

(No Model.)

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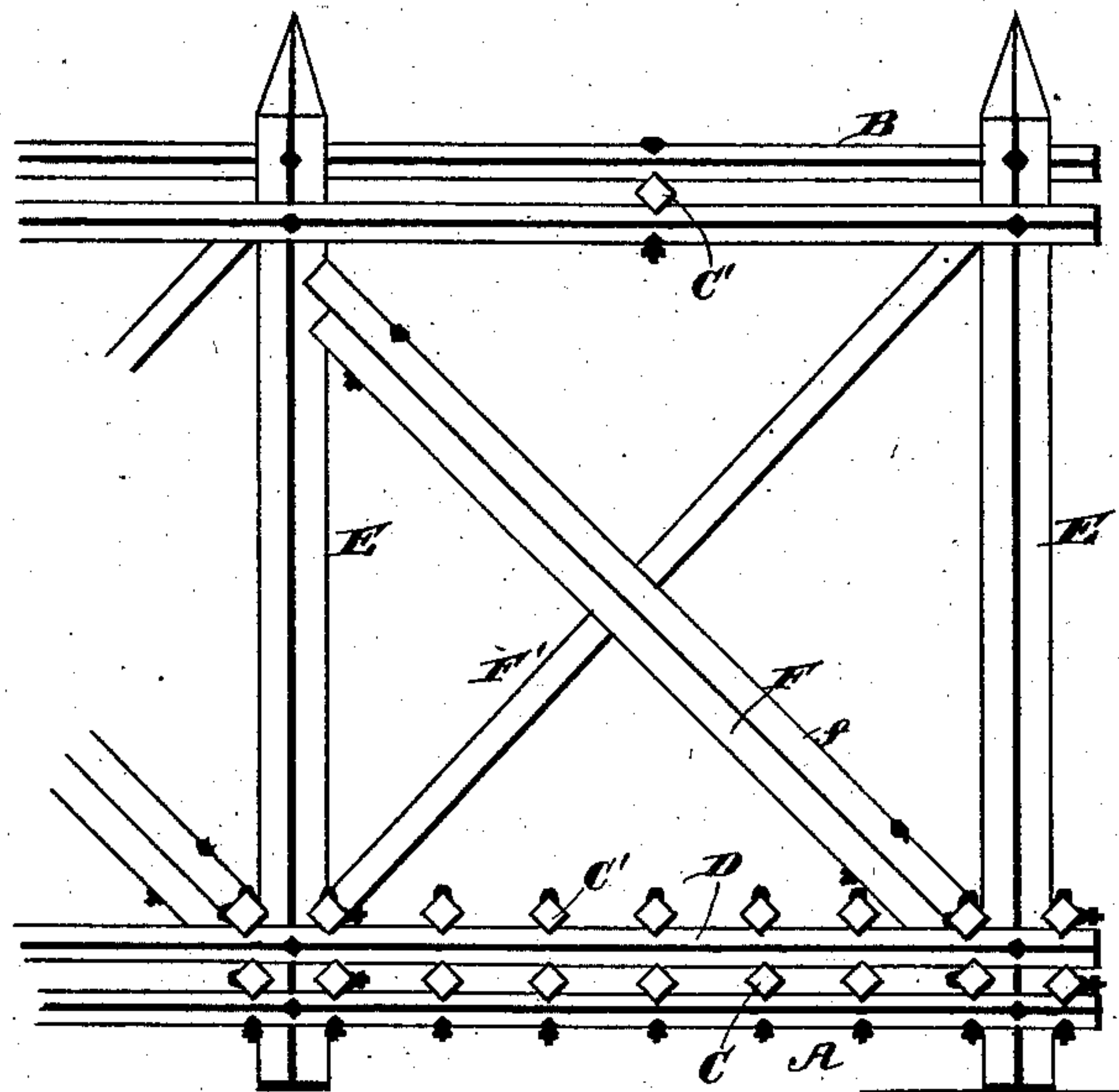
W. J. HOLMAN.

BRIDGE.

