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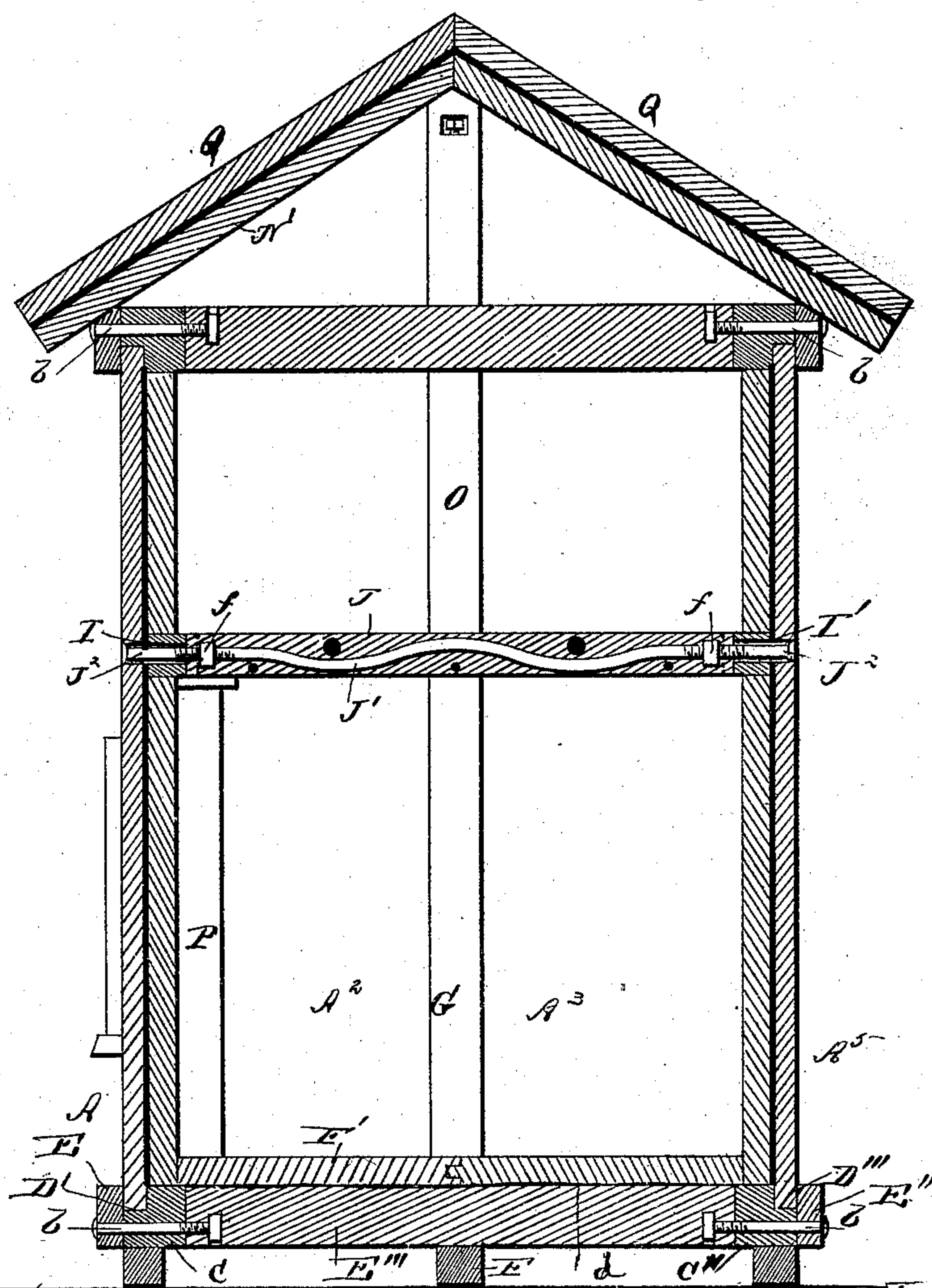
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V. W. BLANCHARD.
PORTABLE BUILDING.

No. 271,776.

Patented Feb. 6, 1883.

Fig. 1.



Witnesses:

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(No Model.)

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Fig. 4.

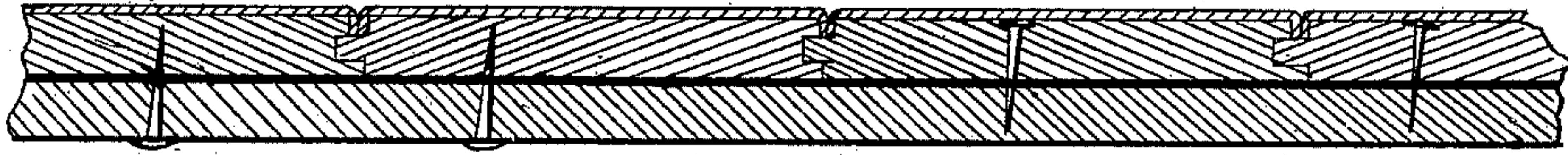


Fig. 2.

