(No Model.) 2 Sheets—Sheet 1.

C. W. SHERWOOD.

BRIDGE.

No. 363,970. Patented May 31, 1887.

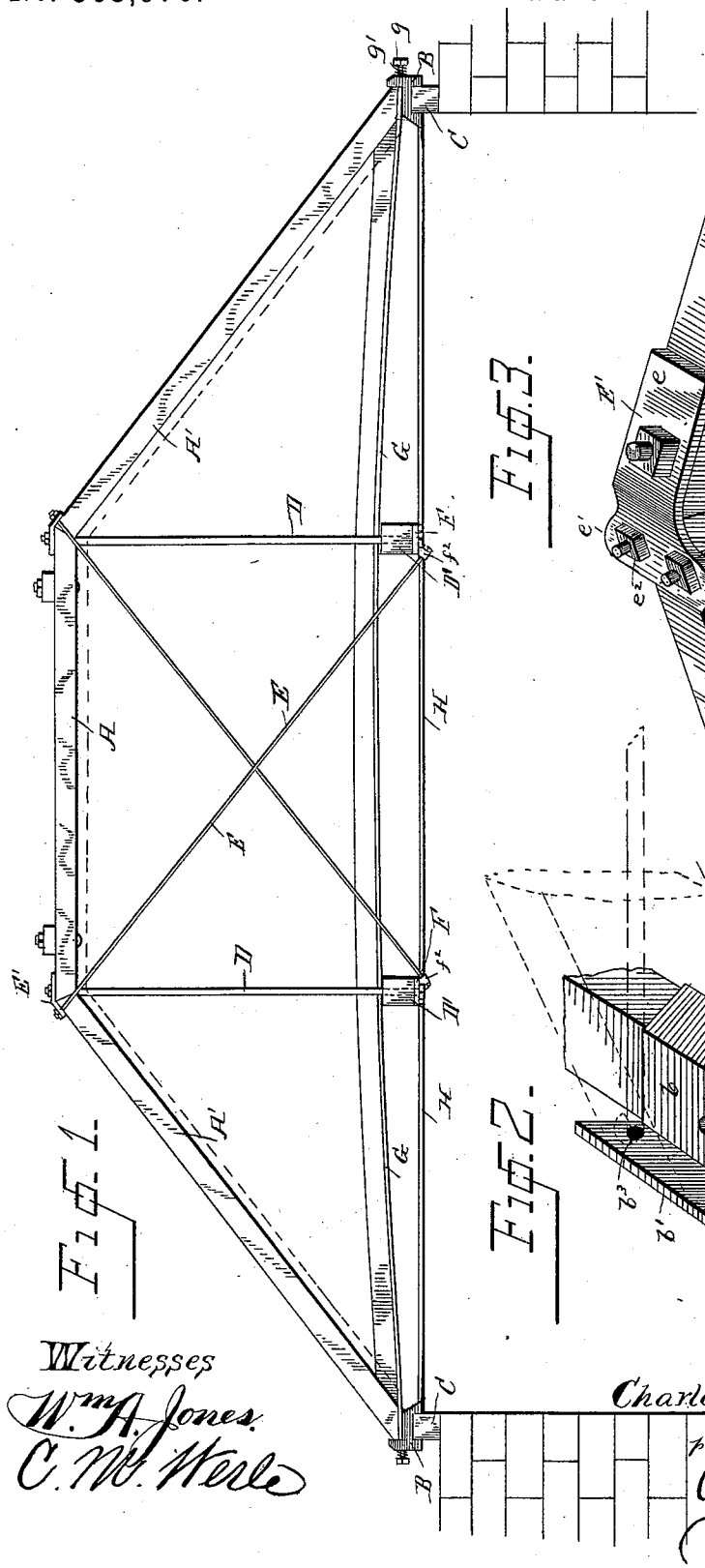


Fig. 1.

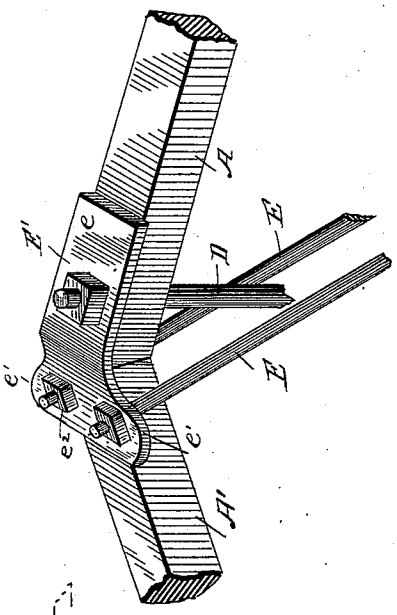


Fig. 3.

