

M. S. & H. B. Carter,

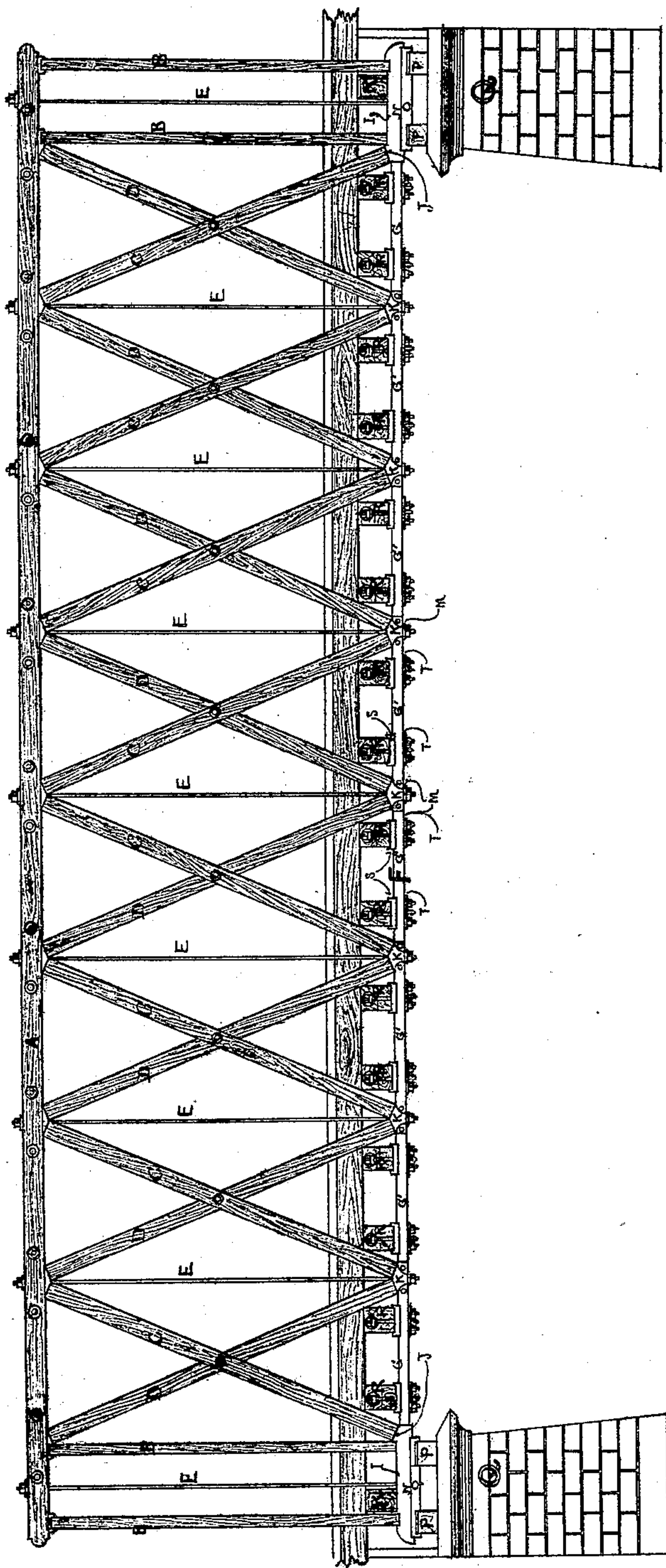
2 Sheets, Sheet 1.

Truss Bridge.

No. 104,110.

Patented June 14, 1870.

Fig. 1.



Witnesses.

