T. W. H. Moseley,

Truss Bridge.

No. 106,855. Patented Aug. 30, 1870.

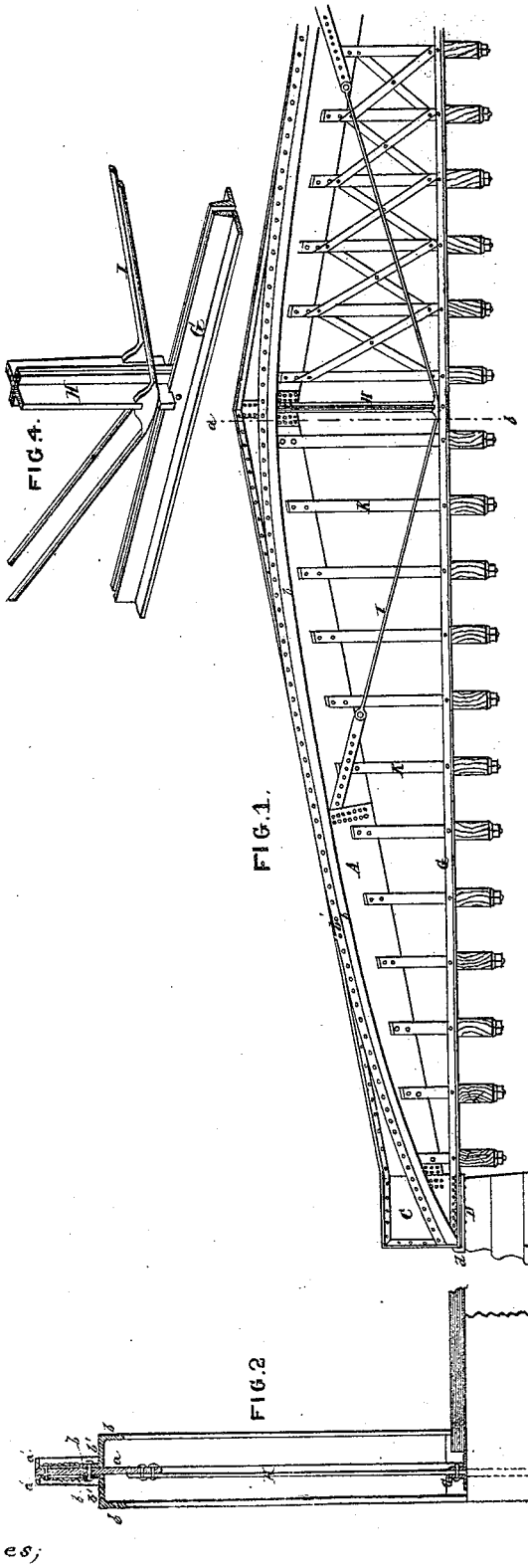

FIG. 1.

FIG. 4.

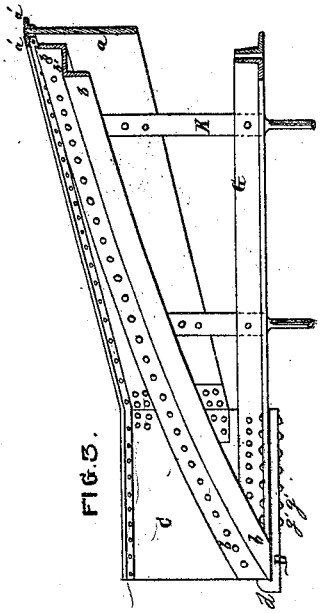

FIG. 5.

FIG. 2.

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UNITED STATES PATENT OFFICE.

THOMAS W. H. MOSELEY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. **105,855**, dated August 30, 1870.

To all whom it may concern:

Be it known that I, THOMAS W. H. MOSELEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Bridge, of which the following is a specification:

My invention is a combination of the mechanical elements or features which occur singly or in various minor combinations in bridges. These elements, as they may be termed, are the king-post, truss, arch, and girder, the object being to avail the use of all in a structure, to which each shall impart its distinguishing characteristics and valuable quality.

In the accompanying drawing, Figure 1 is a side elevation of a bridge constructed after my plan, and including about three-quarters of the span. Fig. 2 is a sectional view, on an enlarged scale, of the bridge, on the dotted line *a b*, Fig. 1. Fig. 3 is a view, on a scale larger than that of Fig. 1, of one of the ends of the structure, which form the side of a bridge. Fig. 4 is a perspective view of that portion of the structure in the vicinity of the foot of the king-post.

