

(No Model.)

5 Sheets—Sheet 1.

T. BAILEY.  
FIREPROOF BUILDING CONSTRUCTION.

No. 576,713.

Patented Feb. 9, 1897.

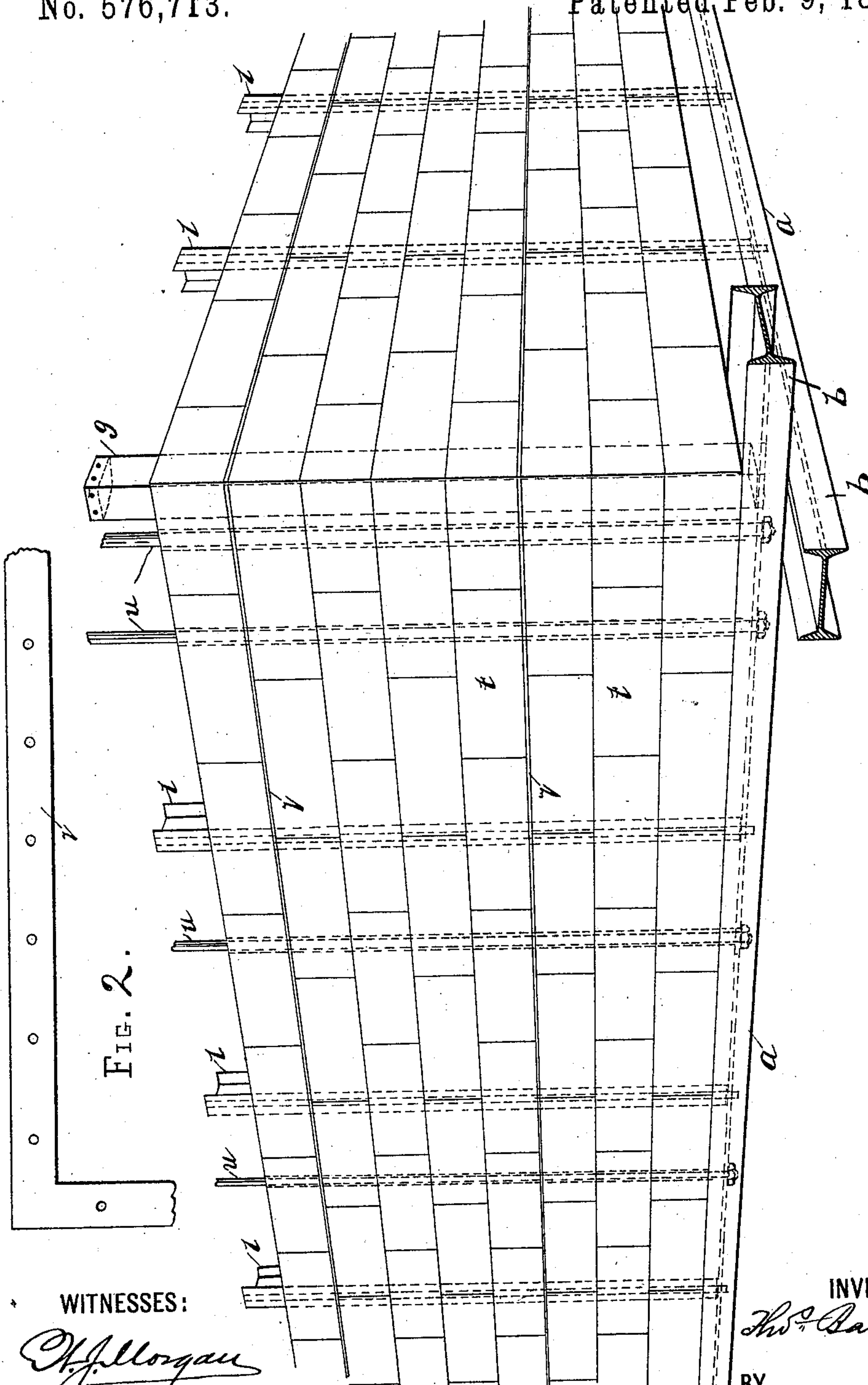


FIG. 1.

FIG. 2.

WITNESSES:

*O. J. Morgan*  
*Jan. G. Alexander*

INVENTOR

*Thos. Bailey*

BY

*A. P. Thayer*

ATTORNEY

(No Model.)

5 Sheets—Sheet 2.

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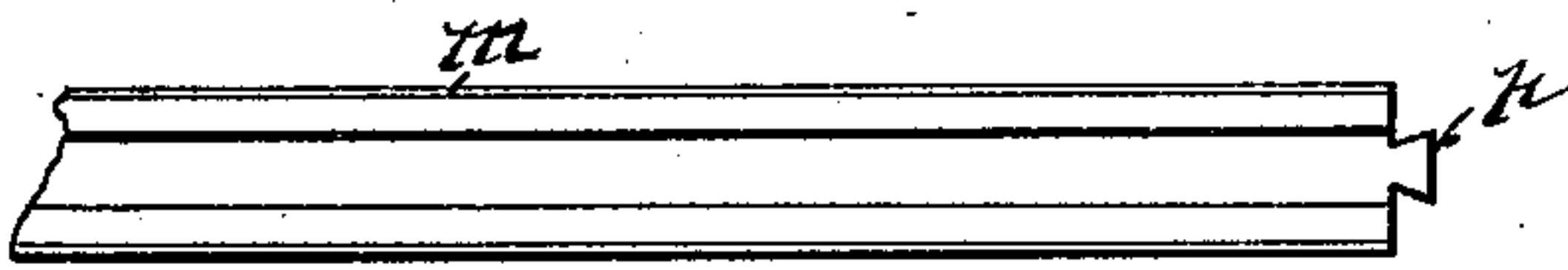


FIG. 4.

