

No. 616,536.

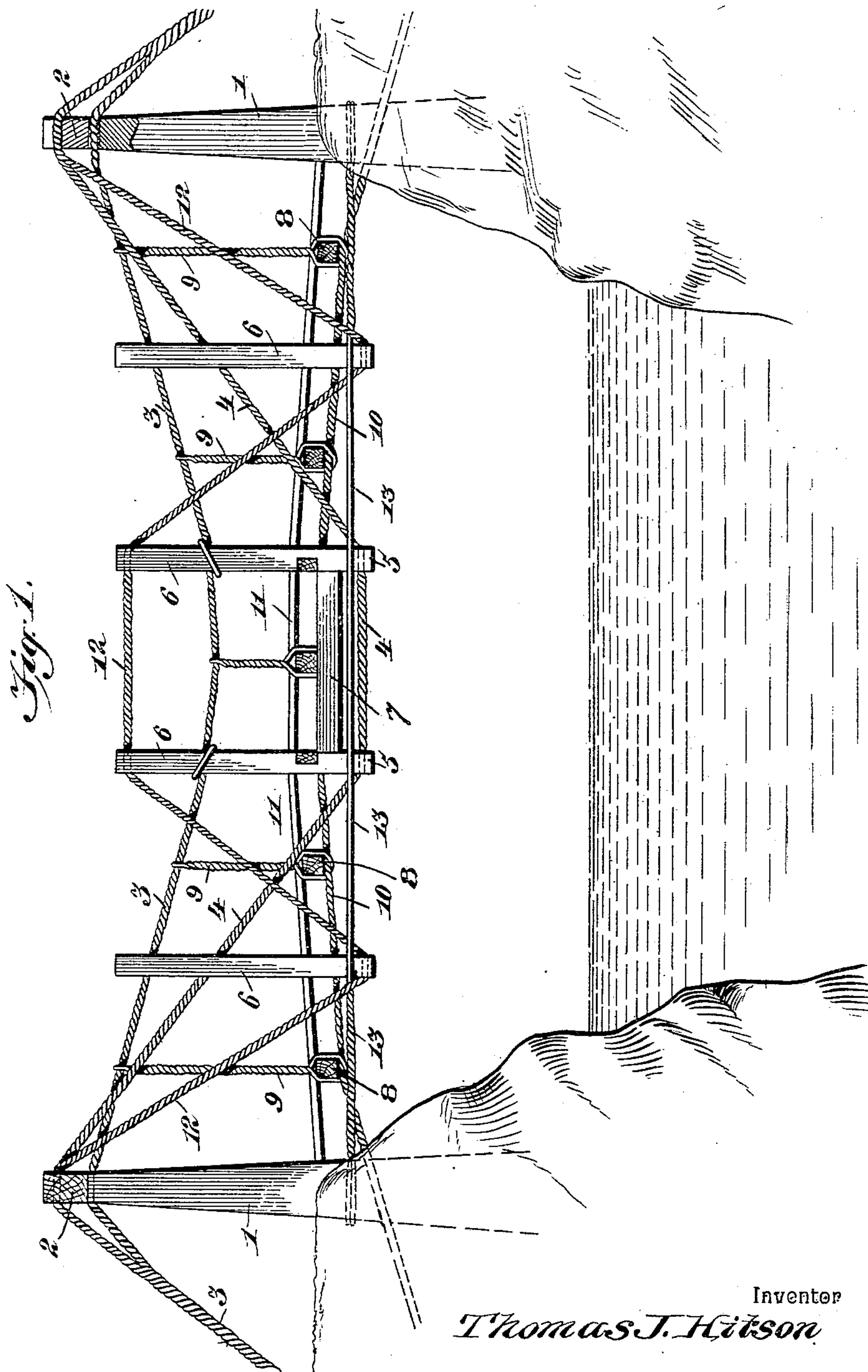
Patented Dec. 27, 1898.

T. J. HITSON.
SUSPENSION BRIDGE.

(Application filed Apr. 12, 1896.)

(No Model.)

