

No. 760,135.

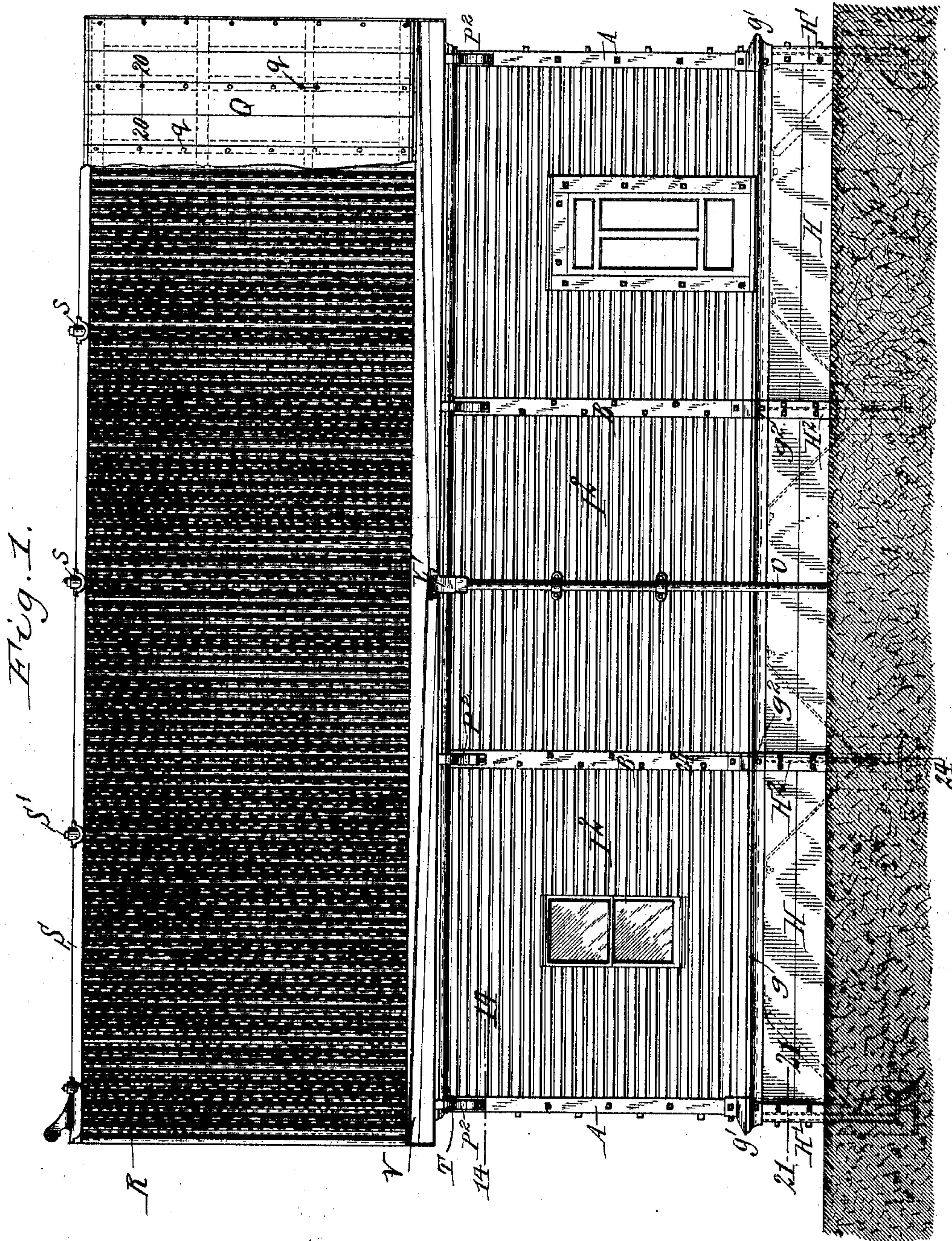
PATENTED MAY 17, 1904.

A. MILLER.
PORTABLE HOUSE.

APPLICATION FILED JULY 16, 1903.

NO MODEL.

8 SHEETS—SHEET 1.



Witnesses:
Louis W. Gratz.
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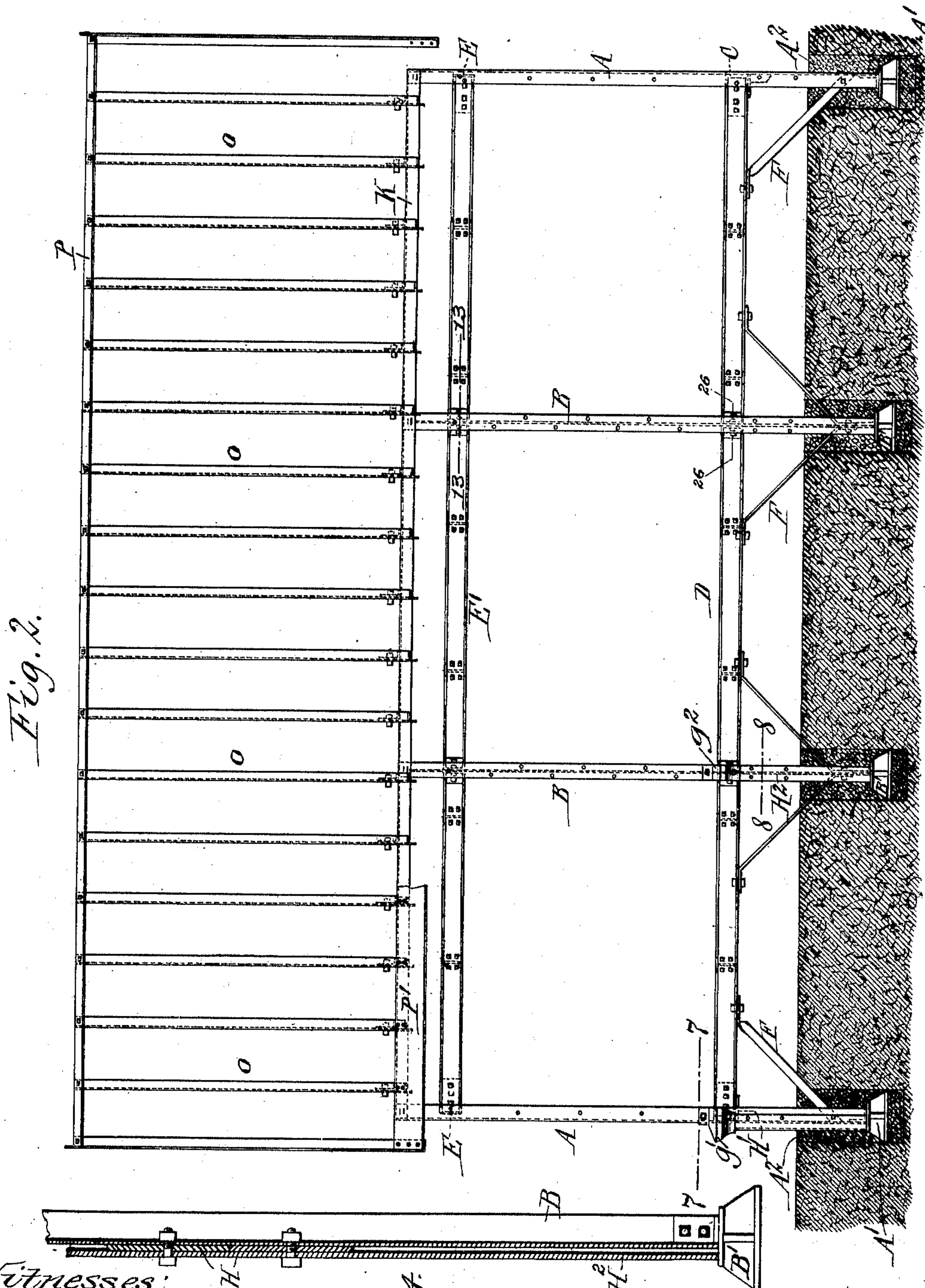
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8 SHEETS—SHEET 2.



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Fig. 24.