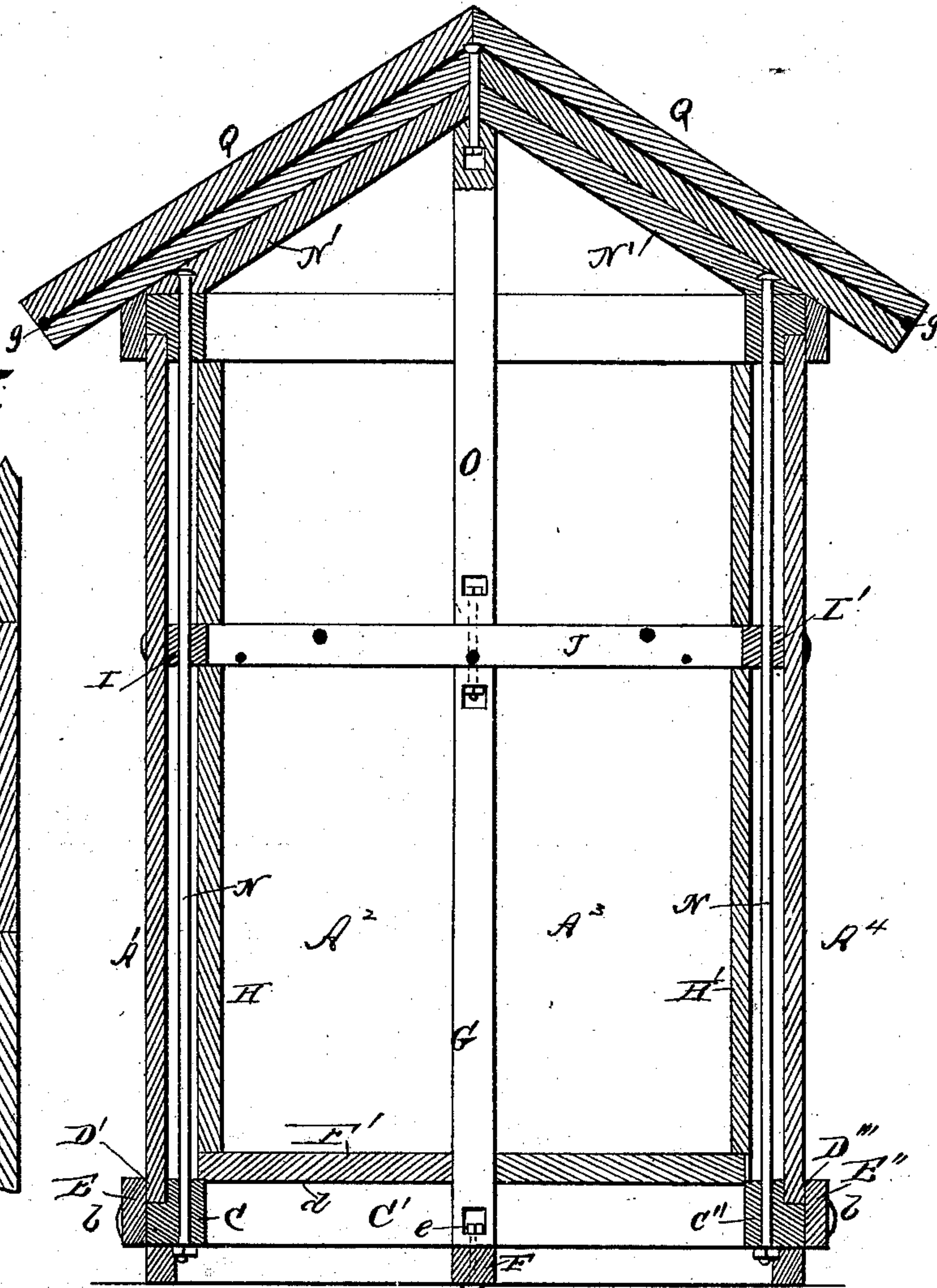


Fig. 5.

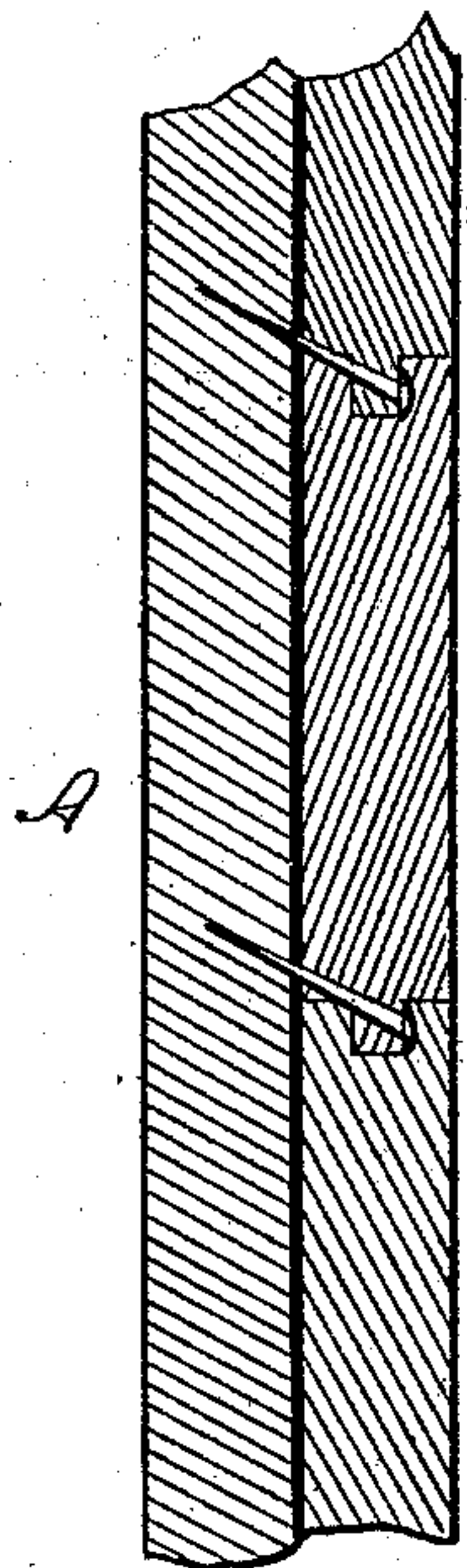
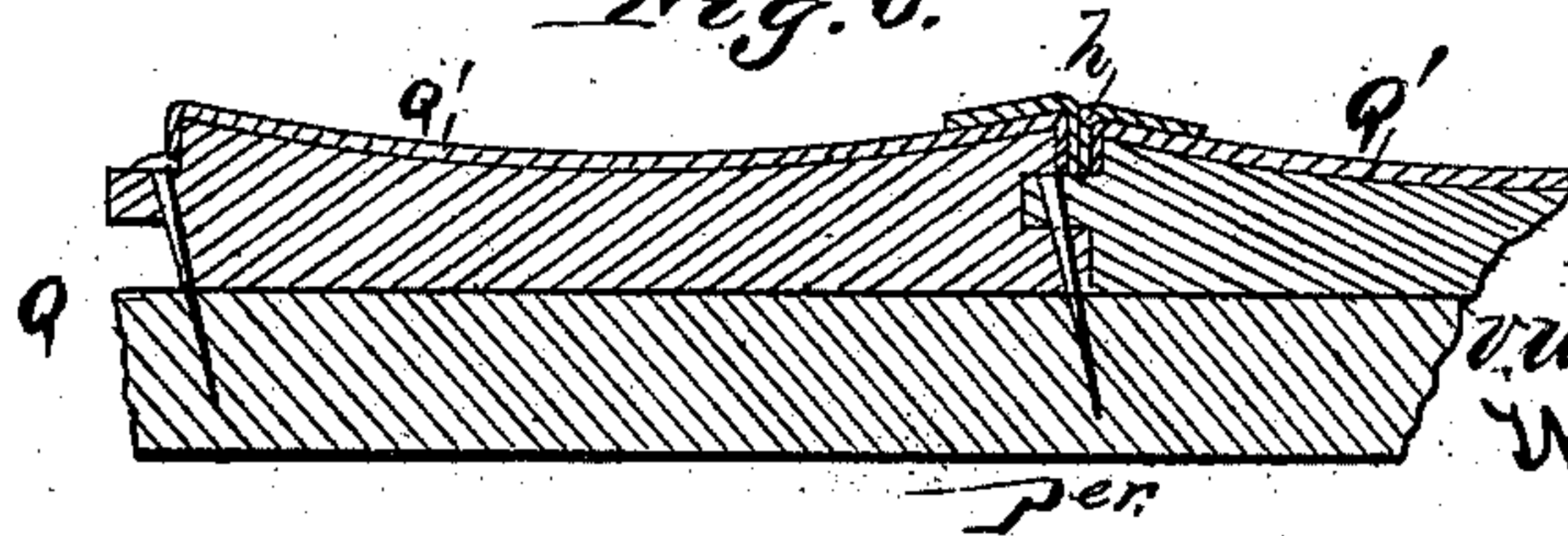


Fig. 6.