2 Sheets—Sheet 1.



Inventor

Thomas J. Hitson

Witnesses

H. G. Dieterich
R. M. Smith

By *his* Attorneys.

C. A. Snow & Co.

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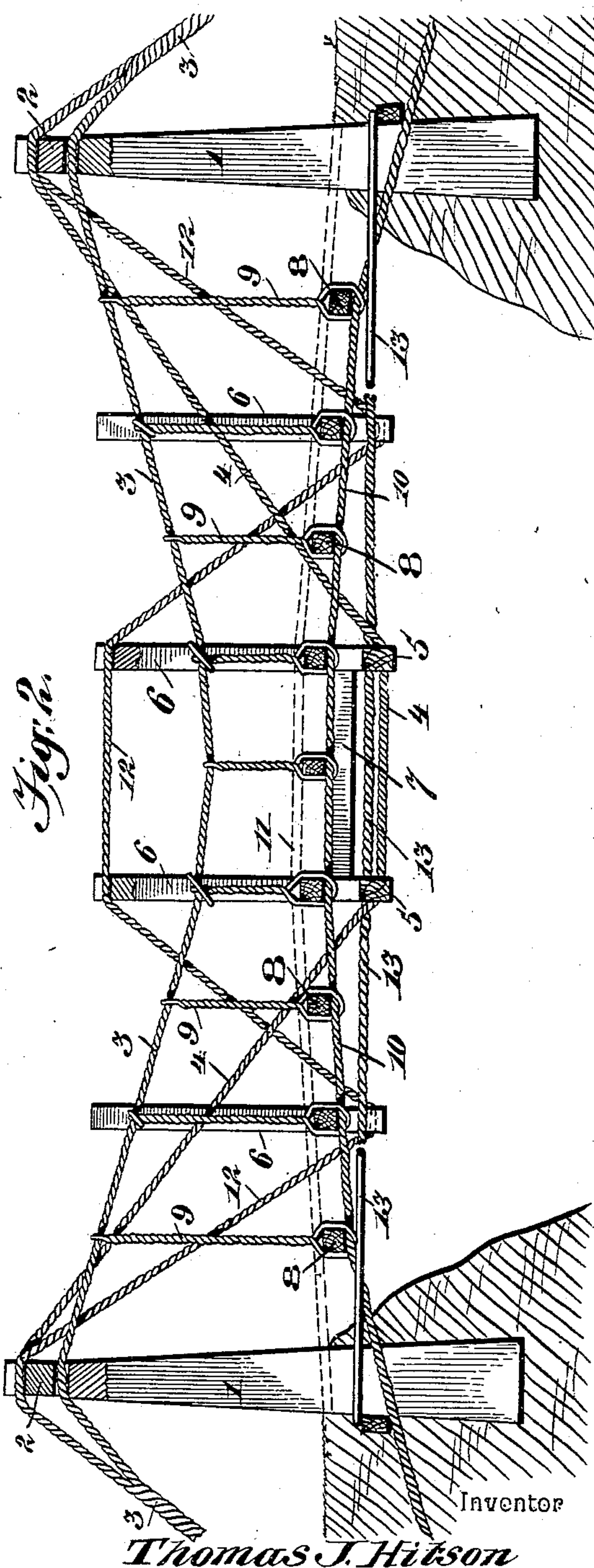
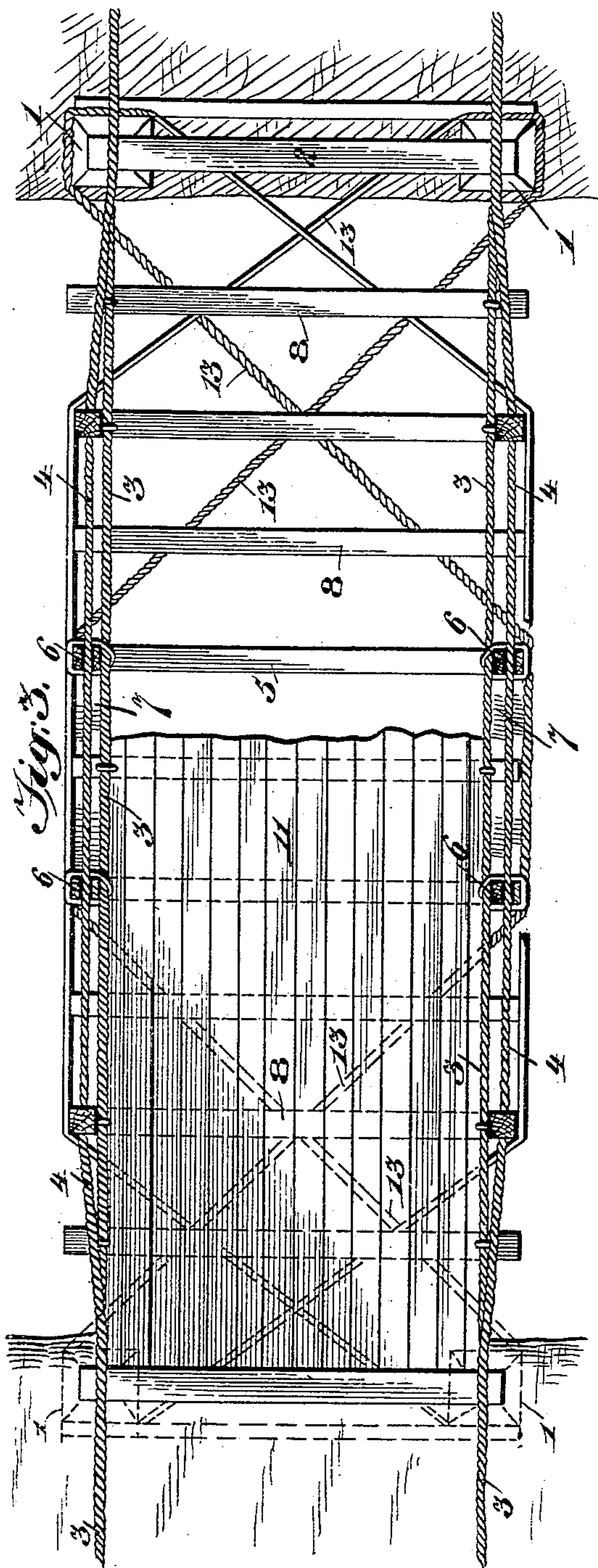
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UNITED STATES PATENT OFFICE.

