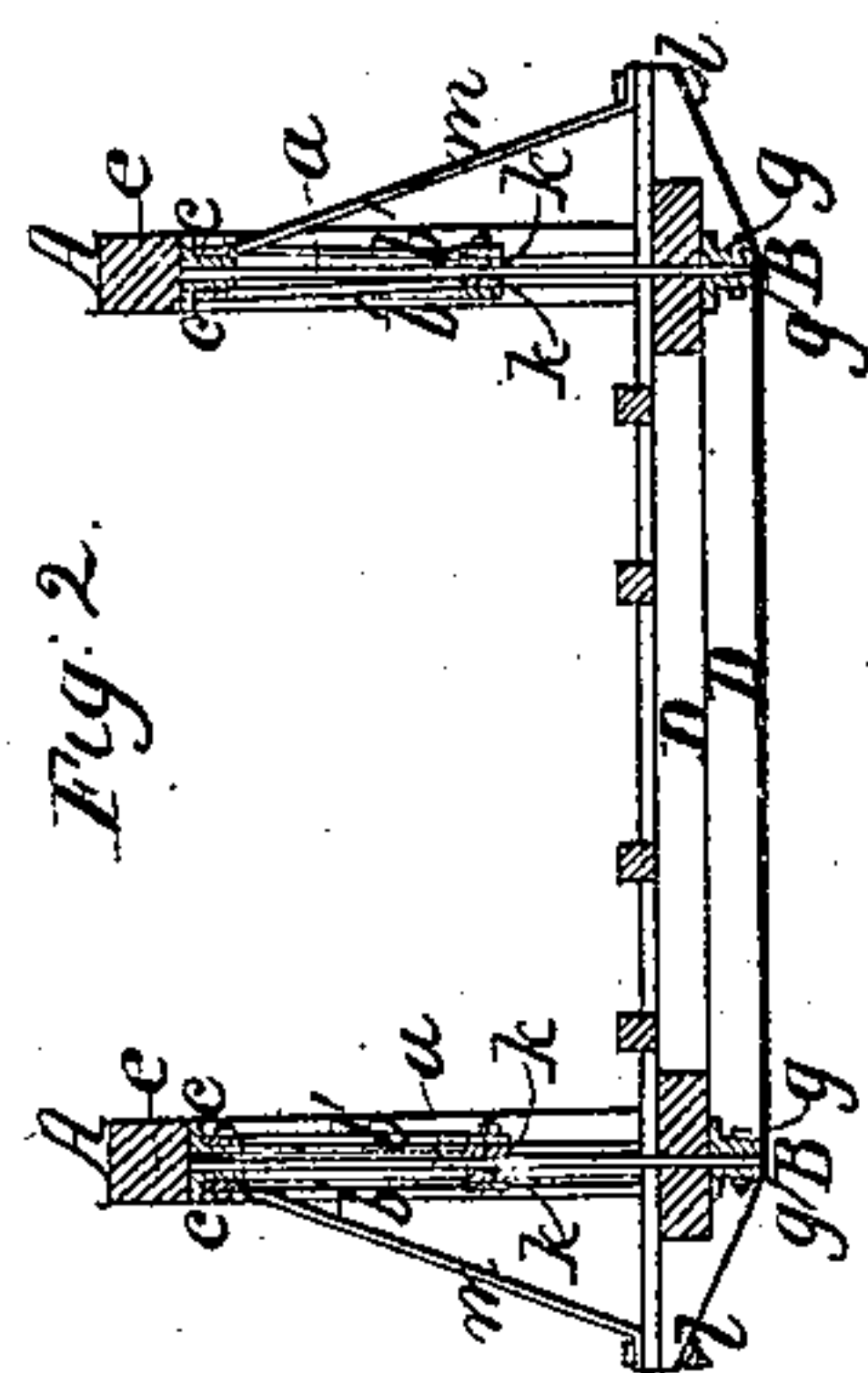
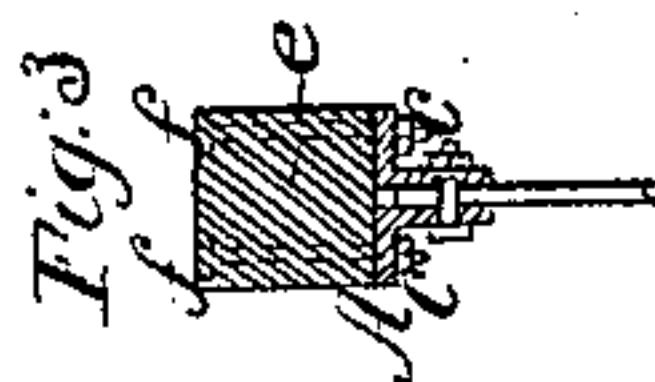
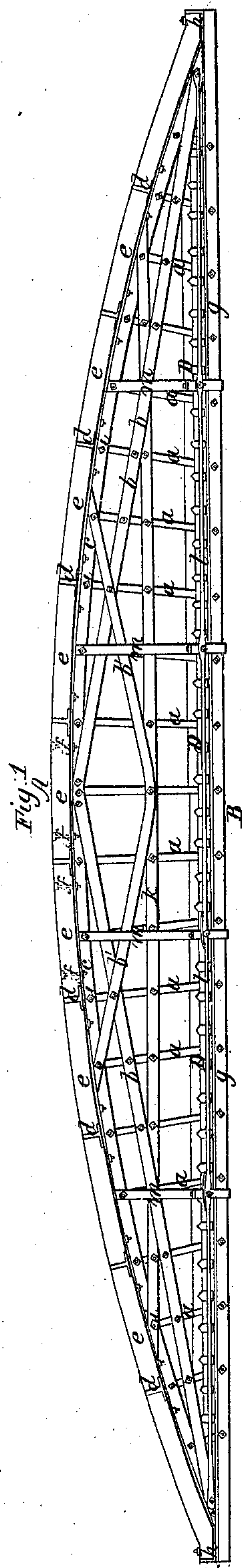


P. C. Guion. Truss Bridge.

N^o 14,313.