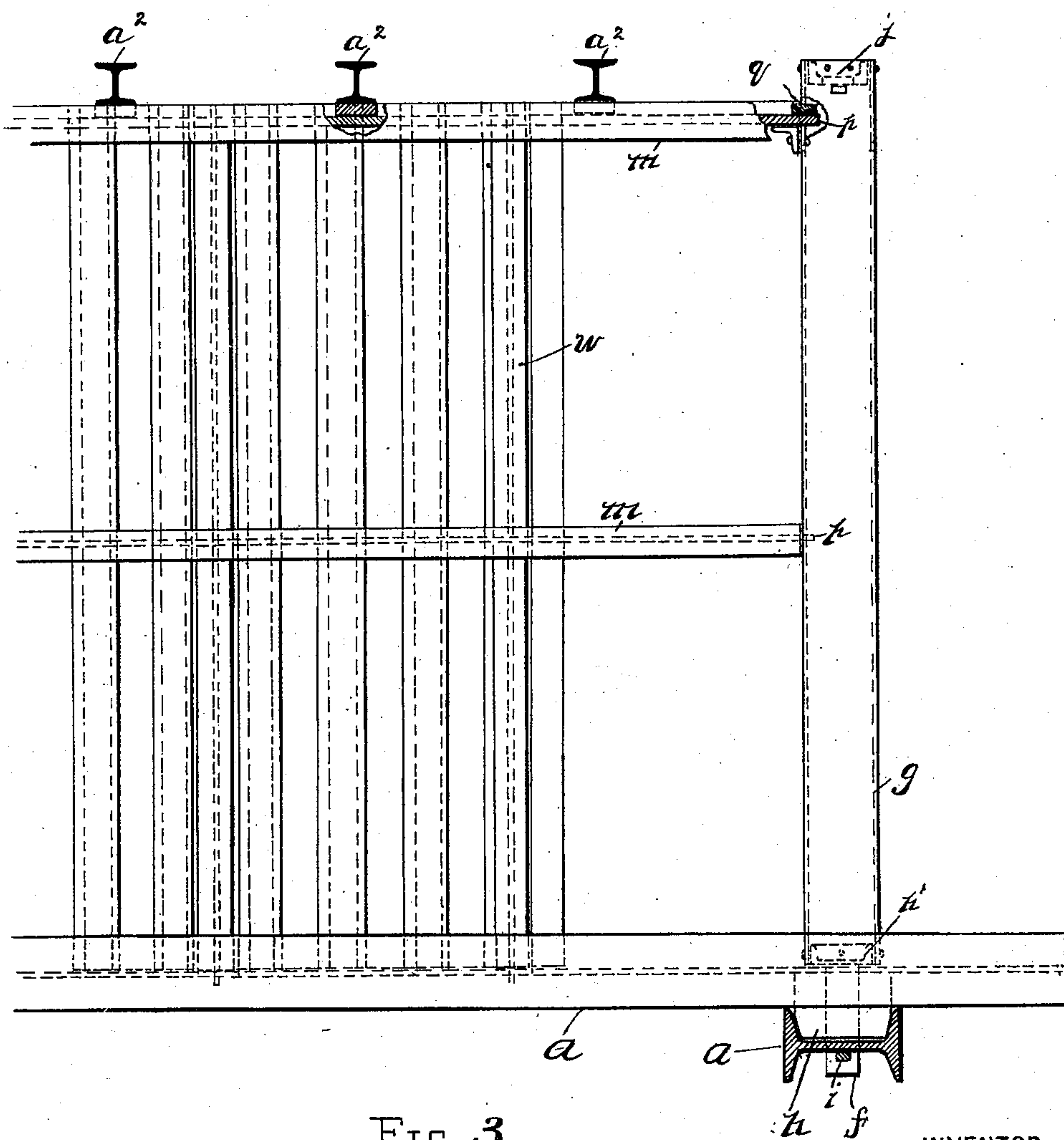
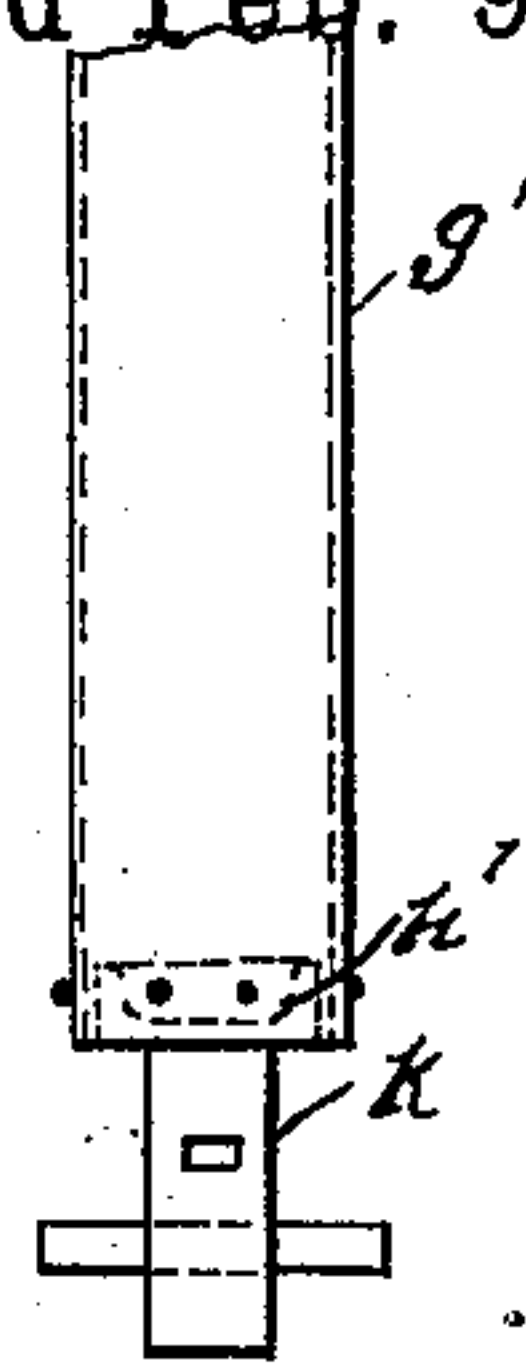


