

(No Model.)

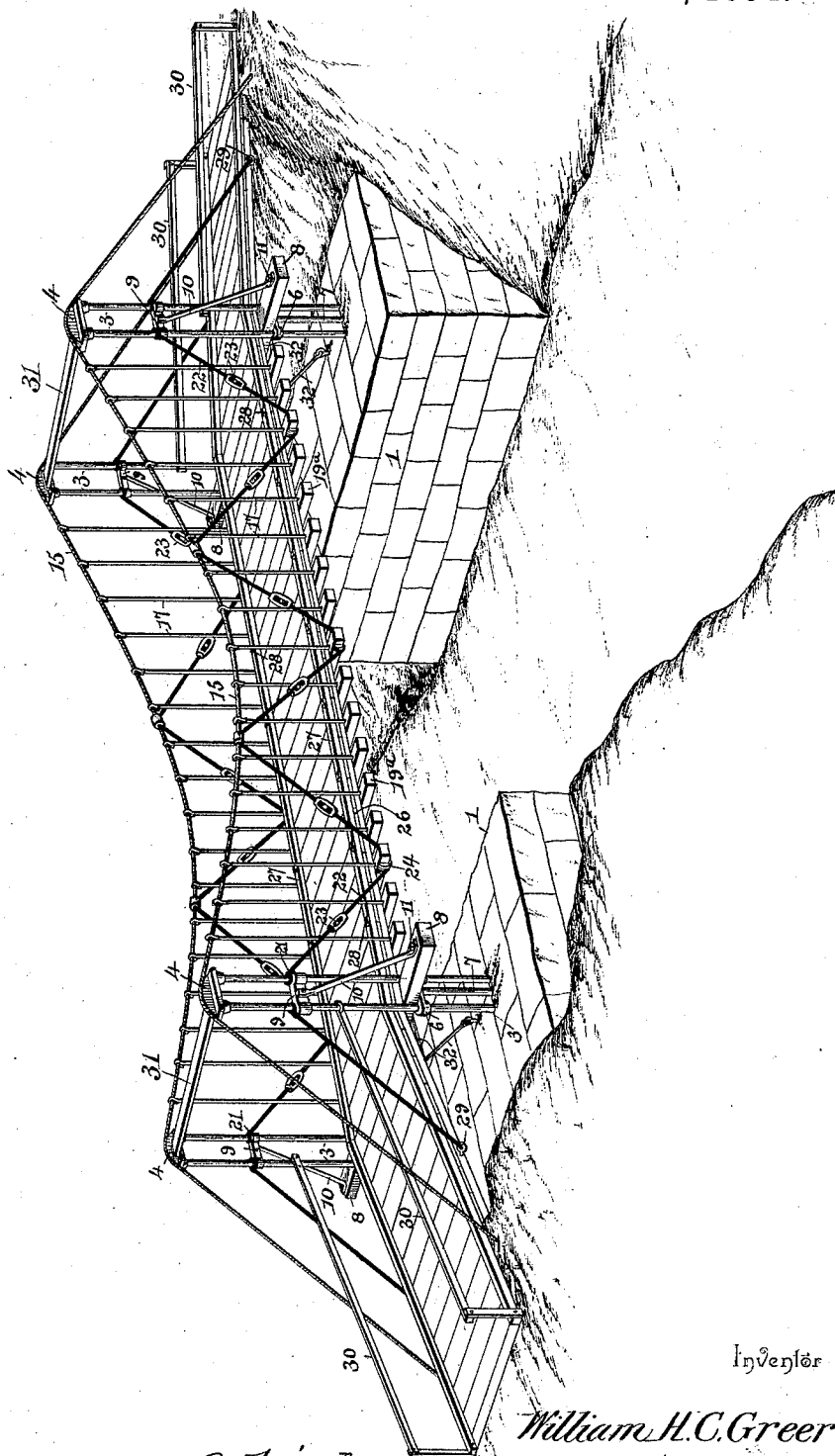
2 Sheets—Sheet 1.

W. H. C. GREER.
SUSPENSION BRIDGE.

No. 513,389.

Patented Jan. 23, 1894.

