

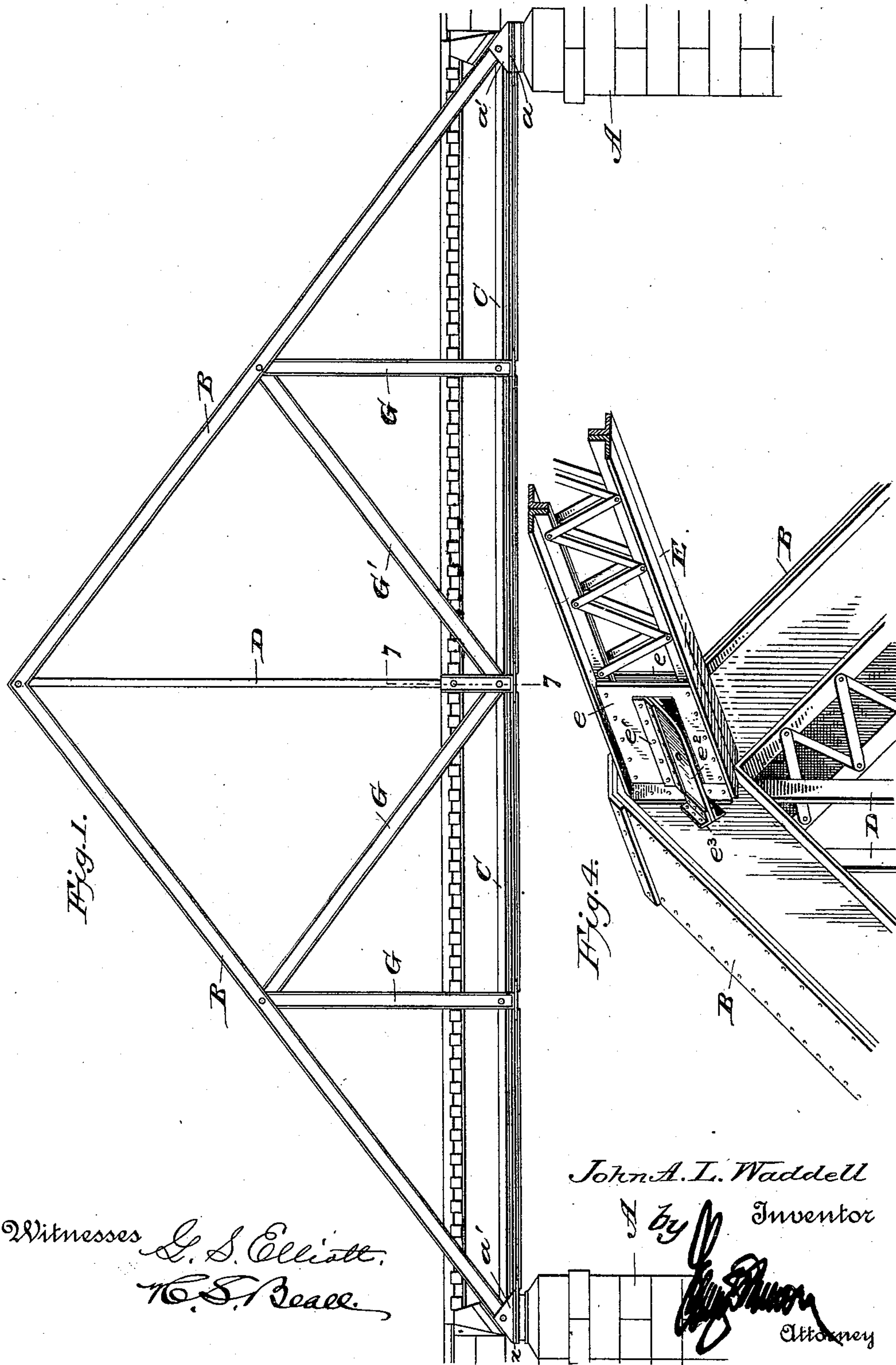
(No Model.)

3 Sheets—Sheet 1.

J. A. L. WADDELL.
TRUSS BRIDGE.

No. 529,220.

Patented Nov. 13, 1894.



Witnesses L. S. Elliott.
W. S. Beall.