The structure which forms one side of the bridge consists, in the main, of A A, a pair of inclined beams, which meet at the middle of the span, and are stepped against foot-plates C, resting on sole-plate D on the abutments E. (The ends of the bridge are similar, and but one is shown in the principal figure.)

b b′ is an arch, which is secured to the two beams, and springs from the sole-plates D on the respective abutments; G, a girder or chord, which unites the foot-plates C and sole-plates D, and thus sustain the thrust, and acting as a chord to the arch; H, a king-post, which forms the middle vertical member of the truss, connecting the beams at their junction with the girder or chord at its mid-length. I, a tension-rod, connecting the haunches of the arch *b b′* with the foot of the king-post H; K K, &c., suspension-rods from the beams A A, to support the girder or chord and the track-sleepers.

I now proceed to describe the parts more in detail.

The beams A meet at the crown or pitch, and each consists of a fin, *a*, strengthened and stiffened by angle-iron *a′ a′* on its sides at the upper edge, and riveted thereto. These fin-plates rise at an angle varying from six to twenty-two degrees, as may be needed, and are the equivalents of the beams or braces in a king-post bridge, or the principal rafters in a roof-truss. The foot of the fin-plate rests against the foot-plate C, which corresponds in function to a skew-back or thrust-block. The foot-plate rests upon and is secured to a sole-plate of shoe D, which also receives the springing of the arch *b b′* and the end of the girder G, as will be presently described. The iron fin-plate *a* varies in thickness as the span of the arch and the expected burden may require, say, from one-eighth of an inch to one inch or more in thickness, and in width to make a chord to half the arch *b b′*, and to repsent on the back of the latter two tangents, meeting at the haunch.

Unsupported, this fin-plate, even with the stiffening of angle-iron on the upper edge, lacks the lateral rigidity to make it serviceable as a thrust-beam; and this brings me to the description of the arch *b b′*, which is made of upright angle-iron, I-iron, or Z-iron, which is preferably of the form best seen in Figs. 2 and 3.

The plate, as shown, has two flanges, *b b′*, united by a web, *b″*, the flanges being vertical, and the web following the camber of the arch. A pair of such angle-irons is riveted to the fins of the thrust-beams A A, one on each side of the latter. The angle-plates forming the arch vary in thickness and width with the span and expected burden of the bridge, being, say, from one-fourth inch to two inches or more in thickness, and from three inches to two feet or more in width. They are riveted through and through on each side of the fin-plate, as shown in Fig. 2. The shoe-plate D receives the springing of the arch, and has a turned-up toe, *d*, against which the heel of the arch thrusts.

The girder G forms the chord of the arch *b b′*, and also prevents the spreading of the feet of the beams or fin-plates A A. Each girder is made of flat-bar, flat-plate, or angle-iron, and preferably of the latter, as clearly seen in Fig. 3, the shaped irons being laid with their vertical flanges back to back, and riveted to-

gether at intervals. At their ends these girders or chords embrace between them the footplate C, to which they are securely riveted. The horizontal flanges of these girders or chord-bars are likewise riveted to the soleplate D, some of the rivets being seen at *g g*, Fig. 3.

I have now described the elements consisting of the inclined beams, the arch, and the girder. The angle-plate arch being added to each side of the fin-plates A, keeps the latter in perfect line, and they then exert their full strength, and each becomes a chord to one-half of the arch, strengthening the latter, especially at its haunches.

H is an iron king-post, preferably formed of two T-bars, *h h*, with their faces together, as seen in Fig. 4. These extend from the beam A above to the girder-plates G beneath, and are made fast to each.

I I are tension-rods, one on each side of the bridge-truss. These are attached at their ends to the ribs of the plates A A, pass obliquely downward to or nearly to the girder G, and take hold of the foot of the king-post, which is then utilized as a strut in the support of the apex of the compound beam and the crown of the arch, the two being practicably coincident as to position. This straining-rod has notch, cut, or gib, to prevent its slipping when the load or burden is thrown on the haunch of the arch.

The suspension-rods K are similar to those in other bridges, and depend from the fin-plate, to support the girders or chords G and the sleepers of the road-bed, as shown at Fig. 2.

Cross or lattice bars may be used between the fin-plates A A and the chord G, in connection with, independent of, or to the exclusion of the suspension-rods K.

What I claim as new is—

The combination, in one bridge-truss, of the following elements: The beams or fin-plates A A, the arch *b b'*, the girder or chord G, king-post H, and tension-rods I I, arranged as described, or in any equivalent manner.

THOS. W. H. MOSELEY.

Witnesses:

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