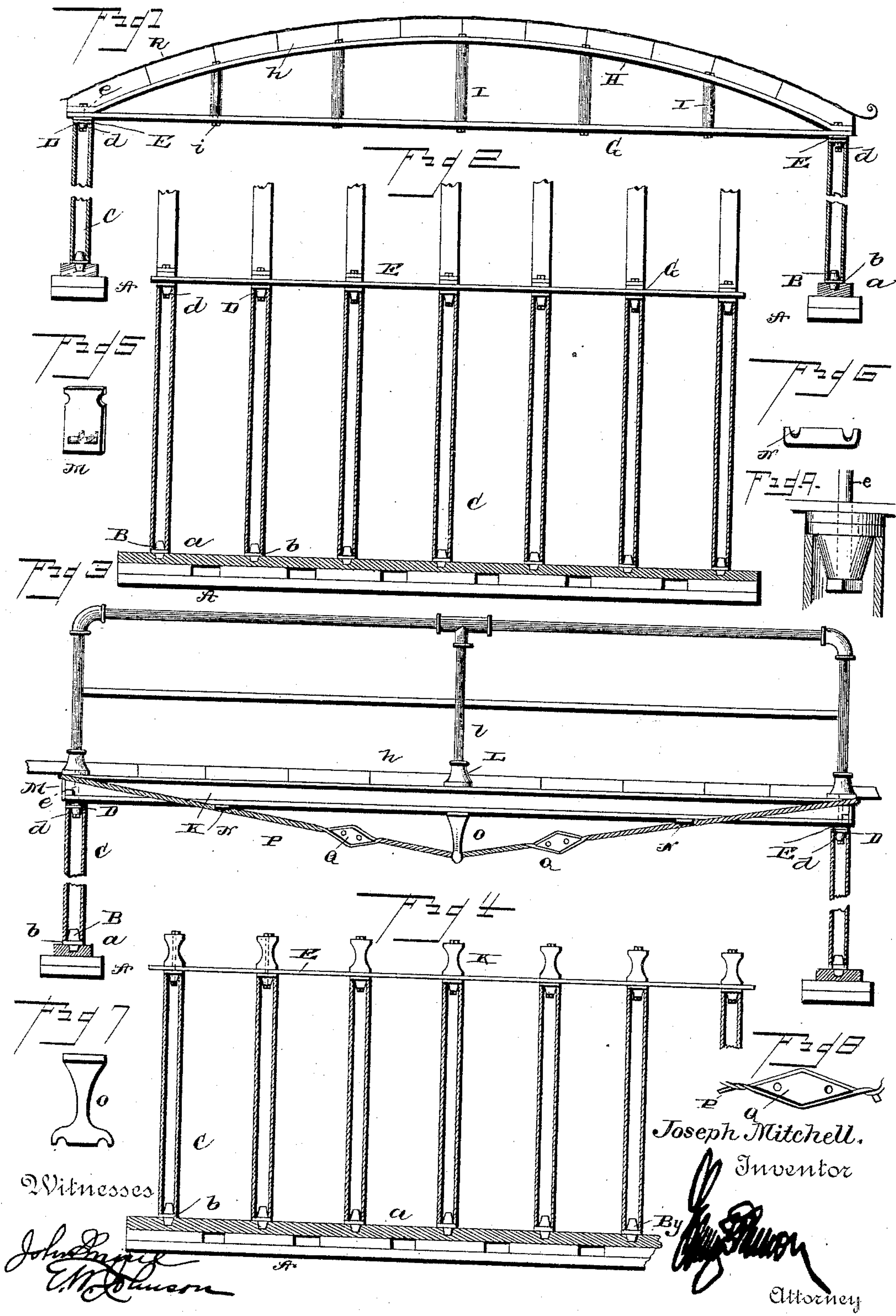


(No Model.)

J. MITCHELL.
CONSTRUCTION OF BRIDGES.

No. 440,490.

Patented Nov. 11, 1890.



UNITED STATES PATENT OFFICE.

JOSEPH MITCHELL, OF ROCHESTER, INDIANA.

CONSTRUCTION OF BRIDGES.

SPECIFICATION forming part of Letters Patent No. 440,490, dated November 11, 1890.

Application filed January 23, 1889. Serial No. 297,323. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MITCHELL, of Rochester, Fulton county, State of Indiana, have invented certain new and useful Improvements in Bridges, of which the following is a specification.

My invention has reference to bridges; and it consists in the improved construction hereinafter described, whereby a simple and durable bridge is provided that is particularly well adapted for culverts and small streams.