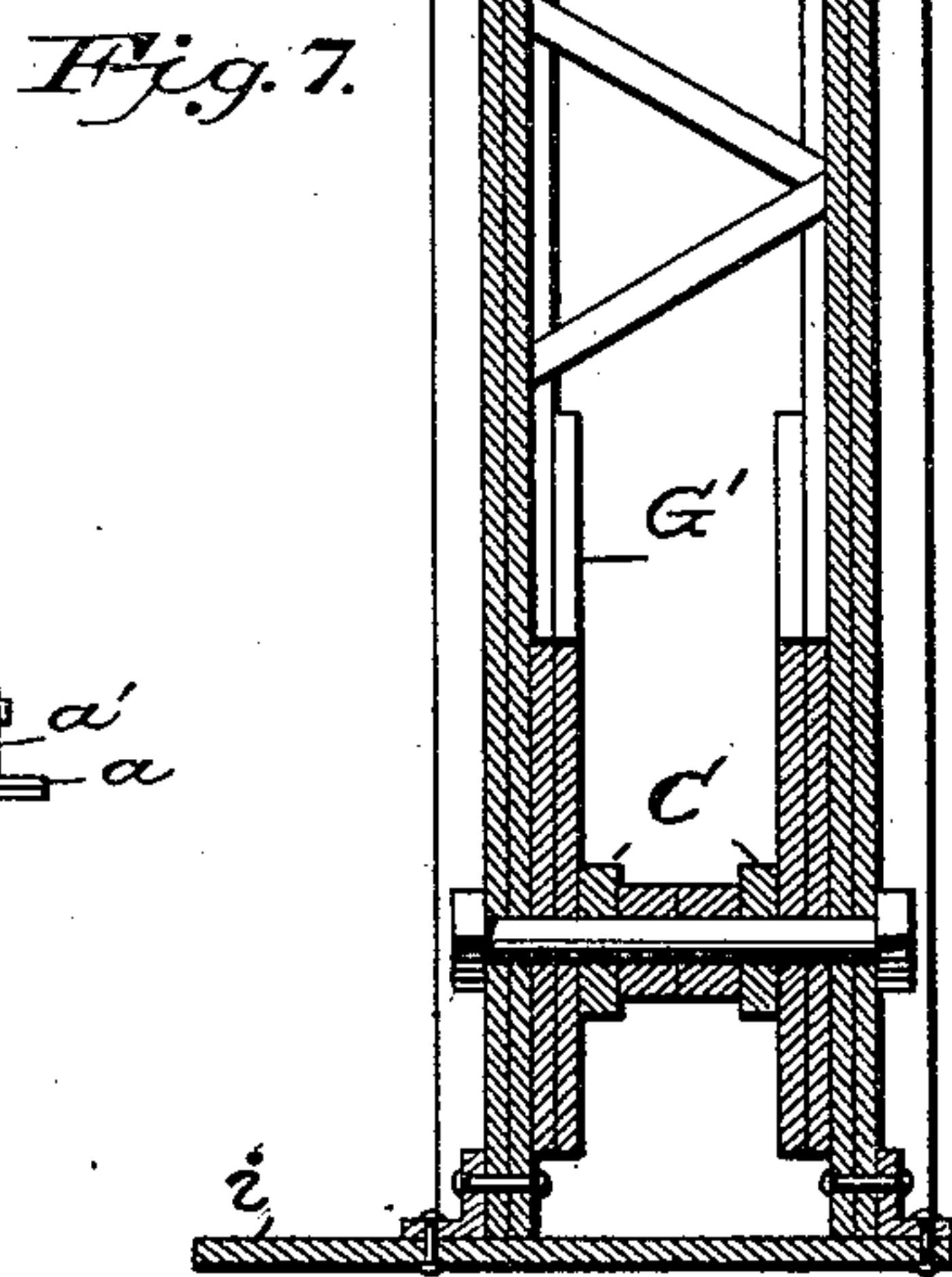
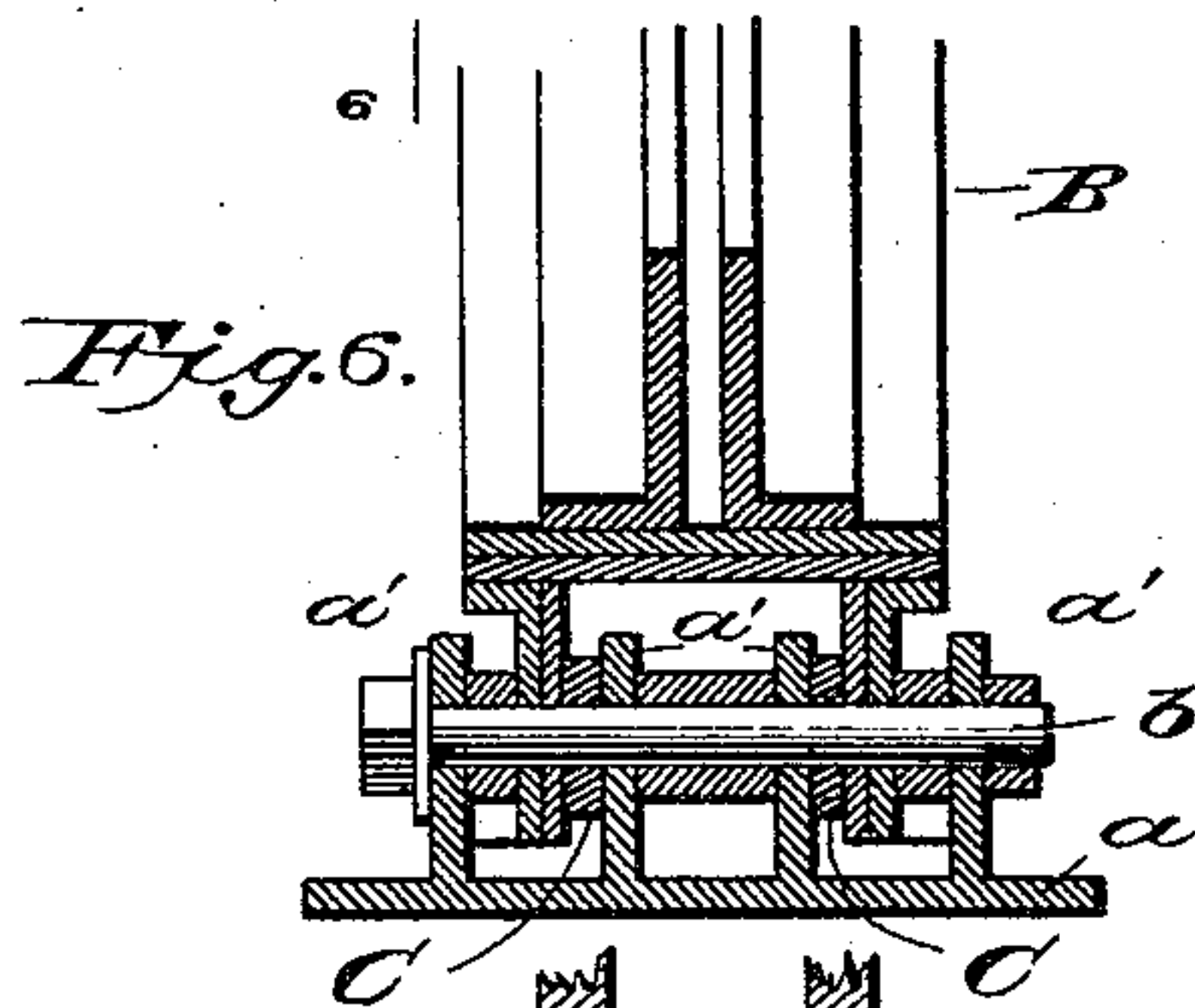
