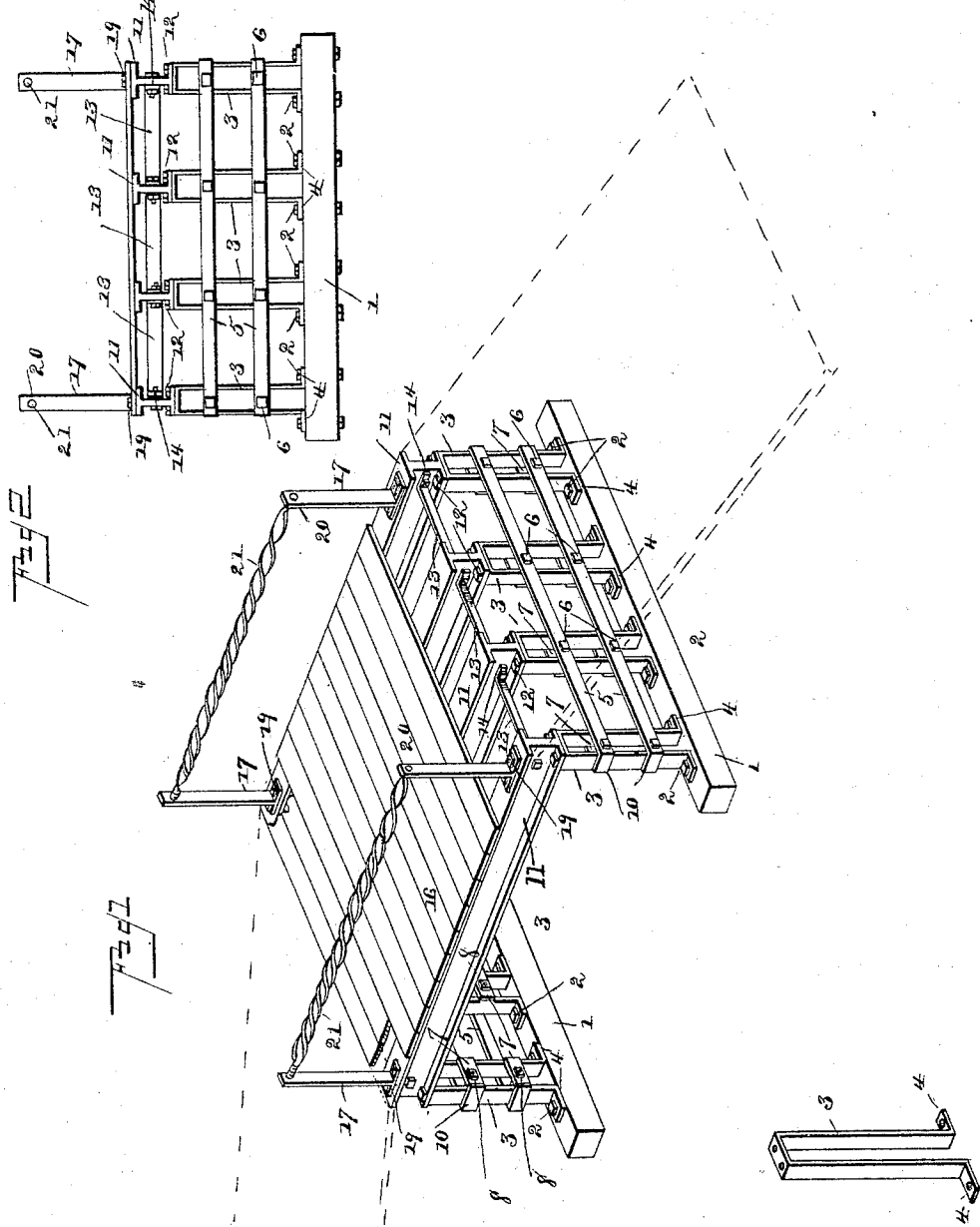


(No Model.)

G. N. CLYMER.
BRIDGE.

No. 416,054.

Patented Nov. 26, 1889.



Witnesses:

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GEORGE N. CLYMER, OF BLOOMINGSBURG, INDIANA.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 416,054, dated November 26, 1889.

Application filed May 31, 1889. Serial No. 312,705. (No model.)

To all whom it may concern:

Be it known that I, GEORGE N. CLYMER, a citizen of the United States, residing at Bloomingsburg, 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, and among the objects in view are to reduce the cost and the amount of metal employed, and to produce an extremely strong and rigid bridge thoroughly braced, and yet withal comparatively light of structure. With these general objects in view the invention consists in certain features of construction hereinafter apparent, and more 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, an end elevation, and Fig. 3 a detail in perspective of one of the vertical girder-supports.

