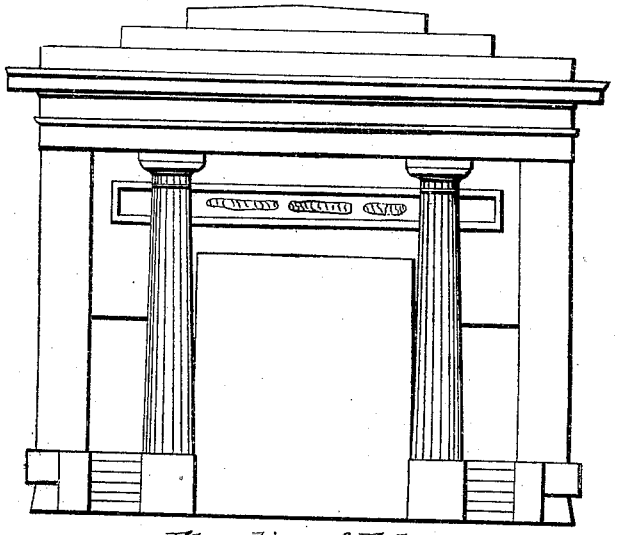
Sheet 1, 5 Sheets.

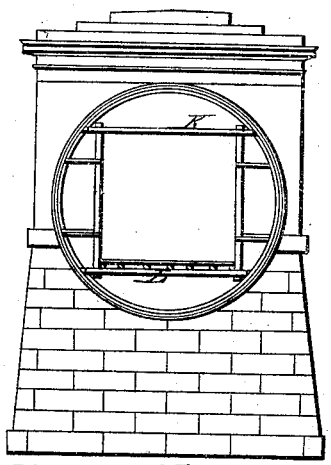
I. Rogers.

Truss Bridge.

No. 2,347. Patented Nov. 10, 1841.

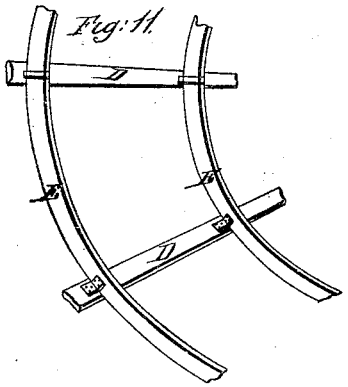


Elevation of Entrance



Elevation of Pier on Waterside

Fig: 11.



Section of Ribs & String Pieces D & E in No VI Iron Bridge

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Truss Bridge.

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Fig: 1.

