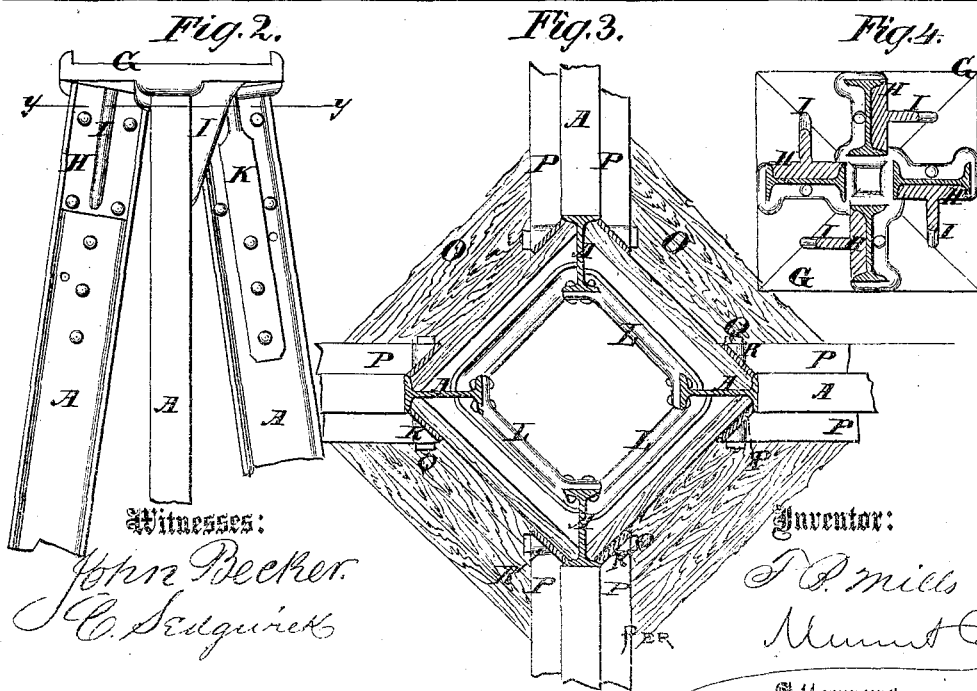
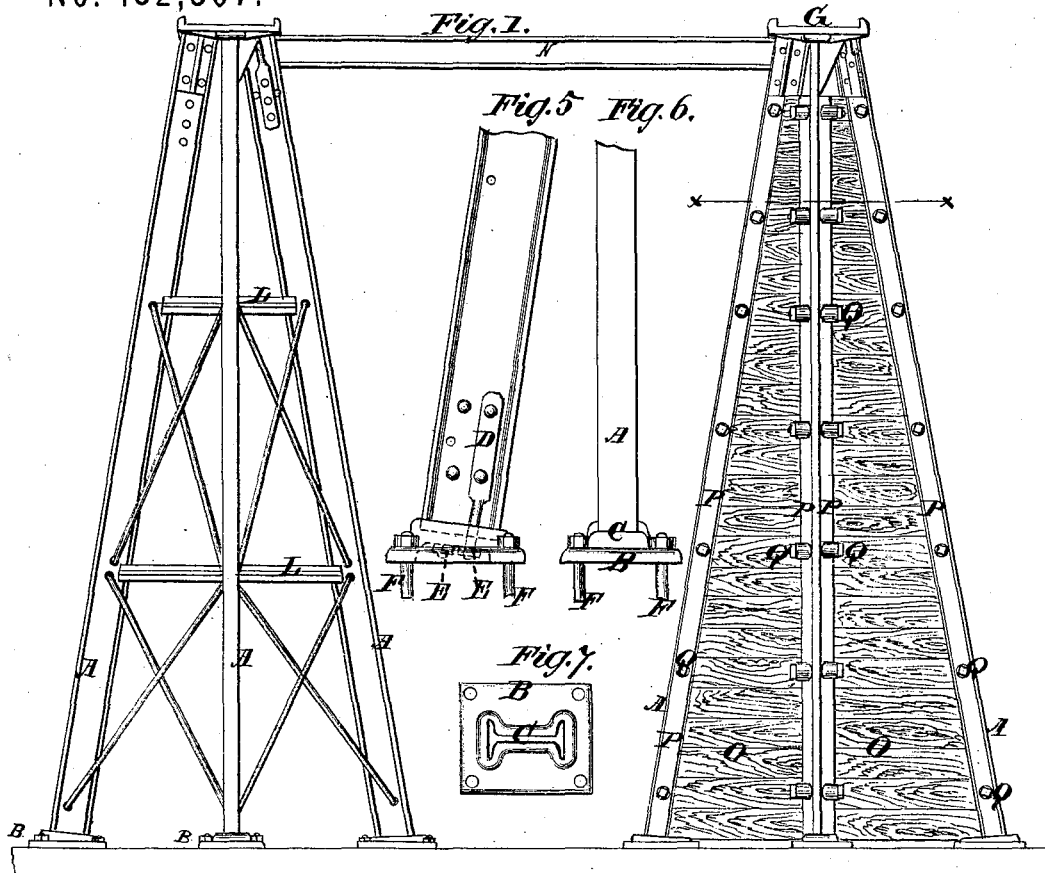


T. B. MILLS.  
 Improvement in Wrought-Iron Piers for Bridges.  
 No. 132,307. Patented Oct. 15, 1872.



Witnesses:  
 John Becker.  
 C. Siquier

Inventor:  
 T. B. Mills  
 My Attorneys.