FIG. 1.



Inventor

William H. C. Greer

Witnesses

Jas. K. McLaughlin

M. S. Duwall

By his Attorneys.

C. A. Snow & Co.

(No Model.)

2 Sheets—Sheet 2.

W. H. C. GREER.
SUSPENSION BRIDGE.

No. 513,389.

Patented Jan. 23, 1894.

FIG. 2.

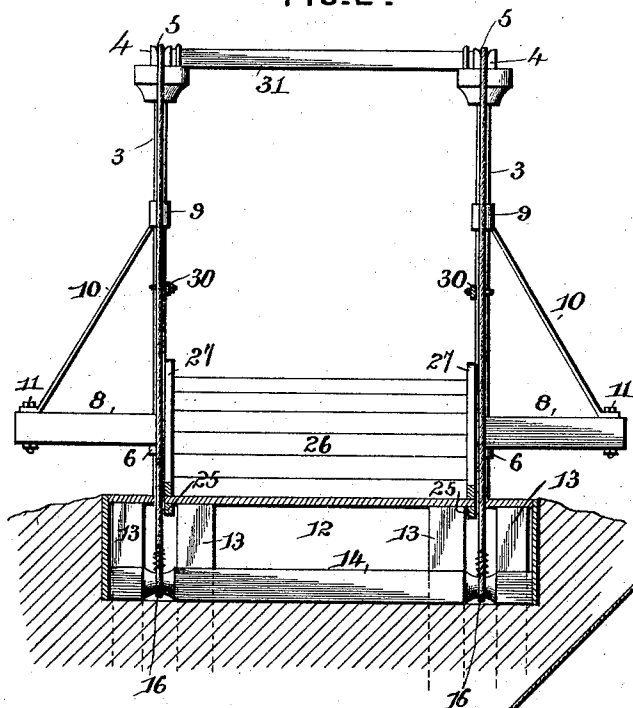
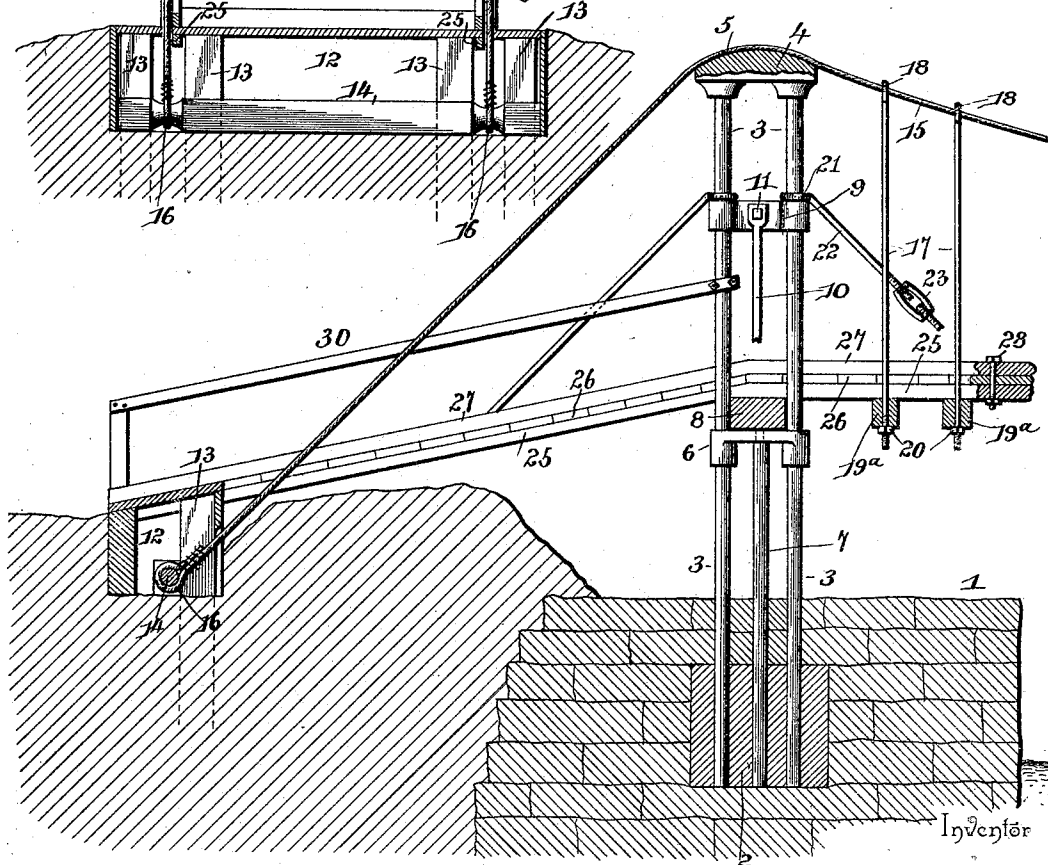