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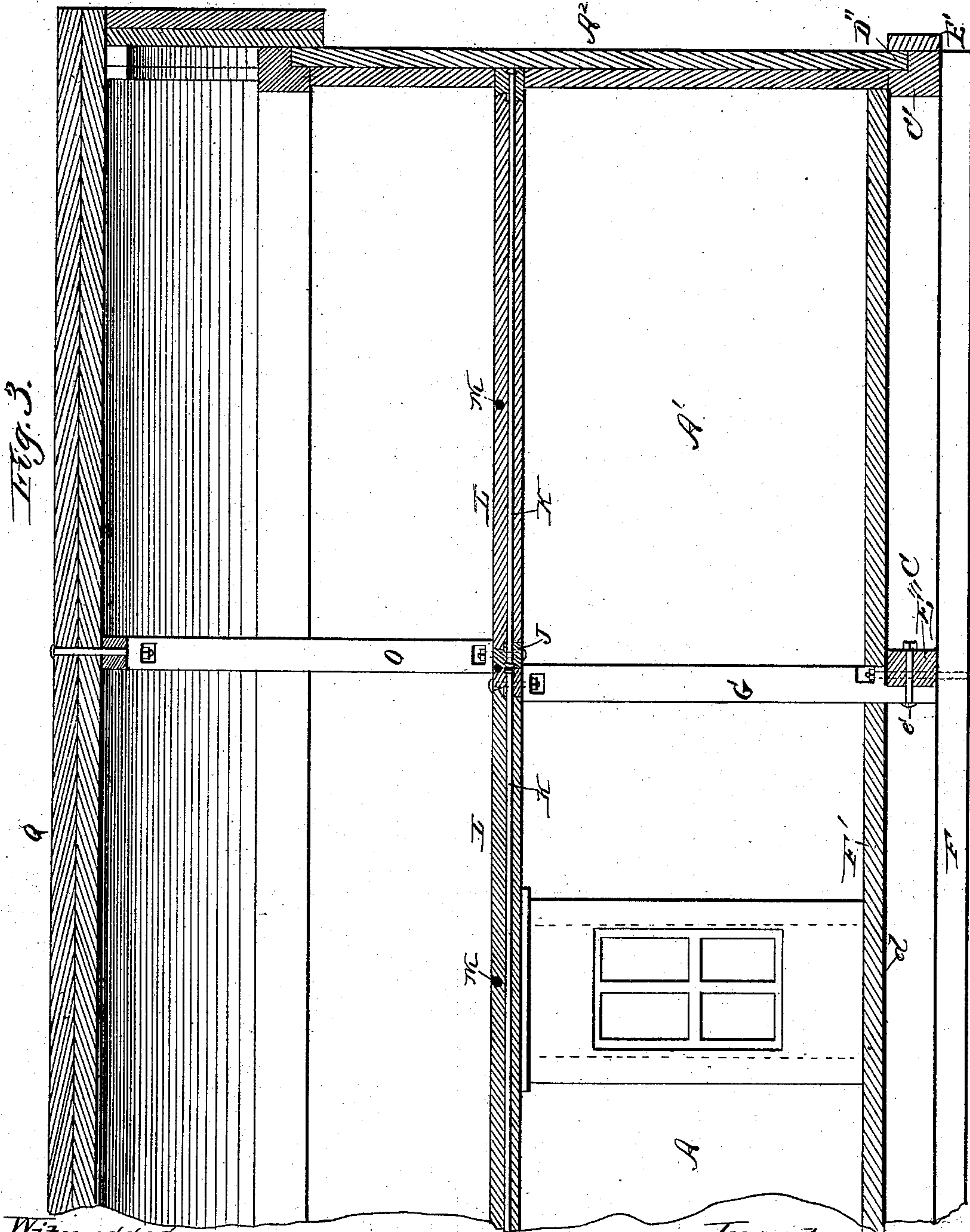
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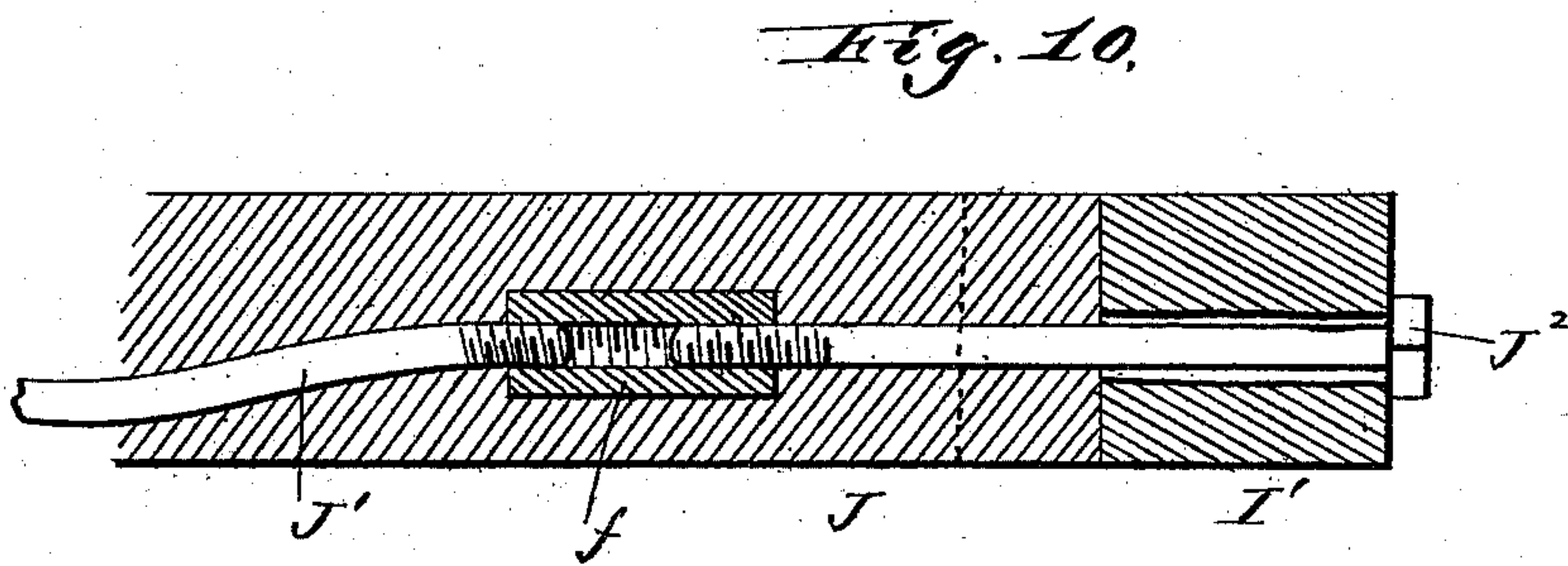