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

1 1 represent the usual wood or metallic mud-sills arranged at both sides of the creek or other water-way, and to the upper surface of each are bolted by bolts 2 inverted-U-shaped risers or supports 3, the lower ends of said supports being oppositely bent to form feet 4, through which the bolts 2 pass. The supports 3 are formed of metal, and each of the series upon one sill registers with a companion support of a series upon the opposite sill. Transverse tie-bars 5 connect the supports throughout the series and are arranged a suitable distance apart, serving as a screen to prevent the entrance of large bowlders into the water-way at points opposite the bridge, and at the same time serving to increase very materially the rigidity of the U-shaped supports. Each of the tie-bars 5 is perforated at intervals, said perforations occurring at points registering with the centers of the space between the arms of the supports, and through the perforations and between the arms are inserted binding-bolts 6, the ends of which project at the opposite sides of the supports 3 and pass through binding plates or washers 7, and are there provided with binding-nuts 8. By this arrangement it will be no-

ticed that the tie-bars are adjustable up and down upon the supports. The terminals of the tie-bars are preferably bent, as at 10, so as to embrace the exteriors of each of the outermost supports of each series. The upper portions or ends of the U-shaped support are flat, and arranged from one support to its companion upon the opposite sill, and so on throughout the series is a series of angle or I shaped girders 11, the lower flanges or bases of which are bound by bolts 12 to the upper ends of the supports 3. Tie-bars 13, the ends of which are bent at right angles, as at 14, and bolted to the webs of each of the girders, are provided at the ends thereof, and may be at intermediate points, if desired. Upon the girders is laid the ordinary flooring or roadway 16.

Any suitable hand-rail may be employed; but for the purpose in view I have found the one herein shown of considerable advantage. The same consists of opposite end posts 17, arranged at each end of the outer of the series of I-bars, and, if desired, at intermediate points. These posts are preferably formed of angle-iron and bolted to the upper flange of the I-bars of beams, as at 19. Perforations 20 are formed in each of the posts near their upper ends, and the same are connected by metal hand-rails 21, the ends of which are threaded in the perforations.

By the above construction it is evident that I have provided a practically fire-proof and otherwise indestructible bridge, rigid in the extreme, yet light, and at a reasonable cost.

Suitable inclines (shown by dotted lines) may be arranged at the ends of the bridge, and, if desired, the construction described may form but one span of a much larger bridge, the remaining spans being duplications of the one described and adapted for connection in a manner that will at once suggest itself to persons conversant with bridge-building, and yet will be wholly within the scope of my invention.

Having described my invention and its operation, what I claim is—

1. In a bridge, the combination of opposite sills provided with series of oppositely-arranged supports, the tie-bars for connecting the supports, a series of I-beams extending from one support to its companion upon the

opposite sill, the whole bound together, substantially as specified.

2. The combination, in a bridge, of a mud-sill provided with inverted-**U**-shaped supports extending at intervals upwardly therefrom, a beam bolted to the upper end of each of the supports, substantially as specified.

3. The combination, with opposite sills, each provided with a series of inverted-**U**-shaped metal supports bolted thereto, of a series of **I**-shaped angle-beams, each connecting a support of one sill with the opposite support of the other sill and bolted thereto, substantially as specified.

4. In a bridge, the combination, with a sill and a series of vertical inverted-**U**-shaped supports bolted thereto, of a series of tie-bars having their ends bent to embrace the end supports of the series, and bolts inserted through the tie-bars passing through the supports and through binding-plates at the opposite side of the supports and provided with binding-nuts, substantially as specified.

5. In a bridge, the combination, with the mud-sills 1, having the inverted-**U**-shaped risers 3, bolted to the sills, as at 2, and having their bottoms bent to form feet 4, through which the bolts are passed, of the tie-bars 5, bolted to the supports, as at 6, and bent, as at 10, to embrace the sides of the end supports of the series, and the **I**-shaped girders 11, extending from each support of one series to a companion support of the opposite series and having their bases bolted, as at 12, to the upper ends of the supports 3, and having the angular tie-bars 13, bolted, as at 14, to the

webs of the **I**-beams, and the hand-rails 21, threaded in the posts 17, mounted at the ends of the beams or girders, substantially as specified.

6. In a bridge, the combination, with the mud-sills 1, having the inverted-**U**-shaped risers 3, bolted to the sills, as at 2, of the tie-bars 5, bolted to the supports, as at 6, and bent, as at 10, to embrace the sides of the end supports of the series, and the **I**-shaped girders 11, extending from each support of one series to a companion support of the opposite series, and having their bases bolted, as at 12, to the upper ends of the supports 3, substantially as specified.

7. In a bridge, the combination, with the mud-sills 1, having the inverted-**U**-shaped risers 3, bolted to the sills, as at 2, of the tie-bars 5, bolted to the supports, as at 6, and bent, as at 10, to embrace the sides of the end supports of the series, and the **I**-shaped girders 11, extending from each support of one series to a companion support of the opposite series, and having their bases bolted, as at 12, to the upper ends of the supports 3, and having the angular tie-bars 13, bolted, as at 14, to the webs of the **I**-beams, substantially as set forth.

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

GEORGE N. CLYMER.

Witnesses:

F. W. KENDRICK,
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