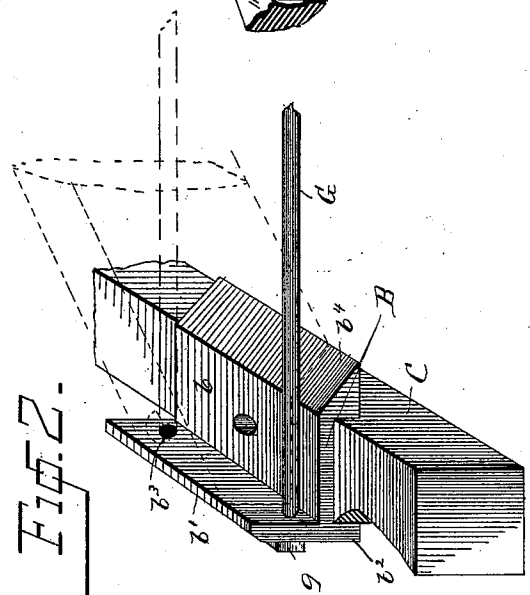


Fig. 2.

Witnesses
Wm. A. Jones.
C. W. Wells

Inventor
Charles W. Sherwood.
per O. E. Duffy
Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. W. SHERWOOD.

BRIDGE.

No. 363,970. Patented May 31, 1887.

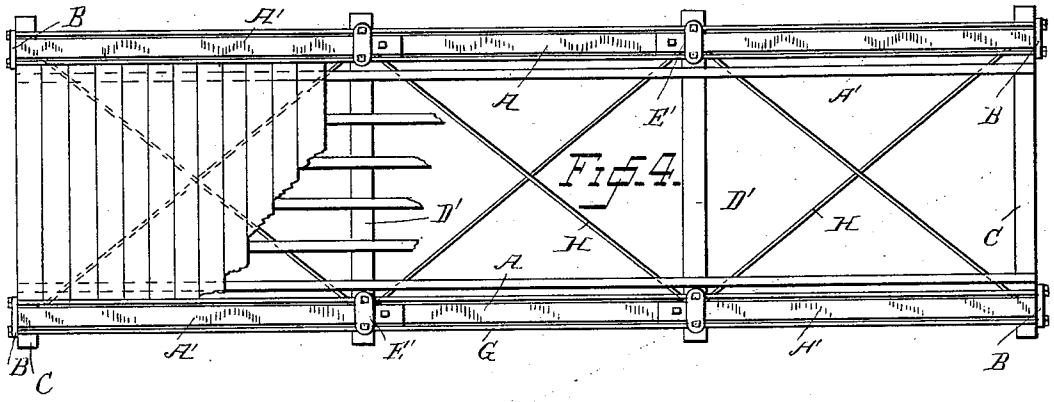


Fig. 4.

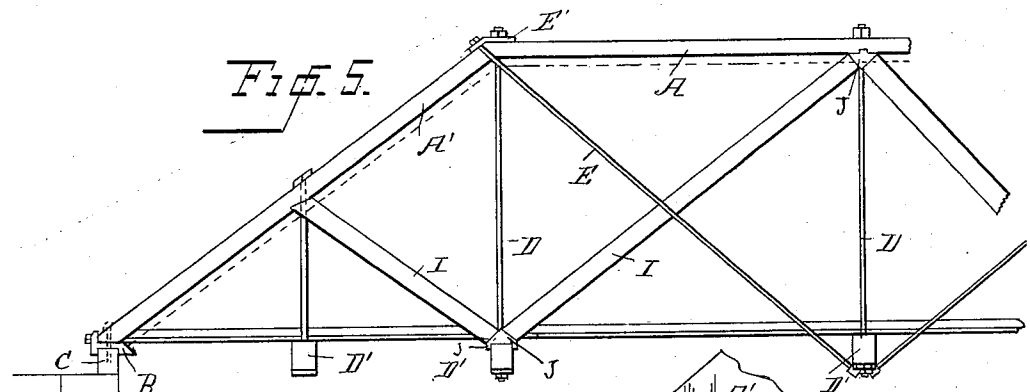


Fig. 5.

