

D. HAMMOND & J. ABBOTT.

Iron Truss Bridges.

No. 150,151.

Patented April 28, 1874.

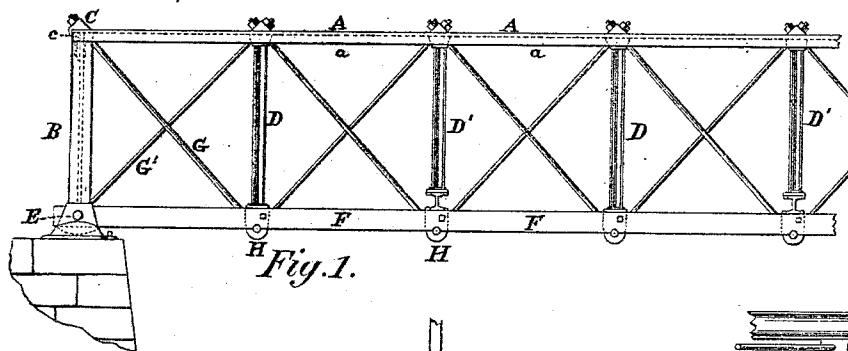


Fig. 1.

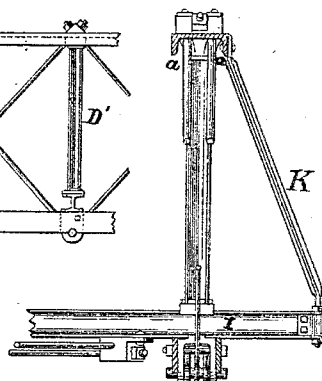


Fig. 3.

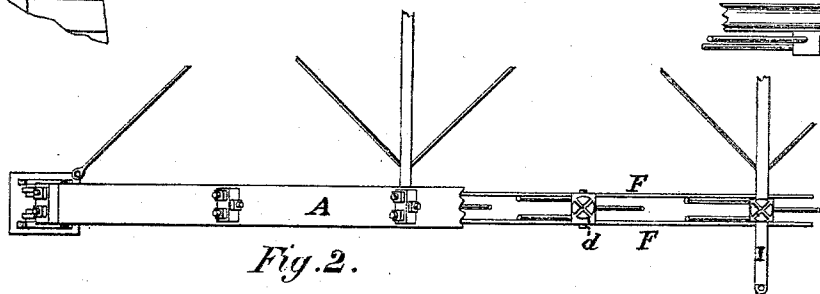
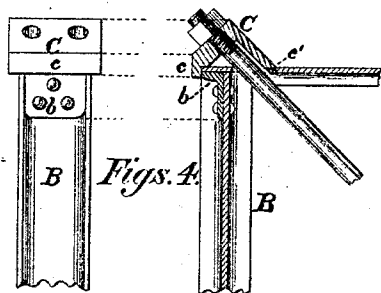
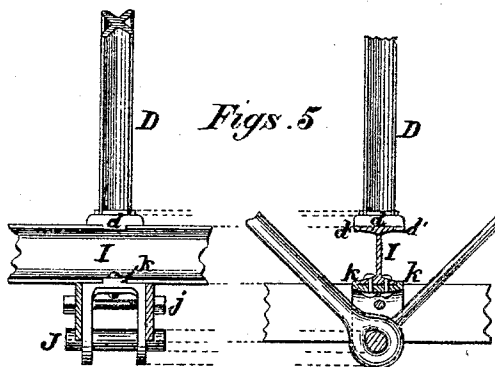


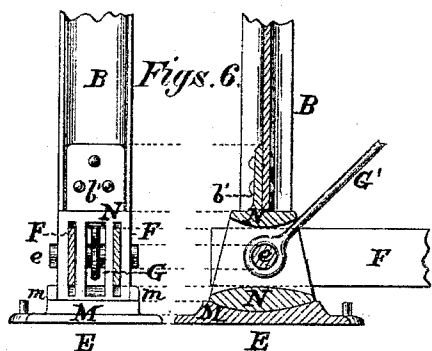
Fig. 2.



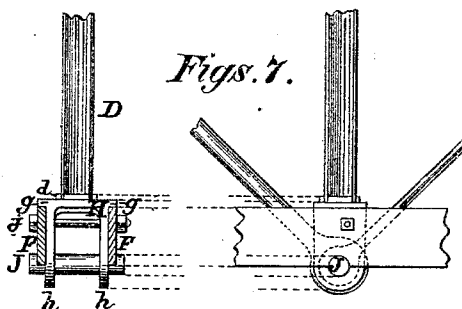
Figs. 4.