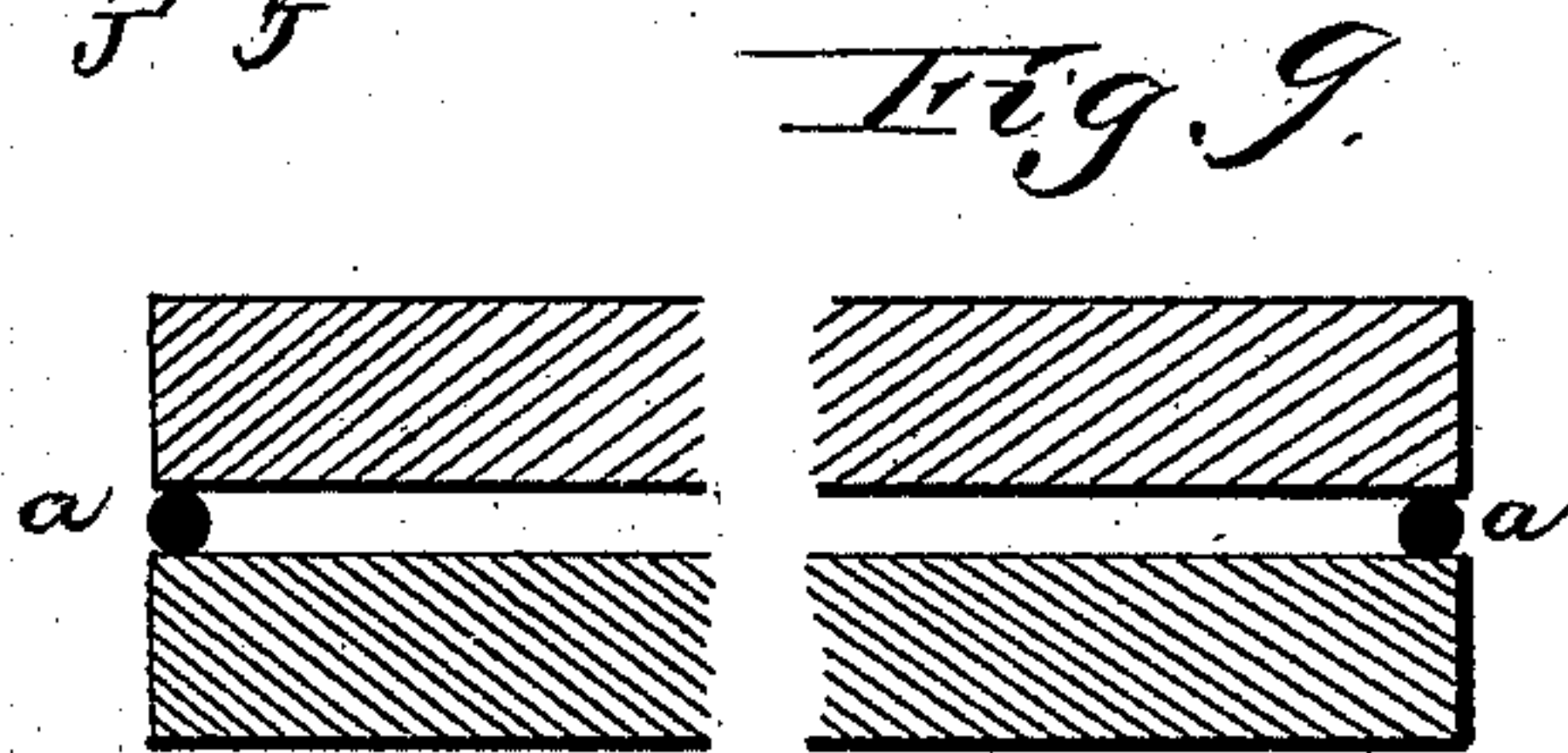
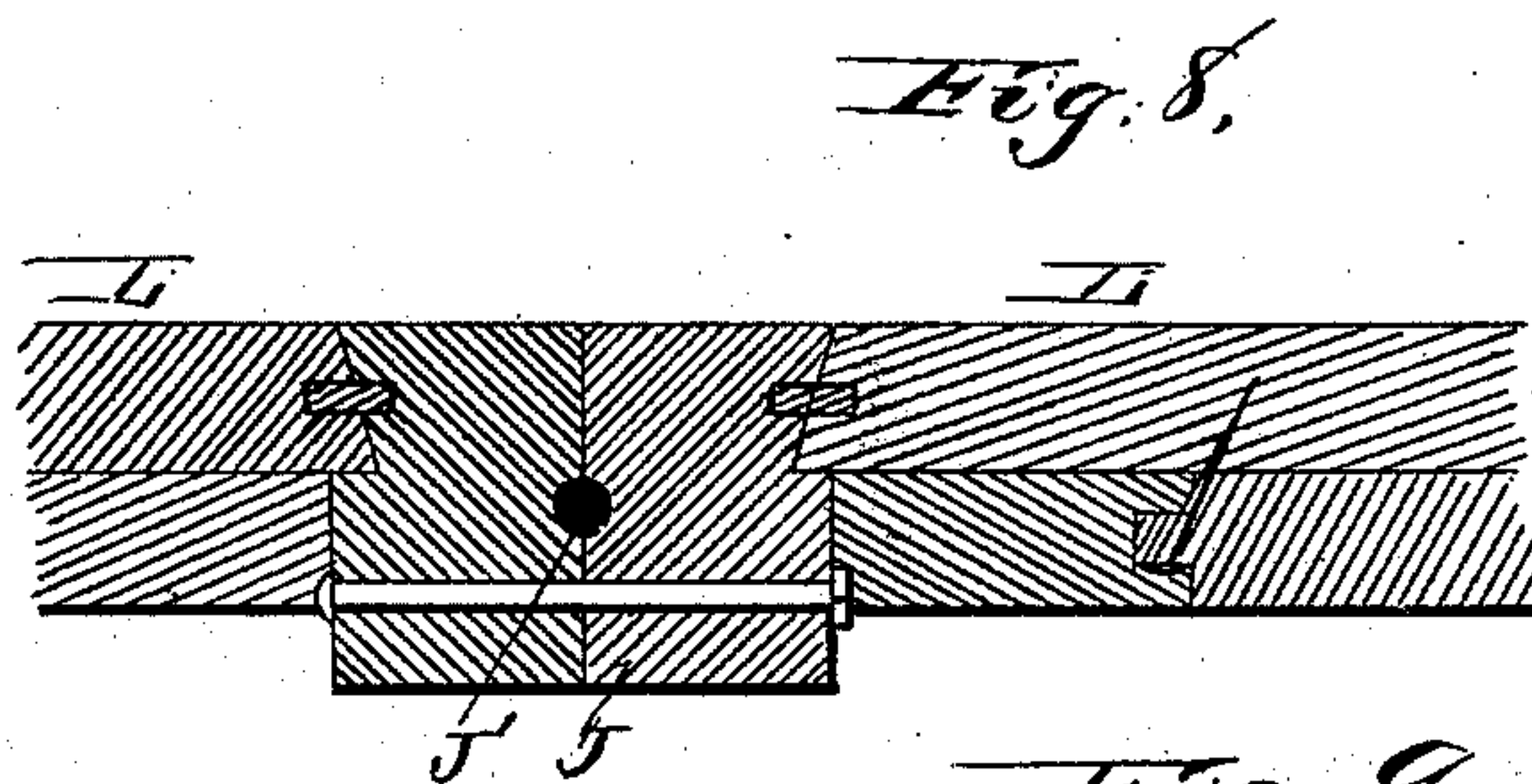
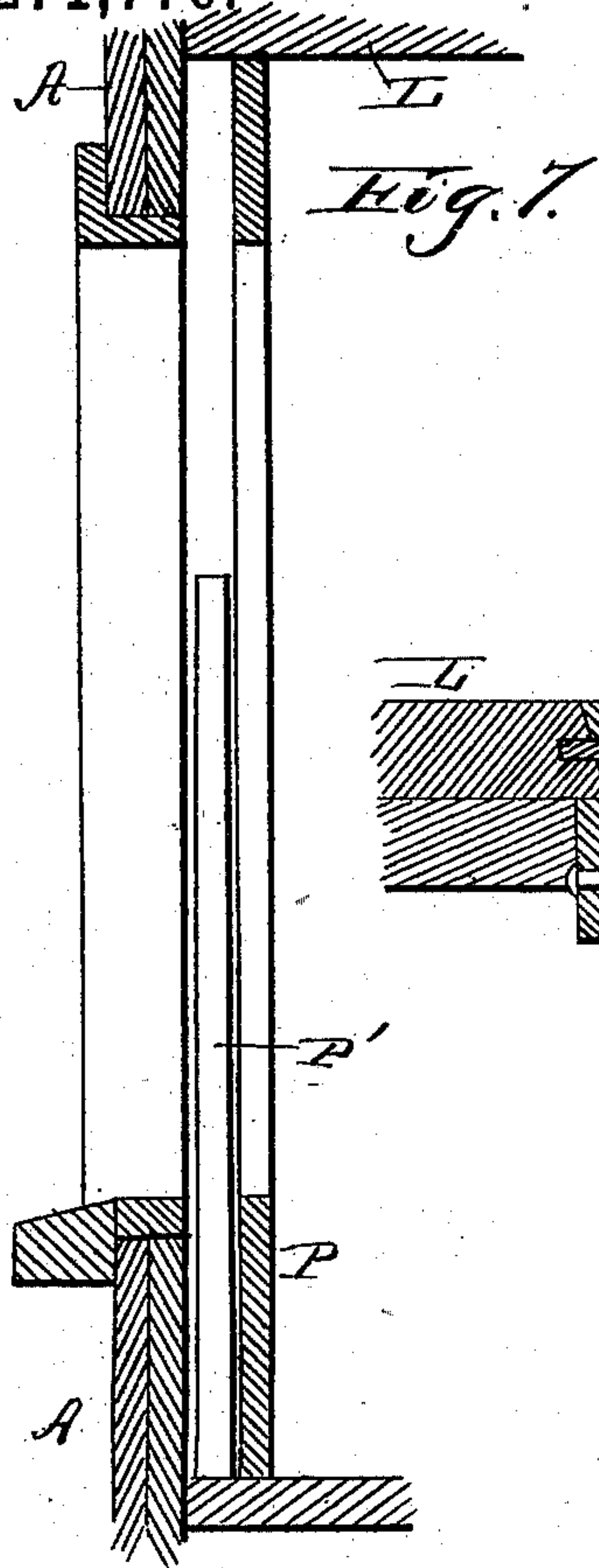
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