FIG. 4.



FIG. 3.



Witnesses

Jas. H. McLaughlin

By his Attorneys.

W. S. Duwall.

William H. C. Greer

C. Snow & Co.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY CLAY GREER, OF SHERMAN, TEXAS.

SUSPENSION-BRIDGE.

SPECIFICATION forming part of Letters Patent No. 513,389, dated January 23, 1894.

Application filed September 28, 1893. Serial No. 486,738. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY CLAY GREER, a citizen of the United States, residing at Sherman, in the county of Grayson and State of Texas, have invented a new and useful Suspension-Bridge, of which the following is a specification.

My invention relates to improvements in suspension bridges, and has special reference to certain improvements upon that construction of suspension bridge illustrated and claimed in United States Patent No. 411,499, granted me September 24, 1889.

The objects of my present invention are, first, to decrease the vertical motion in floor of main span of bridge, thereby adding stability thereto; to provide for a new and improved anchorage for the suspension cables of the bridge; and, furthermore, to improve certain details of construction hereinafter described.

With these objects in view the invention consists in certain features of construction and combinations of parts hereinafter described and particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a perspective view of a bridge constructed in accordance with my invention. Fig. 2 is a transverse sectional view through the anchoring pit. Fig. 3 is a longitudinal sectional view through one end of the bridge. Fig. 4 is a detail in perspective of one of the stirrup-castings.

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

Upon opposite piers 1 located upon opposite banks I locate a pair of opposite transverse base-sills 2, and rising from the ends of each sill is a pair of vertical pillars 3. These pillars are connected at their upper ends by caps or saddles 4, which are provided upon their upper sides with curved grooves 5. A suitable distance above the base-sills the pillars of each pair are connected by metal tie-plates 6, and interposed between these tie-plates 6 and the aforesaid base-sills is an intermediate short pillar 7. The tie-plates of each pair of towers thus constructed are connected by transverse beams 8, the ends of which project beyond the towers some dis-

tance as shown, and are supported by the aforesaid tie-plates. The tie-plates, it will be understood are perforated near their ends for the reception of the pillars which they receive and connect, and may be located at any suitable point desired. Between the floor-beams 8 and the caps 4 the pillars of each tower are further connected by a second transverse tie-plate 9, and inclined brace-rods 10 are bolted at 11 to intermediate points of the tie-plates 9 and the outer ends of the transverse beams 8. This completes the construction of each tower, which as before described, will be seen to consist essentially of pairs of pillars surmounted by caps, transverse tie-plates connecting the pillars and serving to support the transverse beams 8.

Beyond the piers and towers, or it may be located in the masonry thereof, where extra strength is desired, I form transverse ditches or anchoring-pits 12, and sink therein pairs of posts 13, the posts of each pair being arranged a short distance apart as shown in Fig. 2, and in rear of these posts I locate transverse anchors or bars 14. These transverse anchors may be of tough wood or bar-iron as desired, and it will be seen that they extend across the openings intervening between the anchoring-posts of each pair.

Extending from saddle to saddle of the opposite towers are suspension cables 15, the same being of suitable gage and, as usual, sagging between their points of support. The opposite ends of these cables, that is from the towers to their extremities, decline toward the anchoring-pit, and for the reception of the same the ground or masonry is ditched or grooved so that they pass between the anchoring-posts and beyond the same are provided with loops 16, through which the anchoring-bars pass, so that the ends of the cables become firmly anchored and cannot slip.

