D. H. Morrison.
Truss Bridge.

No. 20,082. Patented Apr. 27, 1858.

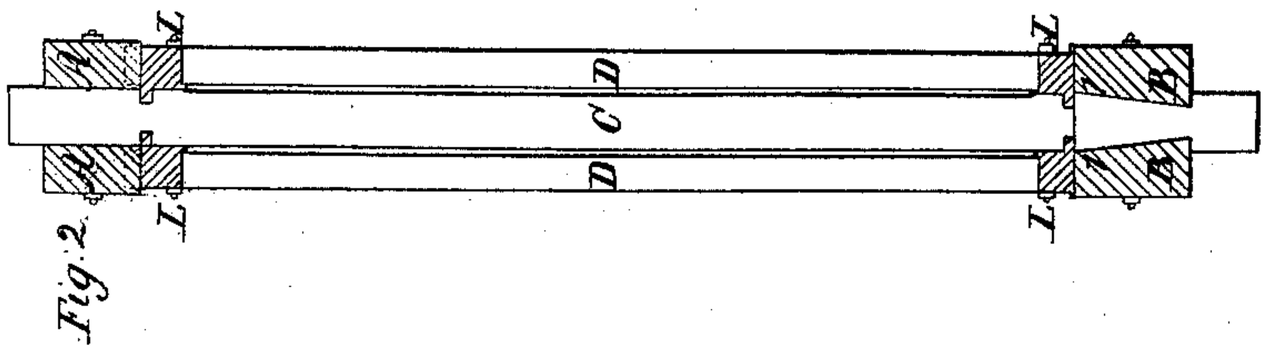

Fig. 2.