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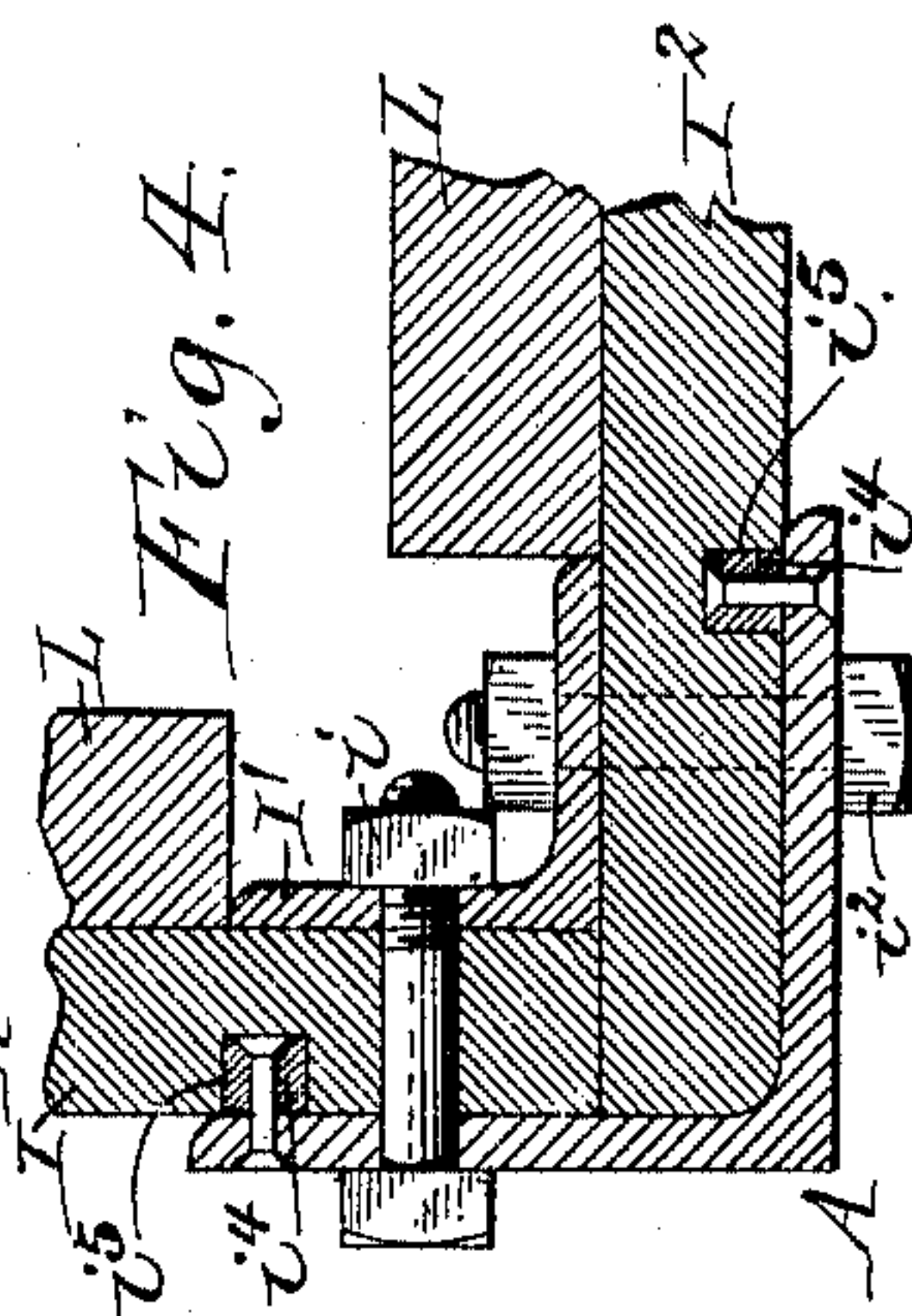
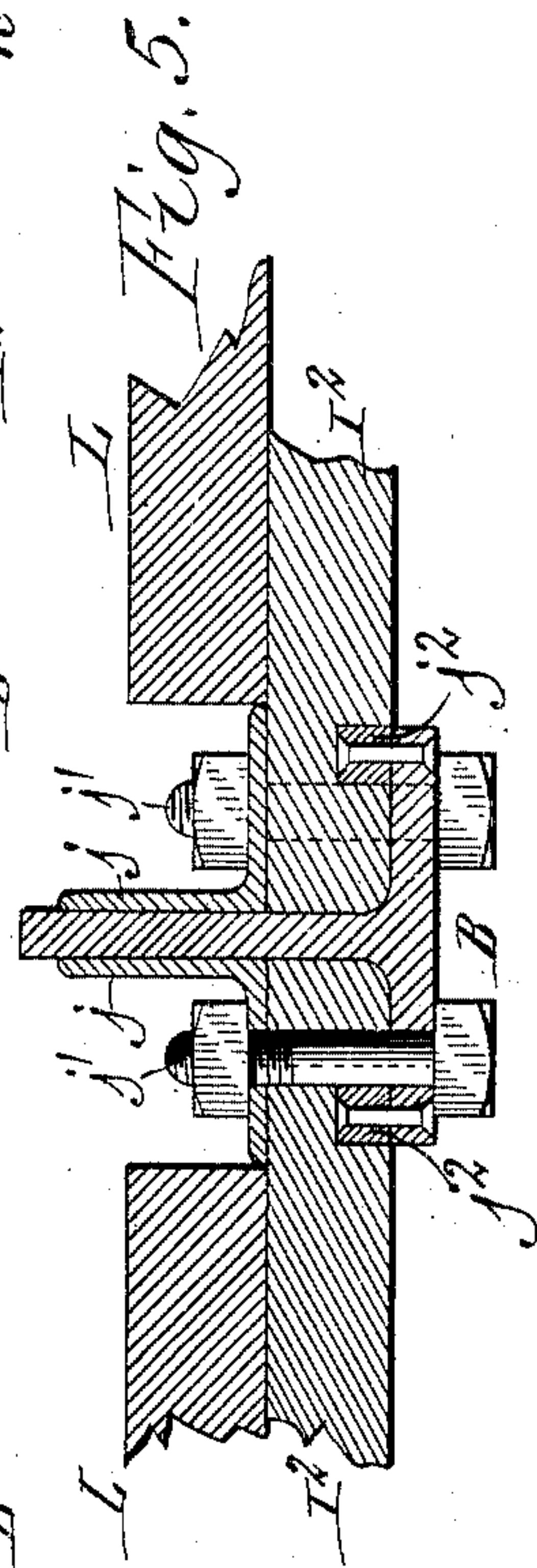
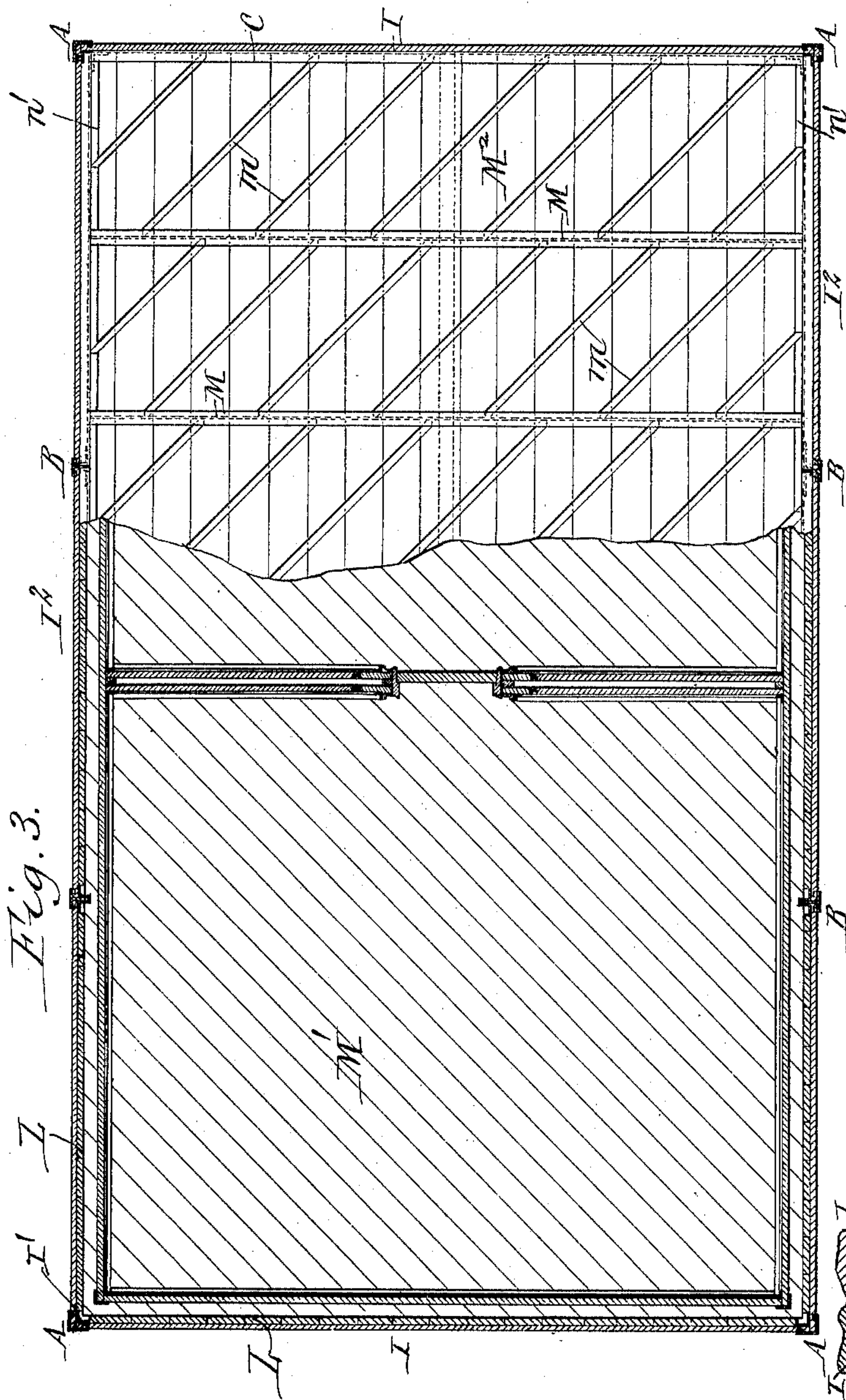
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8 SHEETS—SHEET 4.

Fig. 6.

