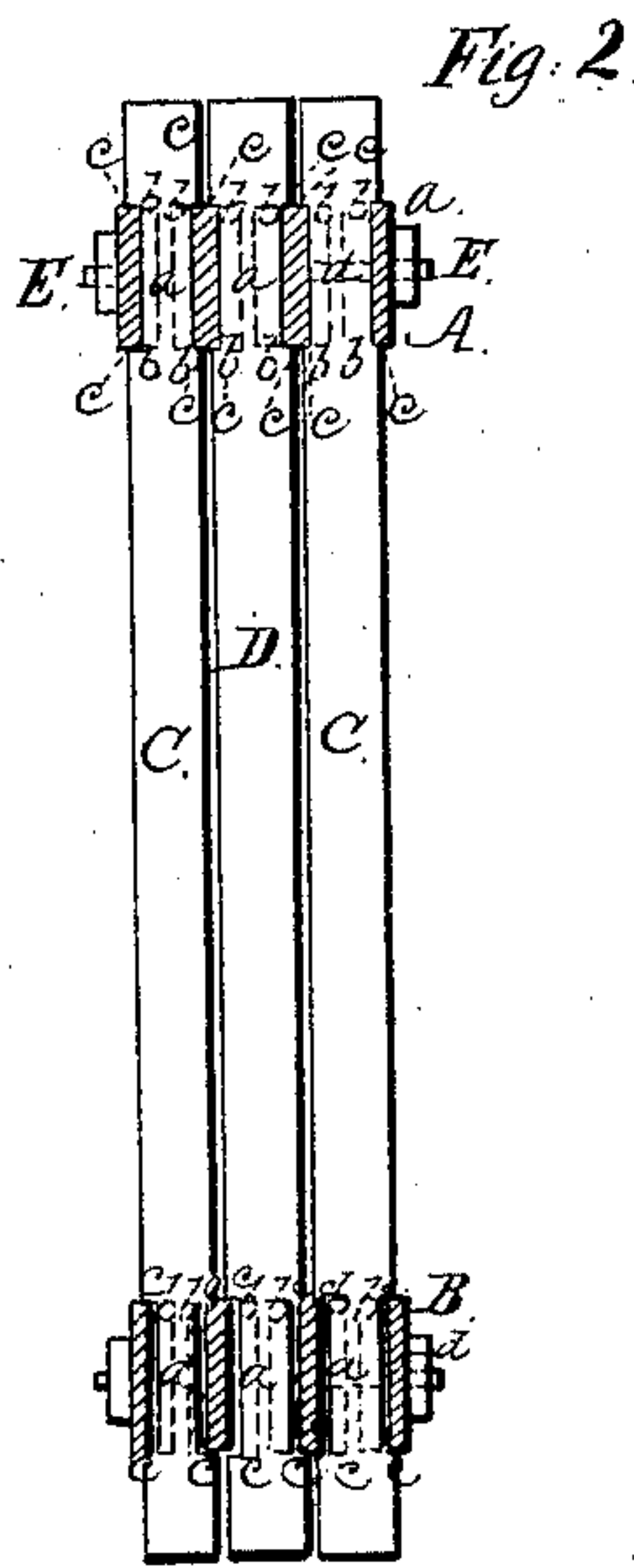
