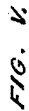
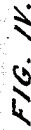


BRIDGE.

No. 187,513.

Patented Feb. 20, 1877.



***INVENTOR:***

Ellery C. Colby.

**WITNESSES:**

Franklyath  
Frank Stuffy

# UNITED STATES PATENT OFFICE

ELLERY E. COLBY, OF GROTON, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO OLIVER AVERY, JR., CALEB BARTHOLOMEW, AND CHARLES PERRIGO.

## IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. **187,513**, dated February 20, 1877; application filed January 29, 1877.

*To all whom it may concern:*

Be it known that I, ELLERY E. COLBY, of Groton, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Bridges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to produce an arch for truss, suspension, and other bridges, roofs, and other purposes, that is very strong, simple, durable, light, and that can be furnished at very reasonable cost.

The invention consists of an arch of railroad-rail, channel, **T**, **H**, **I**, or other suitable-shaped iron or steel, or tubes, which is bent only at each connection with the floor, and at regular intervals, and having the various sections straight between the bends. By constructing an arch of this style much greater strength is obtained than in an arch bent, in the ordinary manner, on the arc of a circle, as the compression or thrust strain is more direct, and far greater strength is obtained.

It also consists in the combination, with the arch, of a peculiar arrangement of posts and truss-rods, which are very light, and can be easily applied to the arch by angle-blocks and nuts.

It also consists of a peculiar angle-block, which is held in its place on the chords by flanges, and has its inclined faces made rounding or spherical, so that the nuts of the truss-rods can accommodate themselves on the spherical faces when they are inserted from a greater or less angle.

It also consists of a peculiarly-shaped shoe, having a central tongue or flange, which fits between the flanges of the **H**, **I**, or other iron, and is bolted to the web of the arch, all of which will be more fully described hereinafter, reference being had to the accompanying drawings, and the letters of reference thereon.

In the drawing, Figure 1 is a side elevation of an arch for a truss-bridge. Fig. 2 is a bottom view of the same. Fig. 3 is a cross-section

on the line *xx*. Fig. 4 is an enlarged view of the angle-block. Fig. 5 represents a number of modifications of iron for the arch.

In the drawing, **A** represents the arch of a bridge, which is made of railroad-rail, channel, **T**, **H**, **I**, or any other shaped iron or steel, or tubes, which is bent only at the various sections where the post and truss-rods pass through the web of the arch, while the space between those points is left perfectly straight, so as to take up the thrust or compression strain without any possibility of deviation. At regular intervals the post-rods **B** and truss-rods **C** pass through the web of the **H** or other iron of the arch, the flanges being placed, by preference, vertically. The chords **D** consist preferably of two flat bars of iron, which are secured at the ends to the shoe **E** by bolts and nuts *a*.

Any other suitable chords may be used, if desired. The shoe has a central tongue or flange, *e*, which fits into the space between the flanges of the **H** or **I** iron, and is secured to the web thereof, while the flanges *e'* of the shoe rest upon the abutment, and the vertical part *e''* receives the ends of the two bolts *a* of the chords.

The angle-block **F** has a flange, *f*, on each side, which clasp the sides of the chords **D**, while the two angled ends *f' f'*, through which the truss-rods **C** pass, are made spherical or rounding on their faces, so that the nuts of truss-rods **C** can accommodate themselves to the faces of the angle-block when they are arranged at a greater or less angle. They are held in place by the post-rods **B**, which pass through said angle-blocks, and secure them in position by the nuts *b*. A washer, *c*, with flanges on both sides, fits onto the upper side of the chords **D** and receives the nuts *b'*, which form the collars of the post-rods. The sway-rods (not shown in the drawing) pass between the nuts of the post-rods and the nuts of the truss-rods, and are secured on the outsides of the chords. The joists for the flooring are laid crosswise and rest on the chords, and are held in position by notches in the lower side thereof.

The great advantages of my improved arch are, that it is much stronger than the ordinary

arch, which is bent on the arc of a circle, as the thrust or compression strain is more direct, and does not deviate from a straight line. It is very light in proportion to the quantity of material used. It is not liable to get out of order, and it can be made at a very small cost.

I am aware that sheet-iron arches for bridges have been bent at regular intervals, and riveted in all the various parts thereof; but this construction is troublesome, as well as being very costly.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The arch-beam A, made of railroad-rail, H-beam, or other iron of analogous character, bent at uniform angles, and at uniform distances from each other, thereby constructing the upper chord of a bridge, in the manner and for the purpose herein shown and described.

2. In combination with an arch having its

sections bent at regular intervals, the post-rods B and truss-rods C, arranged substantially as and for the purpose specified.

3. The angle-block F, having the two angled ends *f f* made spherical, or with rounding faces, as shown, and for the purpose set forth.

4. The shoe E, having the inclined tongue *e*, base-plates *e' e'*, and vertical flange *e''*, constructed and arranged substantially as shown and described.

5. The bridge herein described, consisting of the arch A, post-rods B, truss-rods C C, angle-blocks F, chords D, and shoes E, all constructed and arranged substantially as shown and herein described.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ELLERY E. COLBY.

Witnesses:

FRANK H. DUFFY,  
FRANK GALT.