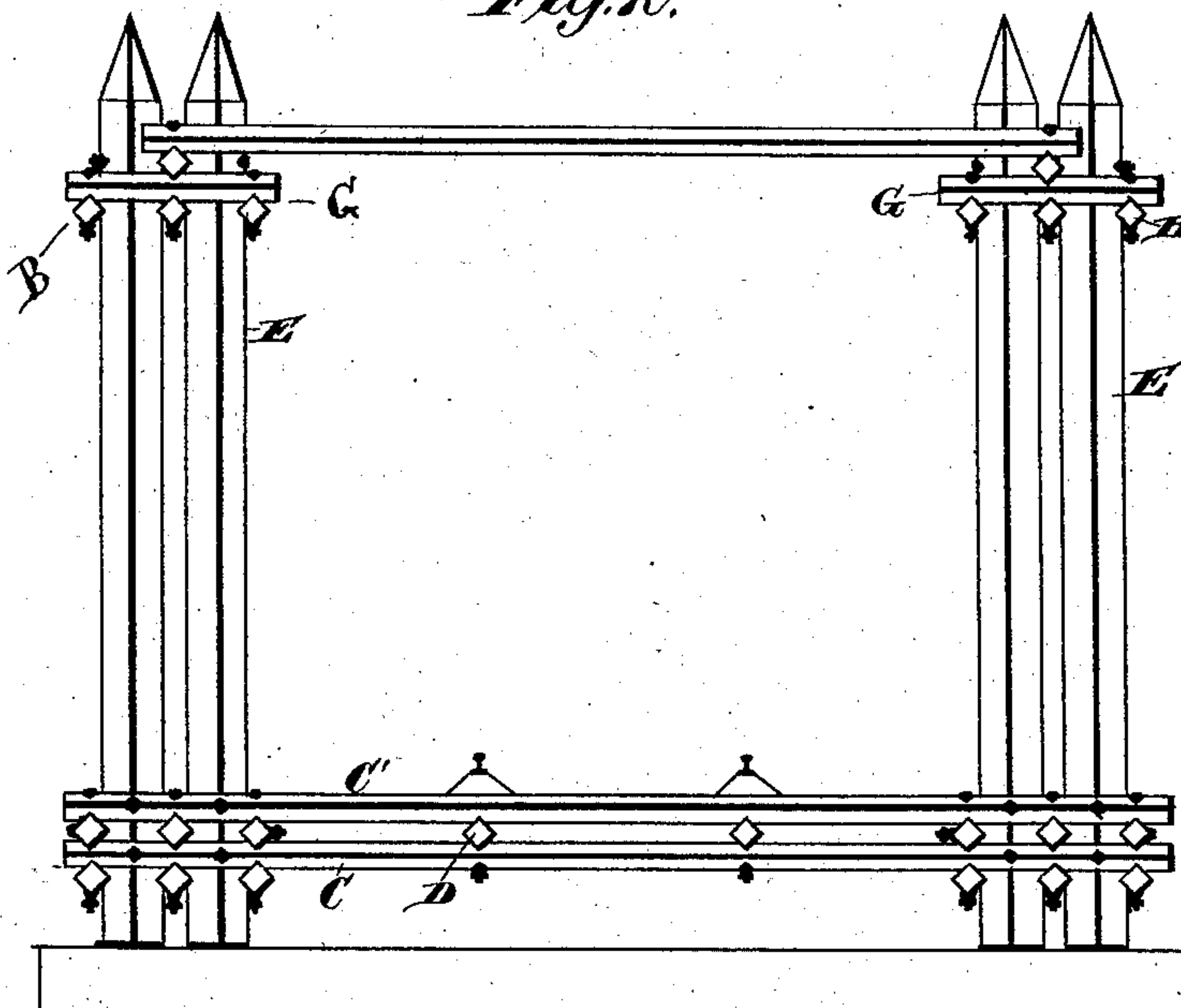
No. 290,054.

Patented Dec. 11, 1883.

*Fig. 1.*



*Fig. 2.*



*Witnesses,*  
*Robert Everett,*  
*J. A. Rutherford*

*Fig. 3.*



*Inventor,*

*William J. Holman,*

*By James L. Norris,*  
*Atty*

(No Model.)