FIG. 3.

WITNESSES:

*W. J. Morgan*  
*Geo. J. Alexander*

INVENTOR

*Thos. Bailey*

BY

*A. O. Thayer*  
ATTORNEY

(No Model.)

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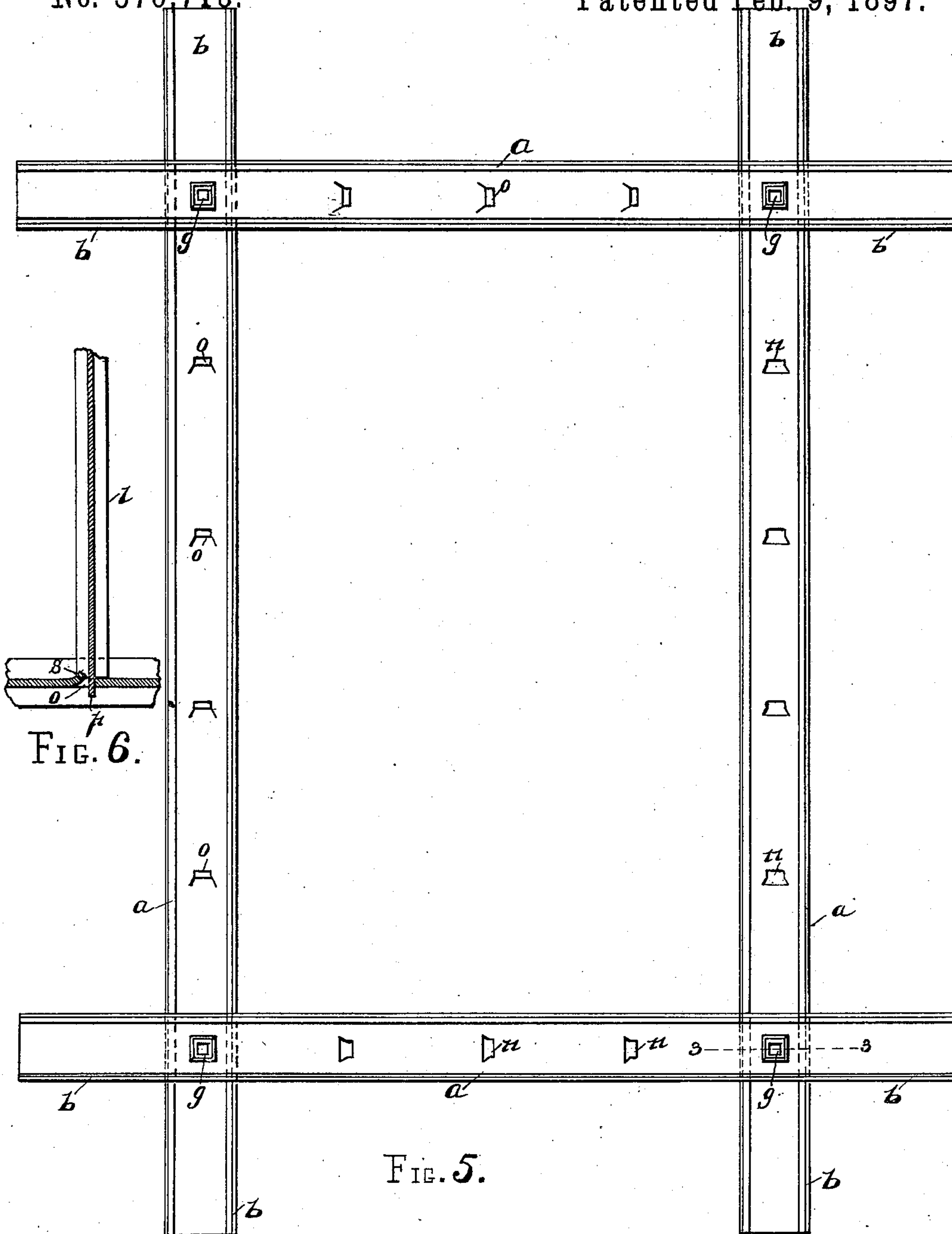


FIG. 6.