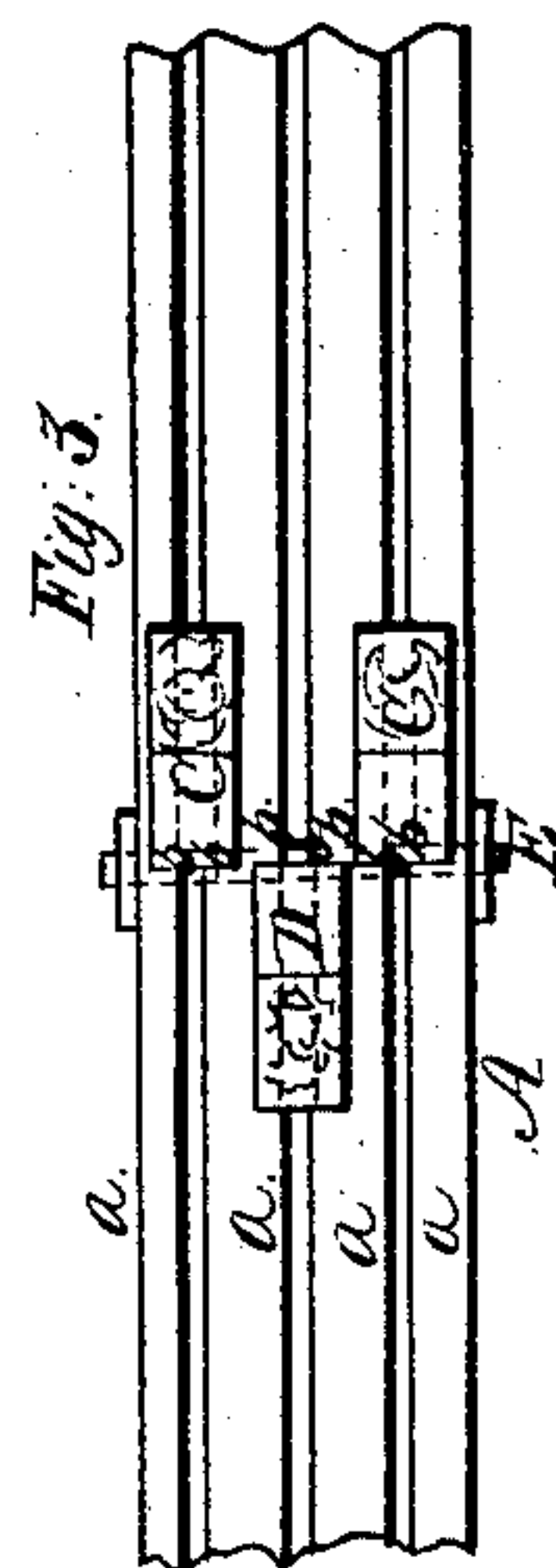
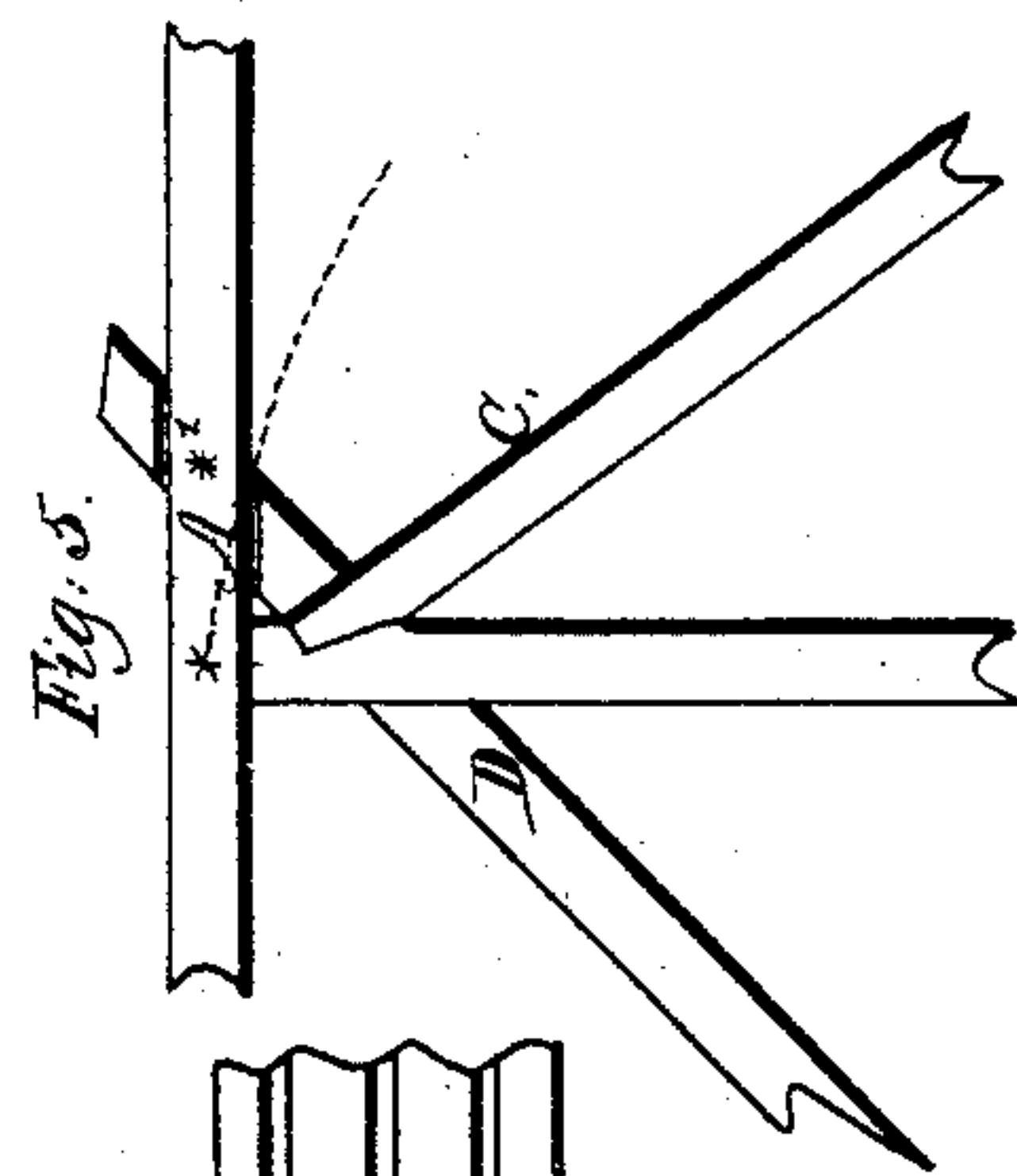
