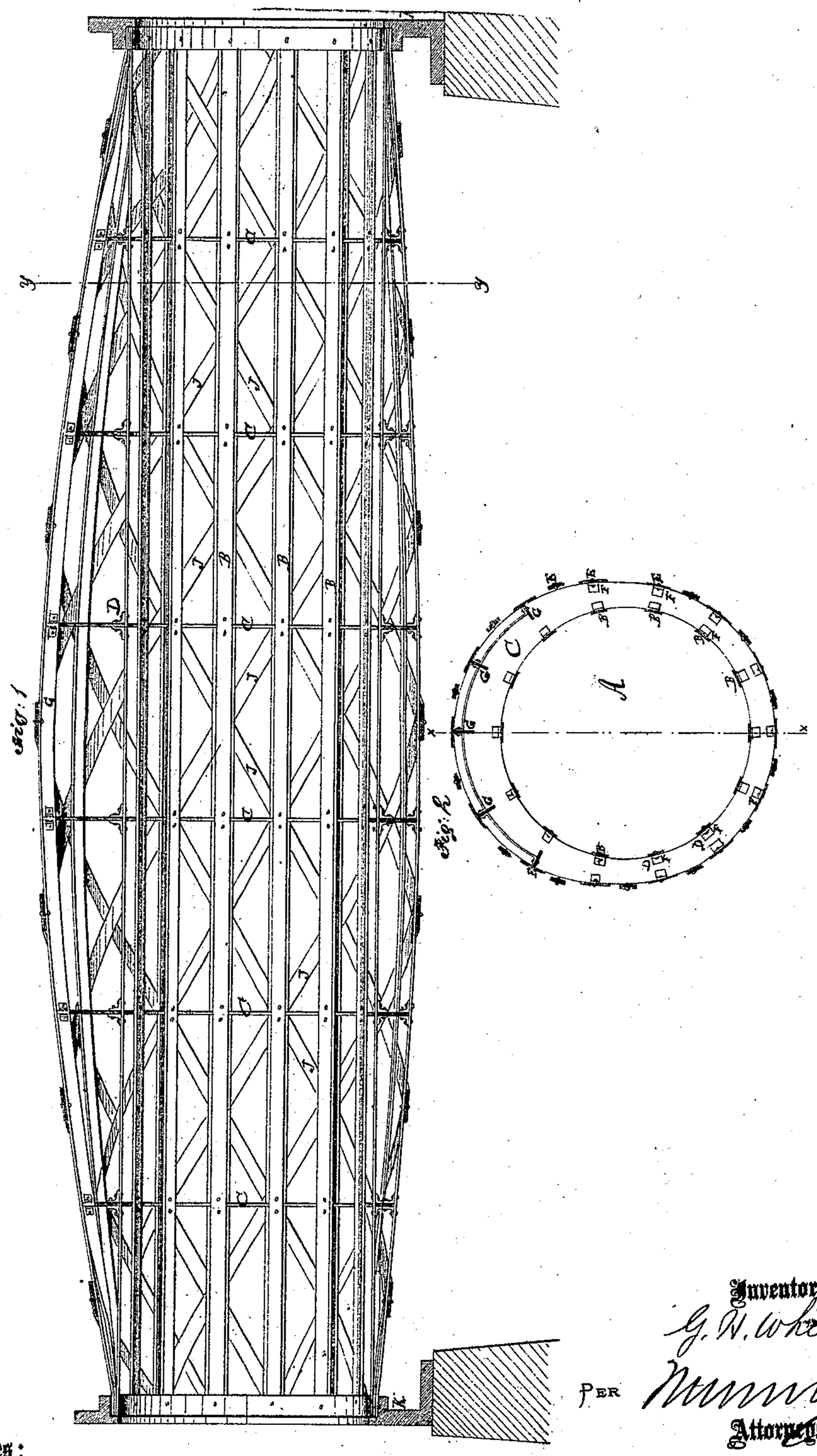
G. H. White,

2 Sheets, Sheet 1.

Truss Bridge.

No. 108,663. Patented Oct. 25. 1870



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Inventor:

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2 Sheets. Sheet 2.

G. H. White,

Truss Bridge.

