass to secure and draw together the sections at their junctions, their upper and under surfaces being horizontal and parallel flanches, when this is combined with vertical columns, pilasters or posts, also cast with horizontal flanches at top and bottom provided with bolt-holes corresponding with bolt holes in the horizontal flanches of the beams, the top end of one column, pilaster, or post and the bottom end of another being bolted to the lower and upper horizontal flanges of two beams to bind together same, in addition to the bolts which draw together the beams.

The second part of my invention, which relates to the method of making the floors, consists in making such floors of narrow plates or sheets of metal with tongues and grooves made on the edges by riveting to the under surface of the plates or sheets a strip of sheet iron to form the tongue, and one or two strips to form the groove, the said strips acting at the same time as ribs to give stiffness to the plates or sheets which constitute the floor, all the said plates being arranged, when put together, to break

joints, by which means I am enabled to make a floor which, for rooms of ordinary size, needs no intermediate supports.

The third part of my invention, which relates to the method of covering the roof by means of a series of plates, consists in making one edge of each plate with a groove, in the same manner as in the floor plates, to receive the opposite edge of the next plate, and thus make one plate lap over the other and bind the two together, that they may not be separated to permit the passage of water, these plates being also provided with cleats or small plates riveted on one end of each plate and made to overlap the end of the next and projecting beyond the lower edge of the large plate to lap over a corresponding and like plate or cleat on the next plate and thus lap all the joints of the roof.

In the accompanying drawings (a) represents a horizontal square frame work which girds the house, that is, which passes entirely around. One such frame work constitutes the base of each story. The beams (a), constituting these frames, are cast in sections, hollow, with the inner face open, the top and bottom being horizontal flanches (b, b,) from the outer face. The ends of each section are formed with flanches (c, c,) projecting inward, so that by means of screw bolts (d, d,) passing through such flanches the sections are united and drawn together to make close joints. Before putting together the different sections their ends should be faced perfectly true and at right angles with the top and bottom surfaces, which last named surfaces should be made as nearly parallel as possible. One of these frames, made and put together as above described, is placed on the foundation (c') and on it are erected a series of semi-columns (f) cast with flanches so as to present externally the appearance of columns or pilasters, but hollow inside to make them light, while the curves of their cross sections gives them stiffness. At each end they are cast with flanches (g, g,) the lower one at the base to rest on the base frame, and the other at the cap to receive the next frame (a) which forms the base of the next story or floor. These semi-columns are placed over and under the junctions of the sections of the beams (a, a,) and are secured there to by screw bolts (h, h,) passing through the flanches (b, b,), so that every column

at each end is secured to two sections, and, therefore, the sections of the beams (*a*) are held together not only by the screw-bolts (*d*, *d*), that pass through the end flanches (*c*, *c*) but by the columns also, by reason of the attachment of each column to the adjacent ends of two sections. In this way one story may be erected on another, and, when thus put together, each side of the house or structure constitutes a frame, and when the four sides are united all these frames brace each other, and make a strong and light structure, which, in the casting of the parts, may be made as plain or as highly ornamental as may be desired, and according to any order of architecture.

When the extent of the building requires it I introduce a cross-beam (*j*) cast with a central vertical rib with a top and bottom flanch on each side like the flanches (*b*, *b*) of the beams (*a*) and with end flanches (*k*) through which bolts pass to secure it to the beams (*a*).

The spaces between the flanches (*b*, *b*) of the beams (*a*) and (*j*) form recesses to receive the ends of floor beams (*l*) which rest on the lower one of these flanches, so that the upper and lower surfaces can be made either flush with the top and bottom surfaces of the beams, or so much within those surfaces as to make the floor and ceiling flush therewith.

The floor beams (*l*) I make with the top (*m*) level, that is, in a straight line or nearly so and the under part in arch form, and cast them onto wrought iron tension rods (*n*) to make them light and stiff. The ends which constitute the abutments are formed to fit in the space between the flanches (*b*, *b*) of the beams.

The floor (*o*) is formed of narrow and thin plates (*p*) of sheet rolled iron with their edges parallel. To their under surfaces and near one edge I secure by rivets a narrow strip of metal (*q*) and under this another strip (*r*) one edge of which is on the same vertical plane with the edge of the plate, thus forming a groove. On the other edge of these plates is secured in like manner a strip (*s*) which projects sufficiently beyond the edge of the plate to form a tongue. In this way every plate has a tongue formed on one edge and a groove on the other, so that in laying the floor, the tongue of one plate fits into the groove of another the upper surfaces of all being flush. The strips of iron, riveted as above set forth to the plates form the tongues and grooves, and add stiffness to the floor. The plates in laying the floor are put together breaking joints, that is, the ends of two in the same line are placed midway between the ends of the one alongside. By these two means a floor for a room of ordinary size can be made of sufficient strength and stiffness, by resting

at the edges on the beams only and without intermediate supports; but when the room is of a very large size, one or more floor beams (*l*) may be introduced.

