

(No Model.)

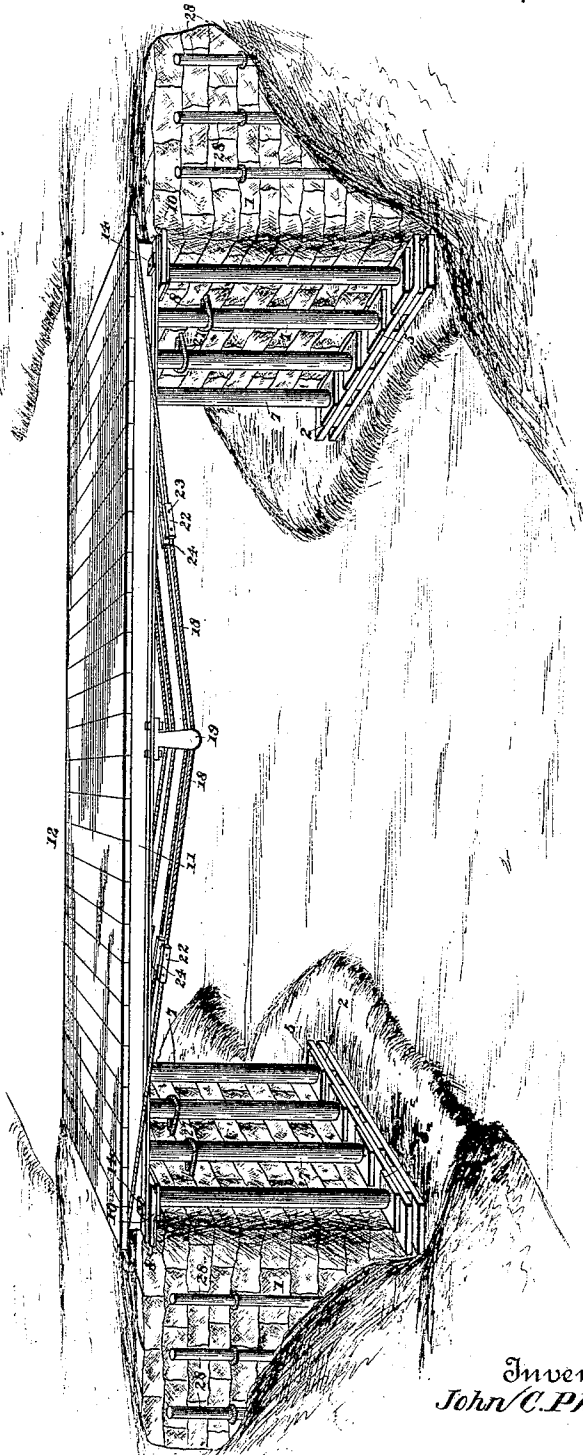
2 Sheets—Sheet 1.

J. C. PHILLIPS.  
BRIDGE.

No. 440,437.

Patented Nov. 11, 1890.

*Fig. 1.*



Witnesses;

*J. M. Withers,*

*W. S. Duwall.*

Inventor,  
*John C. Phillips,*

By *his* Attorneys

*C. A. Snow & Co.*

(No Model.)

J. C. PHILLIPS.  
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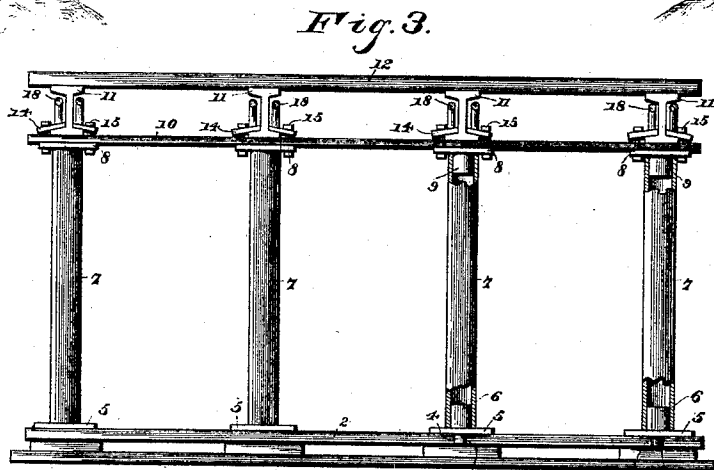
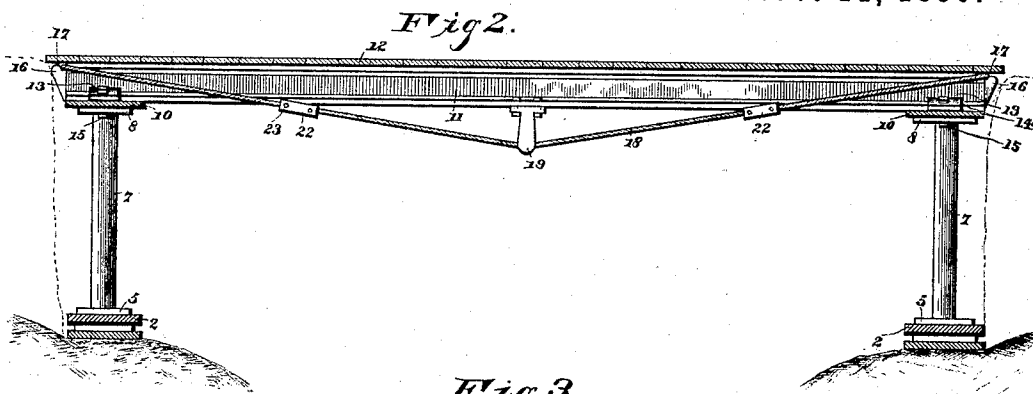