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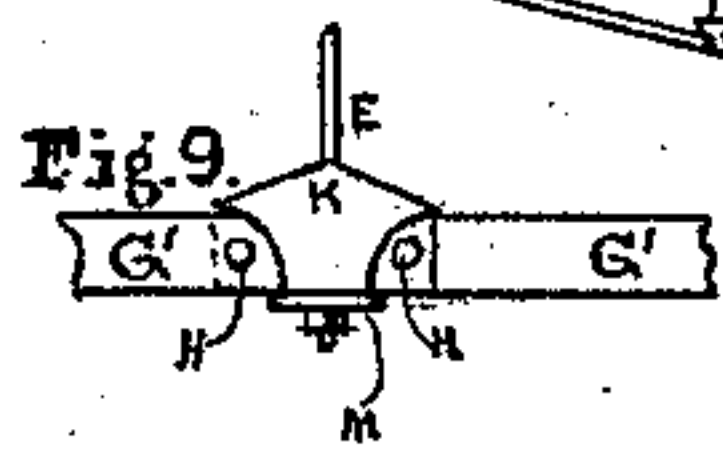
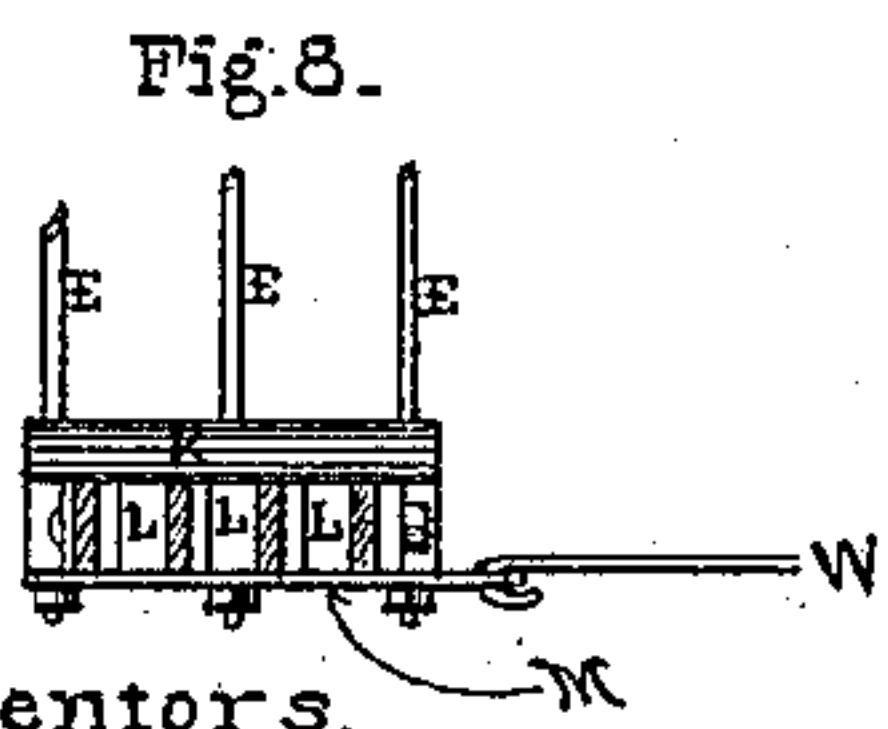
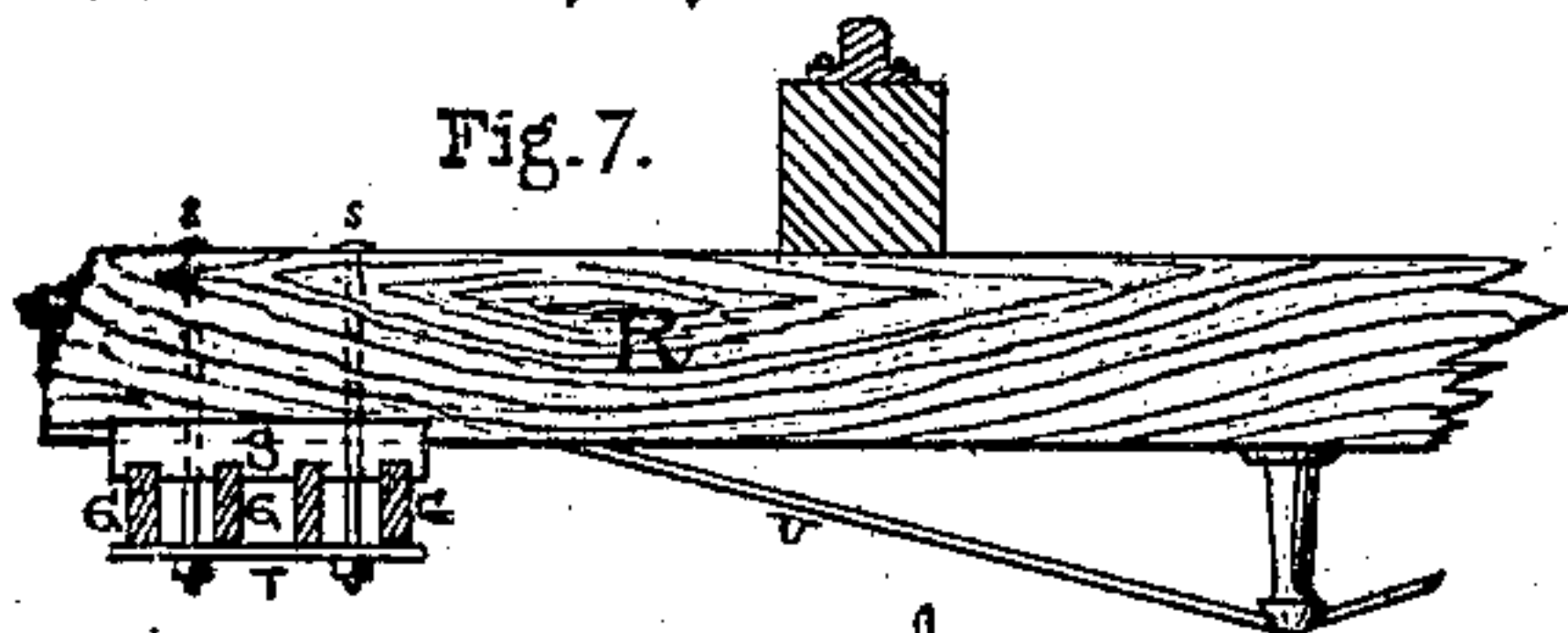