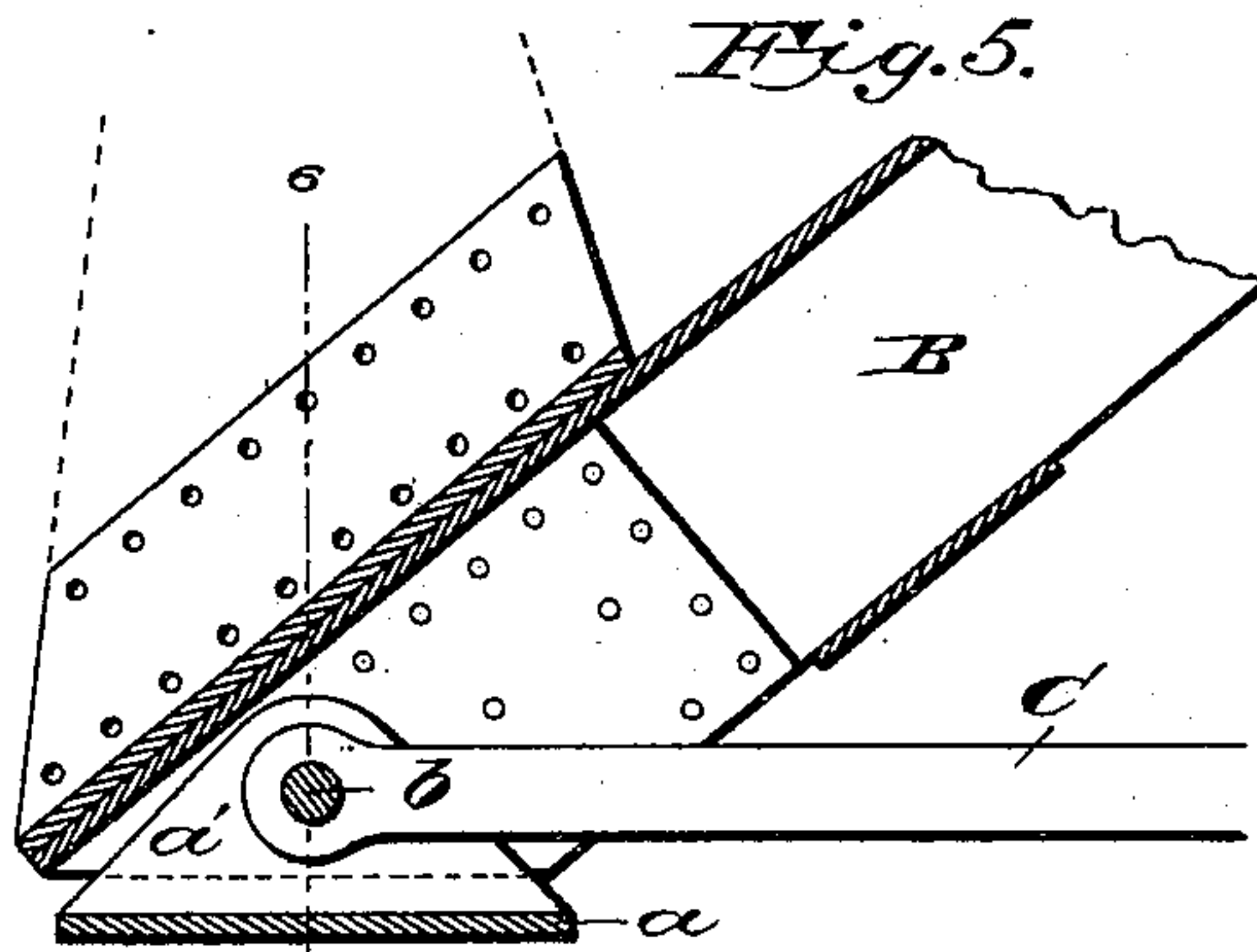
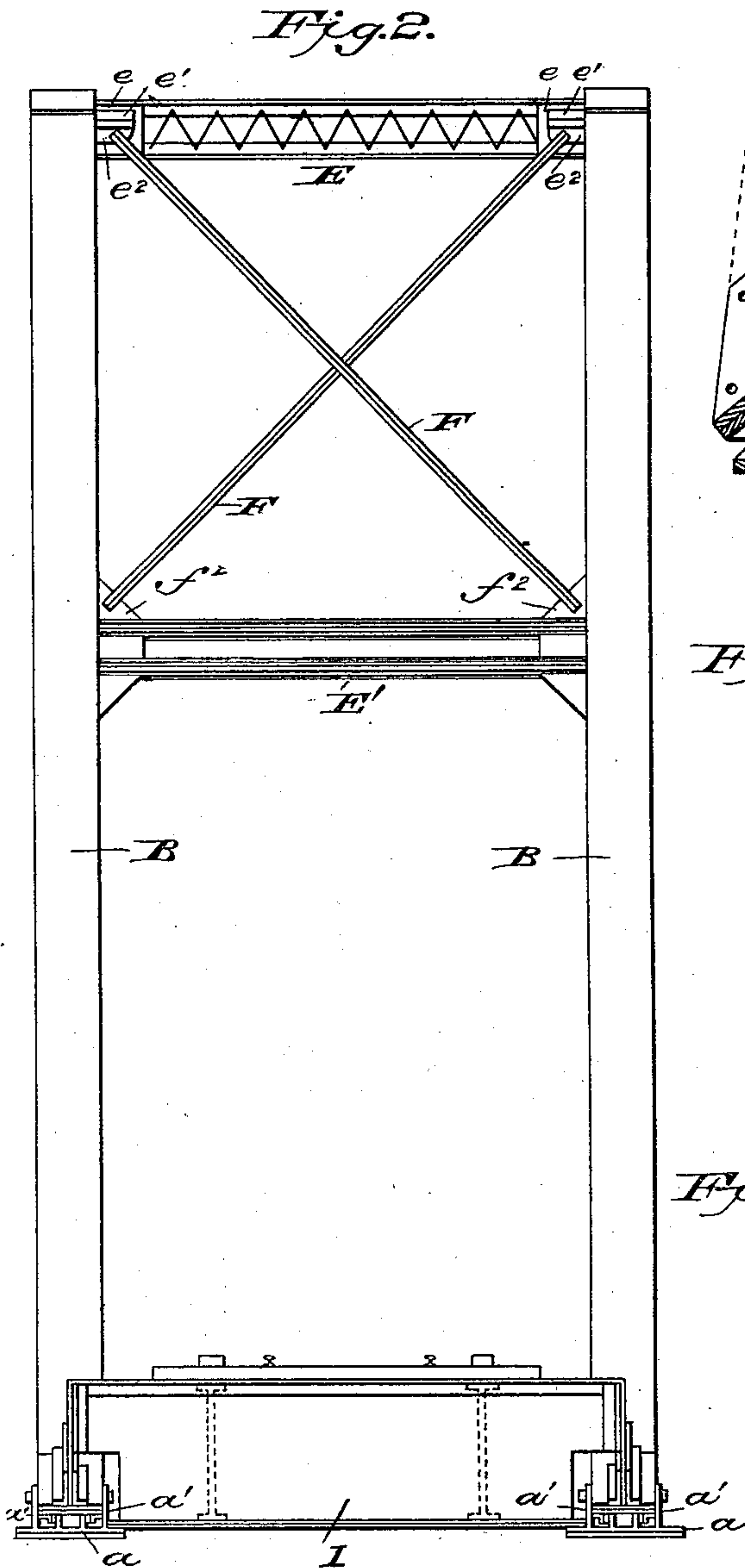
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Witnesses
G. S. Elliott.
W. S. Reall.