THOMAS J. HITSON, OF HERMITAGE, MISSOURI.

SUSPENSION-BRIDGE.

SPECIFICATION forming part of Letters Patent No. 616,536, dated December 27, 1898.

Application filed April 12, 1898. Serial No. 677,316. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. HITSON, a citizen of the United States, residing at Hermitage, in the county of Hickory and State of Missouri, have invented a new and useful Suspension-Bridge, of which the following is a specification.

This invention relates to suspension-bridges, and has for its object to simplify and improve the construction of bridges of the character referred to, to the end that the same may be constructed in a lighter and more durable manner and at the same time be enabled to better withstand heavy traffic and high winds, &c.

The invention consists in certain novel features and details of construction, as hereinafter fully described, illustrated in the drawings, and embodied in the claims hereto appended.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a bridge constructed in accordance with the present invention. Fig. 2 is a longitudinal section through the same. Fig. 3 is a plan view thereof.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

The abutment-towers (indicated at 1) are four in number, and each pair at either end of the bridge is connected by an arch 2.

3 designates the main suspension-cable, which, it will be observed, extends above the floor of the bridge, with the ends thereof passing over the tops of the towers 1 and thence obliquely to the anchorage.

4 represents the truss-cables, which at their central portions extend under the center framework of the bridge, to be hereinafter described, while their ends extend over the arches 2, after which they are spliced or connected to the main cables 3 and extend therewith to the anchorage.

The center framework comprises parallel needle-beams 5, each having at its ends vertical struts 6, extending upward therefrom and rigidly connected thereto. The beams 5 are spaced apart by means of cross-beams 7, and the struts 6 are firmly united to the main cable 3 at the points where said cable crosses the struts. Other struts 6 are arranged at

each side of the center framework and between it and the towers 1.