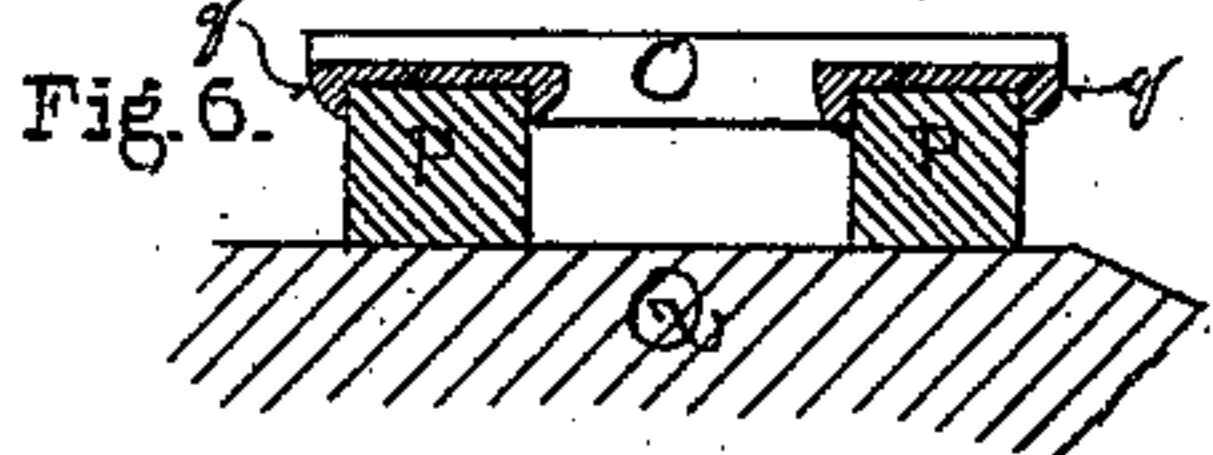
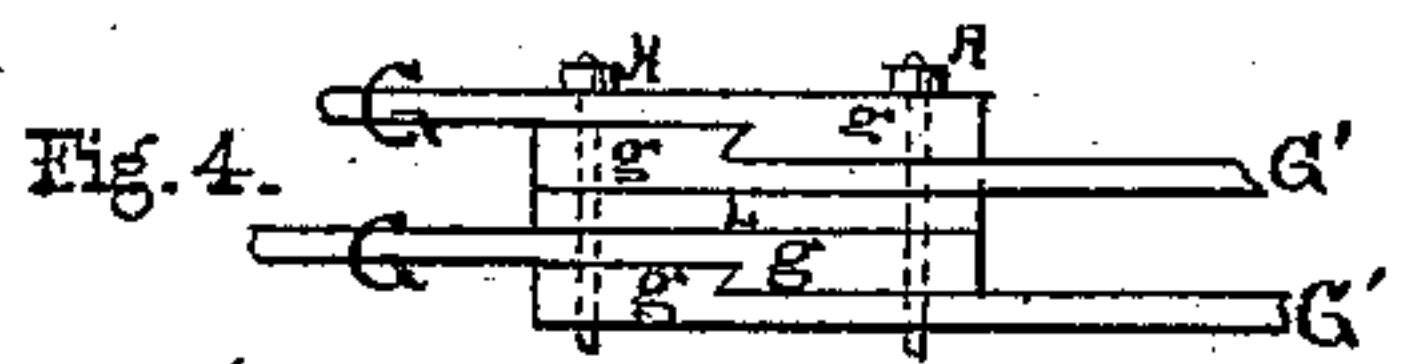