John A. L. Waddell

Inventor

by *[Signature]* Attorney

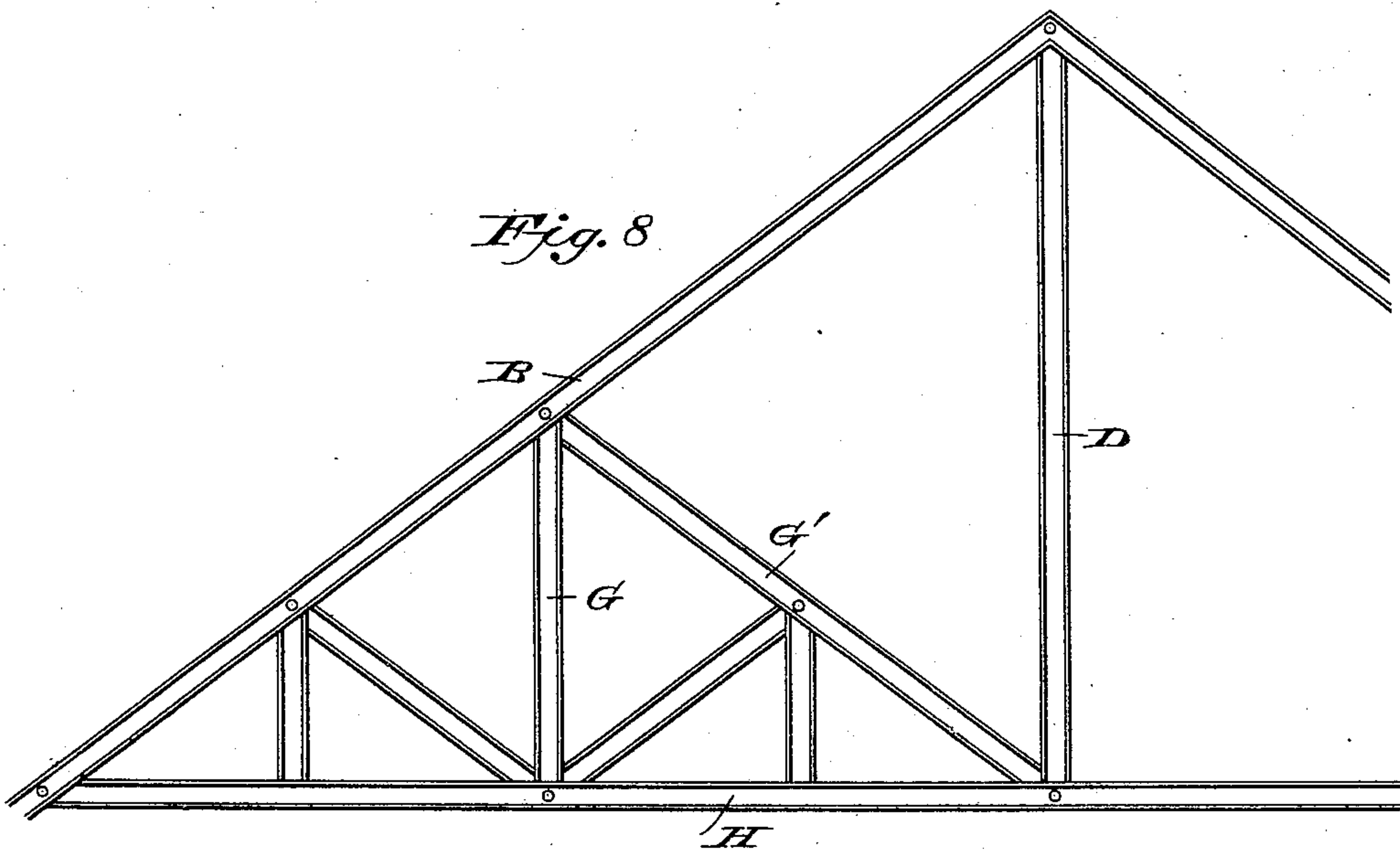