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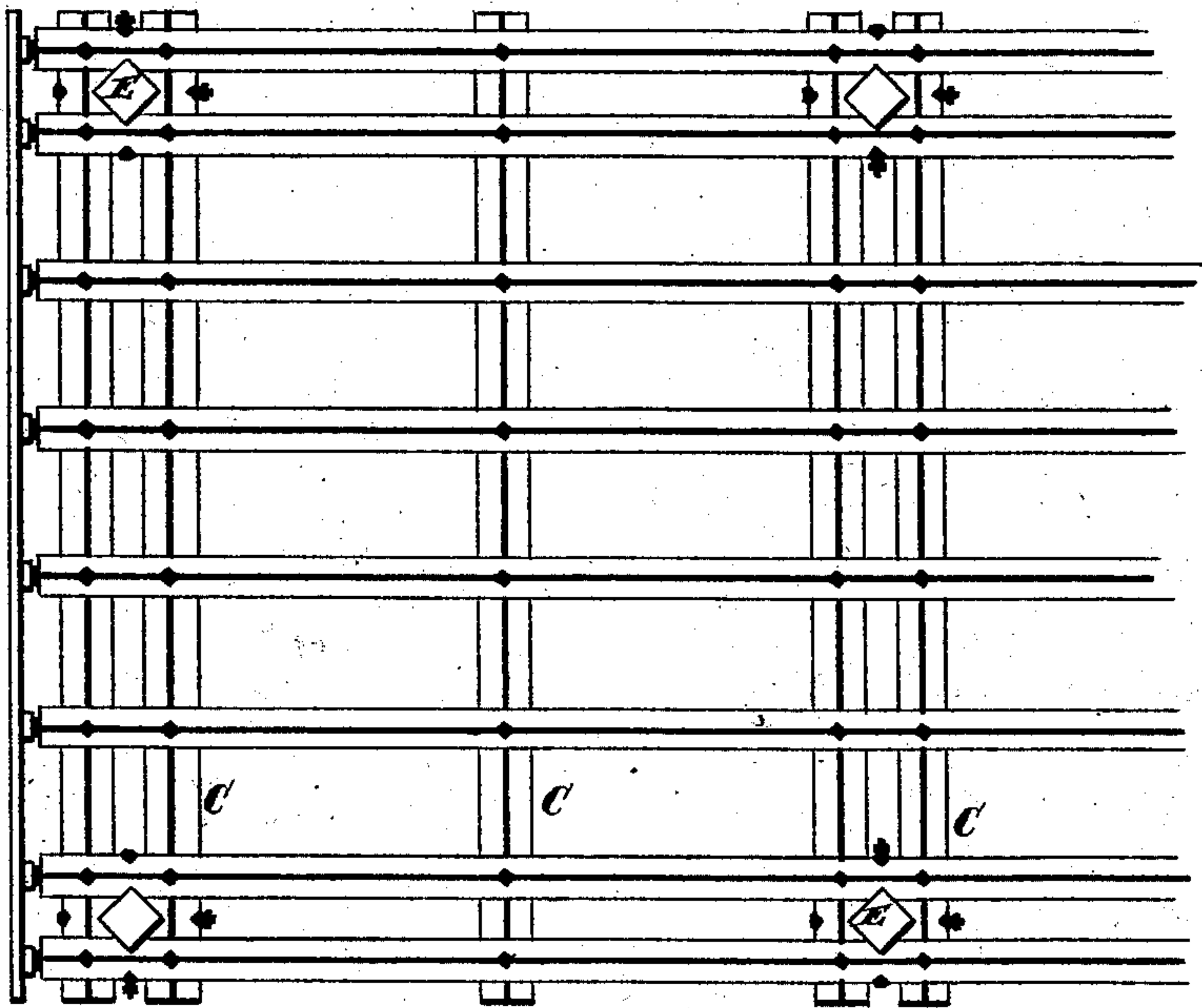
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