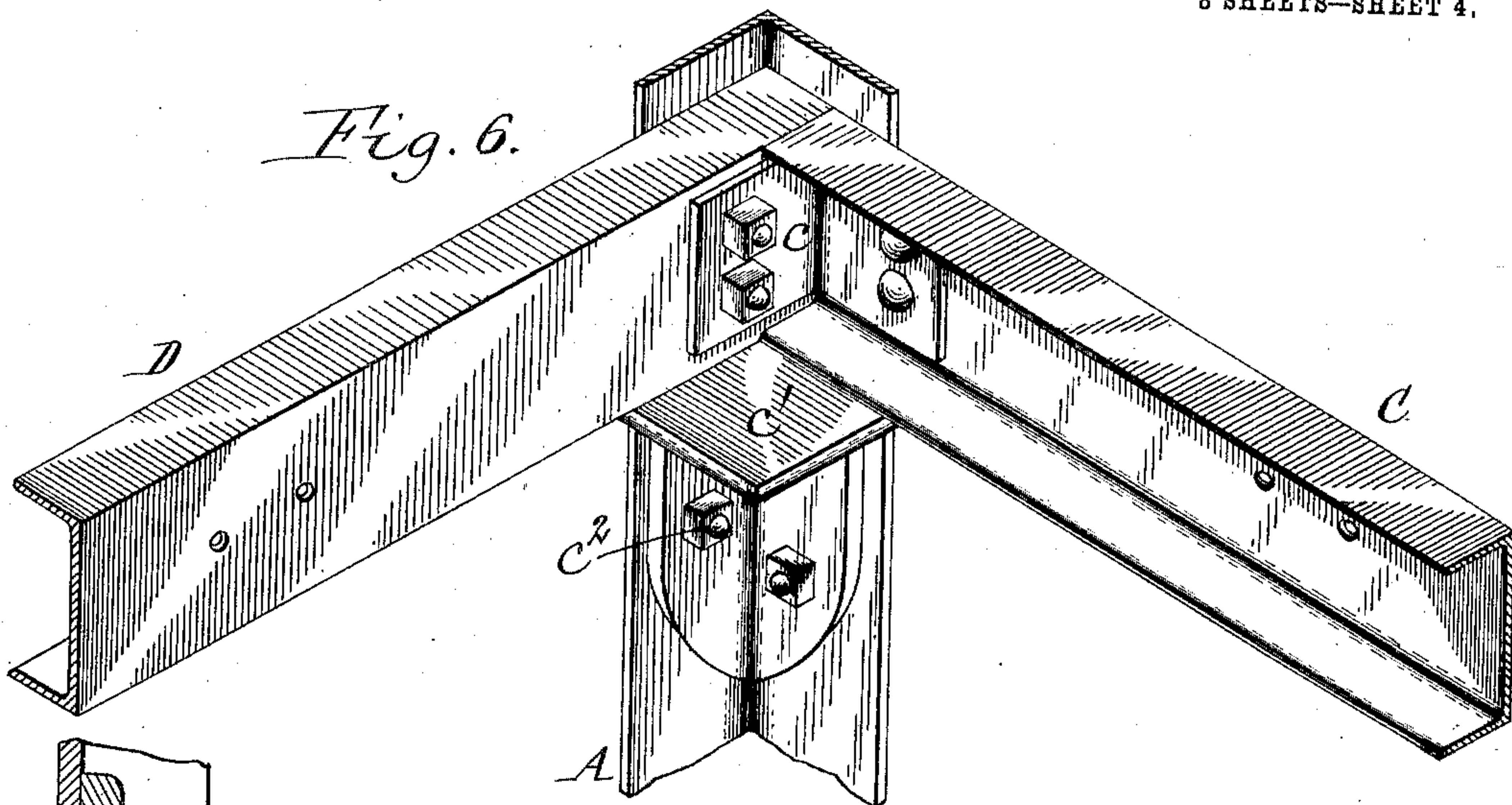


Fig. 7.

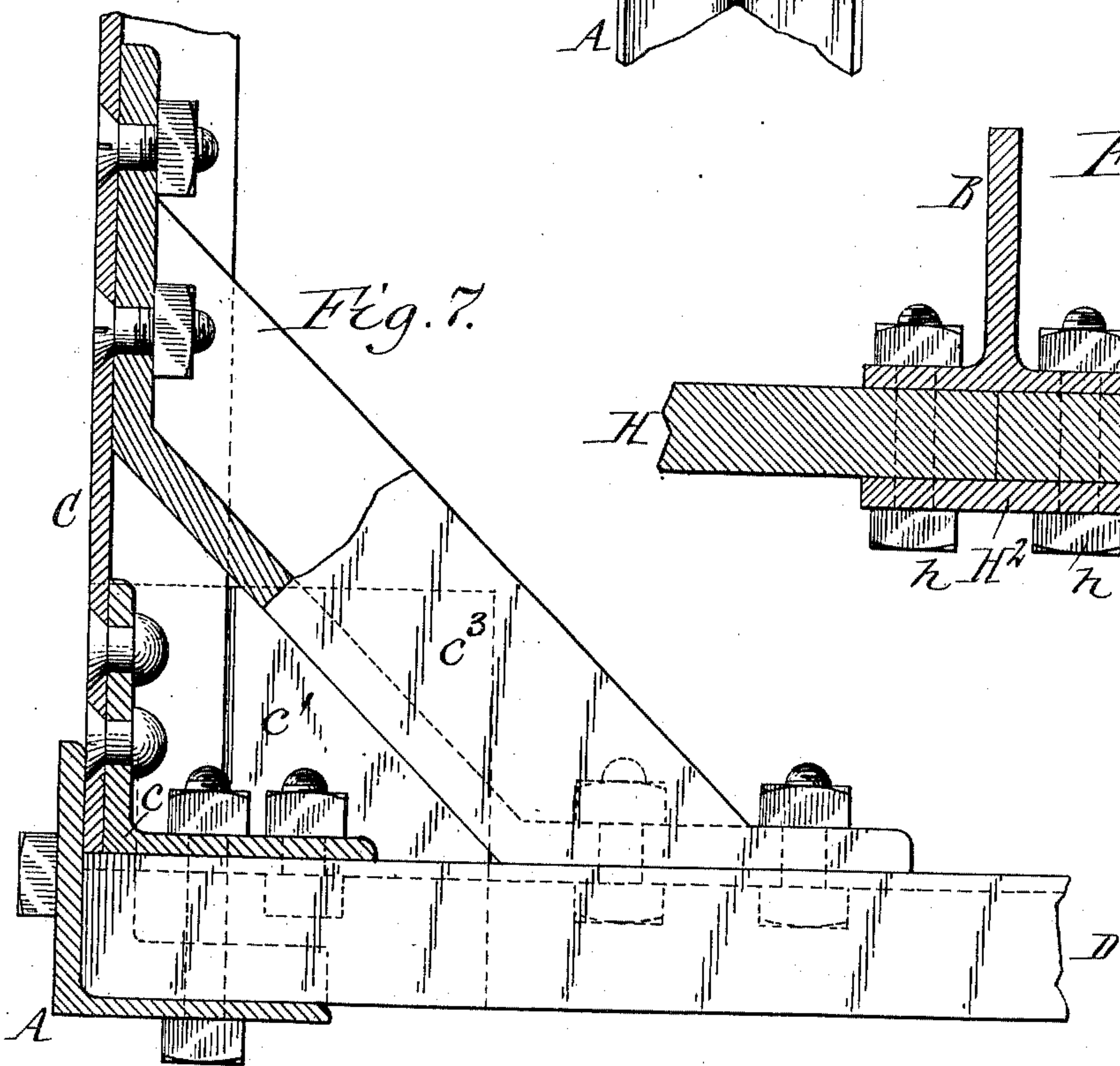


Fig. 8.

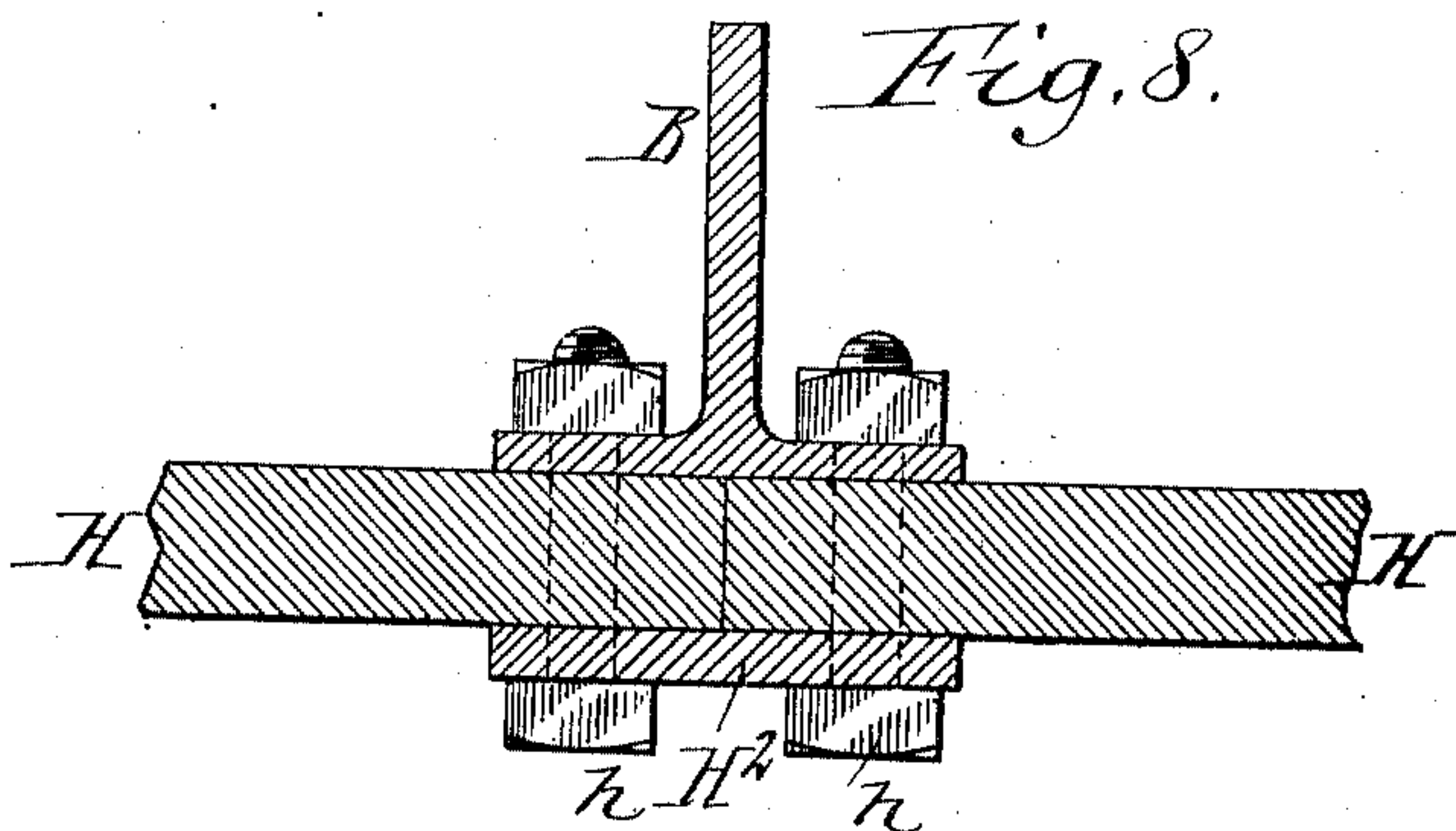
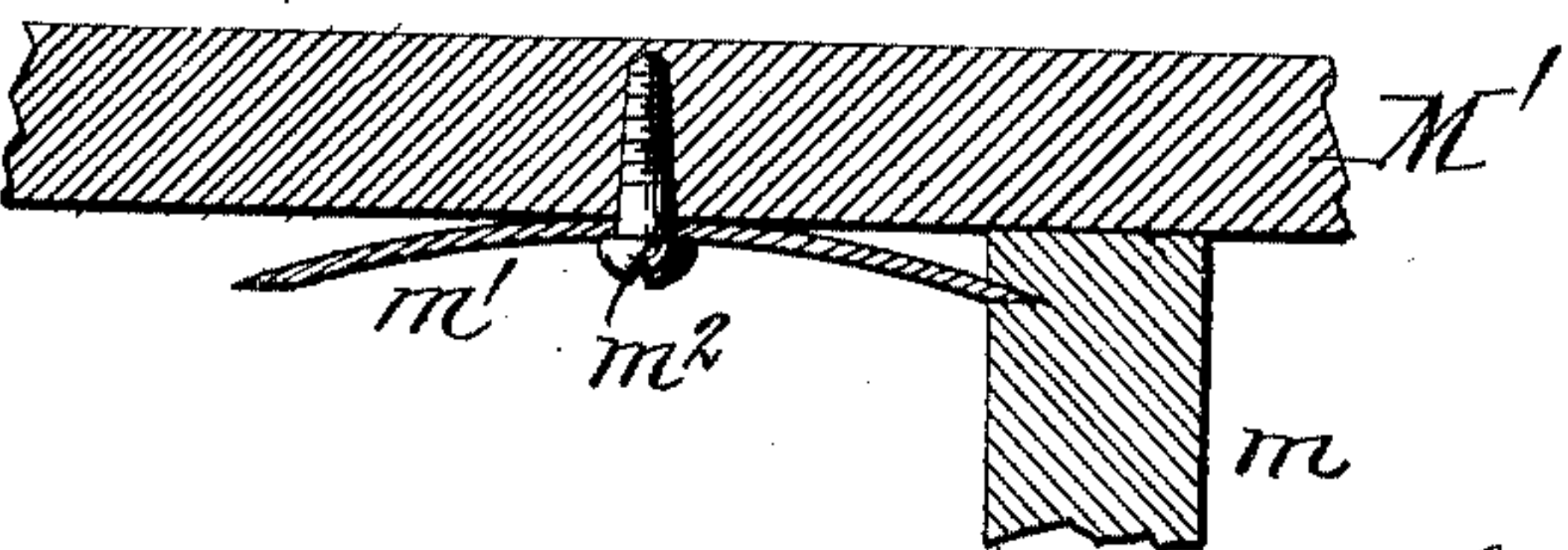