17 designates a series of vertical suspension-rods, the same being preferably formed of round-iron and varying in length, that is being formed longer toward the ends of the series than at the center. These rods have forged at their upper ends or otherwise applied, hooks 18, the said hooks engaging the suspension-cables between the towers. The lower ends of these rods extend through ver-

tical perforations 19, which are formed in the opposite ends of transverse floor-beams 19^a which are arranged at intervals agreeing with the rods. The lower ends of the rods below the floor-beams are threaded, and to these threaded ends nuts 20 are applied and serve to support the floor-beams.

Secured to the inner pillars of each tower, as at 21, is a bracing-rod 22, and the same extends in a zigzag manner under a floor-beam, thence over the suspension-cable, again under a floor-beam, and again over the suspension-cable, and so on throughout the entire length of the span, or in other words, from tower to tower. At intervals this bracing-rod is provided with turn-buckles 23, so that any looseness of the same may be compensated for. Interposed between those floor-beams under which the rod passes and the rod itself are cast-metal stirrups 24, the same having such internal shape as to fit them to the ends of the beams, and are provided upon their under sides for the reception of the rods. Of course any shape of stirrup may be substituted for the one herein shown and the same result secured.

Supported upon the floor-beams is a series of longitudinally disposed stringers 25, and these support the road-bed 26. These stringers, it will be understood, are continued from the towers to the banks at opposite ends of the span. Copings 27 may be arranged along the opposite edges of the roadway and bolts 28 passed through the copings, the roadway, and the stringers. The outer pillars of each tower have brace-rods connected thereto, and the same decline and are connected to the stringers by eye-bolts 29 or other means. Hand-rails 30 extend from the towers to the lower ends of the inclined roadway.

The towers are preferably, though not necessarily, connected by transverse arches 31 located at the upper ends thereof and may likewise be braced by diagonal braces 32 below the roadway.

From the foregoing description in connection with the accompanying drawings it will be seen that I have materially improved and strengthened the construction of bridge illustrated in the patent hereinbefore referred to, in that I render the same more rigid and durable without any material increase of cost, and reduce to a minimum the vertical vibrations of the roadway by my improved manner of bracing.

I do not limit my invention to the precise details of construction herein shown and described, but hold that I may vary the same to

any degree and extent within the knowledge of the skilled machanic.

Having described my invention, what I claim is—

1. In a suspension-bridge, the combination with the opposite towers, the pits beyond the towers, the pairs of anchoring-posts arranged in the pits, the suspension-cables, the roadway, or flooring extending over the pits and connections between the cables and the roadway, and the transverse anchor-bars arranged in the pits beyond the posts and connected with the suspension-cables, substantially as specified.

2. In a suspension-bridge, the combination with the opposite towers, the suspension-cables, the roadway, the transverse beams arranged thereunder, and the suspension-rods between the cables and the transverse beams, of the bracing-rods arranged at opposite sides of the bridge and connected to the towers, said rods between their ends being passed alternately under the beams and connected with the suspension-cables, between certain of the suspension rods substantially as specified.

3. In a suspension-bridge, the combination with the opposite towers, the suspension-cables, the roadway, the transverse beams arranged thereunder, and the suspension-rods between the cables and the transverse beams, of the stirrups 24, recessed to fit the ends of the beams, and having their exteriors provided with curved recesses, and bracing-rods connected at their ends to the opposite pillars at each side of the bridge and between their ends alternately passed under the stirrups and suspension-cables, substantially as specified.

4. In a suspension-bridge, the combination with the opposite towers, intermediate transverse beams, the roadway arranged thereon and declining beyond the towers, the suspension-cables arranged upon the towers and anchored beyond the same, of the bracing-rods connected alternately with the suspension-cables and around the ends of the beams that support the roadway, and supplemental bracing-rods connected to the towers and extending beyond the same and connected to fixed points, substantially as specified.

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

WILLIAM HENRY CLAY GREER.

Witnesses:

SILAS HARE, Jr.,
J. M. HEATON.