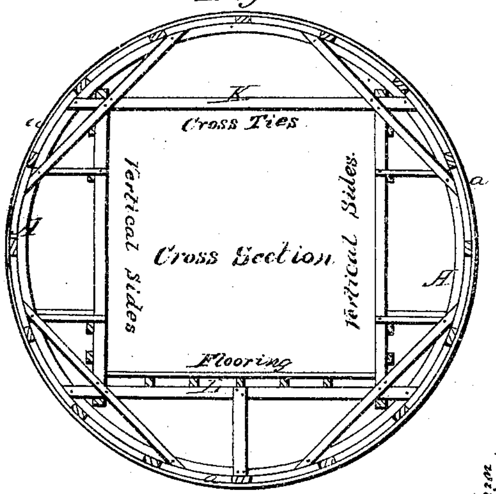
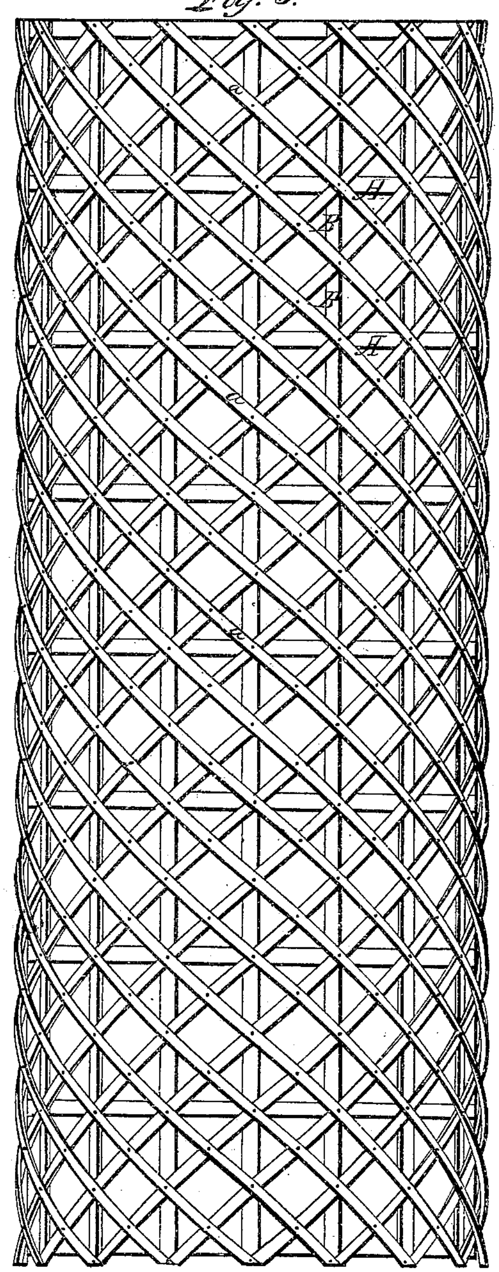
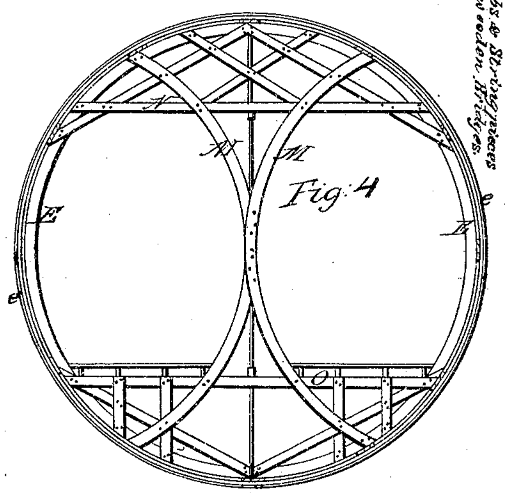


Fig. 3.



Section shewing Ribs & String pieces with the cross bar truss wooden Bridges.



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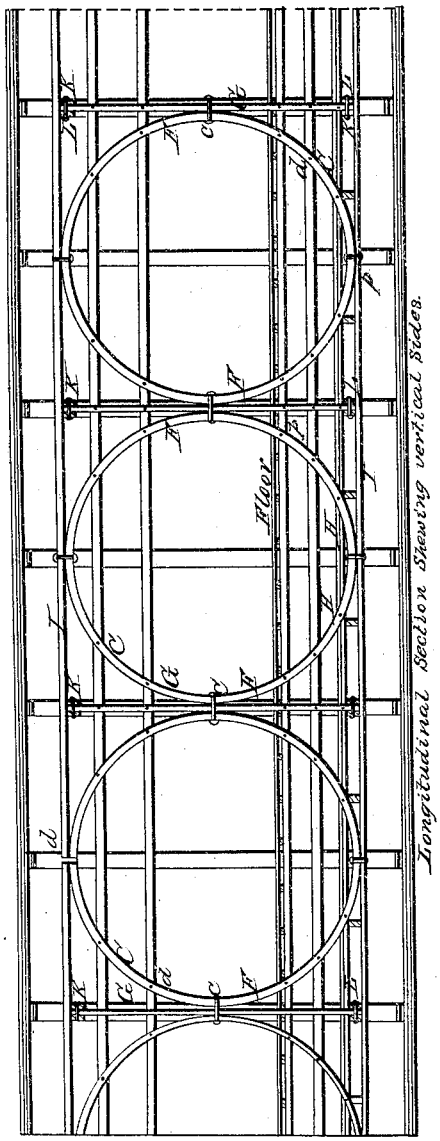

Fig. 2. Longitudinal Section Shewing vertical Sides.