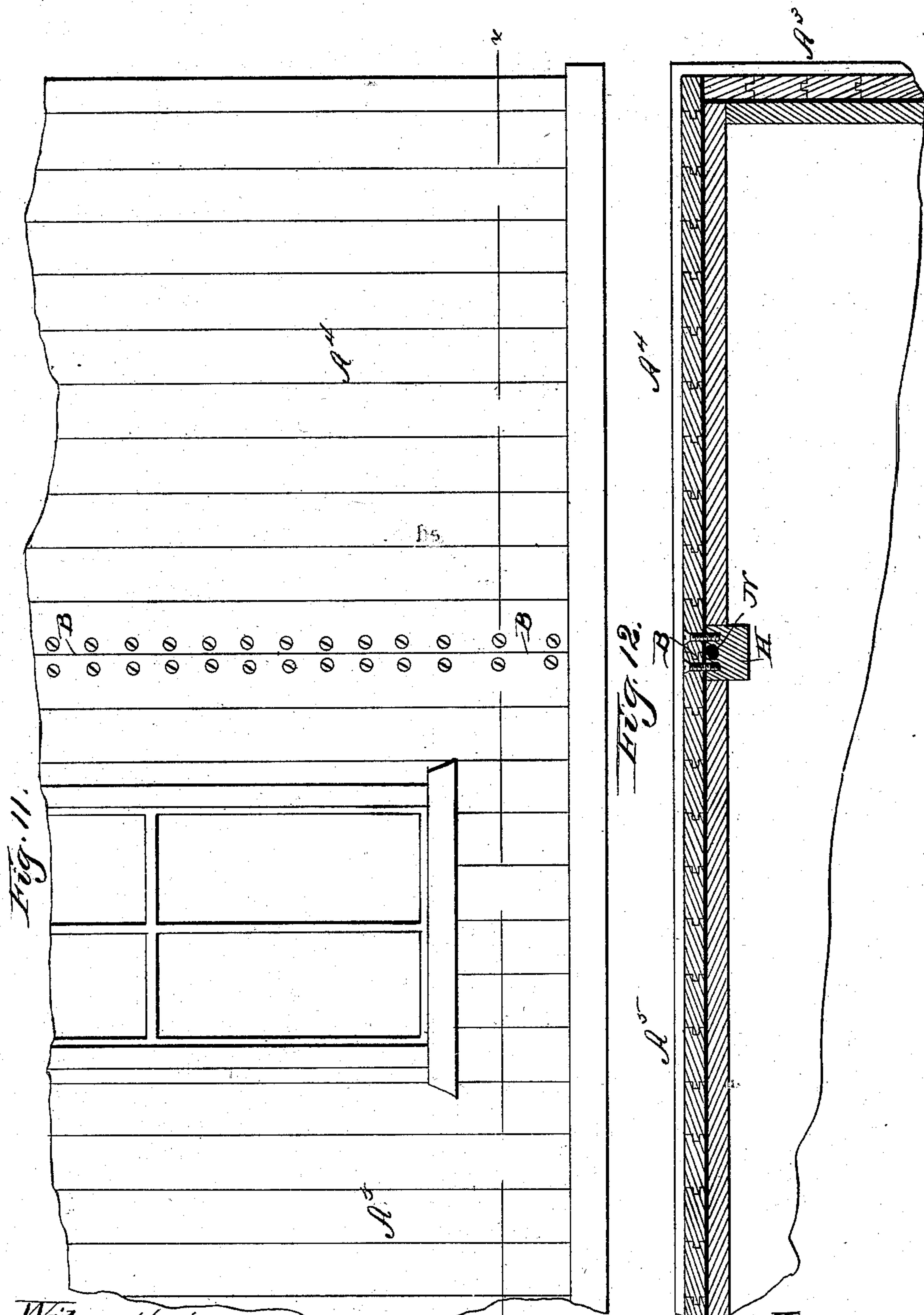
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UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y.