FIG. 5.

WITNESSES:

*W. J. Morgan*  
*Jas. G. Alexander*

INVENTOR

*Thos. Bailey*

BY

*A. P. Thayer*

ATTORNEY

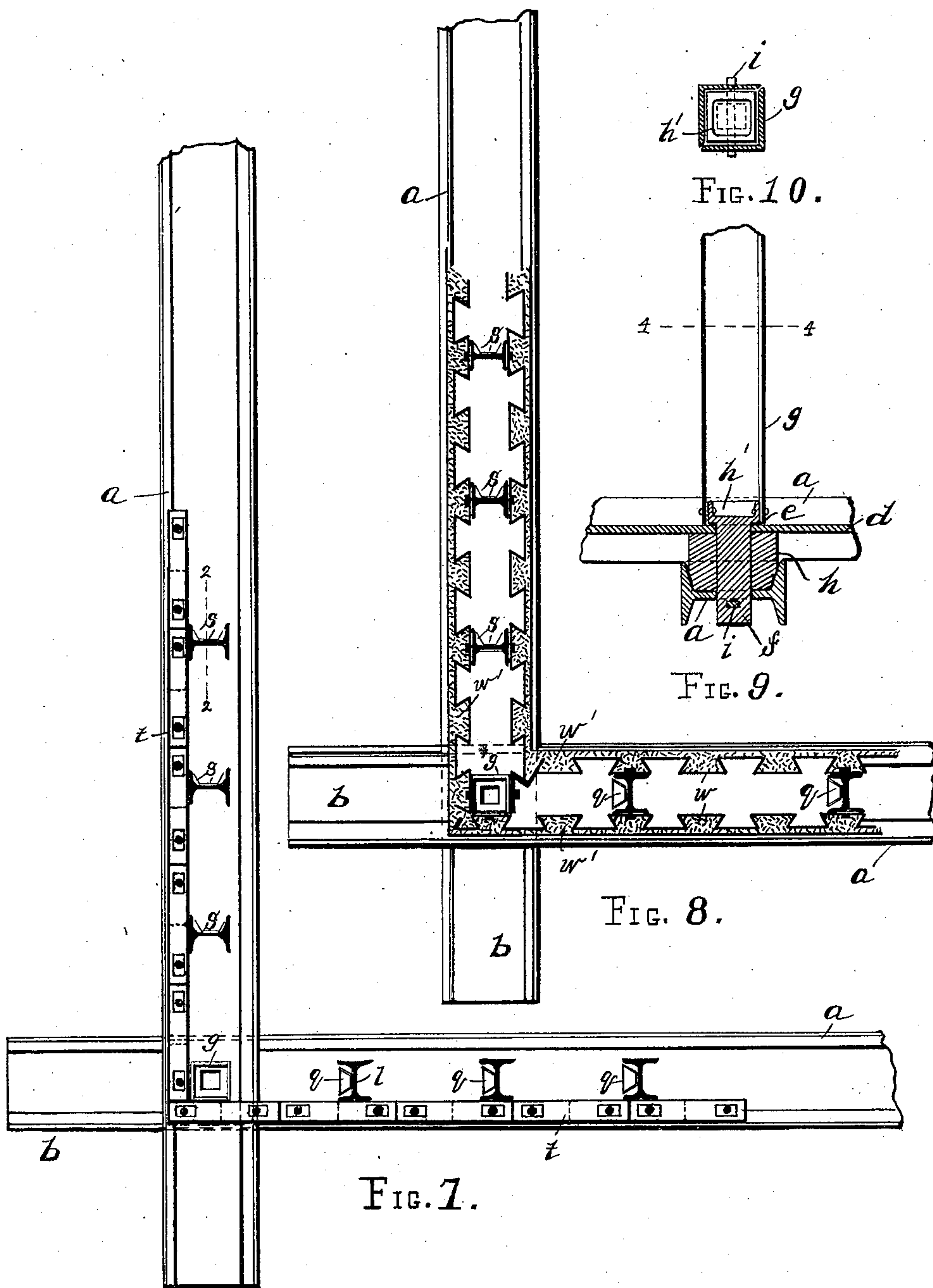
(No Model.)

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T. BAILEY.  
FIREPROOF BUILDING CONSTRUCTION.

No. 576,713.

Patented Feb. 9, 1897.



WITNESSES:

*W. J. Morgan*  
*J. J. Alexander*

INVENTOR

*Thos Bailey*

BY

*A. P. Hayes*  
ATTORNEY



(No Model.)

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No. 576,713.

Patented Feb. 9, 1897.