Fig. 9.



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8 SHEETS—SHEET 5.

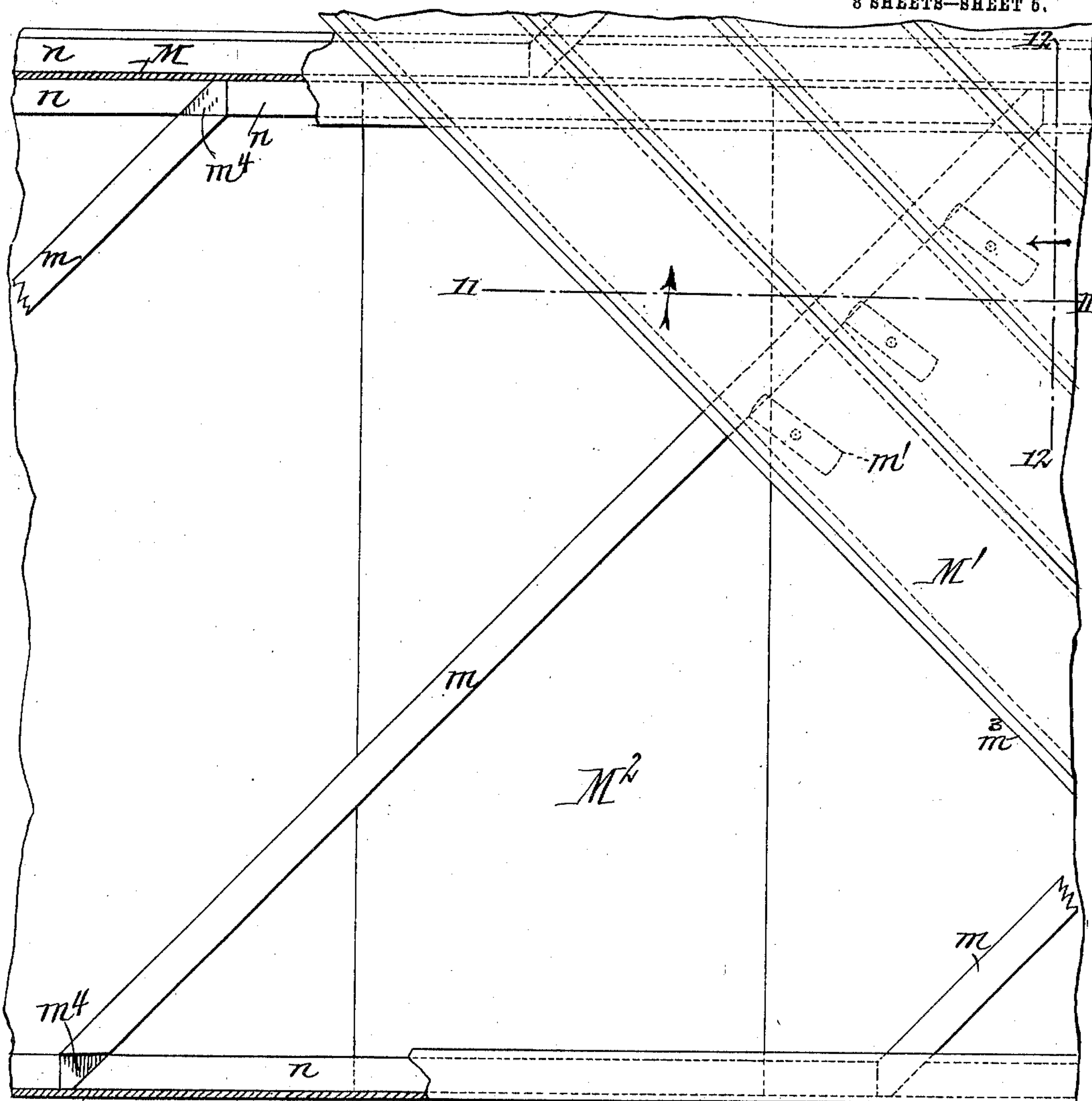


Fig. 10.

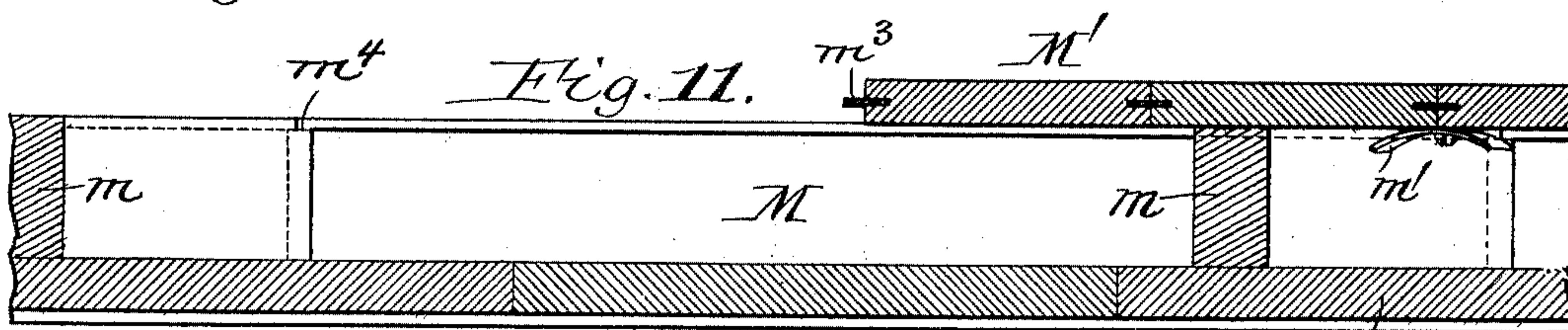
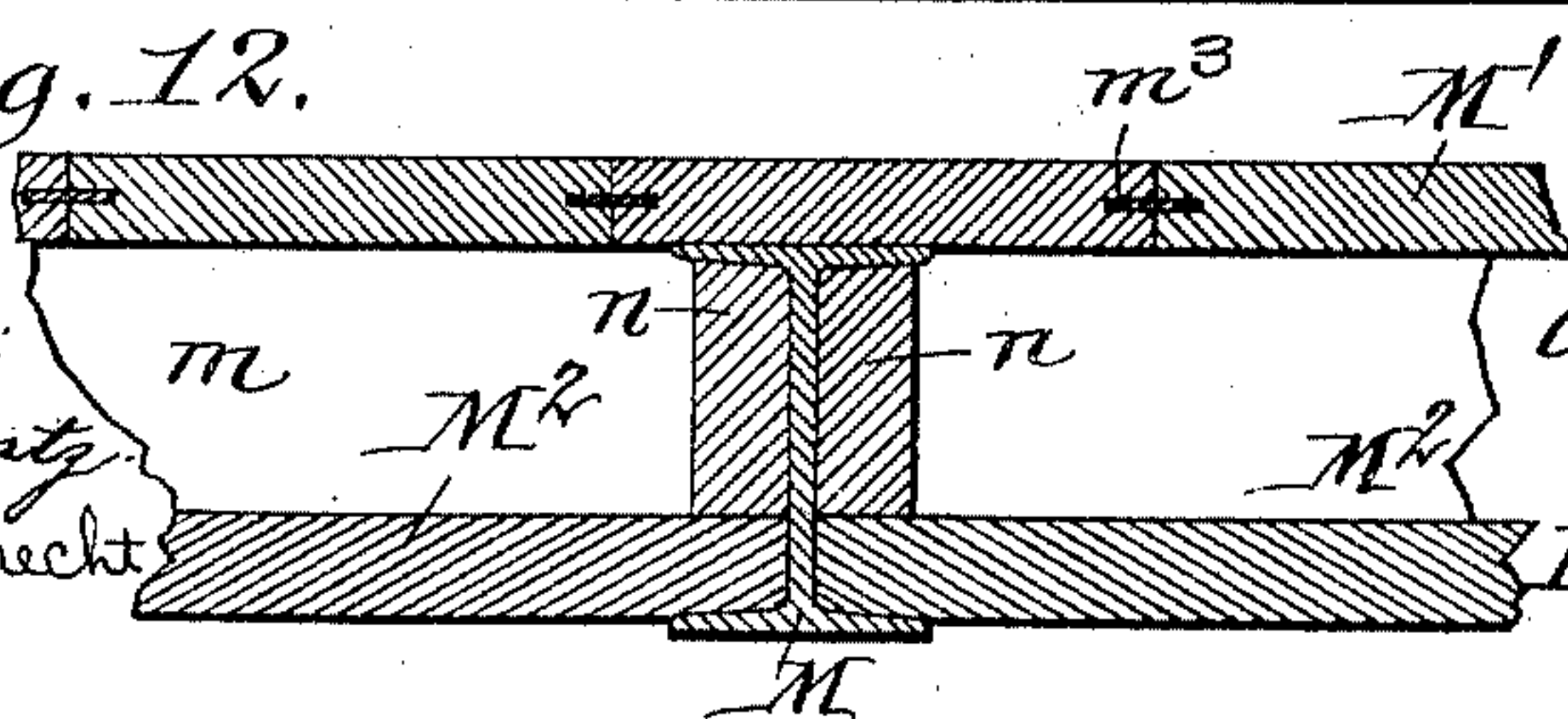


Fig. 11.