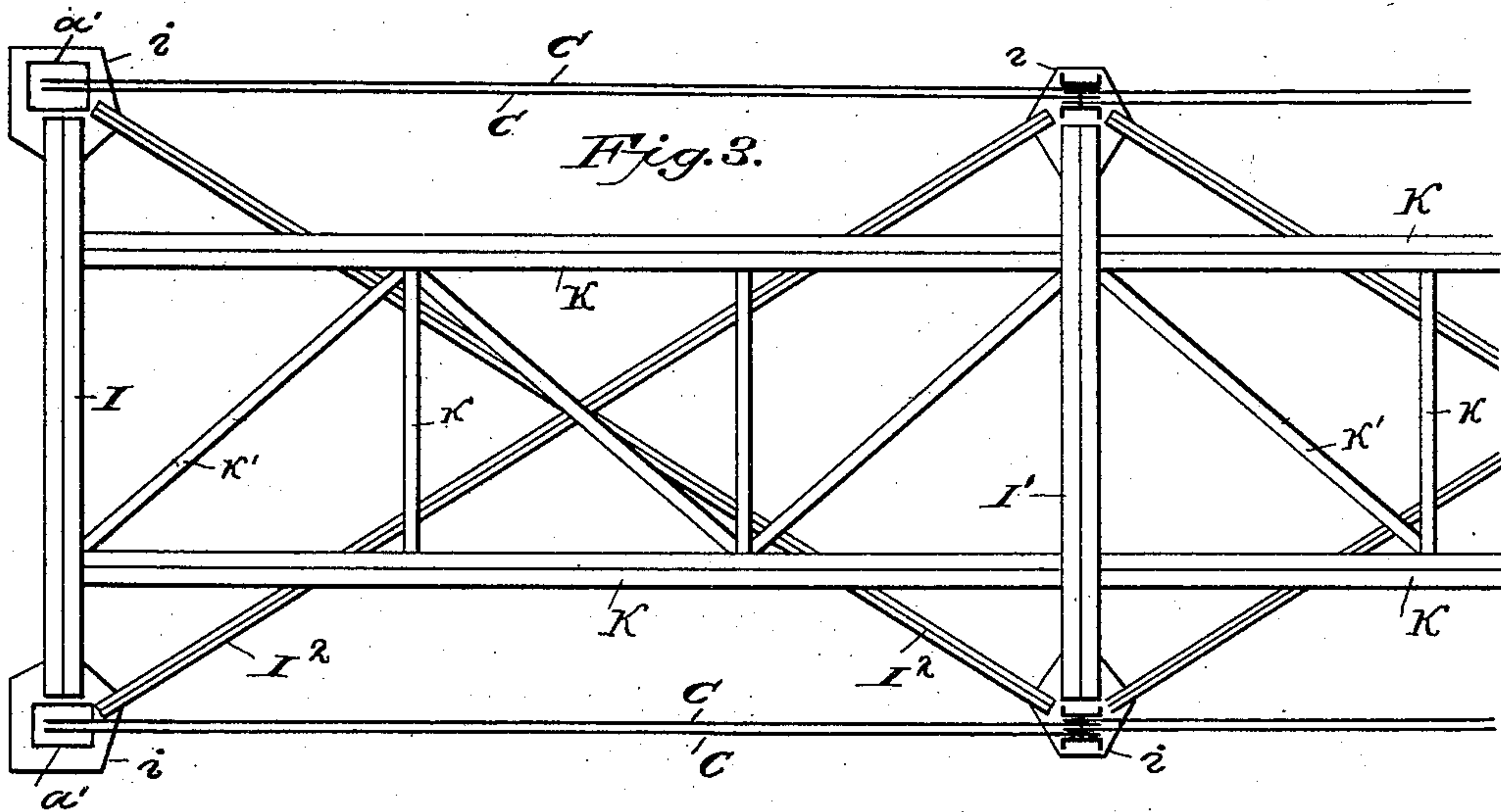
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3 Sheets—Sheet 3.