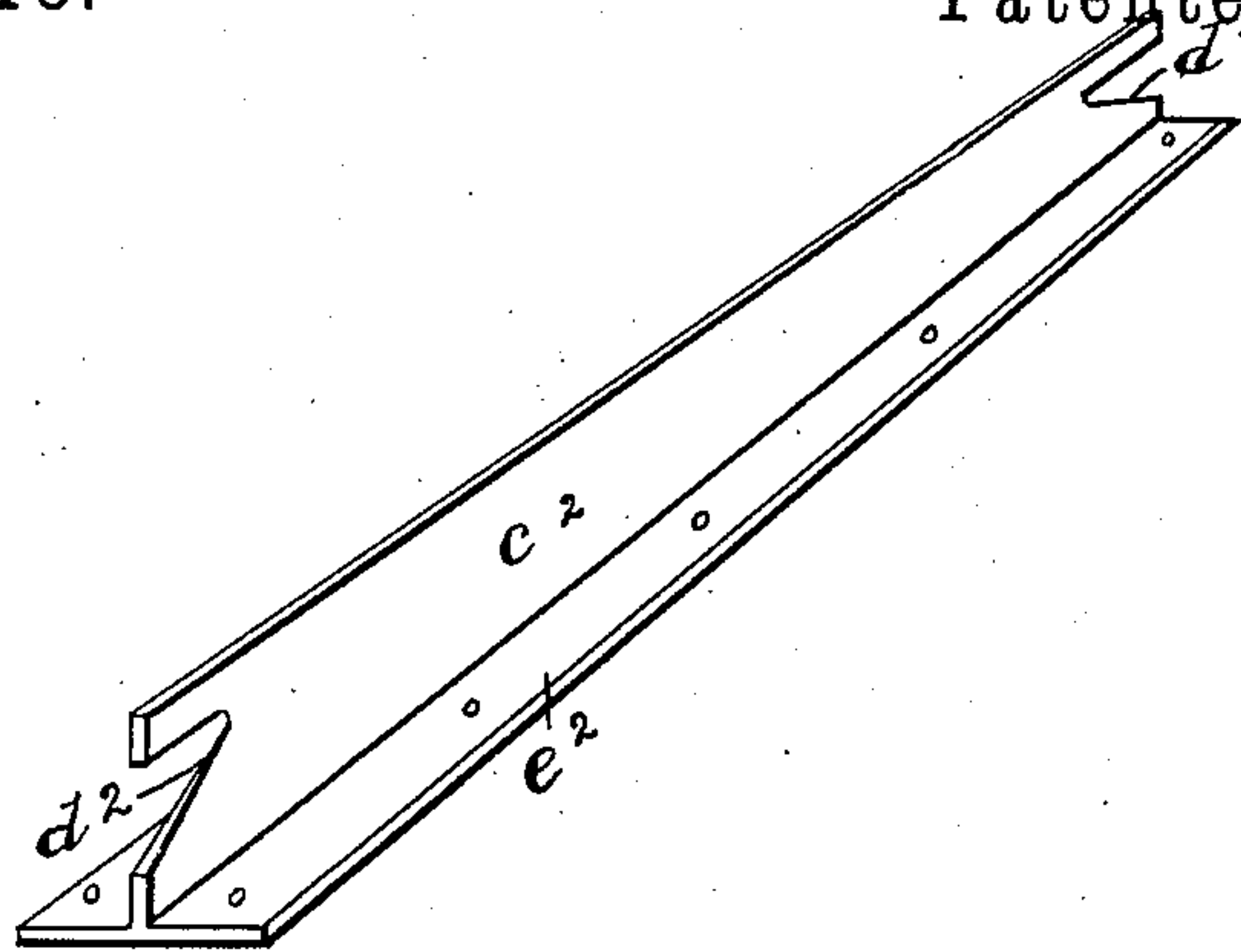


FIG. 13.