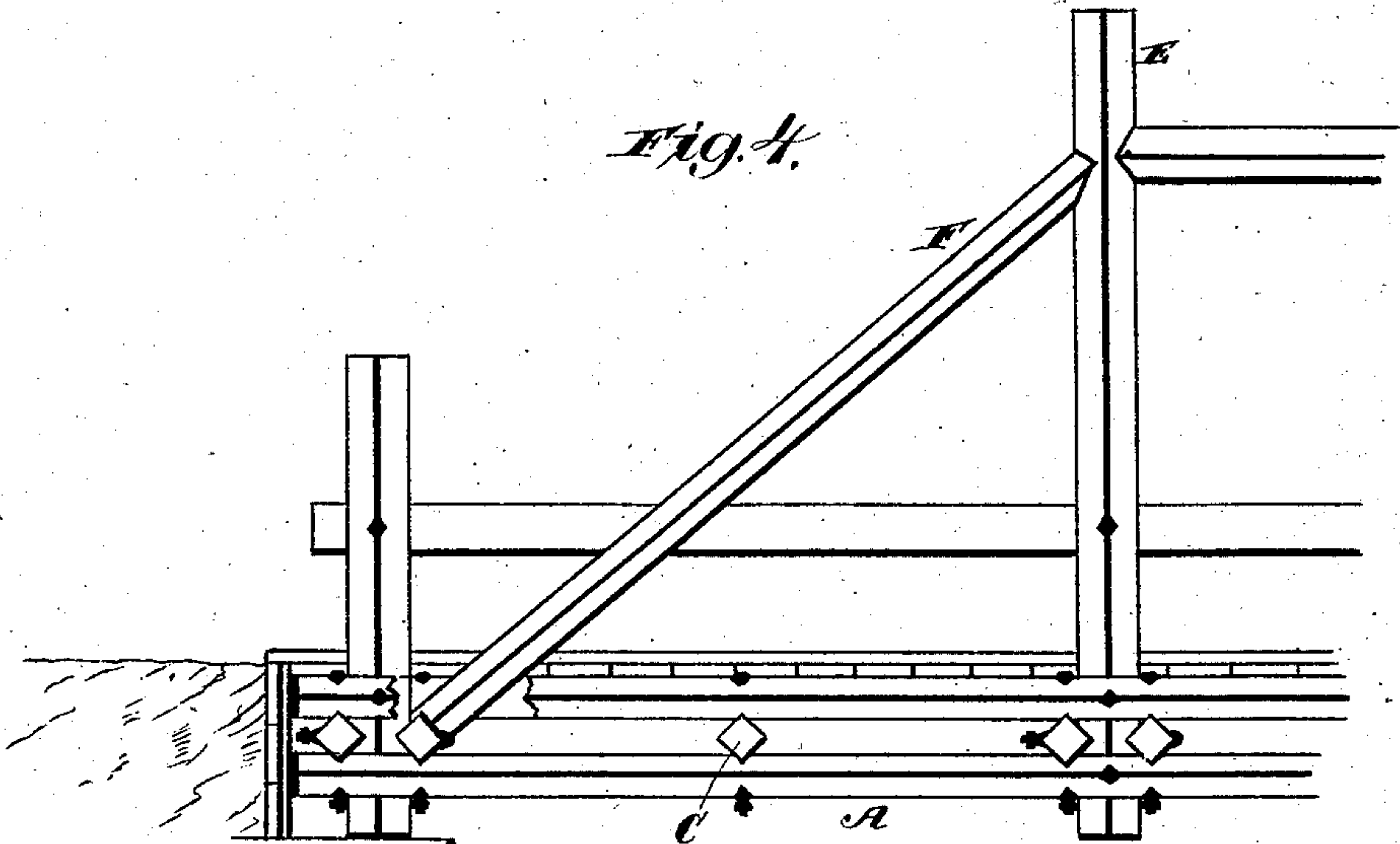
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*Fig. 3.*