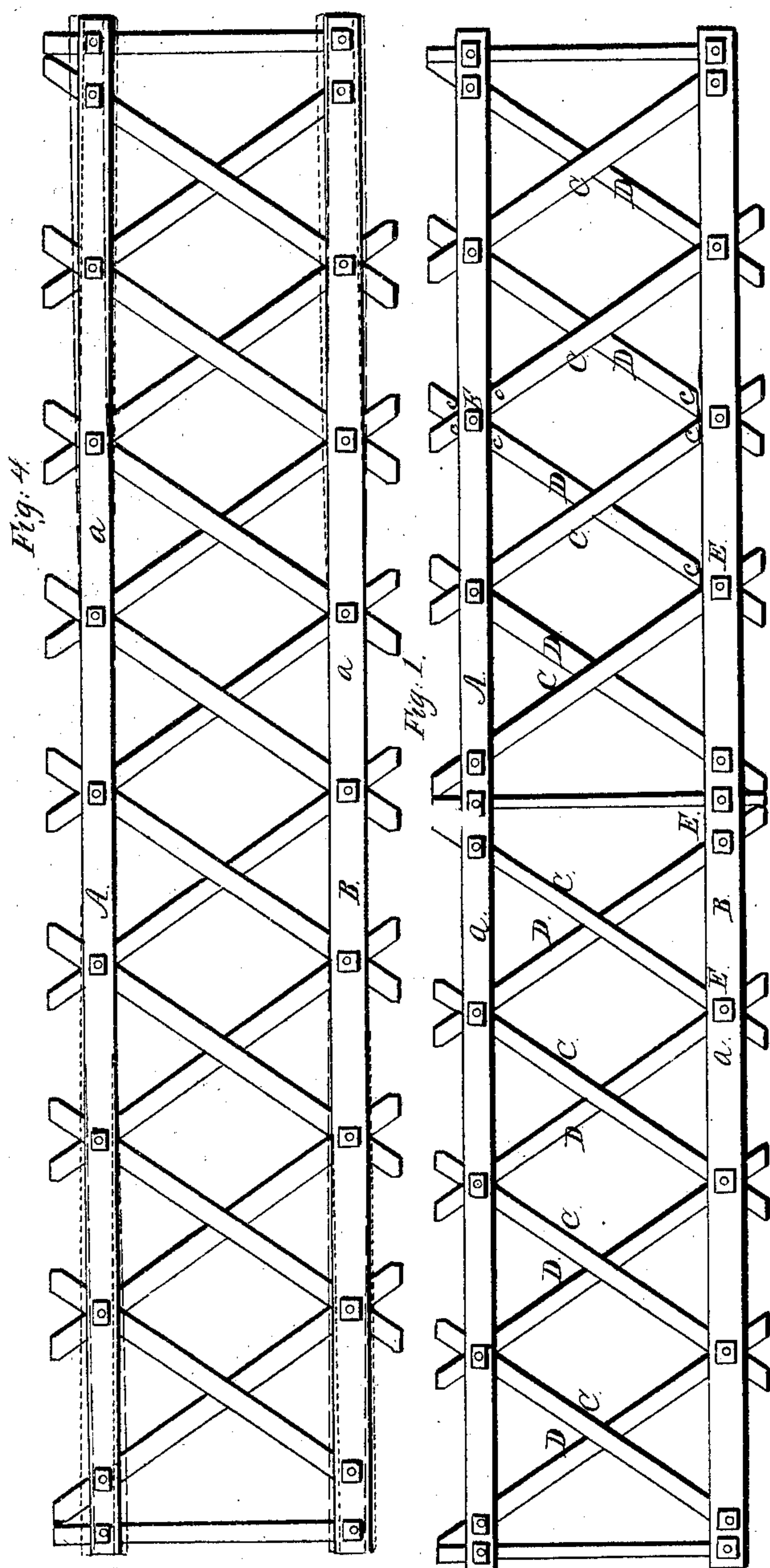