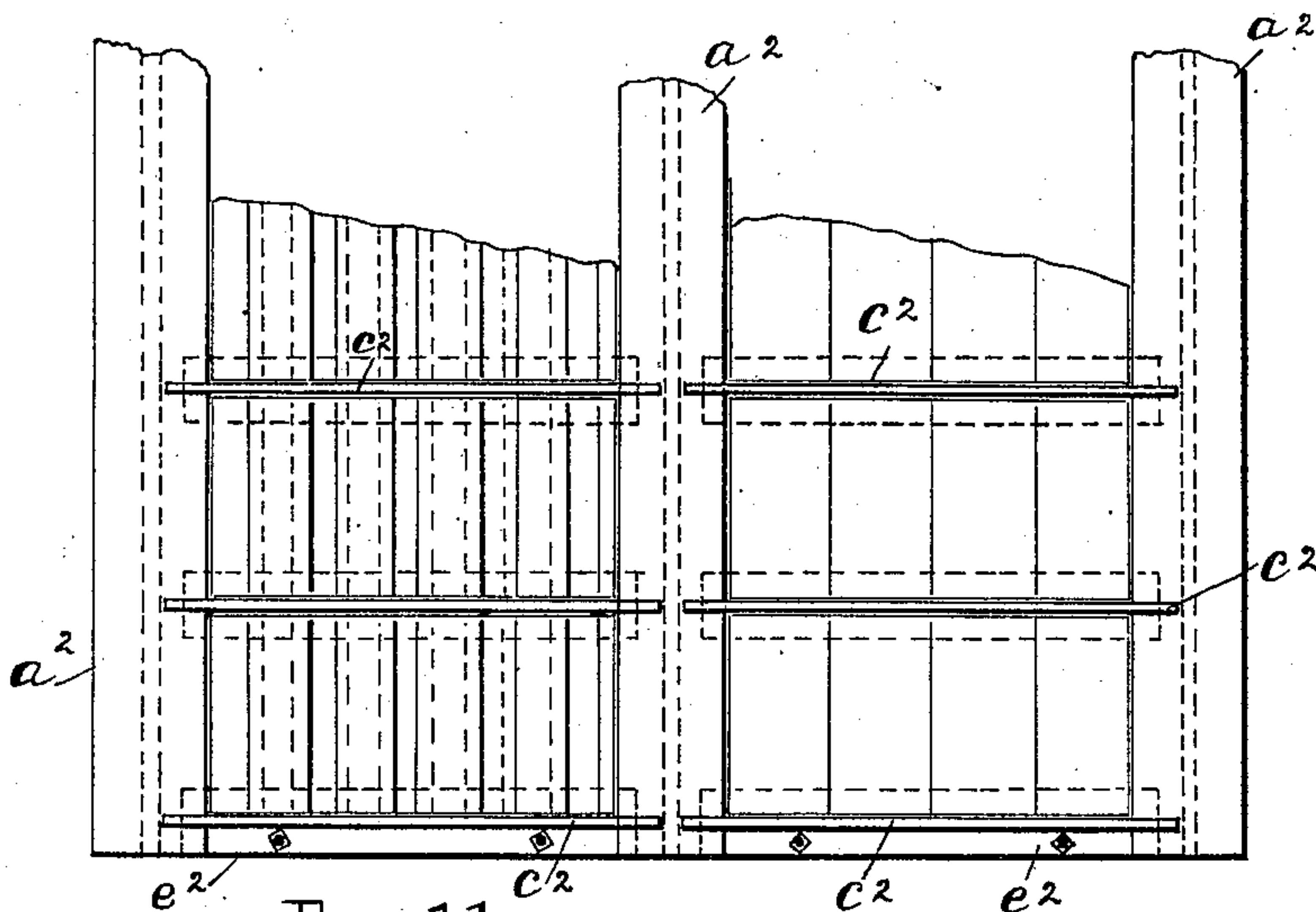


FIG. 11.

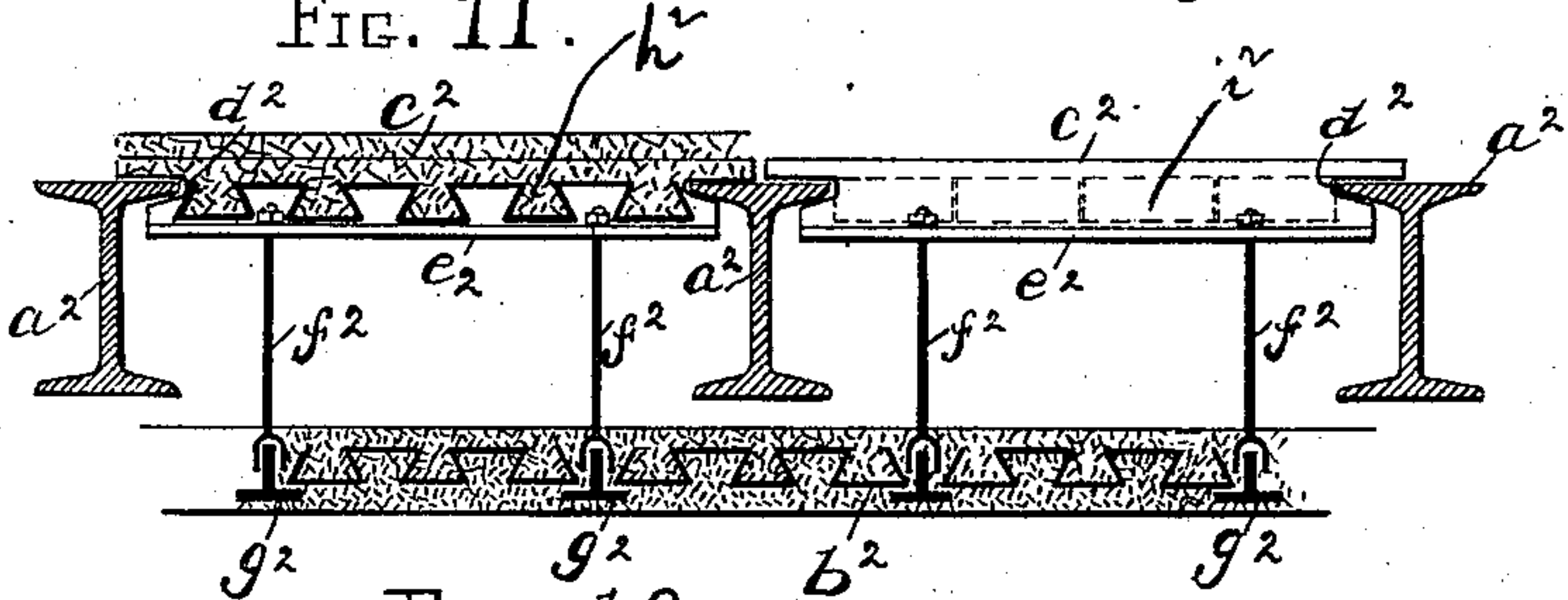


FIG. 12.

WITNESSES:

*W. J. Morgan*  
*James J. Alexander*

INVENTOR

*Thos. Bailey*

BY

*A. P. Thayer*

ATTORNEY



# UNITED STATES PATENT OFFICE.

THOMAS BAILEY, OF NEW YORK, N. Y.

## FIREPROOF-BUILDING CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 576,713, dated February 9, 1897.

Application filed May 8, 1896. Serial No. 590,667. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS BAILEY, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Fireproof-Building Construction, of which the following is a specification.