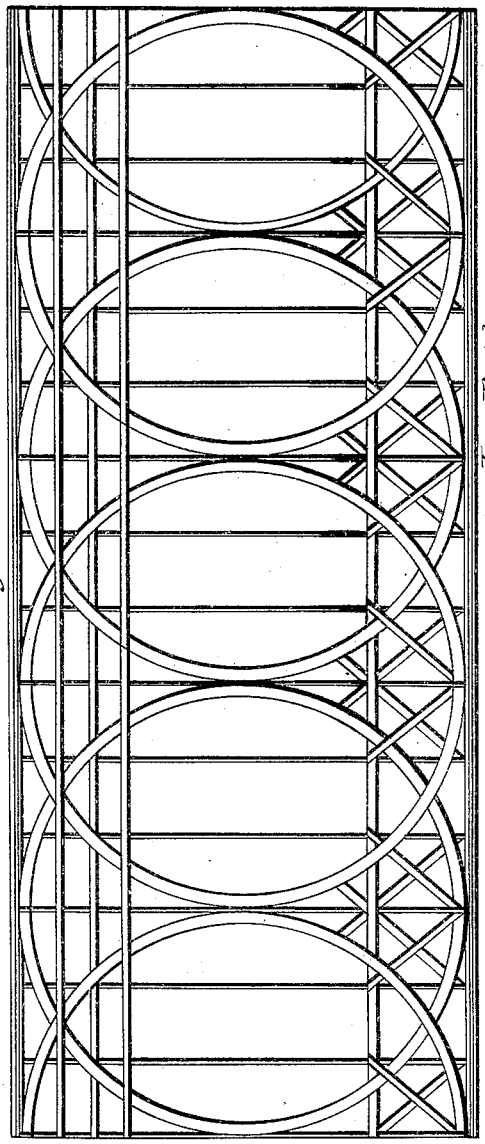

Fig. 3. Longitudinal Section in Iron Bridge.

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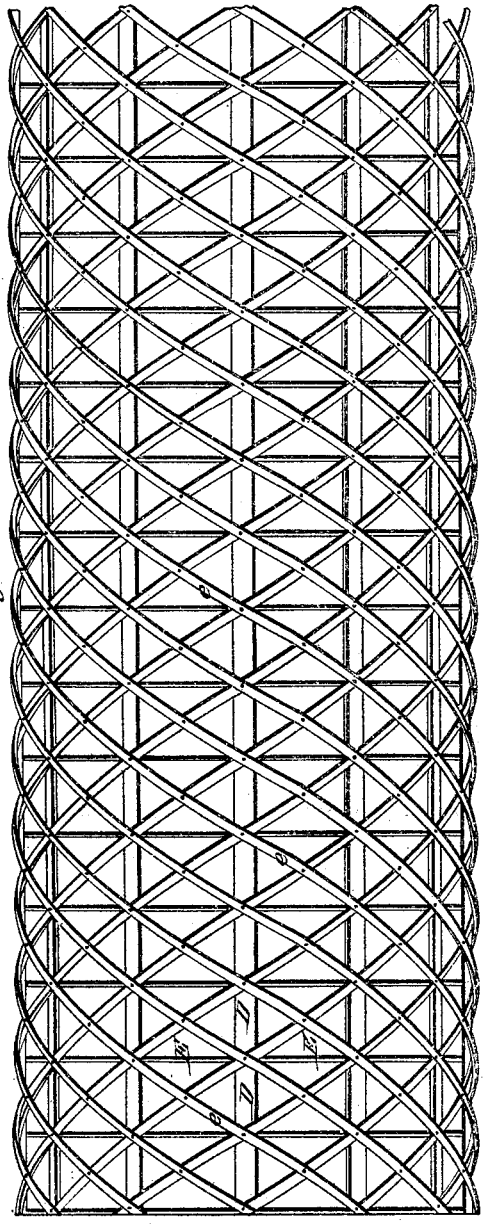

Fig. 6.