PORTABLE BUILDING.

SPECIFICATION forming part of Letters Patent No. 271,776, dated February 6, 1883.

Application filed February 25, 1882. (No model.)

To all whom it may concern:

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the State of New York, have invented certain new and useful Improvements in Portable Buildings; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figures 1 and 2 are vertical cross-sections of my house; Fig. 3, a vertical longitudinal section of the same; Fig. 4, a detail of part of one wall; Fig. 5, another detail of the same; Fig. 6, a detail showing the construction of the roof; Fig. 7, a section vertically through the window-frame. Fig. 8 shows the construction of the floors; Fig. 9, the manner of forming the walls with a layer of cement; Fig. 10, the manner of securing the tie-bolts and floor-timbers. Fig. 11 is a side elevation, and Fig. 12 a section on the line *x x*, Fig. 11.

This invention relates to novel improvements in the construction of buildings, which will be fully understood from the following description when taken in connection with the annexed drawings.

A A' A² A³ A⁴ A⁵ designate the sections which compose the walls of my portable building. These several sections are composed of two layers of wood, the grain or fibers of which are placed at or near a right angle to each other. Each layer is composed of narrow boards of uniform width, suitably matched or jointed together, so as to form close joints that will exclude the passage of both air and moisture. Interposed between these layers of wood is a layer, in one instance, of fibrous material consisting of a thick firm paper, and in another instance, when it is desired to render the building fire-proof, a layer of fire-proof cement that is at the same time one of the most perfect non-conductors of heat that is known—viz., gypsum or sulphate of lime containing twenty per cent. of water, and commonly known as “plaster-of-paris.”

The two layers may be united by screws or by nailing in the joint to conceal the nail-heads, or by other suitable means, care being taken not to run the nails entirely through both layers.

When a fire-proof cement is used as an intermediate layer between the two layers of wood forming a section, a fibrous elastic cord or strip may occupy the interval between said layers of wood around the entire edge of the section, excepting the upper edge.

The section A' is provided with a metallic fire-proof covering or sheathing.

After the boards which form the outer layer of wood in the section A' have been properly matched by the formation of the tongues and grooves, sheets of metal of proper length and width are applied to said boards, fitting their external surfaces, the bent edges of the metal sheets reaching to the tongues and grooves on the edges of each matched board, and being secured in position by nails or screws driven through perforations in the bent edges of said sheets into the edges of said matched boards, the said metal sheets being immovably fixed in position, when the matched boards to which they have been attached in the manner described are placed in proper position to form the external layer of the section in the manner set forth.

The inner layers of wood of the sections A A' A'' A''' A'''' are cut away at the upper and lower edges of these layers to form a bearing below on the supporting-sill, and to afford a bearing above for the upper plate that sustains the rafters of the structure, (see Fig. 1,) and the outer layer of wood in said sections extends downward into a groove formed between the ground-sill and the weather-board attached to the same, and also extends upward into a groove formed between the upper plate and the weather-board attached thereto; and the said section is firmly and rigidly attached to both the ground-sill and the said upper plate by bolts *b* passing through the said outer layer, weather-board, and ground-sill, and also through said outer layer, weather-board, and plate shown in Fig. 1. There is a narrow groove or recess formed in the inner surface of the sections aforesaid by cutting away the inner layer of wood that enters into their constructions, which is occupied by an intermediate plate that is continuous with and in the same plane with the second floor of the structure, the inner layer of wood of said sections affording a firm support and bearing below for

said intermediate plate, the office of which will be presently described. There may be slots formed in the outer layer of wood of the said sections in line with said recesses, each slot being located at the extremity of a movable tie or sleeper, and serving for the passage of an adjusting-bolt from the exterior of the section to a nut secured in the movable tie or sleeper near each extremity of the same.

In the perpendicular line B, where two sections meet or form a junction, there is a groove formed in the edge of the outer layer of one section and a tongue formed on the edge of the outer layer of the other section, so that there is formed a close joint externally in a perpendicular line between the two aforesaid sections. The edge of the inner layer of wood of the aforesaid sections in the perpendicular line B is cut away sufficiently so that when two sections are placed in their proper positions on the ground-sill below a groove will be formed between the perpendicular edges of the inner layers of wood of said sections, that will admit the passage of a metal rod, N, in a perpendicular line between the ground-sill below and the plate bearing the rafters above, passing through the intermediate plate between, the use of which will be hereinafter explained.

There is a layer of fibrous material extending in a perpendicular line over the metal rod just described to a proper distance on each side of the recess it occupies, from the ground-sill below to the intermediate plate above. Said layer of fibrous material forms an intervening layer between the interior surfaces of two sections, where their edges form a junction, and the outer surface of an upright supporting-post, forming a part of the interior frame-work of the structure, that extends between the ground-sill below in a perpendicular line upward to a movable tie or sleeper supporting the floor above.

It will be observed in this connection that the perpendicular edges of each section that meet or form a junction at the perpendicular line B are firmly bolted to the interior supporting-post, the bolts passing through the intervening layer of fibrous material covering the line of junction between the sections, as previously described.

CC' C'', &c., represent the ground-sills of the building, which are firmly secured together by joint-bolts and nuts, the latter being so well known as not to need a detailed description.

