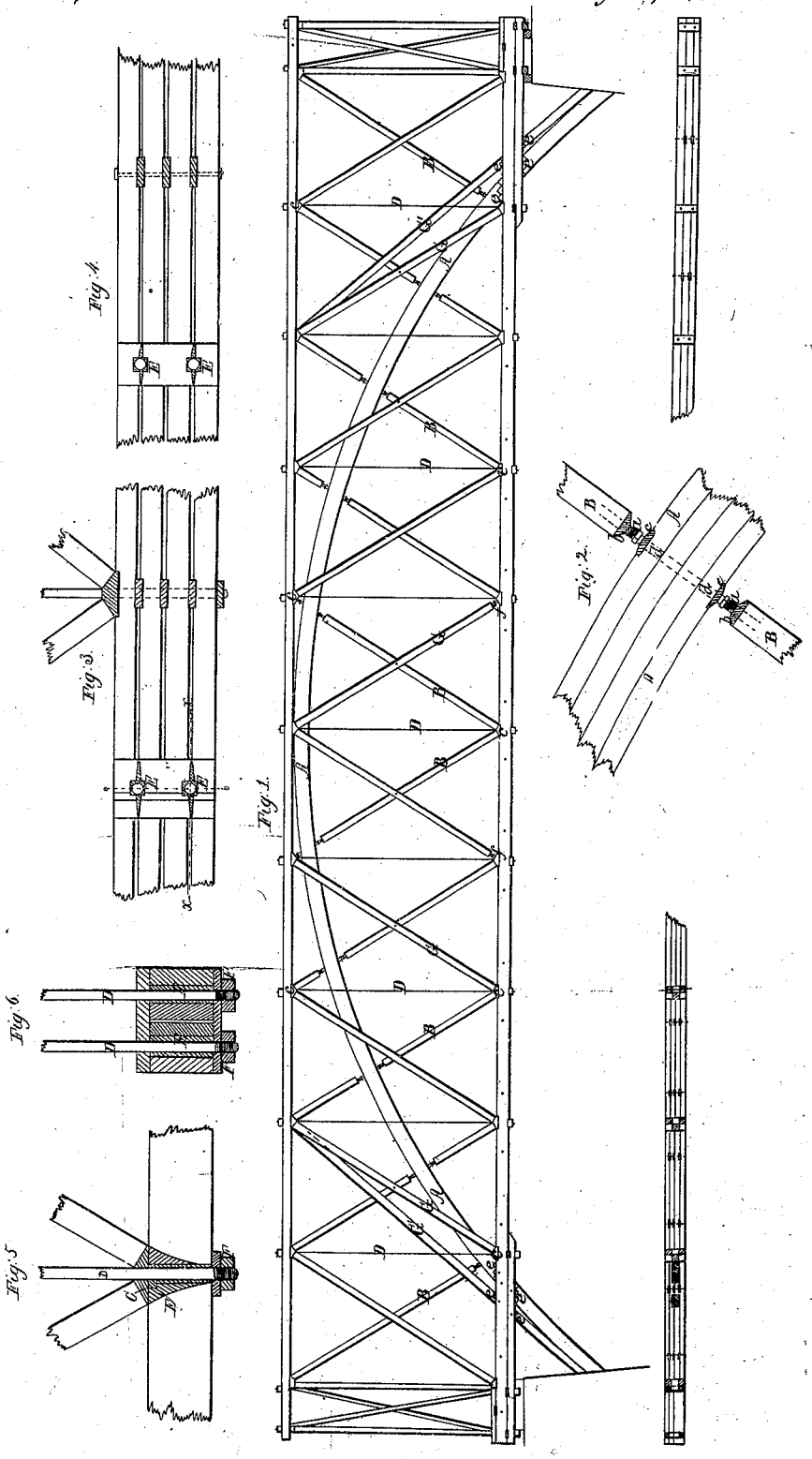
W. Howe.

Truss Bridge.

No. 4,726. Patented Aug. 28, 1846.



UNITED STATES PATENT OFFICE.

WILLIAM HOWE, OF SPRINGFIELD, MASSACHUSETTS.

TRUSS-BRIDGE.

Specification of Letters Patent No. 4,726, dated August 28, 1846.

To all whom it may concern:

Be it known that I, WILLIAM HOWE, of Springfield, in the county of Hampden and State of Massachusetts, have made a new and useful Improvement in the Manner of Constructing the Truss-Frames of Bridges; and I do hereby declare that the following is a full and exact description thereof.