J. A. L. WADDELL.
TRUSS BRIDGE.

No. 529,220.

Patented Nov. 13, 1894.



Witnesses *G. S. Elliott,*
E. M. Johnson.

John A. L. Waddell
Inventor

— by *[Signature]* Attorney

UNITED STATES PATENT OFFICE.

JOHN A. L. WADDELL, OF KANSAS CITY, MISSOURI.

TRUSS-BRIDGE.

SPECIFICATION forming part of Letters Patent No. 529,220, dated November 13, 1894.

Application filed August 23, 1894. Serial No. 521,123. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. L. WADDELL, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Truss-Bridges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a truss-bridge of effective construction in which the batter-posts are connected to the bottom-chords and tied to each other at their upper ends, each pair of batter-posts being provided with vertical supports and inclined braces which connect with the transverse beams of the bridge.

The invention also embodies the special construction of the parts, as will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view of a truss-bridge constructed in accordance with my invention. Fig. 2 is an end view of the upper part of the structure, showing the manner of bracing. Fig. 3 is a plan view showing the arrangement of the floor beams and braces therefor. Fig. 4 is a detail perspective view showing the manner of connecting the upper transverse brace to the batter-posts. Fig. 5 is a detail sectional view showing the connection of the batter-posts with the bearing plates and tie-rods. Fig. 6 is a view on the line 6—6 of Fig. 5. Fig. 7 is a sectional view on the line 7—7 of Fig. 1, and Fig. 8 is a side elevation of a slight modification of my invention.

A A designate the abutments of the bridge upon which rest bearing plates of ordinary construction to which are secured plates *a* having upwardly-projecting portions or flanges *a'* apertured for the passage of pins *b*.

B designates the batter-posts, four of which are used in the construction of the bridge, and these batter-posts are preferably made up of solid upper and side plates, the side plates being flanged for connecting them to the upper plates by means of rivets, and said

side plates are further connected to each other by lattice or lacing bars which are suitably riveted thereto. The lower ends of the batter-posts B have plates secured thereto which are apertured for the passage of the pins *b*, and said pins also pass through bottom chord-bars C which extend from one abutment of the bridge to the other. Beneath each batter-post there are two or more of these chord-bars C, and at the center they are connected to brace-rods which extend from the batter-posts where they are connected to each other at their upper ends.

E designates a cross-strut which extends from the upper end of one set of batter-posts to the other, and this cross-strut is connected to the inner side plates of the batter-posts by means of angle-plates *e*, said angle-plates being further connected to the batter-posts by a plate *e*² which is secured to the angle plate and to the batter-posts by angle-bars *e'* and *e*³, as shown in Fig. 4. The plate *e*² also serves as a connecting means for diagonal brace-bars F which cross each other and are connected at their opposite ends to plates *f*² which connect the cross-strut E' to the batter-posts.