E''' represents a sleeper or tie extending laterally under the ground-floor, in the same plane with it, and firmly secured at each extremity by joint-bolts and nuts to the sills C and C''.

F represents a longitudinal sill or sleeper, extending the length of the structure beneath the sleeper or tie E''', it being securely bolted to said sills and tie and forming a bearing for them at or near the lateral center of the structure.

F' represents the ground-floor of the structure,

divided into sections and provided on its lower surface with a layer of paper, d, saturated with coal-tar to prevent the passage of moisture into the apartment above. The sections forming the ground-floor F' may be securely fastened to the sills and tie or sleeper below by screws or bolts, which may be removed when the building is being taken down to be removed to a new site.

G represents an upright central post or column, extending from the longitudinal sill F through the floor F' to the tie or sleeper above, that assists in supporting the second floor of the structure. This post G is firmly attached to the longitudinal sill or sleeper F by a joint-bolt and nut, e, and it is also cut away near its lower extremity to partly embrace and obtain a bearing upon the sleeper E''', and near the joint-bolt and nut that connects it with the sleeper F there is also a joint-bolt and nut, e', connecting this post to the tie or sleeper E'''.

I I' designate the intermediate plates forming the external support for the second floor. Said plates partly occupy recesses formed in the interior surface of the sections forming the walls of the structure, being supported by the inner layer of wood forming said sections, and also by the perpendicular supporting posts or columns H H'. If desirable, these posts H H' may be joint-bolted to said intermediate plates, although, except when unusual strength and rigidity are required, this will not be necessary. There may be mortises cut at proper intervals in the intermediate plates for the insertion of the ends of the movable ties that support the second floor, and connected with these mortises are slots extending through said plates, that correspond with slots formed in the outer layer of the sections forming the wall of the structure, so that a bolt may be inserted from the external surface of said wall through the intermediate plates, I I', into the ends of the movable ties or sleepers, entering the mortises in said plates.

J designates a movable tie or sleeper for supporting the second floor of the structure. This movable tie or sleeper J is formed in two pieces, secured together by bolts or screws, and it is provided with a groove to receive a serpentine bar, J', of iron, by means of which said tie is made to serve as a truss when it is so desired. It will be seen by reference to Fig. 1 that the rod J' is provided at each end with a nut, f, properly applied by means of a thread, and that a bolt, J², from the exterior of the wall of the structure also engages one end of each of said nuts attached to the ends of the curved bar J'. When the movable tie J is placed in its proper position its ends enter opposite mortises in the intermediate plates, I I', and by means of the adjusting-bolts introduced through the slots on the exterior of the building and also through corresponding slots entering the mortises in the intermediate plates, I I', the whole structure situated between the heads of said adjusting-bolts may be com-

pressed laterally, and by means of the curve in the bar J' passing through the tie J this tie may be elevated, carrying with it the floor it sustains. Each upper edge of the movable tie J is provided with a beveled or acute-angle recess to engage and receive the beveled projection on the end of the sections which form the second floor, and said recess or groove is provided with holes for the insertion of dowelpins, which serve, in addition to the said recess, to connect the aforesaid floor-sections. By having slots in the intermediate plates, I I', and the corresponding ones in the external wall, the tie or sleeper J may be readily moved to and fro in a direction corresponding to the length of the building.

K K designate rods having a longitudinal direction from one movable tie or sleeper J to another passing in the interior of the floor-sections and sustained by said ties or sleepers. It is by means of these rods that a firm unyielding joint is formed between the projections on the end of the second-floor sections and the aforesaid movable ties J J. Besides holding the movable ties or sleepers in their proper position and establishing a firm unyielding joint between said ties or sleepers and the floor-section they sustain, said rods are a valuable auxiliary in aiding to sustain the floor-sections, passing as they do through the interior of said ties or sleepers. A greater or less number of these rods may be used, according to the weight which the floor-sections are required to sustain.

L L designate the floor-sections of the second floor. It will be observed that these sections are each formed of narrow strips of lumber firmly nailed or bolted together, and that each one is provided at its end with a beveled projection that fits into and is secured by the rod K in the acute-angled or beveled recess in the upper edge of the movable tie or sleeper J. I may form said sections of one solid layer of lumber, or of two thin layers with an interspace between them. Each section is provided at each end with dowel-pins, which enter holes made in the movable tie or sleeper J.

M represents a rod provided with a nut at each end, passing laterally from one side of the structure to the other through the interior of the floor sections at right angles to their grain or fiber. By actuating the said nuts from the exterior of the structure the sections forming the second floor may be compressed laterally, while said rod will at the same time serve as a supporting-truss for the floor, the interior of which it traverses. In buildings of only one story, and also those of one and a half story in height, said rod is of great importance, as in such buildings it may be used in place of and as an equivalent for the interior lateral supporting-posts, H H', a light molding being used, in combination with the layer of elastic fibrous material covering the rod and joint, instead of said posts or columns. By the use of rod N, as described, a direct

metallic connection is established between the ground-sill of the structure and the foot of the rafter N', which will firmly bind all of the intermediate parts together in a perpendicular line.

O represents an interior post or column, extending from the second floor to the ridge of the roof, joint-bolted both to the movable tie or sleeper J below and to the upper end of the rafter N', at the ridge of the roof. By means of this arrangement it will be seen that there is a direct rigid connection between the tie or sill F and the ridge of the structure by means of the upright columns or posts O and G and the tie J and joint-bolts and nuts. As an equivalent for the solid posts and joint-bolts and nuts, I may use hollow posts with tie-rods passing through them and secured to the ground-sill and ridge-rafter.

P designates a window-frame, applied to a section forming a portion of the wall of the structure. This window-frame is made in two parts, one of which is attached to the exterior and the other to the internal surface of the wall of the building. The groove in which the window-sash P' slides is formed by the union of the aforesaid parts. The internal portion of this sectional frame extends from the floor to the ceiling on the interior surface of the section to which it is applied, and the window-sill forms a part of the exterior section of the window-frame. This sill is cut away, so as to allow the window-sash to descend to the floor, and the groove in which the sash slides allows it to be raised a certain distance above the sill in the ordinary manner. By this construction and arrangement a single window-sash may be operated to the greatest advantage in practice, it being raised or lowered as may be desired. After the two window-frame sections are removed from the structure they may be secured together by screws or bolts in precisely the same position they occupy in practice, with the sash P' in its usual position, thus making a compact package for transportation. If, in some instances, a single sash is not sufficient, a double sash constructed and applied in the usual way may be substituted. By having the internal section of the frame P made very strong and firmly attaching it to the floor below and ceiling above, and also rigidly securing it to the wall to which it is applied, it becomes a valuable auxiliary in giving strength and rigidity to said wall.