*Fig. 7.*

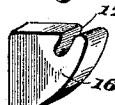


*Fig. 5.*

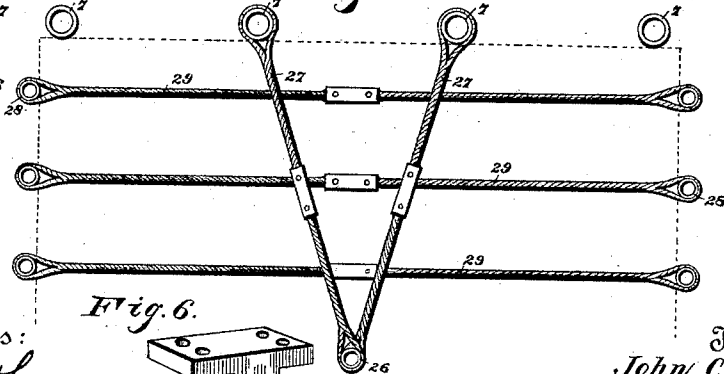
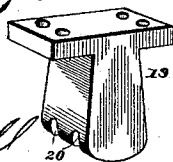


*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

JOHN C. PHILLIPS, OF ROCHESTER, ASSIGNOR OF ONE-HALF TO WILLIAM H. BONSLONG, OF WINAMAC, INDIANA.

## BRIDGE.

SPECIFICATION forming part of Letters Patent No. 440,437, dated November 11, 1890.

Application filed March 8, 1890. Serial No. 343,165. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. PHILLIPS, a citizen of the United States, residing at Rochester, in the county of Fulton and State of Indiana, have invented a new and useful Bridge, of which the following is a specification.

This invention has relation to bridges or short spans of that class adapted for spanning or crossing narrow gorges, streams, &c.; and among the objects in view are to provide a bridge that shall be extremely secure, and therefore capable of withstanding freshets, &c., and that at the same time shall be comparatively cheap, simple, and durable.

With the above objects in view the invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective of a bridge constructed in accordance with my invention. Fig. 2 is a central vertical section. Fig. 3 is a section across the bridge between the supporting pillars and abutments. Fig. 4 is a detail in side elevation of one of the beams. Fig. 5 is a plan view of one of the wings. Fig. 6 is a detail in perspective of the cable central seat. Fig. 7 is a perspective of one end of one of the I-beam castings.

Like numerals of reference indicate like parts in all the figures of the drawings.

Upon the opposite banks of the space to be crossed I construct abutments 1 of masonry or other desired filling. These abutments project from the banks, and in front of each there is located a mud-sill 2. At intervals the mud-sills are provided with openings 3, into which take the tenons 4 of castings, said castings, besides the tenon, comprising a base-plate 5, resting upon the sill, and an upwardly-projecting reduced tenon 6. A series of these castings is arranged at intervals upon each of the sills, and mounted upon each casting is a tubular hollow pillar or support 7, the reduced upper tenon 6 of the casting taking into the lower end thereof. These castings comprise what I term the "foot" castings. In the upper ends of the hollow steel columns 7 there are mounted head castings, which consist of a base-plate 8 and a lower reduced tenon 9, the latter fitting the upper

end of the column. It will thus be seen that there will be a series of columns 7 in front of each abutment, and connecting the upper ends of each series is a metal plate 10. Mounted upon the plates 10 and connecting each pair of pillars 7, and therefore spanning the stream, is a series of steel I-beams, and upon the same there is laid the flooring 12. Each end of each I-beam is provided with an opening 13 near its base, and through each opening there is passed a yoke-plate 14, extending at each side of the beam. This yoke-plate is perforated at opposite sides of the beam, and through the opposite perforations there are passed binding-bolts 15, which bolts pass through the tie-plate 10 and the base 8 of the head castings.