*Fig. 4.*



Witnesses,  
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(No Model.)

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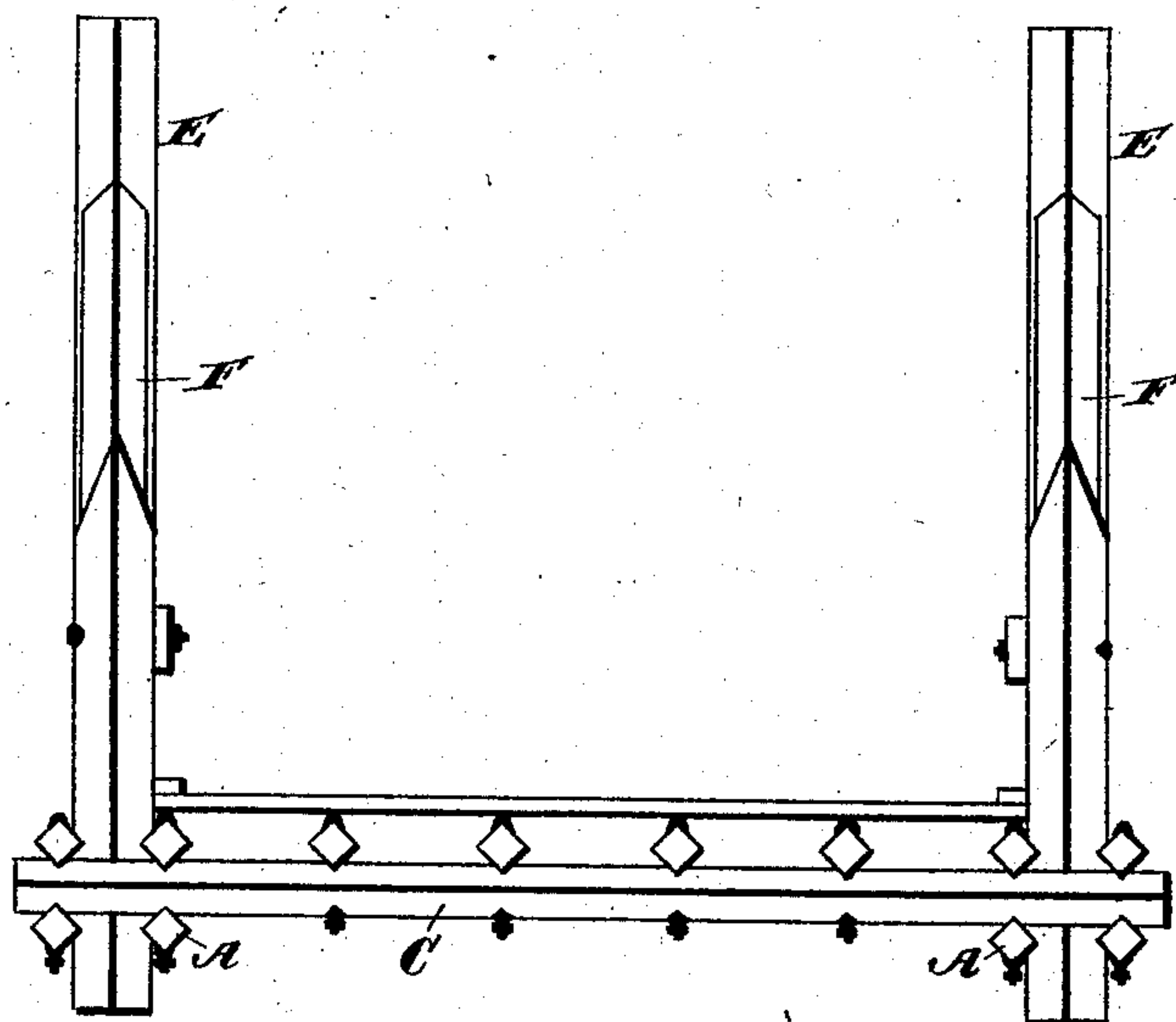
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BRIDGE.