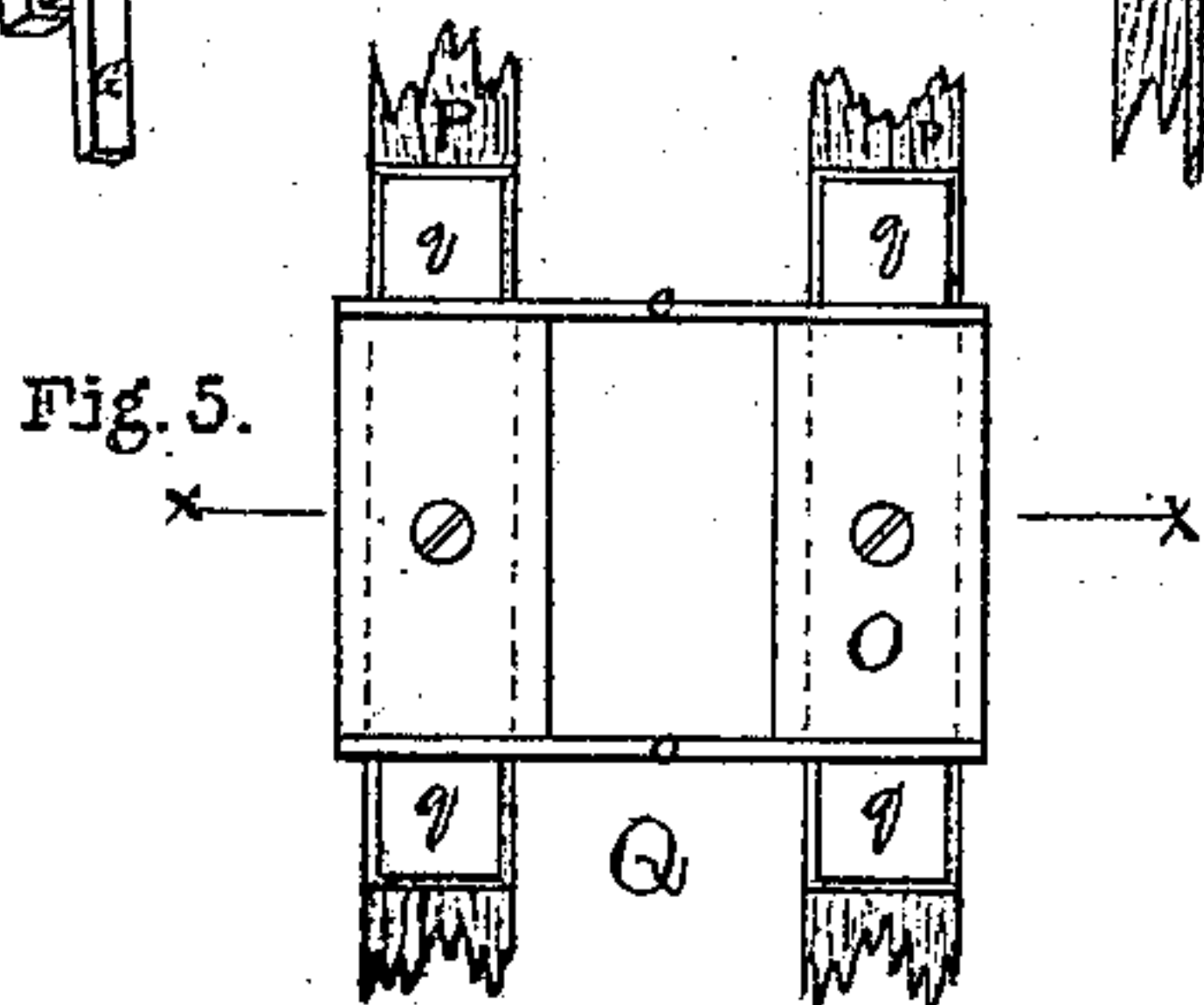
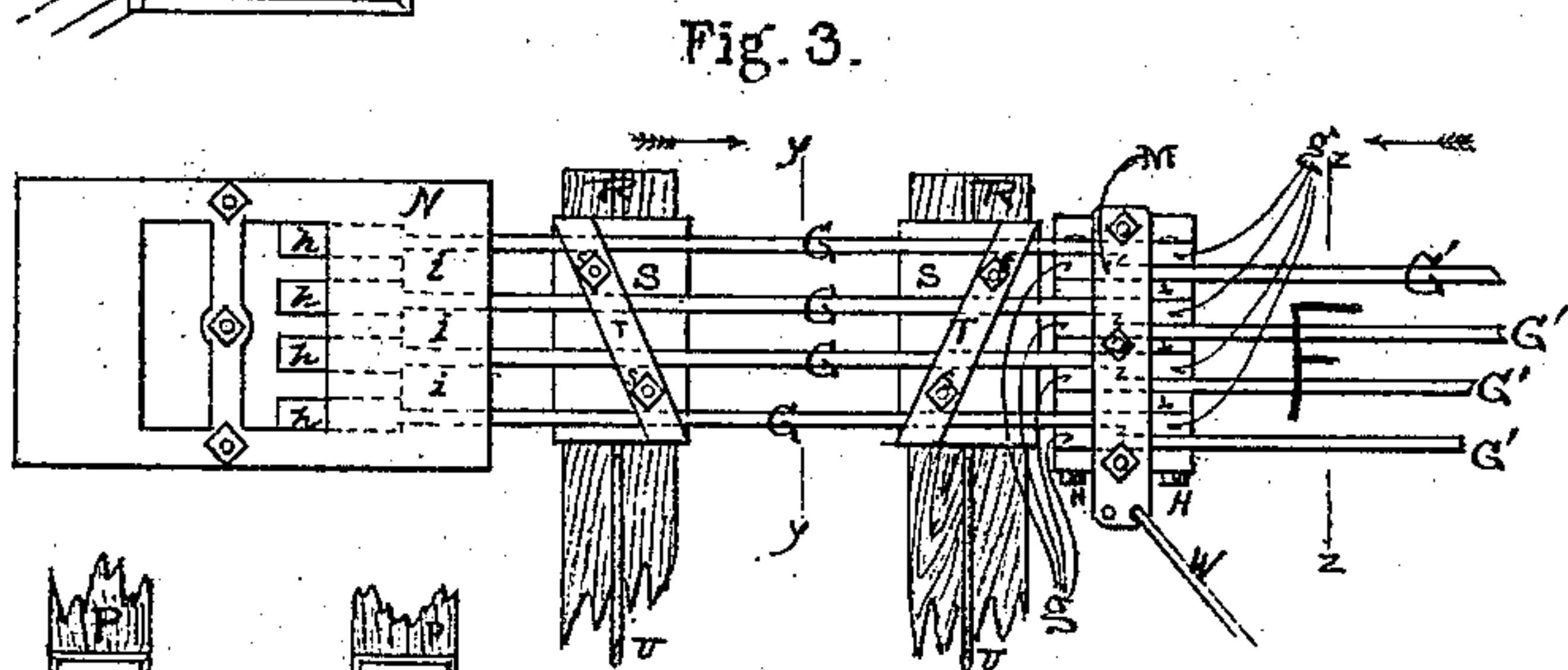
