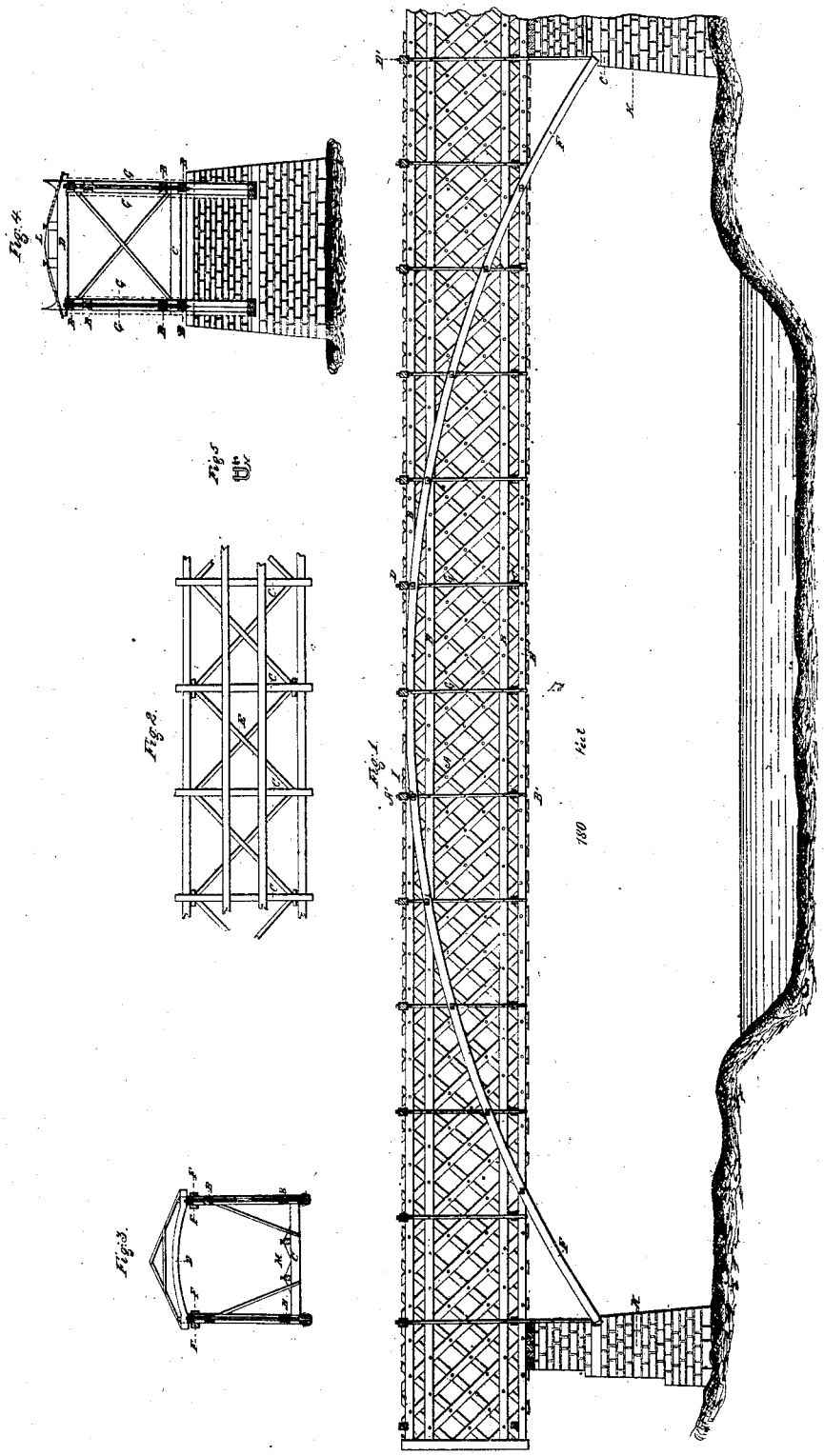
H. Milton.

Truss Bridge.

No. 1,192. Patented Jun. 24, 1839.



UNITED STATES PATENT OFFICE.

HENRY WILTON, OF WRIGHTSVILLE, PENNSYLVANIA.

CONSTRUCTION OF BRIDGES.

Specification of Letters Patent No. 1,192, dated June 24, 1839.