J. Brown, Jr.
Truss Bridge.

No 14,722.

Patented July 7, 1857.



UNITED STATES PATENT OFFICE.

JOSIAH BROWN, JR., OF BUFFALO, NEW YORK.

TRUSS-BRIDGE.

Specification of Letters Patent No. 17,722, dated July 7, 1857.

To all whom it may concern:

Be it known that I, JOSIAH BROWN, Jr., of Buffalo, in the county of Erie and State of New York, have invented a new and useful
5 Improvement in Truss-Bridges; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification,
10 in which—

Figure 1, is a side view of a truss frame constructed with my improvements. Fig. 2, is a vertical section of the same. Fig. 3, is a plan of ditto. Fig. 4, is a side view of an
15 old style of bridge wherein only the main braces are shouldered and passed up between the timbers of the chords. Fig. 5, is also a side view of another old style of bridge wherein the counter braces only are shouldered and passed up between the timbers of
20 the chords.

The object of my invention is to unite all the timbers of each of the chords in such a manner that they shall become as it were
25 one piece, and consequently when the strain or weight comes upon the bridge each set of braces shall act at one point, and upon all the timbers as united, instead of upon them as separated, whereby all chance of the
30 main braces acting upon one timber of each of the chords and the counter braces upon the other timber of each of the same separately or in a manner to twist or rend asunder the said timbers is completely
35 avoided.