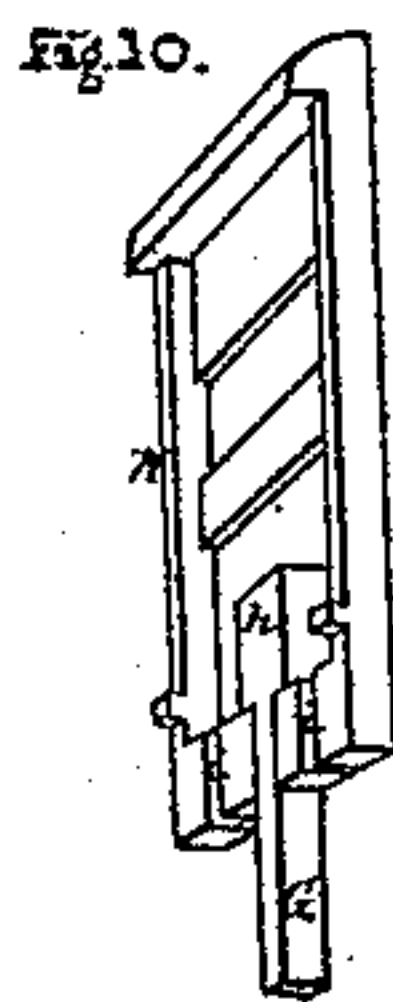
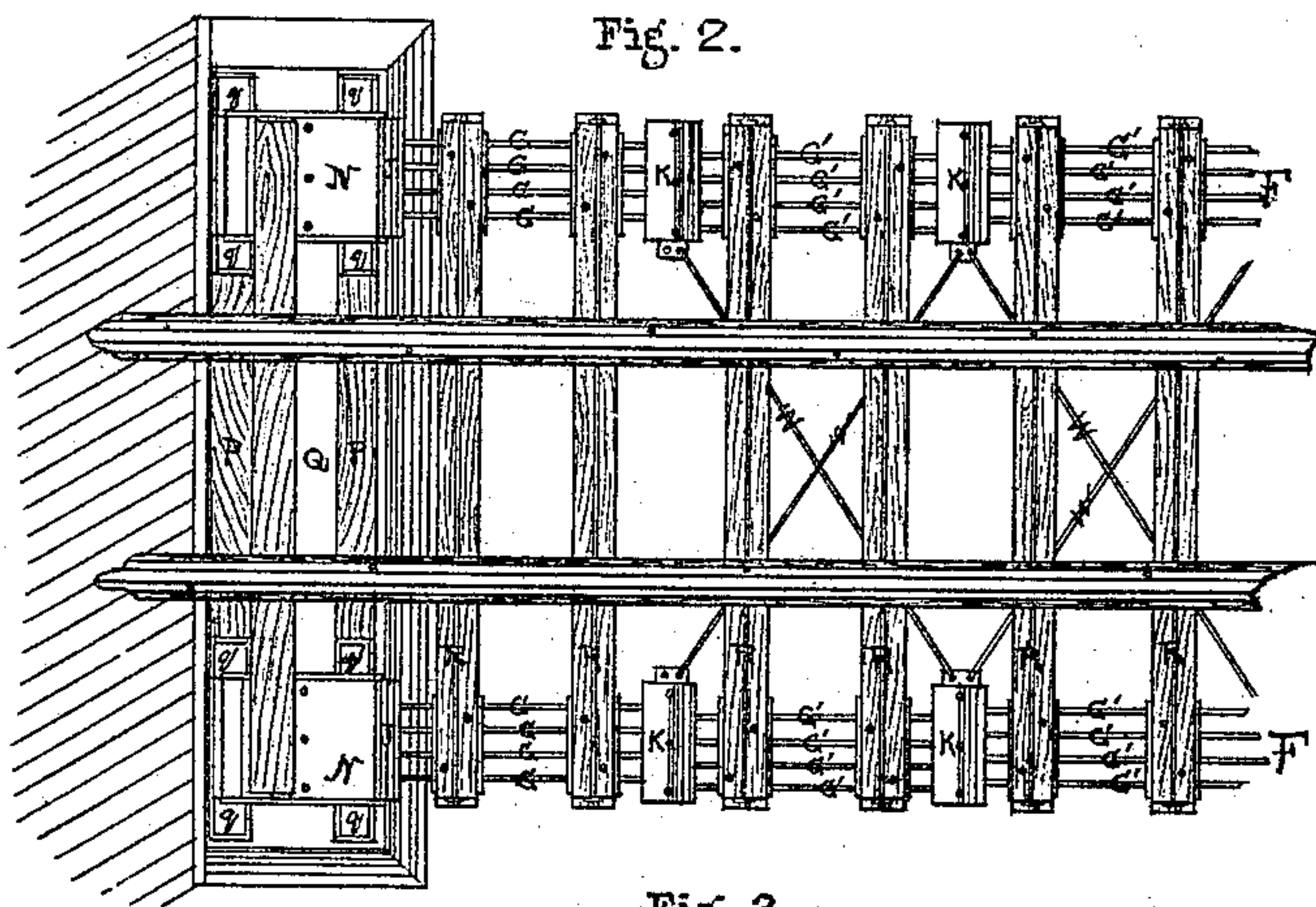
2 Sheets, Sheet 2