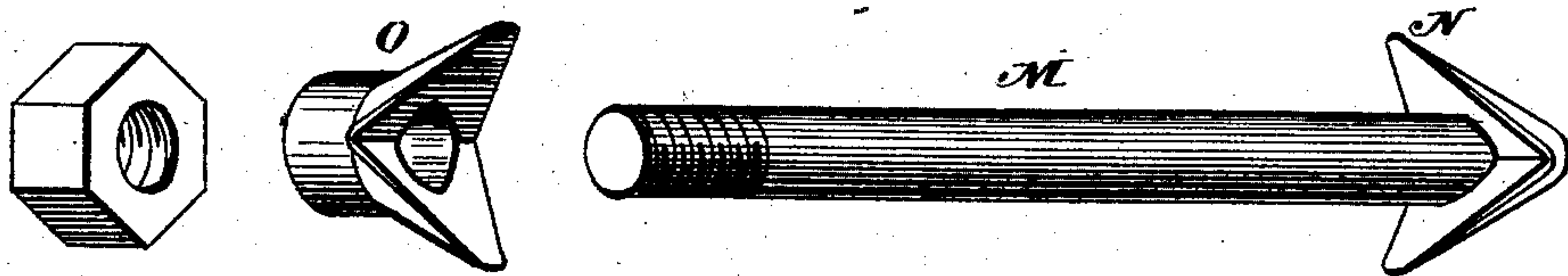
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*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

WILLIAM JENNINGS HOLMAN, OF FORT WAYNE, INDIANA, ASSIGNOR OF  
ONE-HALF TO MICAHAH C. WHITE, OF MINNEAPOLIS, MINNESOTA.

## BRIDGE.

SPECIFICATION forming part of Letters Patent No. 290,054, dated December 11, 1883.

Application filed May 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. HOLMAN, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented new and useful Improvements in Bridges, of which the following is a specification.

The object of the present invention is to provide open or uncovered bridges in which more effectual provision is made for preventing the decay of materials, and in which the timbers are so framed, locked, tied, or secured together as to be less complicated, cheaper, and far more rigid and permanent, and will better withstand the thrusts and tension-strains to which bridges are subjected than in the ordinary methods of construction.

The invention consists in the novel construction and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a section of a truss-bridge, consisting, essentially, of top and bottom chords, lower cross-beams for supporting a railroad-track or flooring, vertical posts, and inclined braces. Fig. 2 is an end elevation of the bridge shown in Fig. 1. Fig. 3 is a plan or top view of a wagon-bridge, showing the lower chords, longitudinal and transverse floor-beams, posts, and manner of securing these parts together, with a breast-wall of planks, an end view of which is shown in Fig. 4. Fig. 4 is a side view of bridge and breast-wall of planks at end of bridge, supported by, though separated from, the ends of projecting timbers by small cast-iron bars or blocks. Fig. 5 is an end view of same without the breast-wall of planks. Fig. 6 is a detail view of the bolt employed for fastening the bridge-timbers together. Fig. 7 is a cross-section of a modified form of angular timber.

I desire it to be understood that I do not restrict my invention to the particular forms of bridges herein illustrated and specifically described, because it will be apparent that the principle or spirit of my invention can be embraced or embodied in all forms of bridges in which wooden timbers, whether horizontal, inclined, or vertical, are employed; and hence it will only be necessary to add that the par-

ticular forms of bridges herein exemplified are selected as methods by which the principle may be illustrated.

The bridge shown in Figs. 1 and 2 consists of the bottom and top chords, A B, the bottom cross-timbers, C C', the packing-sticks D, the vertical posts E, the inclined braces F F', and upper chord packing-block, G. These parts are all composed of pieces or sticks of timbers cut generally square in form, but set or laid in such a way that the sides thereof present angular or inclined surfaces the angles or corners of which approximately coincide with horizontal and vertical lines. The lower chords, A, are each formed of two or more tiers of three parallel timbers, between which the lower cross-timbers C' fit upon the upper tiers of timbers belonging to the lower chords. The packing-sticks D are laid so as to extend longitudinally between the cross-timbers C C'. The vertical posts E are arranged in pairs, and fit between the timbers of the chords and between the cross-timbers C C', adjoining said parts, and the two sections of main braces F are made to foot, respectively, on the upper and lower of the two tiers of cross floor-beams framed about the lower end of posts, while the upper ends of the two sections of said braces shoulder in notches just beneath the lower of the upper chord-sticks, as is shown in Fig. 1. The various horizontal timbers constituting the bottom of the bridge structure are secured together by means of notches made in their contact or abutting surfaces or points where two timbers cross each other, these notches being always on the under side, when one stick may be above the other, so as to leave no exposed crevices for lodgment of moisture. In other words, where two timbers cross each other the top corner apex of one timber is received in a notch made in the nether or lower corner of the other timber. For securing the parts joined in this manner, I make use of a bolt, M, which has a flanged head, N, that projects on all sides from said bolt and has its interior face made inclined or shaped in such a manner as to fit snugly on, about, and around the angle or corner of the timber through which the bolt passes. The other end of the bolt has a removable cast-



