J. P. Avery.
Truss Bridge.

No. 33,629. Patented Nov. 5, 1861.

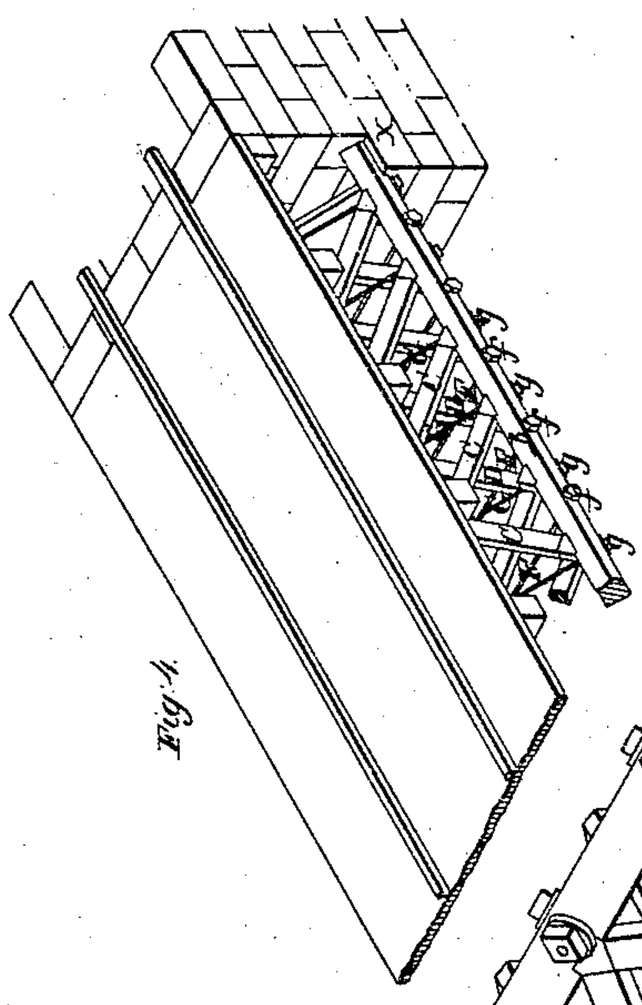

Fig. 1.

Fig. 1

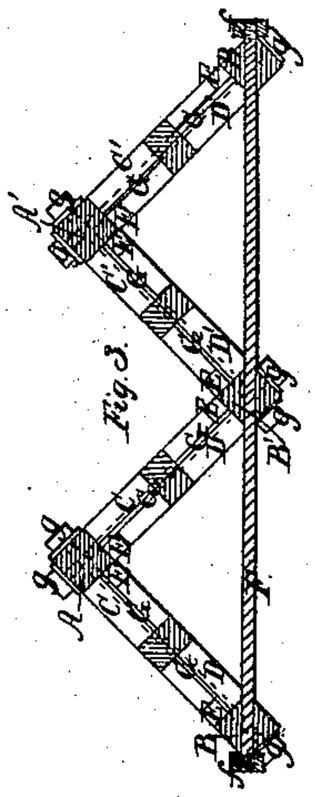

Fig. 3.

Fig. 2

Witnesses;
Geo. Pratt
Hiram B. Cushy

Inventor;
John P. Avery

UNITED STATES PATENT OFFICE.

JOHN P. AVERY, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN TRUSSES FOR BRIDGES.

Specification forming part of Letters Patent No. **33,629**, dated November 5, 1861.

To all whom it may concern:

Be it known that I, JOHN P. AVERY, of the town of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Trusses for Bridges, having for its object the prevention of the lateral swaying that bridges are subject to, particularly when crossed by heavy trains, if the bridges are located where there is a curve in the road or if they are of considerable length; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a perspective view. Fig. 2 is a perpendicular elevation; Fig. 3, a cross-section, and Fig. 4 a perspective view showing rail or carriage way.

In the drawings, A A′ are the upper chords of two combined trusses. Each chord is held in its place by two sets of braces and by iron rods.

B B′ B are the three lower chords of two combined trusses, the central lower chord B′ being the base-chord uniting the two trusses.

C C C′ C′ are main braces, and D D D′ D′ are key-braces. Both main and key braces support the upper chords.

E E are chucks for the purpose of securing firmly the ends of the main and key braces in their proper places at the point of contact with the upper and lower chords.

F F are iron rods passing through the lower chords B B′ B, and are secured at each end by the nuts *f f*, which are screwed upon the ends of the rods, and are prevented from sinking into the timber by means of large iron plates or washers.

G G are iron rods connecting the upper chord in each truss with the lower chords of the same truss, and these rods are secured at each end by the nuts *g g*, which are screwed upon the ends of the rods, and also rest upon large iron plates or washers to prevent their sinking into the timber.

The nature of my invention consists in the combination of two sets of braces standing on two base-chords and terminating at the top in one chord, so as to resemble in a cross-section the letter **V** inverted, thus **Λ**, which combination forms one truss. I then combine two or more trusses by making one set of braces in each truss unite or stand on the same base-chord resembling the letter **W** inverted, thus **M**, which combination of braces forming a series of angles for the support of the upper chords effectually prevents the lateral swaying to which bridges of a long span, or that are located where there is a curvature in the road, are almost invariably subject, for the two upper chords are braced in such a way that it is impossible for any amount of force to give them either an outward or inward inclination, while at the same time the bridge has all the strength that the materials composing it can give.

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

I construct my trusses of timber such as is ordinarily employed in building bridges, using iron rods, nuts, and washers in the manner shown in the drawings. The base-chords in the trusses rest upon the abutments at each end of the bridge.

When my trusses are to be used in railroad-bridges, I combine two trusses having three base and two upper chords, and place the ties for the rails upon the upper chords, making what is called a "deck bridge." Bridges for highways across large rivers may be constructed in the same manner; but it will often be found convenient to construct a bridge with the two trusses separate instead of being combined, and in such cases I use four base-chords and two upper chords and the trusses form the sides of the bridge, the rail or carriage way resting upon sleepers supported by the upper and lower chords together. The timbers for the chords should be square and are placed in the truss edgewise, or so that a line drawn through the opposite angles will be horizontal. The chucks are set in mortises in the chords. The main braces, beginning at each end of the bridge or truss, are set with an inclination toward the center of the bridge, where they meet and form an angle with each other at the point of contact with the upper chord. The key-braces may be set at an angle corresponding with that of the main braces, or at any other convenient angle, and both the main and key braces are held in their proper places on the chucks by screwing up the iron rods.

The bridge is crowned by commencing at the ends and screwing up each of the rods that pass through the upper chords.

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

The combination of two sets of braces standing upon two base-chords and terminating at the top in one chord, forming a truss, and also the combination of two or more trusses thus formed by making one set of braces in each truss unite or stand on the same base-chord, the whole being constructed substantially as herein described, and for the purposes set forth.

JOHN P. AVERY.

Witnesses:
GEO. PRATT,
HIRAM B. CROSBY.