M. S. & H. B. Carter,

Truss Bridge.

No. 104,110.

Patented June 14, 1870.



Witnesses.
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United States Patent Office.

MILO S. CARTTER AND HOSEA B. CARTTER, OF ST. LOUIS, MISSOURI.

Letters Patent No. 104,110, dated June 14, 1870.

IMPROVEMENT IN TRUSS-BRIDGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, MILO S. CARTTER and HOSEA B. CARTTER, of St. Louis, in the county of St. Louis and in the State of Missouri, have invented certain new and useful Improvements in Truss-Bridges; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side elevation of a Howe truss-bridge, constructed with our improvements;

Figure 2 is a plan view of a portion of the floor of the same;

Figure 3 is a plan view of the lower side of a portion of one of the bottom chords, showing one section joint;

Figure 4 is a bottom plan of a section joint, enlarged;

Figure 5 is a plan of one of the friction seats;

Figure 6 is a cross-section of the same on the line $x x$ of fig. 5;

Figure 7 is a transverse section of a lower chord, on the line $y y$ of fig. 3, showing, also, part of a floor-timber with its truss-rod;

Figure 8 is a transverse section of a lower chord, at an angle block, on the line $z z$ of fig. 3;

Figure 9 is a side elevation of a lower chord, showing the end of an angle-block; and

Figure 10 is a perspective view of the upper side of a shoe, with the top plate removed.

Letters of like name and kind refer to like parts in each of the figures.

This invention is an improvement in the Howe truss-bridge; and

It consists in the manner of constructing the sections of the lower chord and in connecting the same to each other and to the bridge, so that there will be no shearing strain upon the joint-bolts, and so that said joints will be accessible for repairs or for the application of protective coats of paint.

Heretofore, in constructing truss-bridges with iron chords at the bottom, the different sections of said chords have been secured to each other by bolts only, by which means said bolts were subjected to a shearing strain, more or less powerful, according to the weight of the superstructure. The constant action of such strain has always caused the lower chords to give way first at the joints, which failure has been enhanced by the inaccessibility of said joints for the purpose of applying to the same protective coatings of paint.

To obviate these objections, in our invention the chord-sections are connected together by means of interlocking projections, which receive all tensile strain and are bound together by means of bolts passing through the same.

In the annexed drawing—

A represents the upper chord, constructed in the usual manner;

B the end posts;

C the main braces;

D the counter-braces; and

E the tension-rods, which parts, being common to all Howe truss-bridges, need no further description.

The lower chords, F, are constructed in sections, which, for convenience, should be equal in length to the distance between the feet of the braces C, and, in addition thereto, one-half the length of the lap of the sections.

As seen in figs. 3 and 4, each of the flat bars G, forming a section, has, formed upon one side, at its end, a head, having a thickness about equal to the thickness of said bar, and terminating at its inner end in a vertical, angular shoulder, which rakes inward, so as to interlock with the head g' of the adjoining bar G' of the next section.

Passing transversely through the bars G and G', near their ends, are two bolts, H, the object of which is to prevent displacement of the parts of the joint, the tensile strain upon the chord being received and sustained by the heads g and g' .

At each end of the chord F is a section, composed of bars G, provided, at their inner ends, with the before-described interlocking head g , while their outer ends are constructed with a T-shaped head, h , by means of which a connection is made with the shoe N.