My invention consists of improvements in construction of the parts of metallic-frame structures whereby substantial buildings of moderate height may be erected on foundations of less expensive structure than ordinarily found necessary and without bolting or riveting the parts together in the erection, whereby much time and expense can be saved and the buildings can be taken down for removal and erection elsewhere when desired, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of parts of two sides of a building constructed in accordance with my invention with hollow-brick inclosing material. Fig. 2 is a plan of a tie-plate used in the brick inclosing wall. Fig. 3 is an inside elevation of part of a side of a building of like construction with dovetail sheet-metal and plaster inclosing material, one of the sills being sectioned transversely and some other parts being also sectioned. Fig. 4 is a plan of part of one of the horizontal ties seen in side view in Fig. 3. Fig. 5 is a plan view of the base or foundation and corner-posts for a building of small size. Fig. 6 is a detail in vertical section on line 2 2, Fig. 7. Fig. 7 is a plan of parts of two sides of a building with fire-brick siding. Fig. 8 is a plan of parts of two sides with dovetail corrugated sheet-metal and plaster siding. Fig. 9 is a detail in section on line 3 3, Fig. 5. Fig. 10 is a section on line 4 4, Fig. 9. Fig. 11 is a plan view of a portion of a floor and ceiling structure. Fig. 12 is a transverse section of a portion of a floor and ceiling structure. Fig. 13 is a perspective view of a cross-bar used to support the filling between the beams.

For the sills *a* I take rolled-metal beams of approved shapes, preferably I-beams, but other shapes may be used, and, having first suitably prepared them for being connected together and for reception of the posts and studding, lay them flatwise in trenches of ap-

proved depth in the ground, with or without concrete or other suitable bedding, where the nature of the soil requires it, using sills of greater lengths than the required lengths of the sides of the structure and placing the transverse sills crosswise upon the others in the lines or planes of the sides of the superstructure, with the edges of the flanges of the upper sills resting on the edges of the flanges of the lower sills and with the end portions of the sills projecting beyond the lines of the superstructure, as shown at *b*, the purpose of these extensions being to afford anchorage for resisting wind-pressure and for maintaining the upright position when the soil may be washed out at one side, as frequently happens in the case of buildings built on the seashore. In the said previous preparation of the sills I perforate the webs *d*, as at *e*, to receive tenons *f* of the corner-posts *g* where the sills cross each other, and I provide metallic blocks *h* to fill the spaces between the webs *d* of the two sills to distribute the weight to be sustained largely on the webs of the sills. The posts *g* will be produced in hollow form in any approved way, as by two angle-bars arranged to inclose a hollow space, as in Fig. 10, and the tenons *f* will be made with a head *h'* and be inserted and riveted as shown in Fig. 9 or in any other approved way.

The tenons *f* will be secured with keys, as *i*, Figs. 9 and 10; under the web of the lower sill. When posts are required of greater length than is feasible in one section, a socket *j* will be inserted in the upper end of a section, and an upper section, as *g'*, Fig. 3, will be connected therewith by a tenon *k*. These tenons may be keyed in two directions, if desired, for greater strength, as indicated in said Fig. 3.

For connecting the metallic studs *l* to the sills and beams or horizontal tie-bars *m* to the posts I make dovetail perforations *n* or *o* through the webs of the sills or posts and provide dovetail ends *p*, Fig. 4, of said studs or ties that will enter the perforations at their wide sides, but will lock therein when shifted to the narrow sides of said perforations, and insert keys, as *q*, to hold them in the locking positions; but instead of employing separate keys I may provide tongues, as *s*, of the metal partly displaced in making the perforations



o, which, being bent aside to admit the ends p, may be bent back after the admission to lock said inserted ends. Instead of the dovetail form of these perforations and ends it is to be understood that any equivalent form that will interlock against pulling out may be used, and I do not limit myself to the dovetail form shown. The posts may have brackets, as j<sup>2</sup>, for additional support of the horizontal tie-bars m.

In Figs. 1 and 7 I represent the siding as consisting of hollow bricks or tiles t, laid on the sills at the outer sides and inclosing the posts and studs and having rods u, extending vertically through them and the sills and beams to stay the bricks against lateral thrusts, and also having flat tie-plates v between courses at suitable intervals apart, through which the rods also pass for securing lateral stability. The apertures of the bricks in which the rods are inserted will be filled with cement to stiffen the walls.

In Figs. 3 and 8 I represent the siding as consisting of dovetail corrugated metallic sheets w with plaster coating w', which also inclose the posts and studs for protection from heat in case of fire in close proximity.

The sheets are arranged with the ribs and grooves upright, and where the edges of two sheets meet they are confined in the grooves of horizontal I tie-bars, as m, Fig. 3, but when sufficiently wide to reach from sill to beam they may be used in connection with studs l, as in Fig. 8, and may be screwed or riveted to them. In the upright arrangement of these sheets they afford material strength for supporting weight above. This form of siding may be used both inside and outside, as in Fig. 8, and the brick siding may also be so used, if desired.