Figs. 5.



Figs. 6.



Figs. 7.

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David Hammond
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UNITED STATES PATENT OFFICE.

DAVID HAMMOND AND JOB ABBOTT, OF CANTON, OHIO.

IMPROVEMENT IN IRON TRUSS-BRIDGES.

Specification forming part of Letters Patent No. **150,151**, dated April 28, 1874; application filed July 21, 1873.

To all whom it may concern:

Be it known that we, DAVID HAMMOND and JOB ABBOTT, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Iron Truss-Bridges; and that the following is a full, clear, and exact specification thereof, which will enable others skilled in the art to make and use the said invention.

The object of this invention is the construction of an iron truss highway-bridge for short spans, to be used instead of the arched bridge for such purposes, whereby the low squatty appearance of the arch for short spans is obviated and an efficient rail at each side of the track is afforded by the truss itself. To this end, the invention claimed in this application consists in the construction of a truss having for its upper chord a rolled channel-bar, for its end posts rolled $\mathbf{I}$ -beams, for the intermediate posts rolled star-iron, and for the lower chords two or more bars of plate-iron, placed edgewise and parallel to each other, these parts, in connection with suitable diagonals, chord-connections, angle-blocks, and girder-shoes, forming a cheap and economical truss for highway purposes, for spans of from twelve to fifty feet. Said invention also consists in the construction of a lower chord connection, consisting of a casting or bent iron plate of a $\mathbf{U}$ form, arranged between the chords of a truss and having a pin running through its lower legs and notched in the lower edges of the chord-bars, said casting or plate forming the seat for the post or brace beam, and the said pin forming the connections for the diagonals of the truss to the chord, as is hereinafter more fully shown. Said invention also consists in the peculiar construction of the end angle-block for the top chord and the filling-piece or head-block for the end post; also, in the peculiar construction of the $\mathbf{U}$ -shaped chord-piece with flanges to form bearings on the chord-bars, and to hold the lateral brace-beam from end movement; also, in the construction of flanged post-seats for the posts on the brace-beams, whereby the appearance, strength, and simplicity of these connections are materially improved.

In the accompanying drawing, Figure 1 is a side elevation of a portion of one of our im-

proved truss-girders. Fig. 2 is a partial plan of the same, a part of the upper chord being broken off to show the lower chord, foot-plates, and diagonals. Fig. 3 is an end view of the same. Figs. 4 are end and sectional views of the end post and its connections. Figs. 5 are side and sectional views of a lateral brace-beam and parts adjoining. Figs. 6 are end and sectional views of a truss-shoe, end post, diagonal, and chords. Figs. 7 are views of an intermediate post and its chord connections.

A is the web, and a a are the downwardly-projecting flanges of the rolled channel-bar that forms the upper chord of the truss. B is a vertical end post of rolled $\mathbf{I}$ -beam iron, which supports the end of the chord A at its head and rests on the truss-shoe E. C is the end angle-block, resting on the end of the chord A and having the lip c projecting downward over the web A of the channel-bar, and the lugs c' , Figs. 4, fitting in slots in the web A, the said lugs c' acting with the lip c to resist the strain produced on the angle-block C by the diagonals G secured therein. At the upper end of the $\mathbf{I}$ -beam end post B is an angular filling-piece, b , shown in Figs. 4, and by dotted lines in Fig. 1, one of the faces of which fits between the flanges of said beam, to the web of which it is riveted or bolted, while the other fits in the web of the channel-beam, between its flanges. D D are the intermediate posts of rolled star-iron, which bear on the lower chords F, through cast foot-plates d and lateral brace-beams I or through the $\mathbf{U}$ -shaped plates H, there being a lateral brace-beam under every other set of star-posts, D'. The upper end of these posts support the upper chord A, through head-blocks similar to those heretofore used in this connection. F F are the bars of plate-iron, placed edgewise, that compose the lower chord. E is the truss-shoe, which consists of the cast-iron base-plate M, with its flanges m and upper concave surfaces between the flanges, and the cast-iron post-block N, with slots for the chord-plates F F and the eye of the diagonal G', which are held in the block by the pin e , which passes through the side of said block. The lower face of said block N is convex, and fits and turns in the concave surface of the base-plate M. With the said block is cast the upward-projecting