Section Showing Ribs & String Pieces with cross Bracing in Iron Bridge

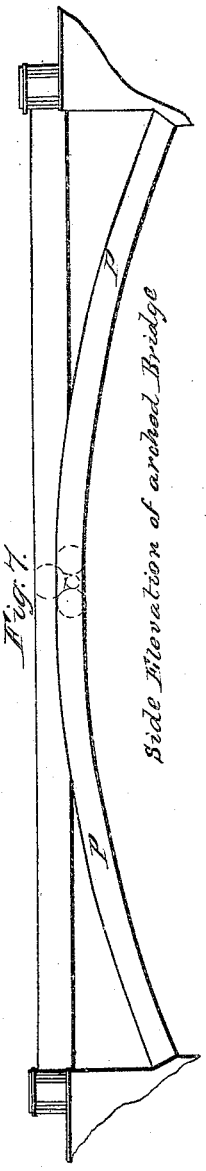

Fig. 7.

Side Elevation of arched Bridge

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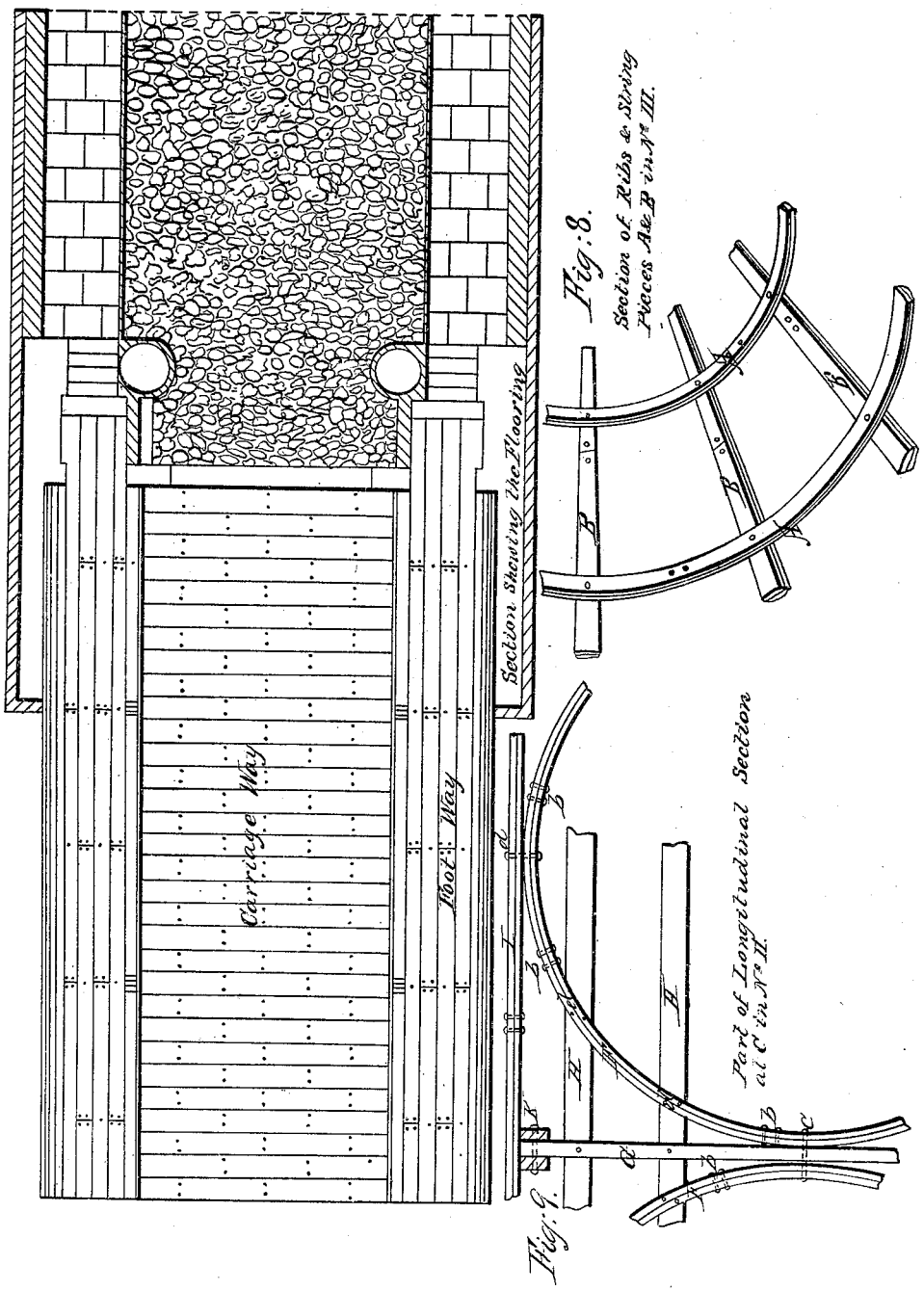

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UNITED STATES PATENT OFFICE.