iron washer, O, which corresponds in shape to the head N, and is used for the same purpose. The washer O is secured by an ordinary nut on the screw-threaded end of the bolt.

5 The posts are secured to the bottom chords in any preferred way. For example, the posts may be notched at their lower ends for the reception of lower chord-sticks of the bottom chord, and the upper chord-sticks of said  
10 chords may be notched for the reception of the corners of the posts.

It will be understood that the bolts used for connecting the various timbers, whether the same be arranged horizontally, vertically, or  
15 obliquely, are always by their heads and washers made to conform to the plane or angular surfaces at the point of contact with the timbers into and through which the bolts are inserted, generally in conformation with the one  
20 above described. Each top chord B is, in the construction shown in Figs. 1 and 2, composed of three parallel timbers or sticks upon the same plane and an upper stick, which, together with the middle lower stick, are fitted between  
25 the double posts E, the other sticks fitting against the outer sides of said posts. A bolt passes through the three lower sticks and the two posts, and one through the two posts and included upper chord-stick, serving to hold  
30 these parts together. The upper packing-block, G, is notched on its under side and fits on the upper corners of the lower sticks of the top chord and into a notch made in the upper stick of the said chord. Bolts pass through  
35 the contact-surfaces of said sticks and packing-block. The main braces F (shown in Fig. 1) are made of a square piece of timber, to which is secured a triangular covering-piece, f, made by sawing a square piece of wood diagonally  
40 from corner to corner. This triangular covering-piece forms the exposed or upper surface of brace and acts as a water-shed. Timbers of a similar construction can also be used on other parts of the bridge—as, for instance,  
45 the lower tiers of upper and lower chords and floor-beams and for track-sills.

Referring to Fig. 2, it will be seen that the end posts rest directly upon the abutments or piers, and that the bottom chords and lower  
50 cross-timbers are secured to said posts above the lower ends of said posts. This necessarily

causes the chords and cross-timbers to be arranged above the abutment, so that they will not lie upon the same and be exposed to the  
decaying influence of moisture. 55

In Figs. 3, 4, and 5 I have illustrated a wagon-bridge strain-beam truss, in which the bottom chords are each composed of pairs of upper and lower sticks secured to posts that rest upon the abutments and hold the chords above  
60 the latter.

In all forms of bridging, where there is danger of earth coming in contact with and of imparting moisture to the ends of the chord-sticks and feet of end posts, I would attach to  
65 the end of each chord-stick a small cast-iron block or bar, against which a breastwork of planks should be made to rest, separating the earth from the timbers and moisture from the ends of the chords and posts, as shown in Figs. 70  
3 and 4.

I am aware of Letters Patent No. 33,629, dated November 5, 1861, and do not claim what is therein shown; but,

Having thus described my invention, what  
75 I claim is—

1. A wooden-truss bridge having its various chords, vertical posts, braces, and cross-timbers arranged with inclined water and fire  
shedding surfaces, the timbers where they  
80 cross each other in contact being joined together by the lower timbers fitting into a notch in the lower corners of the upper timbers, substantially as described.

2. A wooden bridge having its component  
85 timbers arranged so as to present angular surfaces the apices of which approximately coincide with horizontal and vertical lines, substantially as described.

3. The combination of double-tiered upper  
90 and lower chords and transverse floor-beams locked to each other and to packing-sticks and to and about the posts by bolts and notches, substantially as described.

In testimony whereof I have hereunto set  
95 my hand and seal in the presence of two subscribing witnesses.

WILLIAM JENNINGS HOLMAN.

Witnesses:

GEORGE L. BITTINGER,  
D. A. WORDSWORTH.