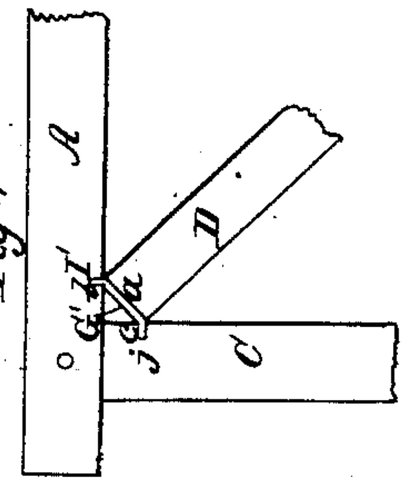

Fig. 4

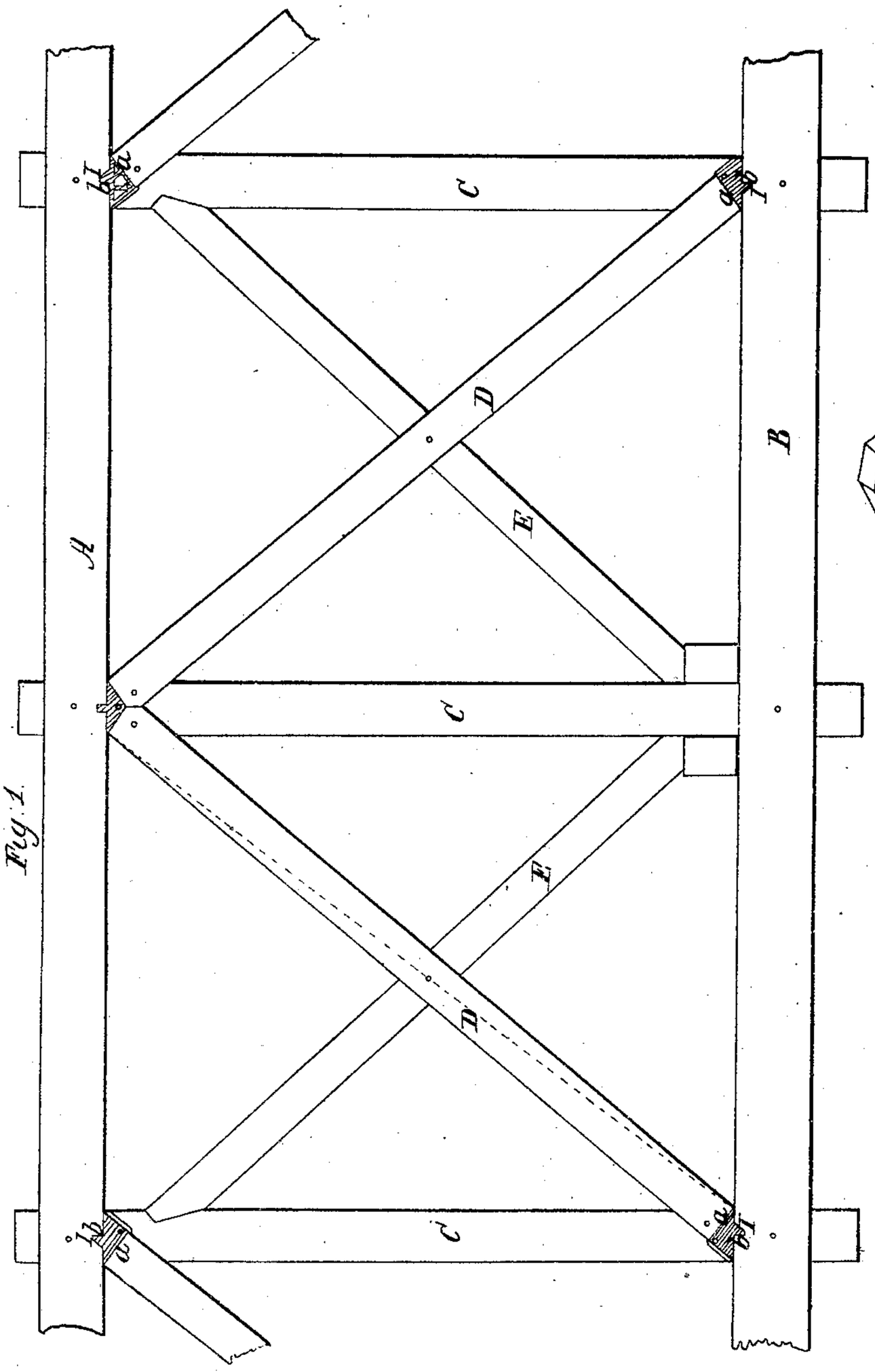

Fig. 1.

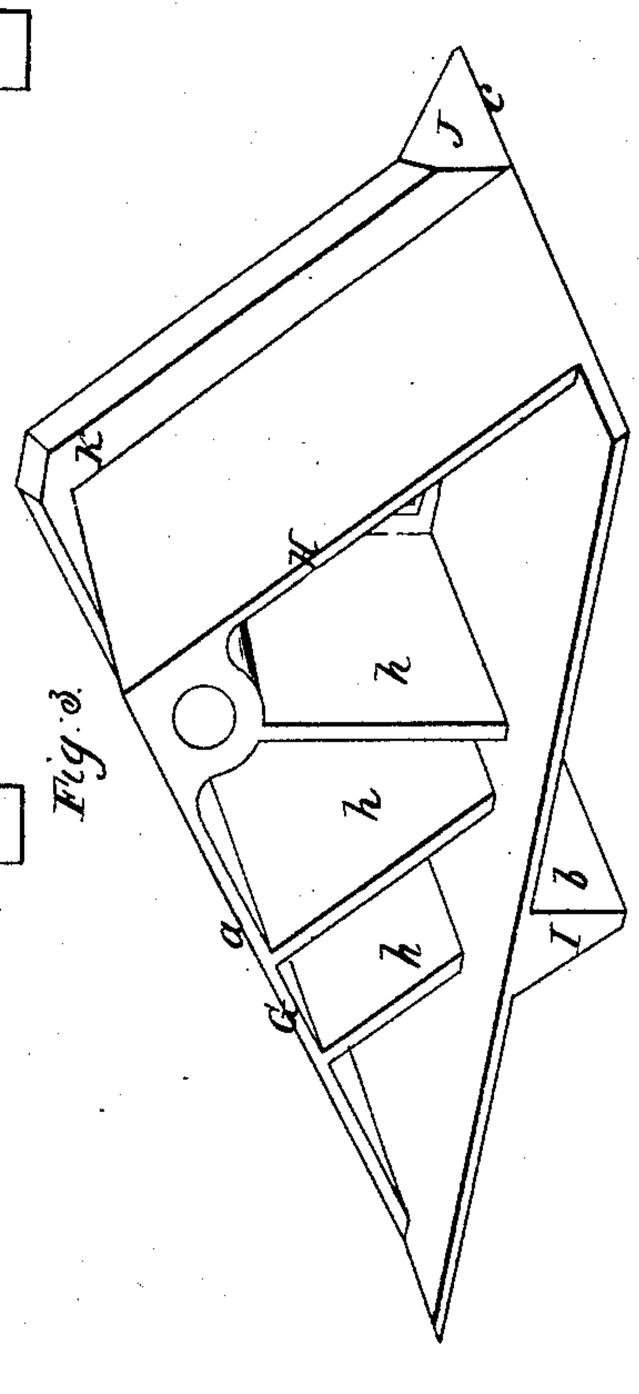

Fig. 3.