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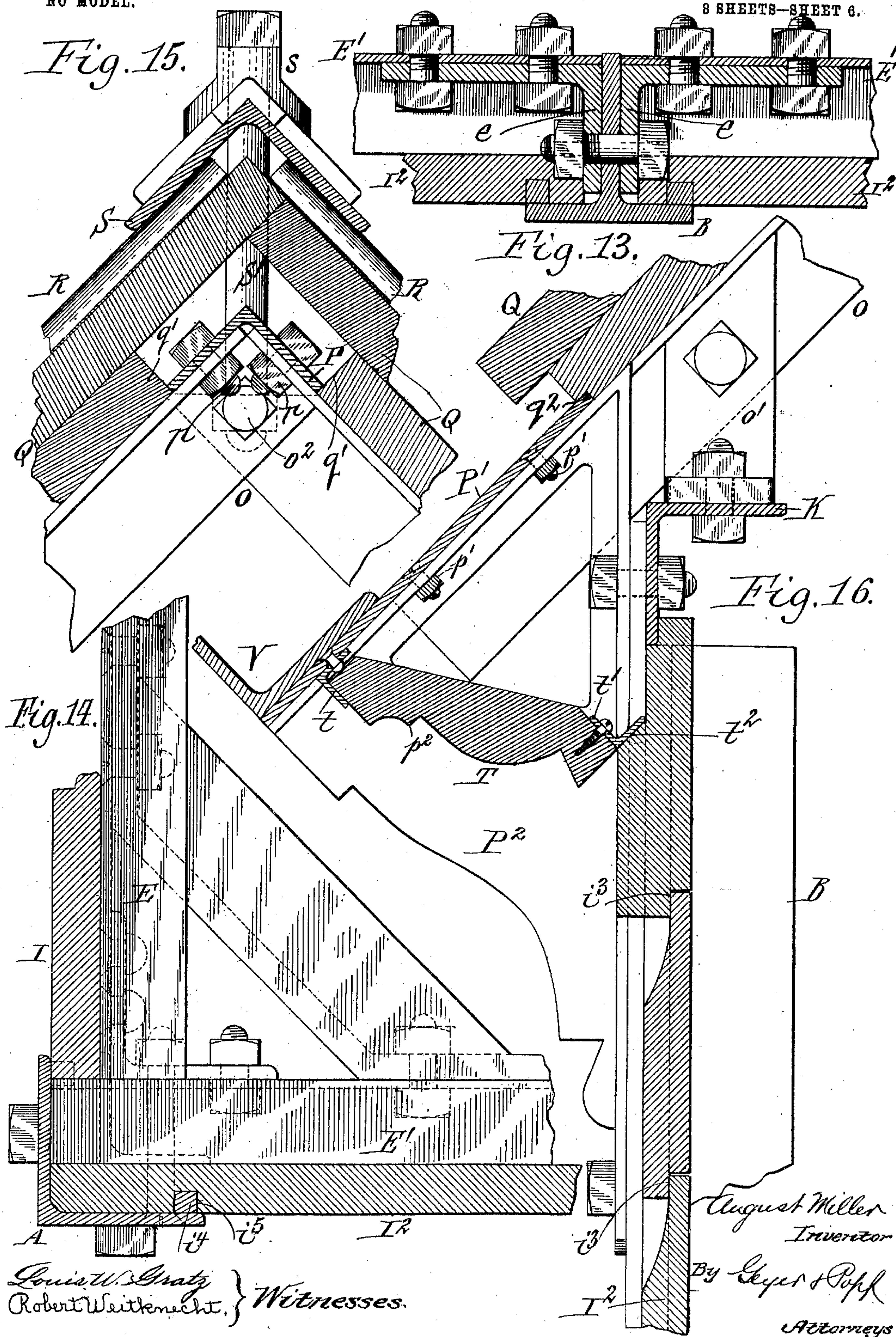
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A. MILLER.
PORTABLE HOUSE.

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NO MODEL.

8 SHEETS—SHEET 6.



No. 760,135.

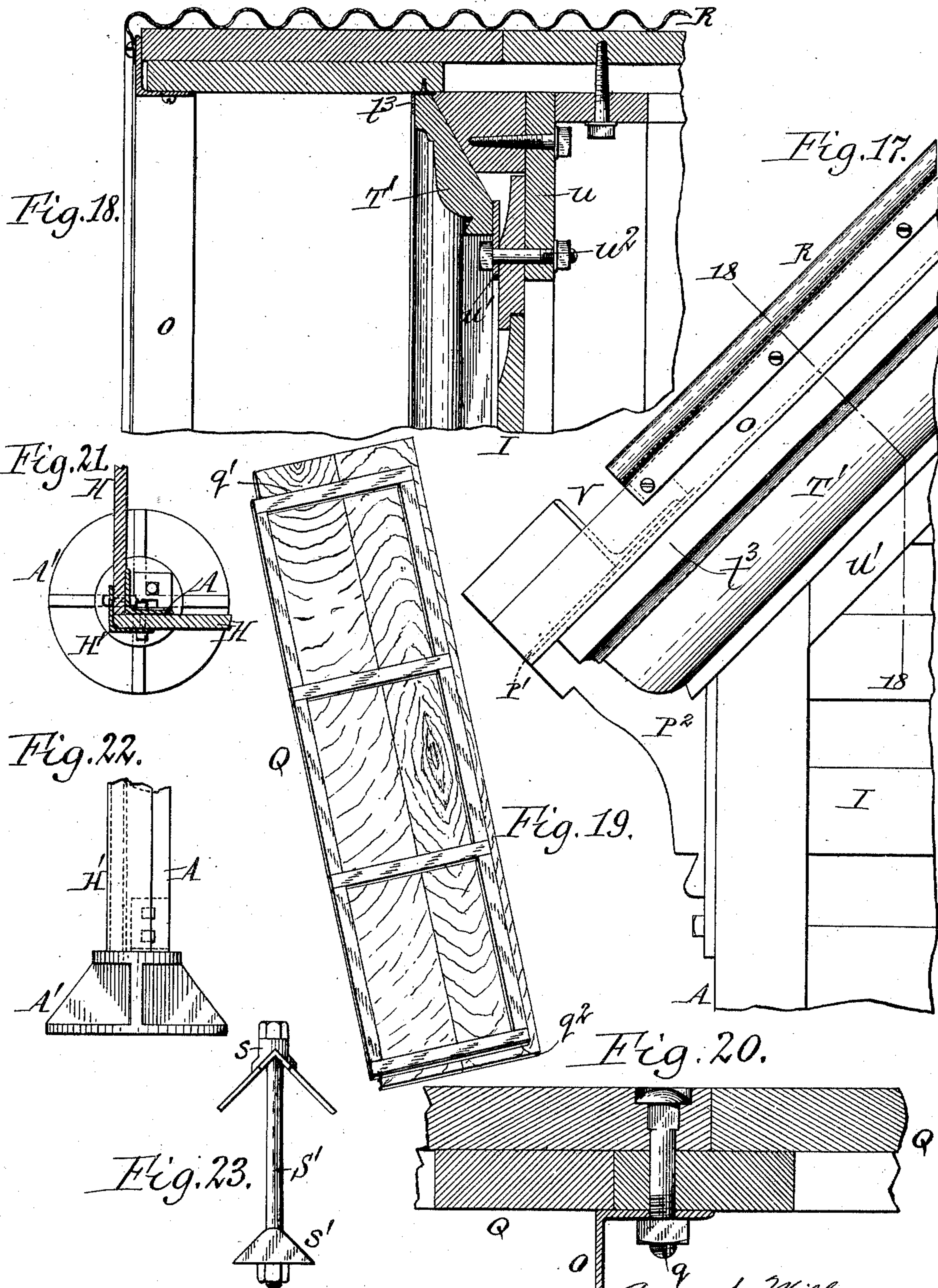
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NO MODEL.