Patented Feb 26, 1856.



UNITED STATES PATENT OFFICE.

P. C. GUIOU, OF CINCINNATI, OHIO.

GIRDER FOR BRIDGES.

Specification of Letters Patent No. 14,313, dated February 26, 1856.

To all whom it may concern:

Be it known that I, PETER C. GUIOU, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in the Construction of Girders for Bridges and other Structures; 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, in which—

Figure 1, is a side elevation of a bridge constructed according to my invention. Fig. 2, is a transverse section of the same, and Fig. 3, a transverse section of the arch of one of the girders of the bridge on a scale larger than Figs. 1 and 2.

Similar letters of reference indicate corresponding parts in the several figures.

The girders which form the subject of this invention are each composed principally of an arch A, a string piece B, forming a chord to the said arch and supporting the floor, suspension rods *a, a*, arranged radially to the arch to suspend the string pieces therefrom, and diagonal braces *b, b, b', b'*. The arch from its peculiar construction may be termed a segmental arch. It is composed of two continuous lengths of wrought angle iron *c, c*, arranged side by side at a little distance apart as shown in the section, Fig. 3, in a form resembling the letter T, and supporting at short intervals a series of wrought or cast iron spurs or double skew backs *d, d*, which are each of the form of an inverted letter, T, and which receive tightly between them square timbers, *e, e*, which are bolted to the string pieces *c, c*, by bolts *f, f*. In this manner an arch is formed the under part of which is well calculated to resist tensional force, and the upper part to resist compressive force, such being the forces respectively brought into action by any weight applied to the arch and tending to flatten or straighten it out.

The string piece B, forming a chord to the arch is composed of two continuous pieces of angle iron *g, g*, arranged at a little distance apart like the angle irons *c, c*, of the arch. The string piece B, is secured at its extremities by suitable shoes, *h, h*, to the ends of the arch. The string pieces and the angle irons of the arch may be formed of pieces of the greatest convenient length bolted, riveted or otherwise connected to-

gether so as to be perfectly continuous from one extremity to the other.

The suspension rods *a, a*, are made of flat bar iron, and are placed between the angle irons of the arch and of the lower string piece and secured by bolts *i, i*, passing through them and the angle irons. One suspension rod is employed under every spur *d*, and one midway between every two spurs but this number is not arbitrary. The diagonal braces *b, b*, extend from the ends of the arch, to the crown thereof. They consist each of two pieces of flat bar iron, and are bolted to the angle irons of the arch and to the suspension rods. The diagonal braces *b', b'*, extend from the lower part of the central suspension rod upward to the angle irons of the arch which they meet about midway between the crown and the extremities of the arch, being bolted to all the suspension rods with which they come in contact. Another brace *k*, arranged as a chord extends across the arch some distance above the chord string pieces B.

The floor timbers D, D, of the bridge are to be supported by two or more girders constructed as above described the said timbers being laid across the string pieces B, B. The bridge is secured against lateral vibration by extending some of the floor timbers beyond the outsides of the girders and bracing them with horizontal wrought iron braces *l, l*, to the ends of the arch and oblique braces *m, m*, extending upward and inward to the arch.

The particular feature of this girder in which I consider it to possess advantages over all other girders is the construction of the arch A, whereby its tendency to flatten or straighten out is counteracted, and the string piece B, is relieved of much tensional strain to which it would otherwise be subjected. It is well understood that when a weight is suspended from an arched or other beam that the tendency of the said weight is to stretch or elongate the lower side and compress or contract the upper side of the beam. This is met by the construction of the arch A, the lower part of which consisting of the angle irons *c, c*, is capable of resisting great tensional strain and the upper part consisting of the skew backs *d, d*, and the timbers *e, e*, fitted tightly between them is capable of resisting great compressive force, and at the same time the peculiar

forms of the several parts composing the arch are such that all unite in a perfectly secure manner, and that the arch can be very easily constructed. Any one of the
5 timbers *e, e*, can at any time be conveniently taken out and replaced when defective. The other parts of the girder are so disposed as to stay the arch and at the same time support the string piece B, at the ex-
10 pense of as little material as is practicable.

I am aware that a trussed girder of the bowstring kind has been made by combining the angular iron with wood the wood being placed on the sides of the iron, and there-
15 fore I do not claim the use of iron and wood only as above described neither do I claim

the application of wood on the sides of the iron arch; but I do claim the application of segmental timbers on the top of the iron arch.

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

The peculiar combination of parts constituting the arch A, to wit, the two angle irons *c, c*, the spurs or double skew backs *d, d*,
25 and the timbers *e*, all applied and united substantially as herein set forth.

Cincinnati Ohio Decr 4th 1855.

PETER C. GUIOU.

Witnesses:

T. R. BALDRIDGE,

DAVID B. GUIOU.