The ends of the I-beams 11 are each provided with triangular-shaped castings 16, which castings are provided upon their upper edges with transverse notches 17. Looped in the notches 17 and depending at each side of the I-beam is an endless cable 18, and interposed between said cable and the beam is a depending cable-seat 19, the upper end of which rests against the bottom of the flange of the I-beam, and the lower end of which is provided with a pair of notches 20, each one of which receives one section of the cable. The triangular castings 16 are of the same width as the web of the I-beam, and are held snugly bound in position against the ends of the beam by means of the cables 18, which are under tension.

The manner of constructing the above-mentioned cable is as follows: A strand of galvanized wire is wound continuously from one casting 16 to the other until a sufficient number of coils have been provided to withstand the strain required, after which clamps 22 are mounted upon each of the sections of cables between the castings 19 and 16, and by suitable tools are twisted, thus completing the construction of the cables. Perforations 23 are formed in the castings 22, and through the same are passed locking-pins 24, so that each pair of castings are connected together to prevent an untwisting of the cable.

If desired, in lieu of the cables described, which in reality form trusses for the I-beams, ordinary rods may be employed and the same

provided with the usual turn-buckles for adjusting the same.

In rear of the abutment at each side of the span there is located an anchor-post 26, and  
5 connecting the same with two of the intermediate pillars 7 at that side of the span are diverging cables 27, formed similar to the trusses for the I-beams, if so desired. A series of  
10 side anchors 28 is located at the opposite sides of each of the abutments, and cables 29, similarly constructed as are the cables 18, serve to connect each pair. The cables 29 and 27 are located some distance below the  
15 surface of the ground, and are filled over by the material of which the abutment is composed.

From the above description, taken in connection with the accompanying drawings, it will be apparent to any one skilled in the art  
20 of bridge-building that I have provided a most simple and rigid bridge, one adapted to withstand rough travel and the rise of water calculated to destroy and sweep away constructions commonly employed.

25 Having thus described my invention, what I claim is—

1. In a bridge, the combination, with opposite series of tubular pillars of uniform height, of mud-sills arranged under the same, a tie-  
30 plate connecting the upper ends of each series of pillars, I-beams resting upon and connecting the plate at one side of the span with that at the opposite side, and bolts passing through the bases of said beams and the  
35 plates, substantially as specified.

2. In a bridge, the combination, with opposite mud-sills, tubular pillars mounted upon the sills, tie-plates connecting the upper ends  
40 of each series, of I-beams connecting the pillars of one series with those of the other and provided opposite each pillar with an opening, and yokes mounted in the openings and bolted to the pillars, substantially as specified.

3. In a bridge, the combination, with the  
45 mud-sills provided with a series of openings, of castings consisting of a central base-plate and opposite reduced tenons, the lower ones of which enter the openings, a series of tubular pillars mounted upon the upper tenons,  
50 castings consisting of a base-plate and reduced tenons mounted in the upper ends of the pillars, tie-plates connecting the upper ends of the pillars, I-beams mounted on the pillars and provided with openings, yokes  
55 mounted in the openings and provided with perforations, and binding - bolts inserted through the yokes, the tie-plates, and base of the upper casting, substantially as specified.

4. In a bridge, the combination, with the

I-beam, castings secured to the ends of the  
60 I-beam and provided with notches, and trusses mounted in the notches and depending at each side of the beam, of the truss-seat casting 19, interposed between the trusses and the  
65 beam and having the notches 20, substantially as specified.

5. In a bridge, the combination, with an abutment, of a series of vertical pillars mounted in front of the same and adapted to serve  
70 as a support for the roadway of the bridge, an anchor-bar located in rear of the abutment, and opposite cables connected to the anchor-bar diverged and having their ends connected to the pillars, substantially as specified.

6. In a bridge, the combination, with an  
75 abutment, of opposite series of side pillars, and of transverse cables connecting the pillars, substantially as specified.

7. In a bridge, the combination, with an I-beam having end castings provided with  
80 notches, of opposite trusses formed of a single piece and depending at each side of the beam, said trusses being formed of a continuous section of wire, clamps mounted at opposite  
85 sides of the trusses and twisted to give the required tension to the trusses, and removable pins inserted through each pair of twist-ers, substantially as specified.

8. In a bridge, the combination, with an  
90 abutment, of a series of vertical pillars mounted in front of the same and adapted to serve as a support for the roadway of the bridge, an anchor-bar located in rear of the abutment, and opposite cables connected to the anchor-  
95 bar, diverged and having their ends connected to the pillars, the opposite series of side pillars 28, and the transverse cables 29, substantially as specified.

9. In a bridge, the combination, with the  
100 mud-sills provided with a series of openings, of a series of lower castings consisting of a central base-plate and opposite reduced tenons, the lower tenons entering the openings, a series of tubular pillars mounted upon the  
105 upper tenons, and a series of upper castings consisting of a base-plate and depending reduced tenons, which tenons take into the upper ends of the pillars, and transverse tie-plates secured to said plates, substantially as  
110 specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN C. PHILLIPS.

Witnesses:

M. O. REES,  
E. T. REED.