8 SHEETS—SHEET 7.



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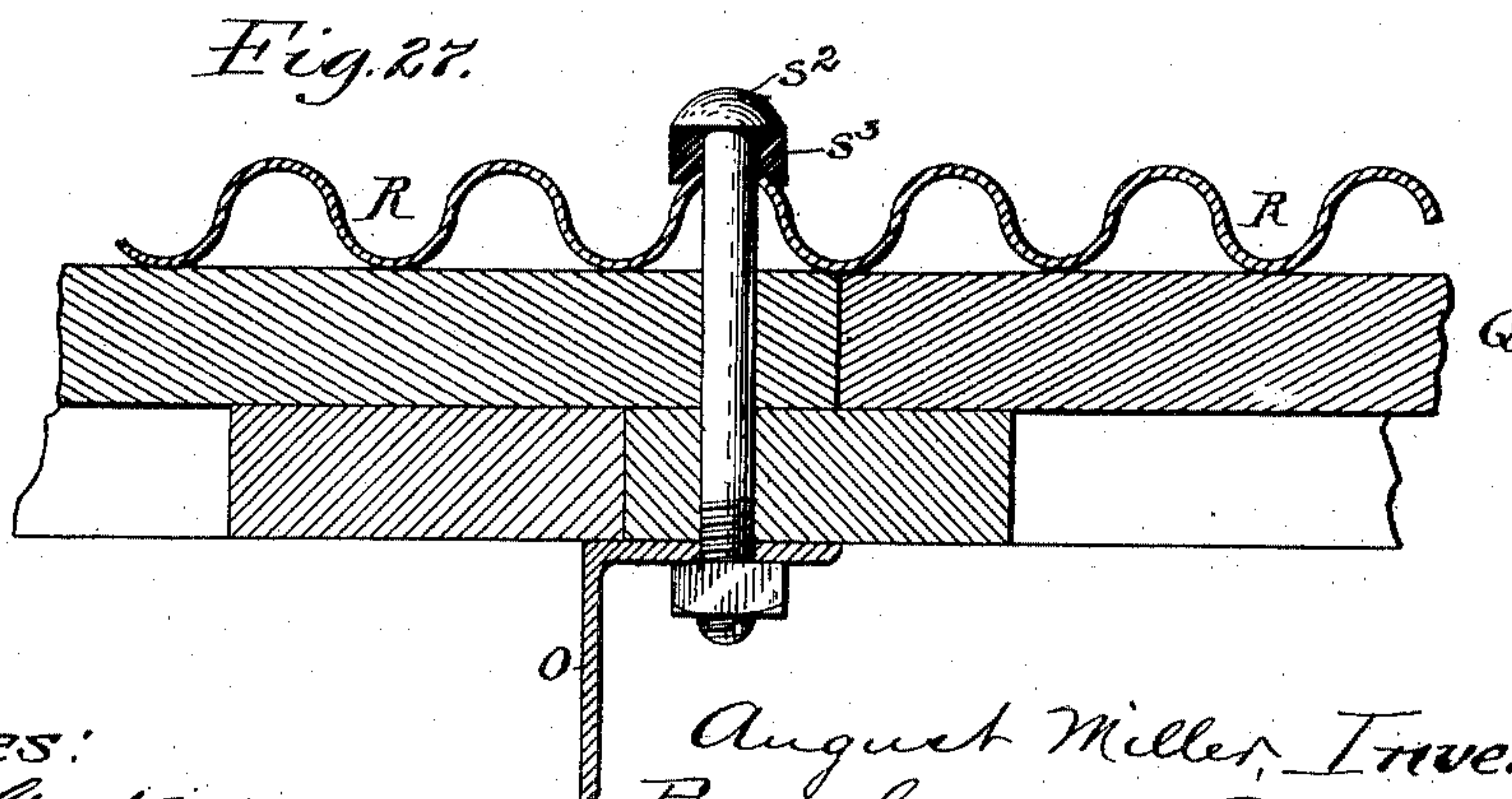
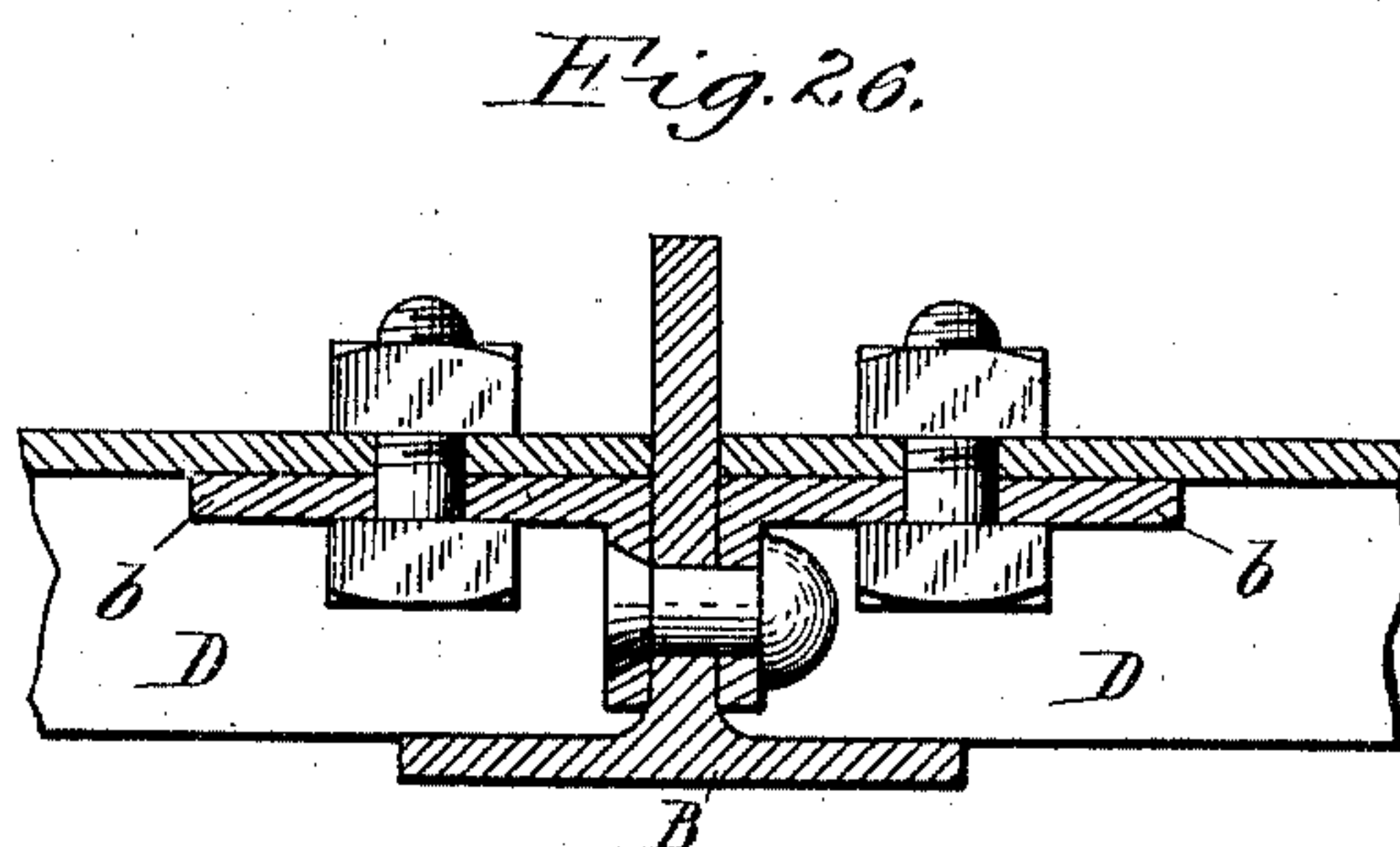
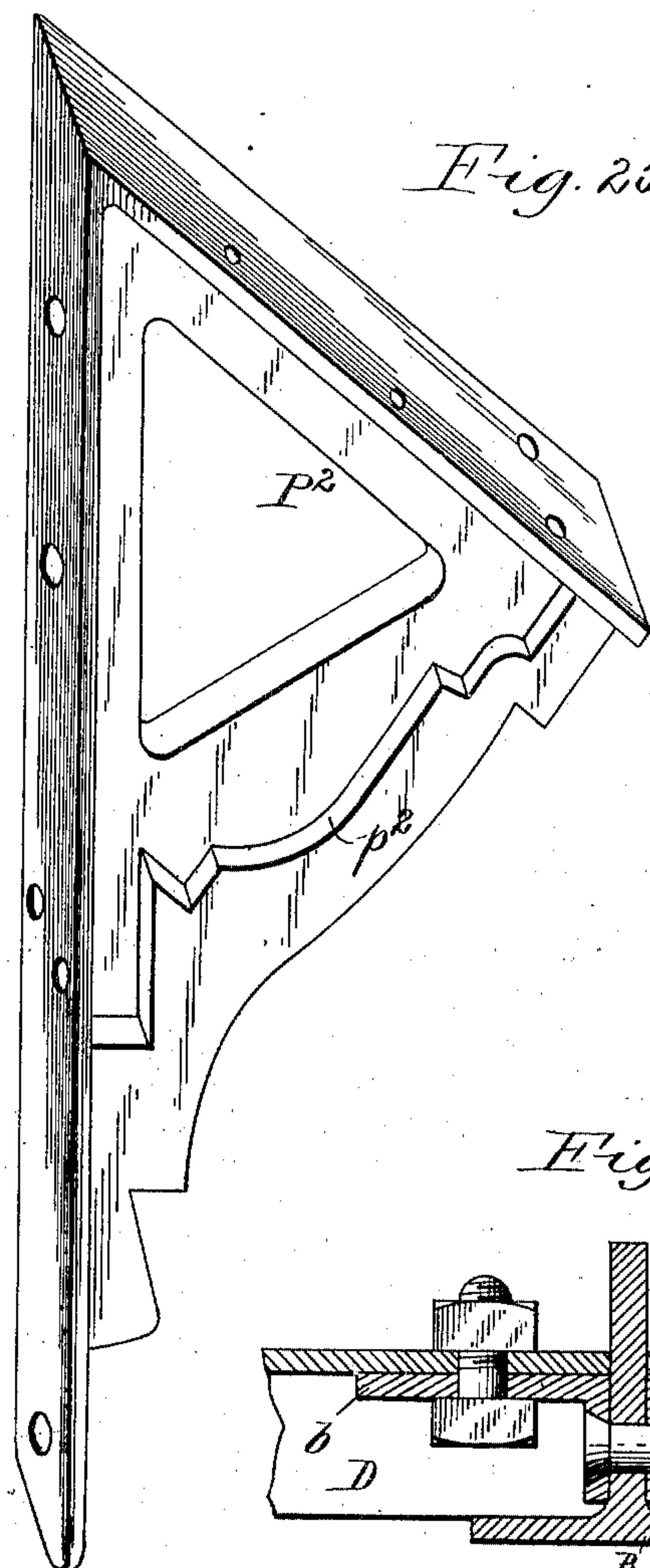
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APPLICATION FILED JULY 16, 1903.

NO MODEL.

8 SHEETS—SHEET 8.



Witnesses:
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UNITED STATES PATENT OFFICE.

AUGUST MILLER, OF BUFFALO, NEW YORK.

PORTABLE HOUSE.

SPECIFICATION forming part of Letters Patent No. 760,135, dated May 17, 1904.

Application filed July 16, 1903. Serial No. 165,800. (No model.)