The general construction of my truss frame is the same with that for which I obtained Letters Patent under date of the 3rd day of August, 1840, but in my improvement thereof I use an arch beam which is combined with the general truss in such manner as that it may be made to coöperate with the other parts of the truss frame in raising or lowering the camber of the bridge in effecting which I have also adopted an improvement in the manner of lengthening or shortening the braces so as to aid also in regulating the camber.

In the accompanying drawing Figure 1 is a side elevation of my improved truss frame. Fig. 2 is an enlarged view of the manner of connecting the arch beam with the counter braces for the purpose of regulating the camber. Fig. 3 is a top view of a part of the lower chord; Fig. 4 is a bottom view of the same. Fig. 5 represents a vertical section through the line *x x* of Fig. 3. Fig. 6 a similar section in the line *e e* of Fig. 3, the last four figures being on the enlarged scale.

A, A, is the arch beam which passes independently between the principal braces G G of the truss frame and is sustained by the abutments in the usual manner, the principal brace being double, and at a suitable distance apart.

B B are the counter braces which at their ends abut on the bearing blocks or wedge pieces C, C, which are to be made of wood or metal, but generally of the latter. The counter braces are in the same plane with the arch beam, and where they would meet it, they are cut off, and are provided with regulating screws *a a* which are tapped into a nut *b b* on those ends of each of the counter braces which meet the arch beam; the screws *a a* entering said braces sufficiently far to admit of any required extent of regulation. The heads of these screw bearings are made hemispherical and are received within concave sockets in the metal plate *c c* affixed to the arch beam. To render these metallic bearings independent of the shrinkage of the timber, there may be bolts or metallic shanks represented by the dotted lines *d d* extending from them through the wood work of the arch beam.

D D are the iron rods by which the straining up is regulated. These rods pass through the string pieces in the usual manner, but I cause them to pass also through metallic sockets that are embraced between the timbers of the string pieces said sockets being so formed as to give to the screw nuts by which the strain is made on the vertical rods, a bearing which is independent of the shrinkage of the woodwork of the string piece.

E E Figs. 3, 4, 5 and 6, represent said sockets, which I make of cast iron, and through which the rods D D are to pass; these sockets extend entirely through the thickness of the string pieces, being situated between the timbers of which said string pieces are composed.

E Fig. 3 is a view of the upper, and E Fig. 4 a view of the lower ends of these sockets, which are widened out by means of wings, or feathers as shown by the shaded lines; these wings, or feathers serving to sustain the bearing blocks, and render them steady. Under this arrangement, the nuts F F by which the rods D D are tightened up do not bear either directly or indirectly upon the timber of the string pieces but only upon the metallic sockets, and the truss, therefore, will not be lowered by any shrinkage of the timber.

To preserve the strength of the string pieces as much as possible where the arch pieces pass through them, I divide the arch pieces at that part, and allow their ends to abut both above and below the string pieces upon cast iron bearings as shown at *e*, *e*, which cast iron bearings being in the form of flat plates where they pass between the timber of the string pieces, do so without sensibly impairing their strength. The two principal braces which are marked G′ that are shown as passing through the lower string piece and as resting in the abutments, are also provided with cast iron bearings *e e* similar to those of the arch beam and for a like purpose.

I sometimes apply screws at the ends of the principal braces, as shown at *f f* Fig. 1, there being inserted in the ends of said braces in the same manner with the screws

a a in the counter braces, the heads of said screws bearing upon the blocks or wedge pieces C, C, which have a concavity in them for that purpose.

It will be seen that by the foregoing arrangement, the camber of the bridge may be readily regulated, by the combination of the rods D D and of the regulating screws *a a* and that the sustaining power of the arch brace is brought into full play, whatever may be the camber of the bridge. Instead of causing the regulating screws *a a* to bear upon the arch beam, the counter braces may be made to bear on the opposite sides of said beam, and the screws *a a* may be inserted in the upper and lower ends of the counter braces, and their heads be made to operate on the bearing blocks, or wedge pieces C C; the effect in this case will be the same with that of the arrangement first described.

Having thus fully described the nature of my improvements in the truss frames of bridges, what I claim therein as new and desire to secure by Letters Patent, is—

1. The manner in which I have combined the arch beam with the counter braces, and the other parts of the truss frame, by means of the regulating screws that are made to bear on the arch beam, or upon the bearing blocks, or wedge pieces C, C, so as to effect the same purpose.

2. I also claim the manner of sustaining the bearing of the braces on the string pieces, by passing the metallic sockets E E entirely through the string pieces, so that the bearing blocks C, C, and the nuts F operate on the upper and lower ends of the sockets, and are not affected by the shrinkage of the wood work.

WM. HOWE.

Witnesses:
THOS. P. JONES,
EDWIN L. BRUNDAGE.