In the accompanying drawings, forming part of this specification, Figure 1 is a side view of so much of a bridge as is necessary to show my invention, the tubular supports being represented in section. Fig. 2 is an end view of the structure shown in Fig. 1, the floor-timbers being omitted. Fig. 3 is a side view of a modified form of bridge embodying my improvements. Fig. 4 is an end view of the supporting portion of said modified form, and Figs. 5, 6, 7, and 8 are detail views. Fig. 9 is an enlarged detail view of one of the upper castings D.

The base or supporting portion of the improved bridge consists of mud-sills A, either of wood or stone, and which are located at equal distances apart on each side of the run or depression which the bridge is to span. It will generally be more satisfactory to construct each of said sills so that the central portion thereof will be presented by a step *a*, in which is seated a casting B, composed of a lower portion seated in the step, intermediate collar *b*, bearing upon the same, and an upper circular portion over which the lower end of the tubular support or pipe C is adapted to fit, the lower edge of said support bearing upon the collar *b*. As shown, the upper end of each tubular support contains a lower portion *d* of a casting D, provided with a flange which rests upon the upper edge of the support, and the said casting is vertically perforated for the passage of a bolt *e*, the head of which bears against the lower face of the portion *d*, while the upper projecting threaded portion of the bolt is passed through the transverse bar E, that connects the several supports, and through the end portions of the several truss-beams. Of these latter two forms are represented.

In Figs. 1 and 2 each truss consists of a

lower metallic bar G and upper arched bar H, the extremities of the latter being bent to bear squarely and be locked upon the end portions of the bar G. The bars G H are relatively braced by a series of intermediate tubes I, which are of varying height, and which positively connect the bars G H together by means of tie-bolts *i* passing therethrough. A flooring composed of transverse timbers *h* is laid and suitably secured upon said truss, and above this flooring a sheet R, of tar or other water-proof fabric, is superimposed, after which the roadway is graded with dirt to the desired level. The interposition of the fabric R not only preserves the wood from rotting, but prevents the dirt working through the timbers.

In Figs. 3 and 4, instead of the trusses previously described, tie-beams K are used, the ends of which are secured by the bolts *e*, and over each end a casting M of the form shown in Fig. 5 is adjusted, so that a cable P may be passed around the same, thence lie in the notches of a block N, Fig. 6, secured to each side on the bottom of the beam, and also in the lower notches of a bracket O, depending centrally from the beam. At either side of the bracket O the two strands of the cable are spread for the insertion of a lozenge-shaped block Q, provided with two perforations, the said blocks registering with each other in pairs, as shown. When it is desired to tighten the cable by increasing the twist in the same, it will only be necessary to insert a bar in the perforation in one of the blocks, and by the use of an additional bar correspondingly inserted in the other block turn the last-mentioned block until the desired tension is secured, after which one of the bars may be withdrawn, while the other bar is forced to engage a registering-perforation in the other block. The casting M above alluded to consists of a flat vertical plate having central ears to embrace the web of the same. Two notches—one on each side and adjacent to the top—afford the proper bearing for the cable.

In either form of bridge the bolt *e* of each end section secures a socket L, having internally-threaded recess for the reception of the lower end of the short vertical length of pipe *l*, which, together with other similar sections

and couplings, form the side railing or guards of the structure.

From the foregoing it will be apparent that the bridge is simple and readily erected and
5 firm and durable when in position.

I claim—

1. The combination, in a bridge, of a series of base-sills, castings mounted therein, tubular supports taking over and engaging said
10 castings, and castings D, seated in the upper ends of said supports and carrying bolts, together with beams secured by said bolts, substantially as set forth.

2. The combination, in a bridge, of sills,
15 castings B seated therein, tubular supports mounted thereon, upper castings D therein having flanges, a transverse bar, and beams, together with a bolt seated in said upper casting for securing said bar and beams, substantially as set forth.
20

3. The combination, in a bridge, of the supports I, bars mounted and bolted thereon, together with cables embracing the ends thereof

and connected with intermediate tension devices, together with tubular supports, castings B D, and securing-bolts, substantially as
25 set forth.

4. The combination, in a bridge, with the supports and beams mounted and bolted thereon, of castings M, adjusted on the ends
30 of the same, cables passed around said castings and connected to intermediate tension devices, together with tubular supports, castings B D, and securing-bolts, substantially as set forth.
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5. The combination, in a bridge, of the supports, beams mounted and bolted thereon, double-strand cables passing around said beams, and perforated tension-blocks interposed between said strands at an intermediate point between the ends of the beam, substantially as set forth.
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JOSEPH MITCHELL.

Witnesses:

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