To all whom it may concern:

Be it known that I, AUGUST MILLER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Portable Houses, of which the following is a specification.

This invention relates to a portable or knock-down house designed more especially as a cheap dwelling for the laboring classes, but also suitable for other purposes, such as military hospitals and officers' quarters.

The object of my invention is the provision of a strong and tight building of this class in which the various frame members and other parts can be constructed at the factory, compactly transported, and readily assembled without the use of nails or similar fastenings and without requiring any fitting or cutting of parts or similar hand labor in erecting the building.

In the accompanying drawings, consisting of eight sheets, Figure 1 is a side elevation of a portable house embodying my invention, a portion of the roof-sheathing being broken away. Fig. 2 is a similar elevation of the metallic frame of the house. Fig. 3 is a horizontal section of the house, taken immediately above the lower floor, the floor-boards being partly broken away. Fig. 4 is a fragmentary horizontal section, on an enlarged scale, taken through one of the corners of the house. Fig. 5 is a similar section through one of the stud-posts. Fig. 6 is a fragmentary perspective view of one of the connections between the sills and a corner-post, the diagonal brace being omitted. Fig. 7 is an enlarged horizontal section in line 7 7, Fig. 2, the upper flange of one of the sills being broken away. Fig. 8 is an enlarged horizontal section in line 8 8, Fig. 2. Fig. 9 is a fragmentary longitudinal section of one of the floor-boards and its fastening-bar. Fig. 10 is a sectional top plan view of a portion of the lower floor on an enlarged scale. Figs. 11 and 12 are fragmentary vertical sections in lines 11 11 and 12 12, Fig. 10. Fig. 13 is a fragmentary horizontal section, on an enlarged scale, in line 13 13, Fig. 2. Fig. 14 is a fragmentary hori-

zontal section in line 14 14, Fig. 1, on an enlarged scale. Fig. 15 is a fragmentary vertical section of the roof on an enlarged scale. Fig. 16 is a fragmentary transverse vertical section of one of the side walls and the lower portion of the roof on an enlarged scale. Fig. 17 is a fragmentary front view of the house. Fig. 18 is a fragmentary longitudinal section in line 18 18, Fig. 17. Fig. 19 is an inverted perspective view of one of the roof-panels. Fig. 20 is a transverse section of adjacent roof-panels in line 20 20, Fig. 1, on an enlarged scale. Fig. 21 is an enlarged horizontal section of one of the corner-posts in line 21 21, Fig. 1. Fig. 22 is an enlarged side elevation of one of the corner-posts and its pier. Fig. 23 is an elevation of one of the tie-bolts which connects the upper and lower ridge-bars of the roof. Fig. 24 is an enlarged vertical section in line 24 24, Fig. 1. Fig. 25 is a perspective view of one of the tie-plate brackets. Fig. 26 is an enlarged horizontal section of the sills in line 26 26, Fig. 2. Fig. 27 is a longitudinal section of the roof, on an enlarged scale, taken through the sheathing and one of the longitudinal fastening-bolts.

Similar letters of reference indicate corresponding parts throughout the several views.

The metallic main frame of the house consists of corner-posts A, intermediate stud-posts B, located at opposite sides of the frame, end sills C, side sills D, stringers E, corresponding to the end sills, and longitudinal stringers E', corresponding to the side sills.

Each corner-post A is constructed of angle-iron, having its apex arranged to face outwardly. It rests upon a pier A' of cast-iron or other suitable material, the post preferably extending about three feet into the ground and being embedded in concrete A², as shown. Each stud-post B is constructed of T-iron having its head or transverse flanges arranged parallel with the side of the house and resting upon piers B' similar to those of the corner-posts.

The side sills D are made of sections of channel-iron of the proper lengths to extend from the corner-posts A to the stud-posts B and from one stud-post to the next, the flanges

of the channels preferably facing outwardly. The end sills are also constructed of channel-iron, but with the flanges facing inwardly, and they are of the proper length to span the space between the corner-posts. As shown in Figs. 6 and 7, the front section of each side sill abuts against the front flange of the adjacent corner-post, while the adjoining end of the end sill abuts against the web of said section. The meeting portions of the side sill and the end sill are firmly tied together by an angle-iron c and are supported by a suitable bracket c' , secured to the adjacent corner-post by bolts c^2 .

The rear sill and the rear sections of the side sills are connected with the adjacent corner-posts by the same means. Each of the four corner connections between the end and side sills is stiffened by a diagonal brace c^3 .

The opposing ends of the front and intermediate sections of the side sills abut against opposite sides of the webs of the stud-posts B and are preferably secured thereto by angle-pieces b , as shown in Fig. 26.

The stringers E E' are constructed of channel-iron like the end and side sills and are connected with the stud-posts B by angle-irons e , Fig. 13.

Inclined braces F preferably connect the sills with the portions of the corner and stud posts which extend below the sills.

g indicates the water-table, and g' ornamental caps which cover the joints of the same at the corner-posts. g^2 indicates similar caps covering the joints of the water-table at the stud-posts.

H indicates base-boards which close the space below the sills and between adjacent corner-posts and stud-posts, as shown in Fig.

1. The outer ends of these base-boards are seated in upright pockets arranged in the base portions of the corner-posts. As shown in Figs. 21 and 22, each of these pockets is formed by the outer side of the corner-post and the opposing inner side of an upright angle-iron H', arranged on the outer side of the post and parallel therewith. This outer angle-iron is arranged at the proper distance from the post to receive the ends of the base-boards between these parts, and the same preferably extends from the sill to the lower end of the post, as shown. The base-boards are bolted or otherwise secured to the flanges of the post and the angle-iron H'. The angle-irons H' also serve to protect the base portions of the posts from the weather.

The opposite ends of the front and rear base-boards and the ends of the intermediate base-boards are clamped by bolts h between the outer sides of the T-iron stud-posts B and upright metallic bars or strips H², arranged on the outer side of said posts and extending from the piers B' to the side sills, as shown in Figs. 2, 8, and 24.

I indicates clapboards applied to the front

and rear walls of the house and extending continuously from one corner-post to the other. The ends of these clapboards are confined in vertical pockets formed by the front flanges of the corner-posts A and the opposing front flanges of upright angle-irons I', arranged on the inner sides of the corner-posts and parallel therewith, as shown in Fig. 4. These inner angle-irons extend from the sills to the lower edges of the stringers E E', and said angle-irons are arranged a sufficient distance apart to snugly receive the ends of the clapboards between the same. The clapboards are clamped in place by bolts i passing at intervals through the opposing flanges of the post and the upright angle-iron.

The clapboards I² on the side walls of the house are made in sections or lengths corresponding to the distances between the corner-posts and stud-posts and between these posts and the doors and windows. The outer ends of their end sections are seated in the pockets or spaces formed between the opposing flanges of the corner-posts and the upright angle-irons I' and are clamped therein by transverse bolts i^2 like the front and rear clapboards. The clapboards rest upon one another, and each of the same is preferably provided at its lower edge with a rabbet i^3 , which receives the beveled or reduced upper edge of the clapboard next below it, as shown in Fig. 16. As shown in Fig. 4, the corner-posts are provided on their inner sides at or near the outer edges of their flanges with vertical weather-strips or tongues i^4 , which enter corresponding grooves i^5 in the outer sides of the clapboards and serve to exclude the weather from between the post-flanges and the clapboards. As the coves of the clapboards extend to the ends of the same, the weather in the absence of such strips would be liable to enter between the clapboards and the angle-iron posts. These interlocking strips and grooves also serve to stiffen and strengthen the frame of the house.

As shown in Fig. 5, the ends of the intermediate sections of the side clapboards and the opposing ends of the end sections are seated in vertical pockets similar to the pockets of the corner-posts. These pockets are formed by the longitudinal outer flanges of each T-iron stud-post and the opposing parallel flanges of a pair of upright angle-irons j , secured to opposite sides of the web of the stud-post. Clamping-bolts j' pass through these opposing flanges at suitable intervals for securing the clapboards between the same. The outer flanges of the stud-posts are provided on their inner sides with vertical weather-strips or tongues j^2 , which enter corresponding grooves in the faces of the clapboards, as shown in Fig. 5.

The corner-posts A and stud-posts B extend a short distance above the stringers E E', and their upper ends are connected together by horizontal tie-bars K, preferably of angle-

iron, as shown in Figs. 2 and 16. The clapboards on the sides of the house extend from these tie-bars to the sills.

Rough boards L are preferably screwed to the inner sides of the clapboards, and the walls of the house are preferably double, with an air-space between their inner and outer portions, as shown in Fig. 3.

M indicates transverse parallel I-beams, which support the lower floor M' and which are connected at their ends to the side sills D by angle-pieces or other suitable fastenings. These beams are arranged at suitable intervals, and their upper flanges are flush with the corresponding flanges of the side sills. m indicates diagonal wooden joists which bridge the spaces between adjacent I-beams M and between the end I-beams and the end sills, as shown in Figs. 3 and 10, and to which joists the floor-boards are secured by any suitable means. The preferred means consist of horizontal bars m', pivoted between their ends to the under sides of the floor-boards similar to turn-buttons and adapted to have their front ends embedded in the side of the adjacent joist by being driven laterally into the same, as shown in Figs. 9, 10, and 11. The pivots m² of the fastening-bars are so arranged relatively to the side of the adjacent joist that when the bars are turned about at right angles to the latter their front arms penetrate the joist and secure the boards in place, while upon turning the bars beyond that position in either direction their front arms clear the joist and release the boards. The penetrating ends of the bars are preferably rounded and sharpened to more easily enter the joist. The bars are readily engaged with the joists by striking the edges of their rear arms with a hammer.

The floor-boards may be interlocked at their meeting edges by any suitable means; but I prefer to employ separate metallic keys or tenons m³, fitted in opposing longitudinal grooves in the edges of the boards and extending across the joints between the same, as shown in Figs. 11 and 12.

Below the main floor M' is preferably arranged a false floor M², composed of rough boards extending lengthwise of the building from one I-beam M to the next and resting upon the lower flanges thereof, as shown in Figs. 3, 10, 11, and 12. The outer ends of the front and rear panels of rough boards rest upon the lower flanges of the end sills.