# UNITED STATES PATENT OFFICE.

THEODORE B. MILLS, OF IOLA, KANSAS.

## IMPROVEMENT IN WROUGHT-IRON PIERS FOR BRIDGES.

Specification forming part of Letters Patent No. 132,307, dated October 15, 1872.

*To all whom it may concern:*

Be it known that I, THEODORE B. MILLS, of Iola, in the county of Allen and State of Kansas, have invented a new and useful Improvement in Piers, &c., for Bridges, of which the following is a specification:

My invention consists in the construction of piers, columns, or abutments of iron for bridge-supports, &c., of four double T-bars stepped in metal pockets or foot-rests on the foundation, at suitable distances apart at the bottom, and converging upward toward a common center for bracing properly with a metal cap, to which all are connected at the top; said cap being also a seat for the bridge-shoe, to which cap the posts or bars are connected in a novel manner. They are also braced at suitable intervals between the top and bottom with horizontal and diagonal braces. The posts are arranged with their greatest transverse diameter in lines radiating from the center, toward which they converge in the upper part for having the greatest strength in the direction of the greatest pressure. Two of these columns or piers are used for one abutment, being placed side by side at a suitable distance for supporting the sides of the bridge, and connected together at the top. The sides are covered with planks extending horizontally between the posts or bars, fitted into the grooves between the flanges, and secured by binding-plates or bars running lengthwise of the posts and bolts, all as hereinafter described.

Figure 1 is a side elevation of one of my improved abutments for a bridge, one of the columns being covered with planking and the other not. Fig. 2 is a side elevation of the upper portion of one of the columns, the parts being enlarged to show the manner of connecting the bars to the cap more clearly. Fig. 3 is a horizontal section taken on the line  $x x$  of Fig. 1, also on a large scale. Fig. 4 is a horizontal section of Fig. 2 on the line  $y y$ , and looking upward. Figs. 5 and 6 are side elevations of part of a post or bar and a foot-piece therefor, showing the manner of connecting them; and Fig. 7 is a plan view of one of the foot-pieces.

Similar letters of reference indicate corresponding parts.

A represents the double T-shaped bars or posts of flanged iron; B, the foot-rest plates

therefor, which are of cast metal, with a socket, C, of the form of the post in cross-section, and formed to correspond with the proposed inclination of the post, of which four are to be placed in a cluster, at suitable distances apart at the bottom—say about one third the height of the column—and brought nearly together at the top for bracing each other to the best advantage. The bars are connected to these foot-rests by the rods D bolted to the sides, and extending through to a cavity in the under side, where they are provided with nuts E, by which the said plates and bars are firmly screwed together, and the plates are screwed down to the foundation by the bolts F. At the top, where the bars of a cluster come nearly together, as shown, they receive a single cap-plate, G, which is suitably beveled on the under side to rest fairly on the ends of the posts, and has a strong plate, H, with a strengthening-rib, I, projecting downward to fit in the groove of one side of each post and be bolted thereto, as clearly shown in Figs. 1 and 2, and on the opposite side of each bar is a bar, K, bolted to it, and extending up through the cap into a socket, where a nut is screwed on. I will also have sockets in the under side of this plate like the sockets C of the foot-plates, if preferred, for receiving the upper ends of the posts. L represents horizontal braces or stays, connecting the bars at suitable intervals between the top and bottom, which may be flanged in any suitable way for strength. Besides these stays I also propose to use diagonal rods or braces M as a further means of bracing the said bars A. The two columns forming an abutment will be connected at the top by a metal or other beam, N. The spaces between the posts A will, when required, be inclosed by planks O, which will be fitted in the groove or angle between the main web and outer flange of the bars, as shown in Fig. 3, and confined by the bars P laid on the outside parallel with the outer flanges of said bars A, and bolted through the planks and the bars A by bolts Q, for the heads and nuts of which washers R, with one beveled side to fit the said clamping-bars, will be used.

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

1. The arrangement of four double-flanged

bars, A, in a tapering frame, with their webs radiating from a center common to all, in the construction of piers or columns for bridges, substantially as specified.

2. The combination, with the said bars A, of a cap, G, arranged to unite said bars and serve as a rest for the bridge-shoe, substantially as specified.

3. The fastening of the said bars A and cap G together by the flanged plates H and rods K, substantially as specified.

4. The fastening of the planking in the angles of the bars A by the bars P and bolts Q, substantially as specified.

5. The foot-rests B, connected to the posts by the sockets, adapted to the oblique arrangement of the posts, and the rods D and their binding-nuts, substantially as specified.

6. The abutment for bridges, comprising a pair of columns of four iron bars, A, with caps G and foot-rests B, constructed as described, and united by a beam, N, all substantially as specified.

THEODORE B. MILLS.

Witnesses:

ALFRED ENNIS,  
WM. HALL JENKINS.