8 designates a series of transverse floor-stringers which are supported from the suspension-cable 3 by means of suspension-wires 9, which connect at their upper ends to the main cable 3 and at their lower ends to the floor-cables 10, of which there are two, one at each side of the bridge and extending under the stringers 8, the opposite ends of the floor-cables extending to the anchorage outside of the towers 1. The suspension-wires 9 are composed of two or more strands, and these strands are separated adjacent to the stringers 8, so as to pass around and embrace said stringers upon opposite sides, after which the strands are brought together and connected securely to the floor-cables 10 and the main suspension-cables 3 in the manner shown.

The main suspension-cable 3 is firmly connected to all of the struts 6 above the floor 11 of the bridge, while the truss-cable 4, after passing over the arches 2, crosses the cable 3 and extends downward under the lower ends of the struts 6, forming a part of the central framework, above referred to.

12 designates an auxiliary brace-cable which extends from one arch downward under the first strut, thence upward over the second strut, and thus alternately above and beneath the several struts between the center framework and the towers, said brace-cable extending horizontally over and connecting the upper ends of the struts of the center framework.

13 designates wind-cables which extend diagonally across beneath the floor-stringers. These cables pass around the towers 1 near their bases, one portion of the cable extending immediately from one tower diagonally beneath the bridge and passing around the outside of the center frame and thence diagonally across to the tower at the other end of the bridge, while the other portion of the cable extends from the tower directly and diagonally across to the opposite side of the bridge to one of the struts between the center frame and towers, where it passes around such strut, outside of the same, extending thence longitudinally upon the outside of the several struts, finally passing diagonally across under the floor-stringers back to the tower on

the same side, but at the opposite end of the bridge.

By means of the construction above described it will be seen that the main suspension-cable 3 adds greatly to the stiffness of the bridge by reason of its being located above the flooring and assists materially in distributing the weight of the structure and the strain equally upon all parts thereof; also, that the center frame, in connection with the truss-cable 4, prevents the bridge from vibrating vertically, and that the auxiliary brace-cable 12 also assists materially in obviating such vertical vibration. The floor-cables, by reason of their arched form, when taken in connection with the main suspension-cable 3 and the wires 9, also add materially to the vertical stiffness of the structure, while the diagonal wind-cables 13 brace the structure against lateral vibration.

It will be understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. In a bridge, the combination with the abutment-towers, a centrally-disposed frame located beneath the floor and vertical struts rising thereon, suspension-cables, and means connecting said struts and central frame with the suspension-cables, of truss-cables supported by the towers and deflected intermediate of their ends to engage with the upper and lower ends of the struts of the central frame, and wind-cables extending diagonally between the lower ends of the towers and the central frame, substantially as and for the purpose specified.

2. In a bridge, the combination with the abutment-towers, and the main suspension-cables, of a center framework consisting of

spaced transverse needle-beams, struts at the ends thereof, and connecting-beams, and truss-cables each extending over one tower thence downward under one needle-beam, thence horizontally under the center framework and up over the opposing tower, the said center framework being suspended beneath the main cable, substantially as described.

3. In a suspension-bridge, the combination with the abutment-towers, and the main supporting-cables, of the transverse floor-stringers, the floor-cables anchored at their ends and extending undersaid stringers and arched as described, and the suspending-wires for the stringers, said wires comprising two or more strands which are separated to embrace the ends of the stringers, after which the end portions of the strands are brought together and connected at their upper ends to the main suspending-cables and at their lower ends to the floor-cables, substantially as described.

4. In a suspension-bridge, the combination with the abutment-towers, and the main supporting-cables, of a centrally-disposed frame suspended beneath said cables and consisting of transverse needle-beams and spacing-timbers, struts connected to said beams and other struts arranged between said center frame and the towers, truss-cables extending over the towers and beneath said center frame, and auxiliary brace-cables extending from the tops of the towers alternately under and over the several struts, said brace-cables extending horizontally over the center frame, substantially as described.

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

THOMAS J. HITSON.

Witnesses:

J. HOUSTON CHILDERS,
JOHN H. MORGAN.