The diagonal joists m are fitted at their ends between the false floor M² and the upper flanges of the I-beams M and the end sills, as shown in Fig. 12, and are held at the proper distance apart by space bars or blocks n, fitted tightly between the ends of adjacent joists and bearing against the webs of said I-beams and end sills. As shown in Fig. 3, the two end joists of each series are shorter than the distance between adjacent I-beams, and

their outer ends are held in position by longitudinal space-blocks n', abutting at their ends against the joists and the webs of the I-beams. The upper edges of the joists are flush with the upper sides of the I-beams, the joists being recessed or rabbeted for receiving the upper flanges of the I-beams and the end sills, as shown at m⁴ in Figs. 10 and 11.

The upper floor of the house is carried by the stringers E E' and is preferably of the same construction as the lower floor just described, the false floor of the same forming the ceiling of the lower story of the house and for this reason being made of a higher grade of lumber than the false lower floor.

o indicates the inclined rafters, preferably constructed of angle-iron and each having one of its flanges arranged parallel with the surface of the roof. The lower portions of the rafters, except the endmost ones, rest edgewise upon the corners of the longitudinal tie-bars K and are firmly connected therewith by angle-irons o', Fig. 16. The upper ends of opposite rafters overlap each other and are secured together by horizontal bolts o² passing through the overlapping flanges thereof, as shown in Fig. 15. The apexes or meeting upper ends of the series of rafters are firmly tied together by a ridge-bar P, of angle-iron, which has its flanges secured to the contiguous flanges of the rafters by bolts p or other suitable fastenings. The lower ends of the series of rafters on the same side of the roof, including the endmost or overhanging rafters, are connected together by a longitudinal tie-plate P', bolted or otherwise secured to the rafters. Each of these tie-plates is supported and firmly held in position by brackets P², which are secured to the faces of the corner-posts A and stud-posts B and to which the tie-plate is fastened by bolts p', as shown in Fig. 16.

Q indicates boards or panels which cover the rafters and the spaces between them and which are secured to the upper flanges of the rafters by transverse bolts q, as shown in Figs. 1, 15, and 20. The panels on opposite sides of the roof meet at the ridge of the latter and extend downwardly to the tie-plates P'. The panels are recessed or rabbeted at their longitudinal edges, so as to overlap each other and form tight flush joints, as shown. They are also preferably recessed or rabbeted at their upper ends to form upper shoulders q', which abut against the lower edges of the ridge-bar P, as shown in Figs. 15 and 19. The panels are provided in their lower ends with rabbets or recesses q², which receive the upper edges of the tie-plates P', forming weather-tight joints at these points, as shown in Fig. 16.

A sheathing R, preferably of corrugated sheet metal, covers the panels Q and extends from end to end of the roof. The sections of sheathing on opposite sides of the roof terminate at or near the apex of the meeting

panels and are securely held in place by an upper ridge-bar S, preferably of angle-irons, the flanges of which bar overlap the upper edges of the sheathing, as shown in Figs. 1 and 15. This upper ridge-bar is firmly clamped down upon the sheathing by vertical tie rods or bolts S', which pass through the upper and lower ridge-bars P S' and through perforated caps s, surmounting the upper ridge-bar, and perforated triangular blocks s', bearing against the under side of the lower ridge-bar. The under sides of these caps are shaped to conform to the upper ridge-bar. The sheathing is firmly secured in place by bolts s² passing through the same, the panels Q, and the lower flanges of the rafters, as shown in Fig. 27. These bolts alternate with the short panel-bolts q and are preferably provided with rubber washers s³.

The ends of the sheathing-sections on opposite sides of the roof are flanged or turned inwardly and secured to the faces of the end rafters, as shown in Figs. 17 and 18.

T indicates cornices which close the spaces between the side walls of the house and the adjacent overhanging portions of the roof. These cornices extend from end to end of the building, and each of the same rests at its outer edge upon the lower flange of a longitudinal angle-iron t, secured to the under side of the tie-plate P', while its inner edge is secured by screws or other fastenings to the outer flange of a similar angle-iron t', the inner flange of which rests upon inclined shoulders or ledges t², arranged on the faces of the adjacent clapboards, as shown in Fig. 16. The ends of the cornice-sections are supported upon shoulders or ledges p², arranged on the sides of the brackets P² and conforming to the contour of the molded cornice, as shown in Fig. 25. The angle-irons t t' also serve to close the joints at the inner and outer edges of the cornice.

The cornice or molding T' in the gables of the house may be secured in place by any suitable means. In the construction shown in the drawings, Figs. 17 and 18, the same is fastened by an angle-iron t³, secured to the under side of the overhanging end panels Q and overlapping the upper edge of the cornice.

The clapboards in the gables of the house are preferably clamped between wooden rafters u and metal strips u', connected with said rafters by transverse bolts u², as shown in Figs. 17 and 18.

V indicates the gutters or eaves-troughs; each of which consists of an angle-iron secured to the outer side of the adjacent tie-plate P' at or near its lower edge. Each gutter preferably slopes toward the center of the building, where it joins the box or receiver V' of a conductor-pipe v.

In my improved building the construction of all the metallic parts or members is such that ordinary commercial or stock iron may

be employed, which can be cut to the proper lengths at the mill or factory by suitable machines, avoiding the employment of skilled or hand labor for this purpose at the place where the building is erected and correspondingly reducing its cost. No nails or similar fastenings are employed for securing together such parts as are intended to separate, and they can therefore be readily transported, quickly assembled, and dismembered at a minimum cost for labor.

An important feature of my improved construction consists in extending the corner-posts and stud-posts continuously from their piers or foundations to the horizontal tie-bars or longitudinal members upon which the rafters rest. This produces a very stiff and strong construction.

I claim as my invention—

1. In a portable house, the combination of a frame having posts provided in their opposing sides with vertical pockets, the outer walls of said pockets being provided with vertical weather strips or ribs, and clapboards seated at their ends in said pockets and provided in their faces with vertical grooves which receive said weather-strips, substantially as set forth.

2. In a portable house, the combination of side and end sills, transverse I-beams supported at their ends by the side sills, joists spanning said I-beams and having their ends arranged between the upper and lower flanges thereof, and floor-boards secured to said joists, substantially as set forth.

3. In a portable house, the combination of the side sills, flanged floor-beams secured at their ends to the side sills, joists spanning said beams, and space-bars arranged between the ends of adjacent joists, substantially as set forth.

4. In a portable house, the combination of side and end sills, floor-beams supported at their ends by the side sills and having upper and lower flanges, false floor-sections supported on the lower flanges of adjacent floor-beams, and joists resting upon said false floor-sections and having their ends confined between the latter and the upper flanges of the floor-beams, substantially as set forth.

5. In a portable house, the combination of side and end sills, transverse I-beams supported at their ends by the side sills, false floor-sections resting on the lower flanges of adjacent I-beams, diagonal joists resting on said false floor-sections and having their ends confined under the upper flanges of the I-beams, and space-bars abutting at their ends against the ends of adjacent joists and arranged between said false floor-sections and the upper flanges of the I-beams, substantially as set forth.

6. A floor structure for a portable house, comprising joists, floor-boards resting on the joists, and laterally-swinging fastening-bars

pivoted to the under side of the floor-boards and adapted to penetrate the sides of the joists with their free ends, substantially as set forth.

7. A floor structure for a portable house, 5 comprising joists, floor-boards resting on the joists, and horizontal fastenings pivoted between their ends to the under side of the boards adjacent to the joist, the front arms of the bars being of such a length that their free 10 ends are caused to penetrate the sides of the joists upon driving the bars into a position about at right angles to the joists, substantially as set forth.

8. In a portable house, the combination 15 with the main or body frame of the house, of rafters resting on said frame, a tie-plate connecting the lower portions of the rafters, and brackets secured to the body-frame and supporting said tie-plate, substantially as set 20 forth.

9. In a portable house, the combination with the main or body frame of the house, of rafters resting on said body-frame, an angle-iron ridge-bar connecting the meeting upper 25 ends of the opposing rafters, longitudinal tie-plates connecting the lower ends of the rafters, and roof boards or panels resting upon the rafters and provided on their under sides near their upper ends with shoulders which 30 abut against said ridge-bar and at their lower ends with rabbets or recesses which receive the upper edges of said tie-plates, substantially as set forth.

10. In a portable house, the combination 35 with the main or body frame of the house, of rafters resting on said body-frame, a lower ridge-bar connecting the meeting upper ends of opposing rafters, roof-boards resting upon the rafters, an upper ridge-bar arranged at 40 the apex of the meeting roof-boards, and vertical tie-rods connecting said upper and lower ridge-bars, substantially as set forth.

11. In a portable house, the combination with the main or body frame of the house, of 45 rafters resting on said body-frame, a lower ridge-bar connecting the meeting upper ends

of opposing rafters, roof boards or panels resting upon the rafters and meeting at the ridge of the roof, sheathing applied to said panels, an upper ridge-bar overlapping the 50 upper edges of the sheathing, and tie-rods passing through said upper and lower ridge-bars, substantially as set forth.

12. In a portable house, the combination with the main or body frame of the house, of 55 angle-iron rafters resting on said body-frame, tie-plates connecting the lower ends of the rafters, and eaves-troughs secured to the upper sides of said tie-plates, substantially as set forth. 60

13. In a portable house, the combination with the side walls and the overhanging roof, of brackets arranged between the side walls and the roof and provided with ledges or 65 shoulders, and a cornice resting at its ends upon the ledges of said brackets, substantially as set forth.

14. In a portable house, the combination with the side walls and the overhanging roof, of opposing angle-irons secured lengthwise to 70 the faces of the walls and the under side of the overhanging roof, and cornices supported at their longitudinal edges by said opposing angle-irons, substantially as set forth.

15. In a portable house, the combination 75 with a side wall having a ledge, and the overhanging portion of the roof, of a longitudinal angle-iron having its upper flange secured to the under side of said overhanging portion, an opposing angle-iron resting upon said 80 ledge, and a cornice resting at its outer edge upon the lower flange of the first-named angle-iron and having its inner edge secured to the outer flange of the opposing angle-iron, 85 substantially as set forth.

Witness my hand this 11th day of July, 1903.

AUGUST MILLER.

Witnesses:

CARL F. GEYER,
EMMA M. GRAHAM.