ISAIAH ROGERS, OF NEW YORK, N. Y.

MANNER OF CONSTRUCTING BRIDGES OF WOOD OR IRON, DENOMINATED THE "SPIRAL-BRACED CYLINDER-BRIDGE."

Specification of Letters Patent No. 2,347, dated November 10, 1841.

To all whom it may concern:

Be it known that I, ISAIAH ROGERS, architect, of the city of New York, in the State of New York, have invented a new and Improved Method or System of Constructing Bridges, Either of Wood or of Iron; and I do hereby declare that the following is a full and exact description thereof.

I denominate my bridge, the spiral-braced cylinder bridge, the materials whether of wood or of iron, of which its exterior framework is composed, being so put together, as to constitute a complete latticed cylinder, from end to end, the lattices being formed by spiral braces, surrounding the cylinders. Within this cylinder, and along its whole extent I construct a hollow rectangular prism, which is to constitute the passageway of the bridge, this prism is formed by the flooring, by vertical sides, and by horizontal cross-ties uniting the vertical sides at their upper edges. The vertical sides I form of a series of rings, or circles, united together, and to vertical studs and horizontal string-pieces, by means of bolts or other adequate fastenings having cross-ties above and below, these forming together a continuous truss bracing, which materially increases the strength of the cylindrical skeleton of the bridge. In bridges of a long span, the roadway is to be dvided into two parts, by a central partition constructed in all respects in a manner similar to that of the vertical sides. The skeleton of my cylinder bridge consists of circular ribs and string-pieces, strongly united together, by or combined with diagonal braces; said braces dividing the whole exterior into diamond formed latticed work. These diagonal braces are in wooden-bridges, constructed of two thicknesses of plank, strongly bolted together, the pieces breaking jointing with each other, the respective diagonal braces form continuous spiral lines from end to end of the bridge, said spiral brace pieces running in reverse directions and constituting a trussing by which the strain or weight is equally distributed over the whole structure. In wooden bridges built upon this principle it is not necessary to use any other timber than plank of from two to three inches in thickness. In bridges of a short span boards of an inch or an inch and a quarter in thickness will afford sufficient strength when properly put together. At their intersections the circles, braces and string pieces are to be bolted, riveted, screwed or nailed together, and the whole frame is intended to be formed without halving the timbers and without the use of mortises and tenons. In bridges of iron the bars of which the ribs and string pieces are formed may be four, five or six inches wide, from one half to three-fourths of an inch in thickness; and in forming the circular ribs these bars are to be bent edgewise. In bridges of this construction as there is not any lateral thrust upon the piers or abutments, they may be laid in stone masonry, or be formed of a structure of timber framed or piles or mud-sills. When a bridge of this kind is to have a span of unusual length one or more arched tubes may be constructed upon the same principle with that of the cylinder of the bridge; which arched tube is to be placed below the cylindrical bridge, its ends bearing against suitable abutments, and its crown, or upper part, coming into contact with the center of the bridge on its lower side.

In the accompanying drawings Figure 1 is a cross section of a cylindrical bridge, of wood, with the rectangular prism therein, constituting the passage way. Fig. 2 is a longitudinal section thereof showing the manner of constructing one of the vertical sides. Fig. 3 is a sectional porton of a wooden bridge, showing the ribs and string pieces, with the spiral cross bracing surrounding them. Fig. 8 is a section of the ribs and string pieces on an enlarged scale showing the manner of joining them together. Fig. 9 a part of the longitudinal section of the vertical side shown in Fig. 2 drawn also on an enlarged scale, for the purpose of exhibiting the manner of combining the respective parts with each other. Fig. 10 is a plan of the flooring of a bridge with a single carriage way, which flooring will not differ materially whether applied to a bridge of wood or of iron. Fig. 7 is a side elevation of a cylindrical bridge of a long span, sustained at its center by a tubular arch PP, bearing against suitable abutments. Fig. 4 is a cross section of an iron bridge, showing a double roadway; in this arrangement the sides of the roadway are not vertical, this not being an essential feature, more especially in bridges of iron. Fig. 5 is a longitudinal section of an iron bridge show-