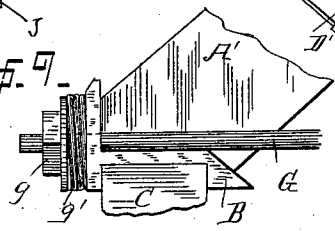


Fig. 9.

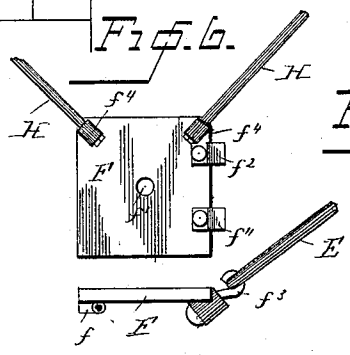


Fig. 6.

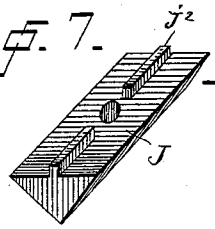


Fig. 7.

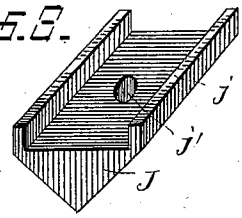


Fig. 8.

Witnesses
Wm. A. Jones.
C. W. Weld

Inventor.
Charles W. Sherwood.
per O. E. Duell
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES W. SHERWOOD, OF ULYSSES, NEBRASKA, ASSIGNOR OF ONE-HALF TO WILLIAM L. SAMPSON, OF SAME PLACE.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 363,970, dated May 31, 1887.

Application filed February 12, 1887. Serial No. 227,429. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SHERWOOD, of Ulysses, in the county of Butler and State of Nebraska, have invented certain new and useful Improvements in Bridges; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form part of this specification.

My invention relates to bridges, and has for its object to provide improvements that shall be simple and durable in construction, economical in cost, and not likely to get out of repair.

My invention consists in the means of bracing and strengthening the bridge by a more simple method, as will be hereinafter more fully described, and then specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation showing the complete single-span construction. Fig. 2 is a detail of the wall-plate shoe as adjusted to the wall-plate and supporting the main brace. Fig. 3 is a detail showing the joint-plate in operative position. Fig. 4 is a top view of the entire single-span bridge. Fig. 5 is a portion of the longer bridge, showing the additional braces as employed. Fig. 6 is a detail of the needle-plate for securing the counter and lateral rods. Figs. 7 and 8 are views, respectively, of the upper and lower angle-blocks; and Fig. 9 is a detail showing the spring for providing for contraction and expansion.

Similar letters of reference indicate like parts in the various figures.

A A are the top chords or beams of the bridge; A′ A′, the main braces, which run from the top chords to the wall-plate shoes B, said shoes resting on the abutment-beams C of the abutments.

D D are the main support-rods, extending down vertically through the needle-beams D′, and are rigidly secured at their tops to the joint-plates E′ and at their bottoms to the needle-plates F.

E E are counter-rods for bracing the structure, passing diagonally from the needle-plate F to the joint-plates E′, to both of which they are secured, as will be hereinafter more fully described.

G G are the bottom tie chord-rods for retaining the bridge in its proper position, being secured at each end to the wall-plate shoes B by the nuts g g. Resting between said nuts g g and the plates B are springs g' g', providing for contraction and expansion of said top chords without adding any extra strain to said chord-rods G.

H H are the rods used for preventing lateral movement, and secured at their ends to lugs f f on the needle-plate F. These rods are horizontal and pass diagonally across the under part of the structure.

I I are additional braces used for longer spans. They extend diagonally from the lower angle-blocks J, resting on the needle-beam D′, to the upper angle-blocks J. These braces rest against the angular sides of the angle-blocks, which secure them firmly in position.