UNITED STATES PATENT OFFICE.

D. H. MORRISON, OF DAYTON, OHIO.

METALLIC SHOE FOR TRUSS-BRIDGES.

Specification of Letters Patent No. 20,082, dated April 27, 1858.

To all whom it may concern:

Be it known that I, DAVID H. MORRISON, of Dayton, Montgomery county, Ohio, have invented a new and useful Improvement in Wooden Truss-Framing for Bridges and other Similar Structures; and I hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

The shrinkage of timbers in cross section causes trusses formed of green timber to become rapidly loose or rickety when the braces rest or bear against the sides of the other parts of the trusses.

The elongation or enlargement of the panels of a truss by shrinkage renders both main and counter-braces too short and the consequent settling of the truss which keeps the main braces tight elongates the diagonal of the panel in the direction of the counter brace and it becomes entirely useless.

My invention relates to a provision whereby a truss bridge or other wooden truss frame is preserved from the deleterious effects of shrinkage.

In the accompanying drawings Figure 1 is a side view of a portion of a truss bridge embodying my improvement. Fig. 2 is a transverse section thereof. Fig. 3 is a perspective view of the shoe on an enlarged scale. Fig. 4 represents a modification of the shoe, adapted for light work.

A, and B, are respectively the upper and lower chords.

C, are the posts. The notches 1, in the sides of the posts, which uphold the lower chords, feather out at their upper parts to afford a sufficient depth of shoulder to support the rear flange of the shoe, hereafter described.

D, are the main brace timbers and E, are the counter braces.

The principal feature of my improvement consists in a device for transferring the thrusts of the braces of a truss wholly to the ends of the fibers of the posts and chords conjointly, instead of sustaining them wholly or partially on the sides of the fibers. For this purpose I employ a cast iron (or other metallic) shoe or angle piece G H I J K, whose longitudinal contour, in its most perfect form is a right angled triangle equal in length to the width of the post and the two sides forming the right angle bearing about the same proportion to the hypotenuse that the length and height of the panel do to its diagonal.

The position of the shoe or angle piece in the truss is with its longest side or hypotenuse against the upper or lower chord as the case may be, and at the side of and in contact with the post, to which it is secured by a bolt L. The sloping sides of the casting consist of two plates G, H, one of which (G) forms such an angle with the chord, as to afford to the end of the brace a bearing surface at right angles or nearly so to its fibers. The plate H, is merely a rib or stay, which together with the ribs *h*, transfer the thrust of the brace to the chord and post.

Projecting from the sole of the shoe and occupying a transverse gain or notch in the top of the lower chord or the bottom of the upper chord as the case may be, is a flange I, whose bearing surface *b*, is at right angles to the fibers of the chord. J, is a flange projecting horizontally from the rear side of the shoe into a suitable gain in the post so as to present a bearing surface *c*, at right angles to its fibers. A flange K, serves to stiffen the shoe and prevent the contact of the brace and post, to obviate decay. By forming the surface *a*, at right angles to the diagonal of the panel and also of the main brace (see dotted line) facility of inserting the latter is obtained while preserving substantially the main feature of the improvement.

The above form of shoe has been employed effectively in bridges of 100 feet span and upward, but for those of less span (excepting railway bridges) and for handrailing on suspension bridges, truss partitions, trestles and gates the shoe may consist simply of a plate G′, whose flanges I′, J′, are gained into the post and chord in the manner shown in Fig. 4.

I am aware that various descriptions of framing have been constructed with metallic shoes furnished with lugs, the office of which is to preserve the shoe from displacement on the timber upon which it rests, but I know of none in which such a disposition and combination of bearing surfaces is employed as to sustain the thrust on the ends of the fibers in three different directions so that the shoe is prevented from following the lateral shrinkage of either the chord or post with which it comes in contact.

I do not confine myself to three bearing

surfaces, as a very slight modification of the shoe admits of two bearing surfaces for the chord and two for the post; but I claim as new and of my invention—

The combination of metallic shoes or angle pieces with the several parts of wooden trusses, in such manner that the cuts or gains made in the timbers of the trusses, against which the bearing surfaces on the shoes rest are at right angles or nearly so to the fibers of the timbers as at *a*, *b*, *c*, for the purpose of preventing the injurious effects of shrinkage,—there being on every shoe at least three such bearing surfaces; one each for the chord, post and brace.

In testimony of which invention I hereunto set my hand.

D. H. MORRISON.

Attest:

GEO. H. KNIGHT,

CLEMENT E. BABB.