ing a vertical elevation of the braced division between the two roadways in Fig. 4. Fig. 6 is a sectional portion of an iron bridge, with its ribs, string pieces, and braces combined together, on the same principle with those of the wooden bridge as shown in Fig. 3. Fig. 11 is a sectional view of a part of the iron ribs and string pieces, showing on an enlarged scale the manner in which they may be joined together.

In Fig. 3, A, A, are two of the ribs, and B, B, one of the string pieces, a number of each being shown in the same figure, as they are embraced by the diagonal braces, *a*, *a*, *a*; each of these braces passing in a continued spiral from end to end of the bridge. In Fig. 8 A, A, are portions of two of the circular ribs, made of two thicknesses of plank, breaking joints with each other, and bolted together, and to the string pieces B, B, B. These string pieces connect, like the ribs, of two pieces of plank united to each other and to the ribs, as above named. In the cross section, Fig. 1, A, A, is one of the circular ribs, and *a* ,*a*, *a*, the diagonal braces; the string pieces being shown in their cross section, between them. In the longitudinal section Fig. 2, showing one of the vertical sides of the roadway, and in the enlarged view of a portion of this section, Fig. 9, F, F, are rings, or circles, consisting of two thicknesses of plank, bolted together as at *b*, *b*, and these rings bolted to each other and to studs G, G, as at C, C, and to string pieces H, H, as at *d*, *d*. I and J are the upper and lower string pieces, from which proceed the horizontal cross ties K, L.

In this bridge, when formed of iron the ribs and string pieces are made of single and continuous bars. In Fig. 6, E, is one of the ribs, and D, one of the string pieces, a number of each being shown in the same figure; and *e*, *e*, are the diagonal braces, surrounding the whole, in the same manner with those shown at *a*, *a*, in the wooden bridge. In Fig. 4, E, is one of the ribs; *e*, *e*, the diagonal braces, the cross sections of the string pieces being shown between them. M, M, are two segments of rings riveted to E, and to cross ties N, O, and united also to suitable brace pieces which may be variously arranged.

In Fig. 11, E, E, are segments of two of the ribs, showing the bars of iron of which they are formed as bent edgewise. D, D, are sections of two of the string pieces. The ribs and string pieces are shown as fastened together in two different modes; the manner of doing this may be varied according to the judgment of the engineer.

In the longitudinal section, Fig. 5, showing the vertical partition, the arrangement of the hoops, string pieces, and brace pieces which enter into its composition, will be clearly understood from an inspection of the drawing, and need not be specially described; nor is it intended to limit the arrangement of these parts to the particular mode therein represented. The bridge so constructed may be covered, or inclosed, either in whole or in part, by a case or roof, of wood, or of metal; the best arrangement in this particular is believed to be the inclosing by a continuous covering of the upper half of the cylinder of which it is composed.

Having thus fully described the nature of my invention, and shown the manner in which the same may be carried into operation; what I claim therein as new and desire to secure by Letters Patent, is—

The constructing of a cylindrical bridge, either of wood, or of iron, by the combining together of circular ribs, string pieces, and diagonal braces, which braces consist of continuous strips of wood, or of iron, surrounding the ribs, and string pieces, and passing spirally, in reversed directions, from end to end of the bridge, thus constituting a braced lattice work, on the exterior of the cylinder. The whole being constructed, arranged, and combined, substantially in the manner herein set forth. I also claim, in combination with such a cylindrical bridge, the forming of a hollow rectangular passage way, having its vertical sides, or a vertical partition, constructed, arranged, and combined, substantially as herein represented and made known.

ISAIAH ROGERS.

Witnesses:
JOHN B. HOLMES,
THEODORE VODCKERS.