filling-piece *b'*, which fits between the flanges of the **I**-beam post B, and is riveted or bolted to its web, thereby holding the post in place and relieving the foot of the same of any appearance of weakness. At the foot of the intermediate posts D' are the post-seats *d*, which are cast with depressions into which the ends of the star-posts fit, and by which they are kept from working out of place. The said seat *d* is used on the lateral brace-beams I, and is cast with downward-projecting lips *d'*, that fit into notches cut in the flanges of the lateral brace-beam I, and is held thereby from sliding on said beam. H is the **U**-shaped post-piece, which may be either a cast piece, or can be made by bending an iron plate into the form shown. It is made with two legs, *h h*, between which the diagonals are inserted, and is held by the pin J and bolt *j* running through said legs. When the pieces H form direct supports for the star-posts D they are cast with the lateral flanges *g*, which project over and rest on the chord-plates F F; but when they support the lateral brace-beams I, they are cast with upwardly-projecting lips *k*, that fit in notches in the lower flange of the brace-beam, and prevent any end movement of said beam. These legs *h h* fit between the chord-bars F F, and are secured to the same by the bolt *j*, the pin J entering a semicircular notch cut in the lower edge of the chord, and thus serving to transmit the diagonal strains to the chords. I is the lateral brace-beam of rolled **I**-beam, which is placed between the post and chord, and is secured to the chord, through the **U**-shaped piece H, by rivets and the upward-projecting lips *k*. K is the side brace, of rolled star-iron, secured at its upper end by rivets to the flange of the channel-bar or upper chord A, and at its lower end to the end of the lateral brace-beam I by a thimble, as in previous constructions.

The angular filling-piece *b* riveted by one face to the web of the **I**-beam end post, and fitting with the other to the web of the channel-bar between its flanges, relieves that end of the post from any appearance of weakness, and gives greater supporting-surface to the chord.

Where the notching of the chords is found objectionable, the hitch-block H can be firmly secured to the chords F F by one or more bolts, *j*, and the legs *h h* extending down sufficiently to bring the pin below the edge of the chord. The notching of the pin into the chords, as shown, is, however, the preferable plan of construction, as the strain down on the posts is then divided into the chord and diagonal strains directly on the pin, as in cases where the chord-pin is passed through

holes in the chords, without the material weakening of the chord, which would result from drilling it to receive the whole body of the pin.

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

1. The construction of a truss having for its upper chord a rolled channel-bar, for its end post rolled **I**-beams, for its intermediate posts rolled star-iron, and for the lower chord two or more bars of plate-iron, placed edge-wise and parallel to each other, said parts being combined by suitable diagonals and chord connections, substantially as and for the purpose specified.

2. A lower chord connection for truss-bridges, consisting of a casting or bent iron plate, of **U** form, arranged between the chords, and having a pin running through its legs and through eyes on the ends of the truss-diagonals, the said connection forming a seat for the post or brace-beam, and the connection between the chords and diagonals, substantially as and for the purpose specified.

3. The attachment of the chord-pin, on which the truss-rods are secured, to the lower chord-bars by means of notches formed in the lower edges of said bars, whereby the post strains are transmitted through the chord-pin to the truss-rods and chords without the necessity of drilling the chords to receive the full size of pin, substantially as and for the purpose herein specified.

4. The end angle-block C, having a lip projecting over the rear end of the upper chord, and lugs *c'* projecting into slots in the web of the chord, substantially as and for the purpose specified.

5. The angular filling-piece *b*, in combination with the **I**-beam, end post B, angle-block C with lip *c*, and channel top chord A, substantially as and for the purpose specified.

6. The **U**-shaped chord-piece H, with lateral projecting flanges *g g*, forming bearings on the chords F F, substantially as and for the purpose specified.

7. The **U**-shaped chord-piece H, with upwardly-projecting lugs *k*, fitting in slots in the lateral brace-beam I, substantially as and for the purpose specified.

8. The post-seat *d* for the top of the lateral brace-beam I, with downwardly-projecting lugs *d*, fitting in slots in the flanges of said beam, substantially as and for the purpose specified.

As evidence of the foregoing, witness our hands this 25th day of September, A. D. 1872.

DAVID HAMMOND.
JOB ABBOTT.

Witnesses:

JENNIE M. GRANT,
A. MCKINLEY.