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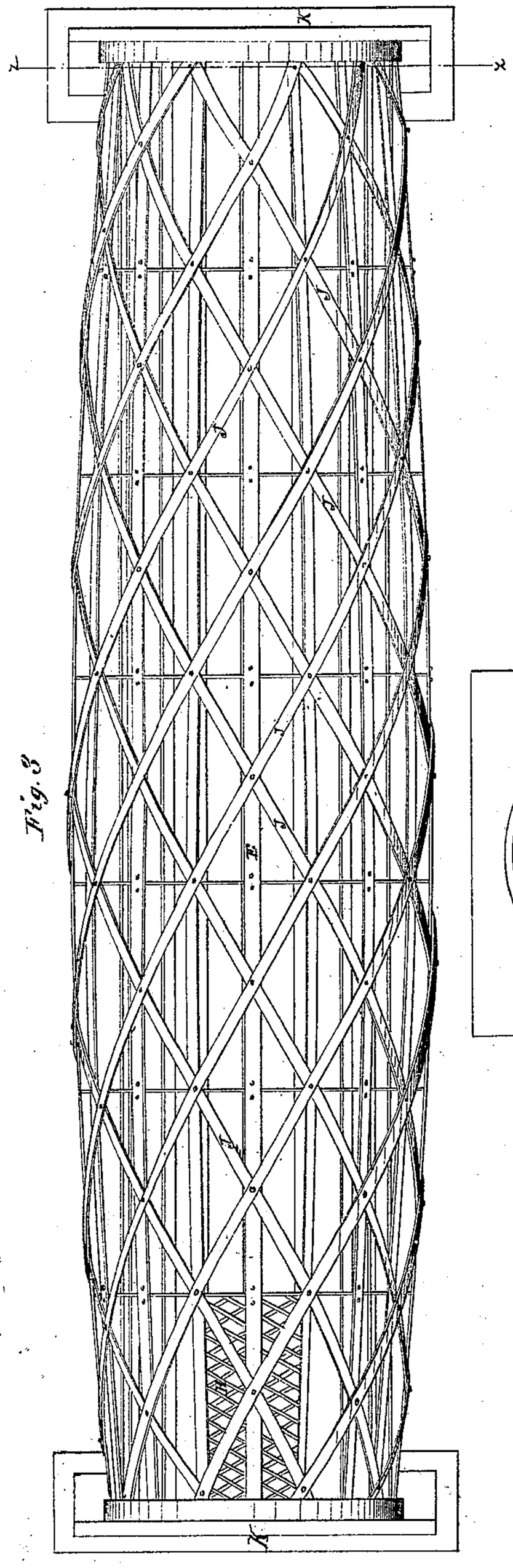

Fig. 3

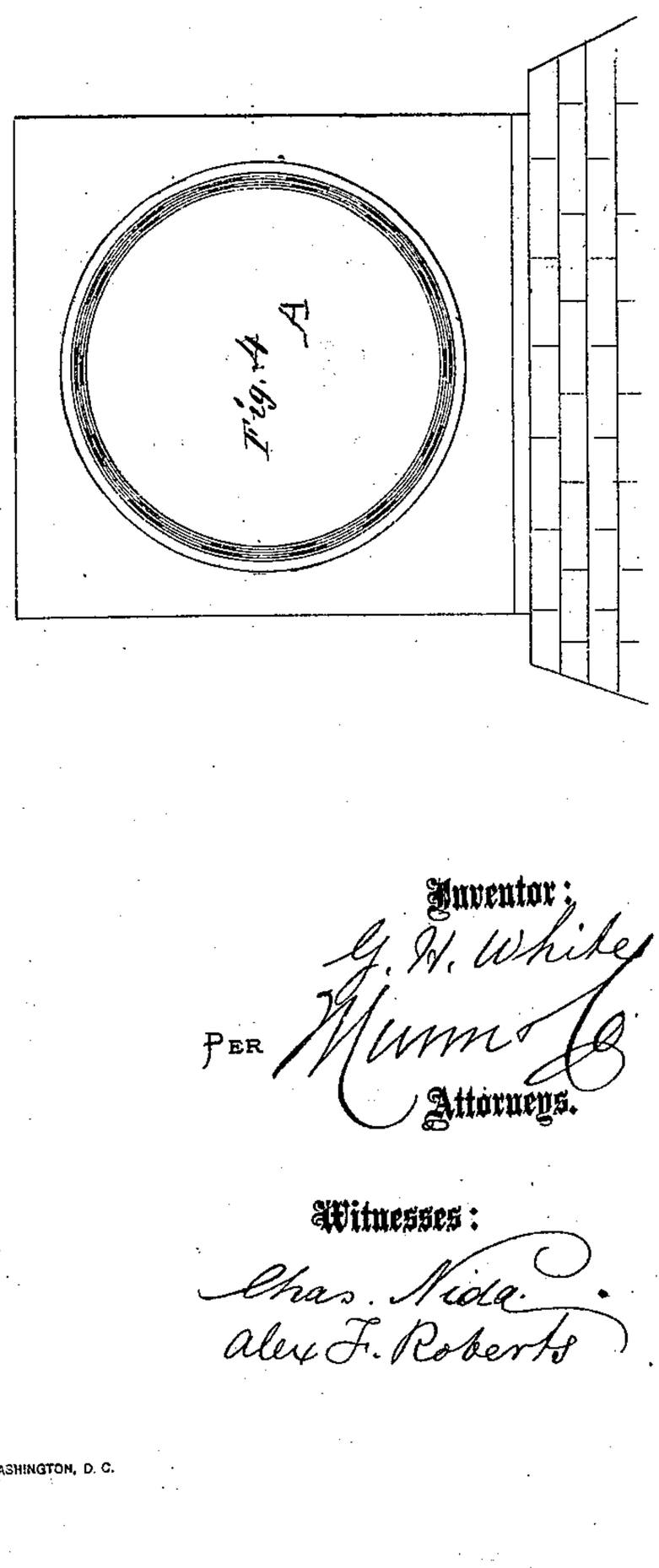

Fig. 4

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GEORGE H. WHITE, OF NEW YORK, N. Y.

