

J. A. McKay,
Truss Bridge.

No. 90,767.

Patented June 1, 1869.

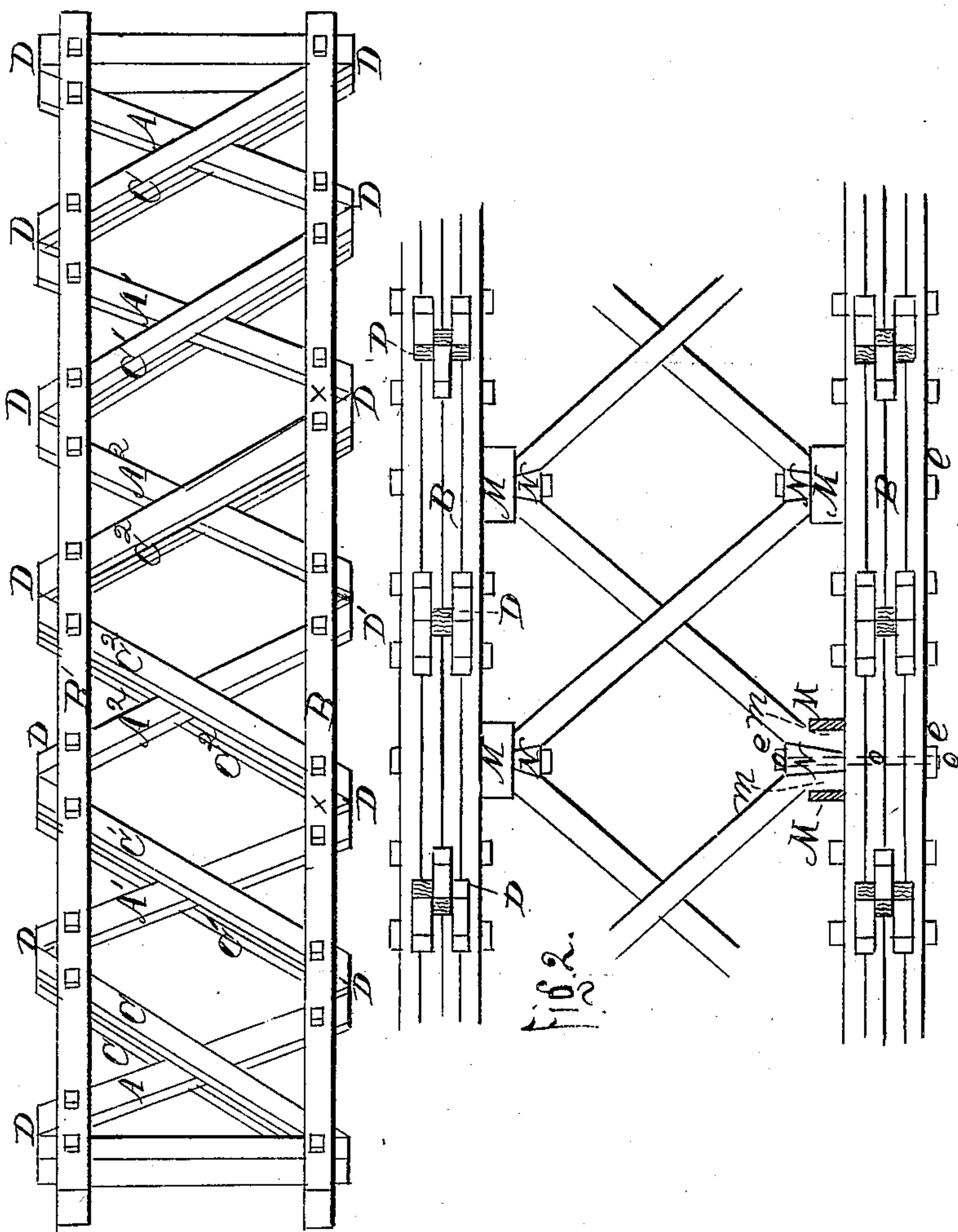


Fig. 1.