The cross-struts E and E' are preferably made up of angle-bars as shown in Fig. 4, said angle-bars being connected to each other by diagonal brace-bars. This method of bracing the upper ends of the batter-posts provides an extremely light, strong and rigid structure with a comparatively small surface to be acted upon by the wind.

From the batter-posts at a point below the cross-struts E' depend vertical supports G which are connected at their lower ends to the chord-bars C, and diagonal braces G' are also provided which extend from the upper ends of the supports G to the lower ends of the center support or post D. This construction (as shown in Fig. 1) provides a truss-bridge of four panels, and when an eight panel bridge is desired the construction is duplicated, as shown in Fig. 8,—inclined braces extending from the lower ends of the supports G to the upper ends of supports depending from the inclined braces G'. This latter construction is preferred when the horizontal chord-bars C are dispensed with and bottom chords H H employed which ex-

tend longitudinally from one batter-post to the other. The bottom chords consist of flanged channels which are rigidly secured to the lower ends of the batter-posts and to the vertical supports or posts D and G.

I I designate cross-beams, the beams I being connected to the lower ends of the batter-posts and the beams I' to the lower ends of the vertical supports or posts D and G. Running diagonally from the ends of one cross-beam to another are braces I² which are secured to said cross-beams by plates *i*, and upon these diagonal braces rest longitudinal beams K which are secured at their ends to the cross-beams I and I', the said longitudinal beams being braced by lateral and diagonal braces *k* and *k'*. Upon these longitudinal beams K the cross-ties or flooring of the bridge rest.

The bridge hereinbefore described is principally made up of flat plates and angle-bars which are so connected to each other as to attain the greatest amount of strength and rigidity with a minimum of weight, and the parts can be made up in sections ready to be connected together at the place where desired for use. Such a bridge is designed especially for railroads, and the span can be from ninety to one hundred and fifty feet. The advantages of the bridge are that the flat inclination of the batter-posts puts a dead-load tension on the bottom-chords, thus giving great rigidity to the structure below; and the height of the truss formed by the batter-posts permits an efficient transverse and diagonal system of overhead bracing which gives rigidity to the upper structure.

The cost of the bridge is small compared with the cost of girder bridges and is very little in excess of that of the ordinary through bridges which have proved unsatisfactory on account of the extreme lightness of the sections, which tends to set up injurious vibrations.

In a bridge constructed as shown in Fig. 8 a shallow floor can be used.

I am aware that prior to my invention there have been built roof trusses in which inclined rafters are used which abut at their upper ends and are connected to each other at their lower ends by a tie beam, a king-post being used in connection therewith; also small "A"

truss bridges without portal bracing for highway structures, and I therefore do not claim broadly such combination except where it is used in a bridge with the bracing hereinbefore described.

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

1. In a truss bridge, the combination, of four inclined batter-posts connected at their upper ends by a cross-strut E, diagonal brace-bars F and intermediate cross-struts E'; vertical posts D and G connected at their upper ends to the batter-posts and to each other at their lower ends by transverse beams I', transverse beams I connecting the lower ends of the batter-posts, and chord-bars which extend longitudinally from batter-post to batter-post, together with longitudinal beams K attached to the transverse beams I and I' and braced by diagonal brace-bars I², substantially as shown and for the purpose set forth.

2. A truss bridge comprising four similarly inclined batter-posts, each pair abutting at their upper ends, a transverse strut which extends from the upper end of one pair of posts to the other pair, transverse struts connecting the posts at a point between their upper and lower ends, plates connected to the posts and to the struts, diagonal brace-bars connected to said plates, longitudinal chords and transverse beams connecting the lower ends of the batter-posts, vertical posts D and G connected to the batter-posts, longitudinal chords and transverse floor supporting beams, the parts being organized substantially as shown and for the purpose set forth.

3. In a truss-bridge, the combination with the batter-posts and cross-struts E, angle-plates *e* secured to the inner sides of the batter-posts and to the cross-strut, and plates *e*² secured to the angle plates *e* and to the batter-posts by means of angle-bars *e'* and *e*³, substantially as shown and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. L. WADDELL.

Witnesses:

IRA G. HEDRICK,
LU TREADWELL.