To carry fireproof filling, as concrete and the like, between the floor-beams a<sup>2</sup>, so as to have wide space between said filling and the ceiling b<sup>2</sup>, I apply cross-bars c<sup>2</sup> for supporting said filling to the upper flanges of the floor-beams, as shown in Figs. 11 and 12, said cross-bars consisting of inverted-T bars or other angle-bars of suitable form, notched in the ends, as at d<sup>2</sup>, to engage said upper flanges of the beams, with the upper edges reaching a little above the upper edges of the beams and their lower edges a little below, so that with filling supported on flanges e<sup>2</sup> of the cross-bars and reaching to or a little above the upper edges of the cross-bars, and so as to cover the tops of the beams, the thickness of filling material need not be in excess of what is needed for protection of the beams above, as is the case when the cross-bars c<sup>2</sup> are supported on the lower flanges of the floor-beams and has the requisite thickness for supporting the floor-boards on top and is correspondingly lighter, and there is larger free space between the ceiling and beam filling for additional protection from fire below.

I suspend the ceiling from the flanges e<sup>2</sup> of the cross-bars by hangers f<sup>2</sup> and in this case

represent said ceiling as consisting of dovetail corrugated sheets plastered on the under side and covered with concrete or plaster on the upper side and supported at the edges of the sheets on the flanges of inverted-T bars g<sup>2</sup>, said bars being supported by the hangers f<sup>2</sup>. I also represent the same form of sheets to support the beam-filling, as h<sup>2</sup>, said sheets being supported on the flanges of the inverted-T bars c<sup>2</sup>, but any other suitable sheets or plates or bricks or other fireproof blocks may be used, as represented at i<sup>2</sup>.

The sills and other exposed parts will be covered with any approved protective coating, as asphalt or tar preparations or paint, for protection against corrosion.

It will be seen that all preparations of the parts for erection may be done in the shop, so that they have only to be assembled and put together and keyed in erection, which may be done quickly with economy of time and labor, and such buildings may be readily taken apart and reerected elsewhere.

I claim as my invention—

1. In metallic-frame structures for buildings, the sills placed crosswise at the angles of the building one upon another and being prolonged beyond the sides of the building outwardly to form anchorage extensions to oppose wind-pressure, said sills secured at the crossings by tenons of the posts inserted through perforations of the webs of the sills and keyed under the lower sills substantially as described.

2. In metallic-frame structures for buildings, the sills consisting of channel-bars placed crosswise at the angles of the building, with filling-blocks between the webs of the sills and secured at the crossings by tenons of the posts inserted through perforations of the webs of the sills and of the filling-blocks and keyed under the lower sills substantially as described.

3. In fireproof-building construction, the combination with metallic sills placed crosswise one upon another at the crossings, hollow metallic posts and tenons having heads inserted and secured in the ends of the hollow posts, said tenons inserted through the webs of the sills and keyed under the lower sills substantially as described.

4. In fireproof-building construction, the combination of metallic sills placed crosswise one upon another at the angles, corner-posts seated on said sills at the crossings and secured by tenons inserted through the webs of the sills and fireproof sidings laid on the outer margins of the sills, said sidings consisting of walls of hollow brick with vertical stay-rods inserted through apertures of the bricks substantially as described.

5. In fireproof-building construction, the combination of metallic sills placed one upon another at the angles, posts seated on said sills at the crossings and secured by tenons inserted through the webs of the sills and fireproof sidings laid on the sills, said sidings



consisting of walls of hollow bricks with stay-  
rods inserted through apertures of the bricks,  
and stay-plates between courses of bricks at  
intervals, said plates perforated and the rods  
5 inserted through them substantially as de-  
scribed.

6. In fireproof-building construction, the  
combination with metallic sills and posts of  
metallic studs and ties having interlocking  
10 ends as *p* inserted in interlocking perforations  
in the webs of the posts or sills and keyed  
therein substantially as described.

7. In fireproof-building construction the  
combination with metallic sills and posts, of  
15 metallic studs and ties having interlocking  
ends as *p*, inserted in interlocking perfora-  
tions as *o*, formed with key-tongues as *s* to  
lock the said ends in the perforations sub-  
stantially as described.

20 8. In fireproof-building construction, hol-  
low metallic sectional posts having joint con-  
nections consisting of a socket as *j* inserted  
and secured in the end of one section, and a  
tenon as *k* having a head inserted and se-  
25 cured in the end of the other section and  
adapted for inserting in the socket and for  
reception of one or more keys below the socket  
and inserted through the shell of the post  
substantially as described.

9. In fireproof-floor construction, the floor- 30  
beam-filling supporting-bars secured to the  
upper flanges of the floor-beams and extend-  
ing both above and below the upper surfaces  
of said beams, and consisting of inverted  
angle-bars with the intermediate plates and 35  
filling therein carried on the flanges of the  
angle-bars below the level of the upper sur-  
faces of the beams substantially as described.

10. In fireproof-floor construction, the floor-  
beam-filling supporting-bars secured to the 40  
upper flanges of the floor-beams and extend-  
ing both above and below the upper surfaces  
of said beams and consisting of inverted  
angle-bars, with the intermediate plates and  
filling thereon carried on the flanges of the 45  
bars below the level of the upper surfaces of  
the beams in combination with the fireproof  
ceiling suspended from the flanges of said  
bars and below the lower edges of the beams  
substantially as described. 50

Signed at New York city, in the county  
and State of New York, this 29th day of April,  
A. D. 1896.

THOMAS BAILEY.

Witnesses:

W. J. MORGAN,  
JAS. G. ALEXANDER.