Fig. 2.

Witnesses.

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JOHN ALEXANDER McKAY, OF AUBURN, INDIANA.

Letters Patent No. 90,767, dated June 1, 1869.

IMPROVED BRIDGE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN ALEXANDER McKAY, of Auburn, in the county of De Kalb, and State of Indiana, have invented a new and useful Improvement in Bridges; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view, showing one side of the bridge detached.

Figure 2, a detached horizontal section, showing the lock hereinafter described.

This invention consists—

First, in the arrangement of the main and counter-braces, as hereinafter described, for the purpose of effecting an equilibrium of tension and compression throughout the entire truss; and,

Secondly, in the arrangement and construction of a metallic shoe, with a suitable wedge, a bolt, and peculiarly-formed ends of the lateral braces, as will be more fully explained.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A A' A² represent a series of braces, which extend diagonally through the lower and upper chords B B', as seen in the drawings, fig. 1, at any desired angle from a perpendicular.

These braces are arranged in sets, commencing at the centre of the truss, each set diverging in opposite directions, as seen in fig. 1.

The braces are single, and extend above and below the upper and lower chords, and are secured in position by means of suitable bolts, or other equivalent means.

C C' C² represent a series of braces, which correspond to braces A A' in every respect, except that these are double, while those are single.

These braces are also extended through the chords, to which they are in like manner bolted, and stand in a reversed, but correspondingly-diagonal position to the single ones.

D represents a triangular key, which is inserted in the triangular space formed by the surface of the chord and the surfaces of the braces, both above and below the said chords, as will be readily understood from the drawings.

Now, it will be observed that the single braces A² A² intersect exactly at the centre of the truss, just below the under surface of the lower chord, where they are keyed, as above described.

They extend thence upward obliquely to a point where they meet, on either side, a set of double braces, which are marked C' C', and are at that point keyed and bolted, as before, while at the same time each double brace thereafter, in every successive instance, both above and below, and throughout the entire truss,

unites with one of the single braces, as will be fully understood from the drawings.

It will be further observed that the central double braces unite in the centre of the upper truss, exactly over the corresponding intersection of the single braces.

M represents a shoe, which is constructed as seen in Figure 3, consisting of an oblong box, having its cavity so formed that it will fit the heel of the brace, as shown at m.

N represents a wedge, which is inserted between the ends of the lateral braces, and is held in position by a bolt, O, extending through it.

The bolt is provided with a tightening-nut, e.

The whole device forms a strong but simple lock, which prevents the braces from being withdrawn, and admirably fits them for the successful resistance of tension or compression, thus effectually preventing all lateral motion.

The operation of the above-described combination of braces forming my truss, is as follows:

When a weight is placed at any given point of said truss, as, for instance, at the centre, the result will be to create a tension on braces C² C², and also to create a corresponding compression on braces A² A², the effect of which is to create a compression of that section of the upper chord, between the braces C² A², and also a compression of that section of the chord between the intersection of the braces C' A².

But suppose that the weight is shifted to a point marked x, the effect would be to reverse the order of the tension and compression, so that the braces that before sustained the tension now sustain the compression, and *vice versa*.

Thus the compression and tension, in practice, will be ever changing at every successive point to which the weight is removed, thereby perfectly equalizing the strain over the entire length of the truss.

By this arrangement for controlling the tension and compression of the braces, the top chord is not in the least liable to kink or buckle.

Another important advantage of this system of bracing is, that it prevents the bridge from swelling in front of the load, as in many other bridges.

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

The combination of the chords B B', the single and double braces A A' A², each bolted to the chords independently of all the others, and the triangular blocks D, intervening between the adjacent ends of the braces, when said parts are constructed and arranged substantially in the manner and for the purpose herein set forth.

J. A. McKAY.

Witnesses:

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J. S. GOSHOM.