Q represents the roof of the portable building, which roof is formed in sections of sufficient width to insure ease in handling and transportation. This roof is composed of two layers of wood, the grain of which is placed at an angle to each other, and these layers are secured together by a metallic connection that does not penetrate the external layer externally. A fire and water proof cement is used, which forms an intermediate layer between the aforesaid layers of wood. A cord or strip, g, of fibrous material, is interposed between the

two wood layers and located at the edges (or near the edges) of each section, excepting the upper or ridge edge. By the use of this cord *g* a space is formed between the wood layers that may be filled by a liquid preparation of suitable fire and water proof cement, which will become hard at ordinary temperatures. By this means the fire and water proof element is protected from the disintegrating effects of the sun and frost by the external layer of wood which enters into the construction of the roof-sections. This external wood is firmly cemented in position and prevented from rapid decay by the adhesive and preservative qualities of the cement used. By thus employing the cement it is in a thin layer, which is more desirable than a thick layer would be applied in the usual manner. Both layers of wood should be accurately jointed or matched together, so as to be of themselves proof against the passage of water, and the external surface of the outer wood layer should be kept well covered with a good fire-proof paint.

Q' represents a metallic sheathing applied on the roof *Q*. With the exception that each board of the external layer in the roof is hollowed or grooved so as to form a gutter, and at the same time the metallic sheathing is adapted to fit the same, the application of said sheathing to the roof is in every respect similar to its application to the sections entering into the vertical walls of the building which has been above described.

Between each concave section or gutter forming the roof *Q*, I interpose a *T*-shaped piece of metal, *h*, forming a water-tight joint, while the sheets of metal forming the gutters come in contact at their joints. In some instances the metal sheathing may be substituted for the layer of fire and water proof cement, or it may be used in combination with the latter. In all cases where the roof is composed of several sections, as described, the boards of the external layer of wood next to the edge of the section should be grooved or guttered and a metal sheathing applied in the manner described, with the *T*-shaped pieces of metal interposed between the sections to make a water-tight joint.

By reference to Fig. 3 it will be seen that the ground-sills *E'''*, near the center of the building, are secured to the lower interior lateral supporting-post by joint bolts passing upward through said sills in a perpendicular line into said post, and that they are also secured to the central lateral tie or sleeper by joint-bolts passing through said tie in a lateral direction, and that these bolts are in close proximity to each other. By thus passing the bolts in two directions, as stated, they prevent the sills from splitting or giving away when subjected to great strain.

Having described my invention, I claim—

1. The sections which compose the walls of a building, formed of two layers of wood suitably jointed, the fibers of one layer being ar-

ranged at right angles to the fibers of the other layer, in combination with an interposed non-conducting substance and with metallic connections which do not penetrate entirely through the external layer, substantially as described.

2. The combination of two layers of wood so arranged that the grain in these layers does not run parallel with each other, metallic connections for the layers, consisting of nails or screws obliquely driven through the base of the tongue of each board forming a layer, and extending into but not through the adjacent layer, and an interposed layer of fibrous or fire-proof material, substantially in the manner and for the purposes described.

3. A section for the wall of a portable building, composed of boards matched or jointed in two opposite crossing layers, in combination with a metal sheathing having its edges bent at right angles and secured between the joints of the boards forming the outer layer of the section, substantially as described.

4. The section for the wall of a building, composed of boards matched or jointed in two opposite crossing layers, in combination with the cord or strip of yielding material forming a space between the said layers and a layer of fibrous or fire-proof material filling said space, substantially as described.

5. A section for the wall of a building, composed of boards jointed and secured together in two opposite crossing layers, in combination with an interposed filling, metallic sheathing-strips having their edges confined between the joints of the outer-layer boards, and *T*-shaped sealing-strips applied substantially as described.

6. The combination of the metallic sheathing, formed into gutters and applied as set forth, in combination with two crossed layers of wood, with or without a layer of water-proof cement between them, when the whole is used as a section of the roof of a portable building, substantially as described.

7. A layer of fibrous material applied between and combined with the upright posts of the frame-work that support the ties or sleepers above the ground-floor and the inner surface of the wall, said wall and uprights serving to compress the intervening layer of fibrous material, substantially as described.

8. A longitudinal tie or sleeper running the entire length of the building beneath the sleepers that support the ground-floor, in combination with joint-bolts and nuts that attach said sill to the lower extremities of upright columns which extend upward to the ties or sleepers above, the lower ends of said columns being halved into a sleeper or tie that supports the ground-floor, substantially as described.

9. A serpentine or tortuous bar or rod of metal combined with and inclosed in a tie or sleeper, and adapted to serve as a truss for adjusting the floor resting on said tie or sleeper, and adapted for being operated by adjusting

bolts on the exterior of the building, substantially as described.

10. The combination, with the tie J, of the curved truss-bar J', the square nuts f, and the two adjusting-bolts J², substantially as and for the purposes described.

11. In combination with the curved truss-bar, the tie or sleeper J, formed of two parts and provided with a groove, substantially as described.

12. The upper edge of each tie or sleeper provided with the beveled recess, in combination with and for engaging the beveled projection on the upper edge of the sections forming the floor, substantially as and for the purposes set forth.

13. The floor of a portable building, formed of sections, the ends whereof that cross the grain being provided with beveled projections, in combination with a beveled recess in the supporting ties or sleepers, substantially as and for the purposes set forth.

14. The dowel-pins connecting the sections which compose the floor with the supporting ties or sleepers, in combination with said sections and sleepers, substantially as described.

15. The plate I' and section A⁵, provided with slots, in combination with the floor-sections and their supporting-ties or sleepers and the bolts, substantially as described.

16. The plates I I', provided with slots and the sections A A⁵, also provided with slots, in combination with the curved truss-rod J', nuts, and adjusting-bolts f J², the latter extending through the sections, substantially as described.

17. The rods K K, extending from one tie or sleeper to another in a longitudinal direc-

tion, and passing in the interior of the floor-sections, in combination with the ties and floor-sections, substantially as described.

18. The ground-floor F', divided into sections adjustably secured to the sills, and provided on its under surface with a layer of paper, d, saturated with coal-tar or its equivalent, substantially as set forth.

19. The upright rod extending in a recess in the sections forming the wall of the building from the sill to the top of the plate and passing through the foot of the rafter, substantially as described.

20. A window-frame consisting of two vertical parts, the interior portion extending from the floor below to the ceiling above, and the parts constructed and applied to the wall of a portable building substantially as described.

21. The interior section of a two-part window-frame secured to the inner surface of the wall of a portable building, and extended from floor to ceiling, forming a supporting-column for the sectional wall, substantially as described.

22. The combination of the two joint-bolts e e' with the tie or sleeper E''', tie F, and post G, the said bolts passing through the sill, one bolt in a lateral and the other bolt in a perpendicular direction, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VIRGIL W. BLANCHARD.

Witnesses:

HENRY P. SISSON,
JOHN R. QUAlFE.