The wall-plate shoes B are usually made of cast-iron, and preferably made in the form shown. Extending upward and downward at right angles with the main portions b of the shoes are flanges b, b^2, respectively. The upper flanges are used to support the lower ends of the main braces A′, and also secure the lower tie-chords, G. The shoes B being of wider dimensions than the braces A′, the flanges of the shoe will extend beyond the edges of said braces sufficient to allow the top chord-rods to pass through the holes b^3 and be secured by the nuts g g. The lower flanges, b^2, are used to grip the abutment-beams C, and opposite to the projecting flanges b' b^2 are downwardly-projecting angular flanges b^4, the inward or straight projection also forming a grip for the abutment-beams C. Thus by means of these flanges the shoe is firmly held in contact with the wall-plate. The angular sides of the projections b^4 serve as a support to the main braces A′. Thus it will be seen that the braces are held rigid with the wall-plates by means of the shoes B.

The joint-plates E′, which rest partially on the top chords, A, and main braces A′, are utilized for the purpose of binding the joints together. These plates are made in the form shown—*i. e.*, curved from the main portion e

of the plate. Downwardly and outwardly are the ears e', which extend far enough beyond the edges of the braces A A′ to allow the counter-rods E to pass through them and be secured by means of the nuts e^2 on each side of said joint-plate. Passing through the main portion of the plate and secured thereto are the main support-rods D. It will be noticed that the support-rods are secured through the joint-plate just to the right of the joining of the top chord, A, and main brace A′, (shown in Fig. 3,) and the counter-rods secured through the joint-plate just to the left of the joining of said braces, and as the rods are secured at each end they will tightly bind the joints together.

The needle-plates F are made square and fit on the bottom of the needle-beams D′, just under the main support-rods D, said rods passing through the holes f', nuts being then screwed on, which firmly secure the plates to the beams. On one side of the needle-plates are bosses or lugs f^2, which have central holes, in which rest the screw-eyes f^3, the object of these eyes being to secure the counter-rods E to the needle-plates. On the sides at right angles to the ones having the bosses are lugs f^4, which are cast radial with the central holes f. These lugs are used to secure the lateral rods to the needle-plate and keep them rigid with the rest of the structure.

The angle-blocks J J are used to give a bearing-surface to the additional braces I. The lower blocks are provided with flanges j, which rest on the needle-beams, said block being by these means held from lateral movement. Through the center of these blocks are holes j', through which pass the main support rods D. The upper blocks are made similar to the lower ones; but instead of flanges a spline, j^2, is used, which rests in a corresponding groove in the top chord-beams, A. This block is also provided with central holes, which receive the main support-rods D. Thus it will be seen that the entire structure is greatly strengthened, braced, and supported by means of my present improvements.

Of course it is obvious that I may deviate within reasonable limits from the herein-described construction without departing from the spirit of my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a bridge, the main braces, the top chords, and the lateral and counter rods, in combination with the wall shoe-plates B, resting on beams C of the abutment, the joint-plates E′, having ears to which the counter-rods are secured, the needle plates having lugs on their under surface, to which are secured the counter and lateral rods, and the angle-blocks J, all arranged substantially as shown and described.

2. In a bridge, the combination of the main braces and rods, the wall shoe-plates B, having downward-projecting flanges which rest on abutment-beams C, and the upward-projecting flanges which receive the tie-chords, said flanges forming a support for the main braces, which are firmly secured together by means of bolts, substantially as described.

3. In a bridge, the main braces and top chords, in combination with the joint-plates, to which are secured the main support-rods, said plates being provided with projecting ears to receive the counter-rods, and the needle-plates provided with lugs to receive the counter and lateral rods, substantially as specified.

4. In a bridge, the main braces and top chords, in combination with the wall-plate shoes, strut-braces I, the needle-plates having lugs to receive the counter and lateral rods, and the angle-blocks having flanges and splines, whereby they are held in position, as and for the purpose specified.

5. The main braces and top chords, in combination with the wall-plate shoes, the lower tie-chords secured thereto by means of nuts, and springs resting between said wall-plates and nuts to provide for contraction and expansion, substantially as specified.

6. As a new article of manufacture for bridges, the wall-plate shoe consisting of the plate B, flanges b' b^2, and beveled plate b^4, all cast in a single piece and serving for clamp and seat for the main brace A′, substantially as described.

7. In a bridge, the combination of the wall-plate shoe constructed as described, the braces A′, and the joint-plate E′, substantially as described.

8. In a bridge, the combination, with the wall-plate shoe constructed as described, of the brace A′, the joint-piece E′, the support-rod D, the counter-rod E, and the chord, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES W. SHERWOOD.

Witnesses:
JULIUS SOLGER,
CHARLES M. WERLE.