Letters Patent No. 108,663, dated October 25, 1870.

IMPROVEMENT IN TUBULAR BRIDGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE H. WHITE, of the city, county, and State of New York, have invented a new and useful Improvement in Tubular Bridges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to tubular bridges, and consists in certain improvements thereon which will be specified hereinafter.

In the accompanying drawing—

Figure 1 represents a vertical longitudinal section of the bridge, showing the frame-work at its extremities and the abutments on which it is supported, the section being on the line *x x* of fig. 2.

Figure 2 is a vertical cross-section of fig. 1, on the line *y y*.

Figure 3, plate 2, represents a top view of the bridge.

Figure 4 is a vertical cross-section on the line *z z* of fig. 3.

Similar letters of reference indicate corresponding parts.

This bridge is constructed by combining two sets of longitudinal or horizontal ribs with a series of vertical ribs, and a set of radial ribs set edgewise, or on a radial line from the center to the circumference of the tube, the whole being surrounded by two series of spiral ribs, which act both as ties and braces.

Beneath the spiral ribs, and before they are adjusted, I apply to the upper portion of the arch, throughout the length of the bridge, diagonal braces, securely bolted or riveted to the radial ribs before mentioned and to the vertical ribs.

A represents the tube in which the track or roadway is laid, which in cross-section is designed to be a true circle, formed by the interior series of longitudinal ribs B, which are fastened to the interior of vertical ribs C, by means of knees or angle-irons, as seen at D in the drawing.

E represents the other series of longitudinal ribs, which is fastened in the same manner to the outer edges of the vertical ribs C.

F represents the knees or angle irons by which they are fastened.

G represents the radial ribs, which, like those mentioned, extend the entire length of the bridge. They are let into slots cut in the vertical ribs, and are fastened, like the other longitudinal ribs, at each intersection with the vertical ribs C, by angle-irons, as seen in the drawing.

The bridge is arching on all sides, from one end to the other, but the upper portion or crown, which is strengthened and partially supported by the radial ribs G, is about twice the distance from the center of the tube that the bottom and sides are. This formation is plainly seen in the longitudinal section, fig. 1, thus providing for an amount of vertical pressure vastly above what the base-tube, or what a simple round tube, constructed in any manner, would sustain.

In fig. 3, plate 2, a portion of the upper arch is seen, provided with diagonal braces H. This system of bracing is continued the entire length of the arch, and occupies the space between the two outer radial ribs and the vertical ribs.

J represents the spiral ribs, of which there are two series, passing in opposite directions, each making about one turn or revolution around the structure. These ribs are securely bolted or riveted together wherever they intersect. They are also firmly bolted or riveted to the outer longitudinal ribs E.

At the ends of the structure the longitudinal, as well as the spiral ribs, are brought to a circle, and firmly secured (by riveting or bolting) to a circular band of metal, which is securely confined within the frame-work at each terminating point of the structure.

K represents the frame-work, which rests upon the abutments, as seen in the drawing.

The tube or roadway A is of uniform diameter from end to end, and corresponds to the inner portion of the vertical ribs C.

The structure being formed mainly by longitudinal ribs arching on all sides, it will be seen that every rib of the inner tube is a chord of the arch.

The structure is designed to be made of either wood or metal, the sizes or dimensions of the several ribs and braces being determined by the span of the bridge and the purpose for which it is designed.

It is believed that this is the best disposition that can be made of either metal or wood, in the formation of a tubular bridge, and its advantages over similar structures made of boiler or other sheet or plate-iron, or of wood, must be obvious to all who understand the subject.

I am aware that attempts have been made to construct tubular bridges by a simple lattice-work formed of either iron or wood, with an interior roadway of rectangular form, and interior bracing; but I am not aware that tubular bridges have been constructed in the arch form.

In my improvement the longitudinal ribs is the essential feature. The spiral ribs, being combined with them, and assisting to strengthen the arch, and the whole rigidly connected together at the ends and

to the frame-work K, as heretofore described, distinguishes my structure from anything of the kind heretofore presented to the public.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. A tubular bridge, forming a perfect circle at any cross-section, but gradually enlarging in diameter from each end toward the center, as shown and described.

2. In combination with ordinary spiral ribs J, the arc-ribs G, chord-ribs B, and vertical ribs C, arranged to co-operate in the support of the structure, as set forth.

3. In a tubular bridge, arched ribs G, supported in heavy frame-work K at each end, as shown and described.

GEO. H. WHITE.

Witnesses:

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