The nature of my invention consists in providing each of the main and counter braces with two gains at top and bottom, and each of the timbers of the chord with a gain
40 at the point where the braces are applied corresponding with the gains in the braces and passing the braces thus formed up between the timbers, with the gains of the braces in such relation to the gains of the
45 timbers that when the timbers of the chords are brought together they shall all be combined in such a manner as to become as it were only one piece no part of which can be operated upon or affected independently of
50 the other by the downward and upward thrusts common to truss bridges, even if the bolt which passes laterally through and intersects each set of braces and the timbers of the chord were removed, so long as the
55 chords have no lateral play.

To enable others skilled in the art to make

and use my invention, I will proceed to describe its construction and operation.

A, represents the upper and B the lower chord of the bridge; each is composed of
60 four timbers *a, a, a, a*, as shown in Fig. 2.

C, C, are the main braces, and D the counter braces.

b, b, are the gains cut in the timbers of the upper and lower chords, and *c, c*, the gains
65 cut in the main and counter braces. The outer timbers of both chords have only one gain cut in them at top and bottom, while the intermediate timbers have each two
70 gains to correspond to the gains of the braces which, both main and counter, have each two gains, both at top and bottom. The gains in the braces and in the timbers all match when the parts are brought together,
75 as shown in Fig. 2, or so that the shoulders, formed by the gains on each brace, bear upon two timbers of the bottom and top
chord, both on the upper and underside of the same, and thus by the gains of the three
80 braces and the gains of the timbers the whole structure is united together in such a manner as to become one piece, as it were, no portion of which will be affected independently of another in a manner to twist or
85 break asunder the same.

E, E, are the bolts which pin the parts laterally together after they have been brought together as described.

It should be observed that the bolts E have no other office to serve than to hold the
90 parts laterally together, and if removed the two chords and the timbers thereof would still be united and capable of resisting all vertical strain just as effectually as if the bolts were in.
95

I am aware that a bridge with the counter braces having gains and passed between the timbers of the chords is not new, such an arrangement having been contrived by Geo. W. Thayer in 1848; but in this arrangement,
100 as will be seen from Fig. 5 of the drawing, the counter braces and main braces are not combined so as to act unitedly at one point, and upon all the timbers of the chords connected or as one piece. The bearing of the
105 counter braces also extends so far forward or in rear of the main braces which abut against vertical posts that a considerable length of leverage is furnished wherewith to spring or rend asunder the chords when the
110 weight is applied to the bridge. This will be understood by imagining the * to be the

fulcrum of the counter brace, and the distance from * to *' to be the leverage of the counter brace wherewith to spring the intermediate timbers of the chords, as illustrated
5 by the red line.

I am also aware that two braces with a single gain at their upper and lower end crossed diagonally and passed up between two timbers of a chord and united by a bolt
10 have been employed in the construction of a bridge by Jas. H. Stewart, but in this arrangement the timbers of the chord are not combined with each other by the shoulders formed by the gains and consequently the
15 braces, instead of acting upon the timbers of the chord as united in one piece, they act upon the timbers as separated, and thus while one forces the other pulls, as illustrated by the red and blue lines in Fig. 4,
20 and consequently the timbers are twisted in opposite directions on the bolt and rent asunder.

I do not claim broadly furnishing the main or counter braces with gains and passing them between the timbers of the chords;
25 but

What I do claim as my invention, and desire to secure by Letters Patent, is—

Providing each of the main and counter braces with two gains at top and bottom, 30 and each of the timbers of the chord with a gain at the point where the braces are applied corresponding with the gains in the braces, and passing the braces thus formed, up between the timbers, with the gains of 35 the braces in such relation to the gains of the timbers that when the timbers of the chords are brought together they are combined and become, as it were, only one piece, no part of which can be operated upon or affected 40 independently of the other by the downward and upward thrusts common to truss bridges, even if the bolt which passes laterally through and intersects each set of braces and the timbers of the chord were re- 45 moved, substantially as and for the purposes herein set forth.

JOSIAH BROWN, JR.

Witnesses:

B. W. FENWICK,
GOODWIN Y. AT LEE.