The spaces between the columns, pilasters or posts are filled up by plates of cast or sheet iron (*t*). If the outer surface be required to be smooth, the plates are formed on their edges with tongues and grooves as in the manner of making the floors above described; but if it be desired to make the outer surface in imitation of weather-boarding, then a groove is to be formed on one edge of each plate, the other edge of the plates answering the purpose of a tongue to fit in the grooves, so that the plates, when put together, will overlap one another. The plates prepared after either of the above modes and cut of the required lengths are inserted one by one in the upper end of grooves formed in the columns, pilasters or posts, and let down and fitted into each other, the flanches forming the grooves for the reception of the plates being cut out at the top the breadth of one plate to admit of their insertion, the last of the series of plates being secured in place by pins driven into holes made for that purpose in the columns, pilasters or posts.

When windows or doors are to be put into the panels or spaces between the pilasters &c., the said pilasters are either cast with the requisite recesses or rabbets to receive the windows or doors, or otherwise adapted to receive the window or door frames. For windows I usually insert a cast iron panel (*u*) cast with or without ornaments, the upper edge of such panels being properly formed to constitute the window or sill.

The cornice (*v*) is cast in sections like the beams (*a*) with flanches on their ends projecting inward that they may be drawn and secured together by screw bolts in the same manner as the beams (*a*). After the sections have been united, they are then secured to the upper ends of the columns, pilasters or posts in the same manner as the beams (*a*). In this way, the cornice is made to constitute the upper frame of the structure.

The framing for the roof is formed as shown at (*w*) in the drawings, and rests on the part (*x*) of the cornice and within the ornamental part thereof, which is to be pierced at the proper places for the reception of spouts to carry off water. The covering for the roof is made of a series of plates formed with a groove on the lower edge in the manner of making the plates for the floors, the upper edge of one plate being fitted into the groove at the lower edge of the next plate above, so that the plates overlap each other from the top to the bottom, thus effectually preventing leaks. The plates should be of sufficient

length to extend from the middle of one rafter (*w*) to the next. For the purpose of covering the end joints and preventing leaks, to one end of each plate is secured a cap-plate (*y*) which extends or laps over the end of the next plate, and also over a like cap-plate (*y'*) below it. In this way all the joints are completely covered and the plates are effectually prevented from sagging or bending to make a leak. At the angles of the roof the plates are bent to the required form that there may be no seam at the angles.

The pilasters are represented as being hollow semi-columns with projecting wings or flanches to give breadth of support at the ends where they join the horizontal beams. This is the form which is best adapted to the purpose as it unites strength and beauty with lightness; but so long as the flanches are retained this form may be varied at pleasure. Where it is to form a division between two houses I prefer to make the pilasters flat with projecting flanches at top and bottom as represented at Figs. 9 and 10. When thus constructed, I fill up the space between the pilasters or posts and the horizontal beams with masonry or with metal panels, as above described.

I have above stated that the floors, roof and paneling between the columns, pilasters or posts are made of sheet iron, but I do not wish to confine myself to the use of rolled sheet iron, as thin plates of cast iron, with strips riveted to their under surface to form the tongues and the grooves and to give stiffness, will answer a good purpose, although I prefer rolled sheet or plate iron, such as thin boiler iron.

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

1. The method, substantially as herein described, of making the frame work of iron

houses of more than one story by means of beams cast in sections with end flanches which receive bolts for uniting and drawing them together and with top and bottom parallel flanches, when this is combined with columns, pilasters or posts cast with horizontal flanches at top and bottom, the top flanch of one column, and the bottom flanch of another being secured by bolts to the horizontal flanges of two beams one column above and the other below the point at which the beams are joined for the purpose and in the manner substantially as described.

2. I also claim the method, substantially as herein described, of making the floors by means of thin plates of metal formed with a groove on one edge and tongue on the other by riveting narrow strips of metal to their under surface and near the edges, the plates so formed being put together breaking joints, substantially in the manner and for the purpose specified.

3. I also claim the method, substantially as described, of covering the roofs of houses by means of series of thin metal plates, formed each with a groove on one edge, by riveting narrow plates or strips to the under surface thereof, that the edge of one plate may fit into the groove on the lower edge of the next above and so on throughout the series, substantially as described, when these plates are also provided with the lapping pieces or plates riveted or otherwise secured to the upper surface of one end of each plate in each series to lap over the end of the contiguous plates of the next series, the said lapping pieces of each series being also made to lap one over the other, substantially as and for the purpose specified.

JAMES BOGARDUS.

Witnesses:

JOHN LONDON,
C. BROWNE.