To all whom it may concern:

Be it known that I, HENRY WILTON, of Wrightsville, in the county of York and State of Pennsylvania, have made certain new and useful Improvements in the Construction of Bridges, which are described as follows, reference being had to the annexed drawings of the same, making part of this specification.

The nature of these improvements consists in combining and arranging the right line or horizontal bridge with the arch bridge in a peculiar manner which will be hereafter particularly described, by which the cost of the bridge is reduced and the strength increased.

Figure 1 is a side view of the bridge; Fig. 2, plan of the lateral bracing; Fig. 3, section through the line A B of Fig. 1; Fig. 4, section through the line C^1 D^1 of Fig. 1 and projection of the arch; Fig. 5, one of the stirrups.

The same letters of reference on the several figures refer to the same parts.

A represents the latticed trusses, B chords of ditto, C lower transverse beams, D upper transverse beams, E lateral bracing between said beams, F arches, G suspension bars, H stirrups at the lower ends of the suspension bars, I horizontal brace bolts, K the abutments, L railways on the top of the bridge, M section of a railway on the lower beams.

The drawings represent a right line bridge whose trusses are composed of small pieces of timber crossed at an angle of about 47 degrees and pinned together, having parallel string pieces or chords pinned to the sides of said trusses similar to other bridges long in use and now public property. Two of these trusses are placed parallel to each other at a convenient distance apart and connected together by the transverse beams and diagonal braces. The arches are arranged at the sides of the trusses—one on each side of each truss—there being four arches to the two trusses secured by horizontal screw bolts passing through them and the chords and through the intersecting points of the lattice pieces and blocks placed between them and the arches—the heads of the bolts being outside and the nuts inside. The ends of the arches rest against offsets of the abutments. In the spaces between the lattice work and the arches are placed segment pieces of timber whose ends rest against the chords. The outer suspended braces pass vertically through the projecting ends of the upper transverse timbers and extend down the side of the trusses between them and the outer arches to the bottom of the lower chord,—being secured by horizontal screw bolts passing through them, the trusses, and the inner suspended braces; which latter braces extend vertically from the top of the inner string pieces, down the inside of the trusses through the lower cross beams to stirrups which embrace the ends of the outer and inner braces.

The rail way may be constructed on the lower transverse timbers, as seen at Fig. 3. The drawings Fig. 4 represent it placed on the upper transverse timbers.

The bridge is extended in length beyond the abutments for the purpose of producing a counterbalancing weight.

The number of lattice pieces in this bridge is about one fifth less than is usually put in a right line bridge, this reduced quantity of timber being in part supplied by the introduction of the segment arches combined with the horizontal trusses and bearing endwise against the abutments.

This bridge will bear an equal weight on any given point between the abutments, the arch preventing the right line bridge sinking in the center of the span, and from losing its vertical position; at the same time the right line bridge holds the arch to its proper place and prevents it from rising, or giving way at any point between the abutments and the vertex of the arch. It is stronger and will bear a greater weight at a point where the right line bridge on the lattice principle is weakest—namely in the center of the span—whereas by this combination at this point the bridge is strongest because the arch which supports it from sinking in the center is strongest and will bear a greater weight at the vertex than at any point between it and the end of the chord; and further, the right line bridge is strongest at the point where it unites with the weakest part of the arch, namely, between the vertex or center of the span and the abutment. This mode of construction also relieves the abutments of a great portion of the lateral pressure from the thrust of the arch, when not connected with the right line bridge. And by this combination any piece of timber or iron may be taken out and replaced with little expense

and without injury to the superstructure, as the arch will sustain the superstructure while the lattice pieces or chords can be taken out to be replaced by others; and in repairing the arches the horizontal part of the bridge will sustain the weight. The suspension bars can also be taken out and replaced easily as the horizontal screw bolts are secured by nuts or burs.

A very material point gained in this improved construction is the removal of the difficulty experienced in the construction of the lattice bridge in their twisting and the parts spreading and separating which destroys the bridge and which the suspended braces and horizontal bolts above described effectually prevent.

The invention claimed and desired to be secured by Letters Patent consists:

In the employment of the vertical braces and horizontal bolts, as herein set forth, in combining the arch with the right line or lattice bridge.

HENRY WILTON.

Witnesses:
WM. P. ELLIOT,
ED. MAHER.