As seen in figs. 3 and 10, the shoe N is constructed with a plain lower surface, while its upper side is covered by means of a plate, I, provided with a horizontal step for the reception of the lower ends of the posts B, with an angular step, J, for the lower ends of the first pair of braces, C, and with suitable vertical openings for the reception of the post tension-rods E'.

The interior of the shoe is provided with a recess corresponding in width to the breadth of the end of the chord over the heads h , and in depth to the thickness of said heads, while a number of channels, i , corresponding in size, shape, and position with the chord-bars G, and extending longitudinally outward from said recess, receive said bars and permit their heads, h , to engage with the ends of said recess, as shown in figs. 3 and 10. By means of the plate I the chord and shoe are secured firmly together.

The joints between the intermediate chord-section (composed of the hook-headed bars G', joined as shown in fig. 4,) are covered by means of angle-blocks K, provided at their ends with flanges k , which pass downward upon either side of the chord.

Between each pair of interlocking bars G' is placed a packing-block, L, for the purpose of giving the necessary width to the chord, and also to afford space between said bars for the center tension-rod, which passes

downward through the center of the angle-block and joint, while the outer rods pass through the ends of said angle-blocks outside of the chord, and, by means of a clamp or plate, M, placed over their lower ends and extending transversely across said chord, secures said angle-block and chord firmly together.

The shoe N rests in a friction seat, O, which rests upon and is secured to the wall-plates P, upon the top of the pier or abutment Q, said friction seat being provided with flanges o, which project upward upon either side of the shoe and hold it firmly in position, laterally, while allowing such longitudinal movement of the shoe as may be required by the expansion or contraction of the materials of the lower chord under thermal variations.

In order to afford greater bearing-surface upon the wall-plates, four lugs or flanges, q, corresponding in width to said wall-plates, project from and form a part of the friction-seat, as shown in figs. 2 and 5.

The floor-timbers R rest in chairs, S, placed at regular intervals upon the chord F, and are secured thereto by means of two bolts s, which, passing downward through said timbers, the chairs, the chord, and a plate or clamp, T, are provided, at their lower ends, with screw-threads and nuts in the usual manner.

In order to allow the bolts s to pass through the floor-timbers upon either side of the center, they, together with the clamp, are placed diagonally to the line of the bridge, as shown.

If required, each floor-timber may be trussed, as shown in fig. 7, in which event it will be necessary to groove or score the lower side of each timber from its ends inward, so as to admit the truss-rod U, or to form each timber of two pieces, with a packing of plank placed between to cover said rod, but, in either case, the washer placed between the truss-rod nut and the end of the timber laps over the solid portions, so as to give a firm bearing to the rod.

The usual diagonal brace-rods W may be employed to connect the lower chords, as shown.

In actual construction, we thoroughly coat the surfaces of the parts at the joints with paint, and interpose between the angle-blocks, chairs, &c., and between the chord-bars, sheets of lead, so that the surfaces thus covered are fully protected, while the remaining portions of the chord, being readily accessible, may be covered with paint at any time.

Having thus fully set forth the nature and merits of our invention,

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

The lower or tension-chord F, composed of the bars G and G', provided with the solid hooked heads g, and connected together by means of the interlocking of said heads, the bolts H, and the packing-blocks L, substantially as shown and described.

Also, the angle-block K, constructed in the manner shown and described, and combined with the plate or clamp M and the interlocked chord-bars, as to receive and cover the joint, substantially as set forth.

Also, the friction-seat O, constructed with the laterally-projecting bearings q, adapted to the wall-plates P, in combination with the shoe N, substantially as and for the purpose shown.

Also, the metallic tension-chord F, constructed of sections joined together by means of solid interlocking heads and transversely-binding bolts, in combination with the shoe N, the end posts B, the main and counter-braces C and D, respectively, the tension-rods E, and the upper chords A, substantially as shown and described, the whole forming an improvement upon the "Howe truss-bridge."

In testimony that we claim the foregoing, we have hereunto set our hands this 28th day of March, 1870.

MILO S. CARTTER.

HOSEA B. CARTTER.

Witnesses:

JAMES H. COMFORT,
C. T. FORD.