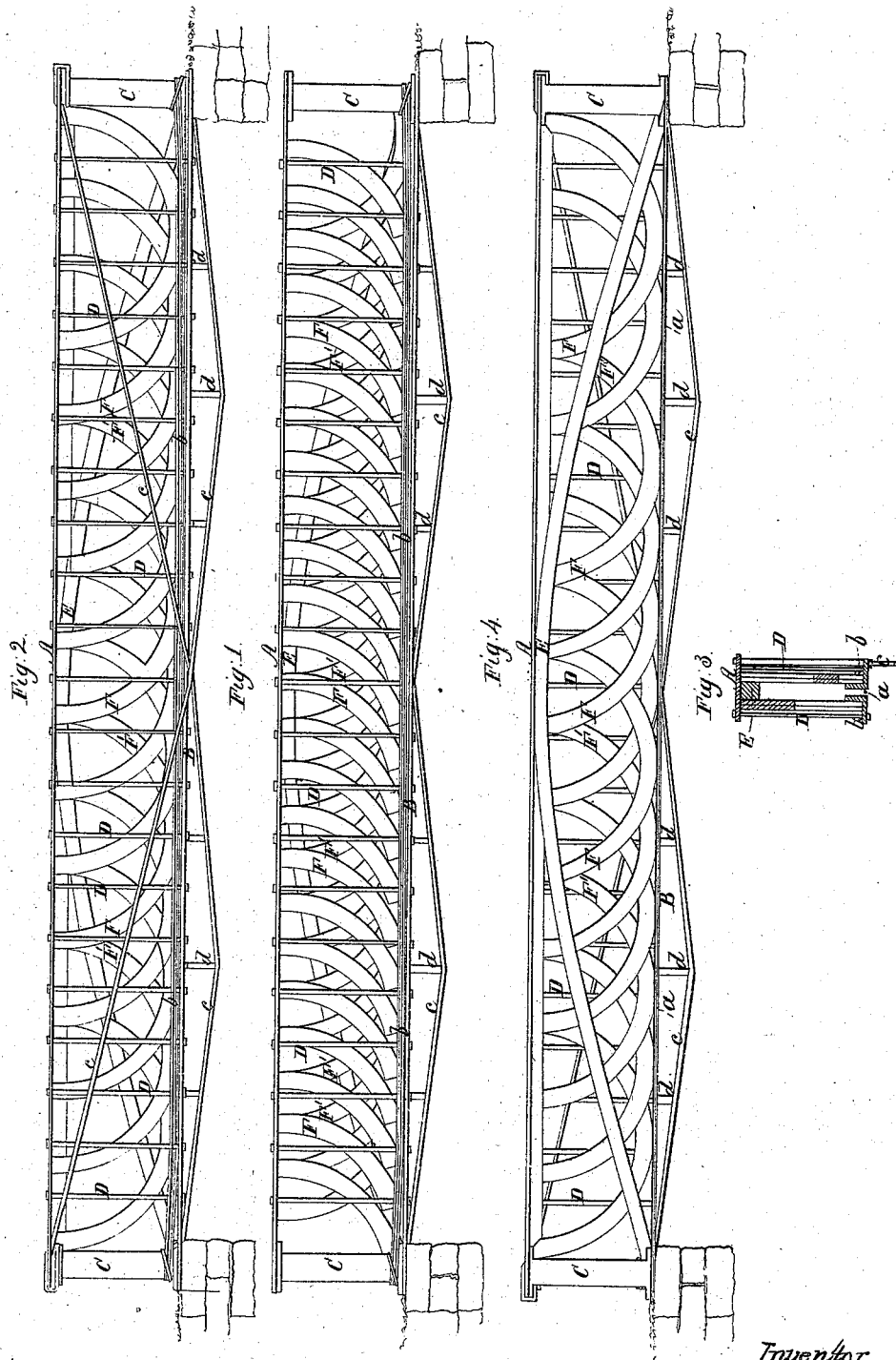


*J. Boles, Jr.*  
*Truss Bridge.*

*No. 7,920.*

*Patented May 30, 1863.*



*Witnesses*  
*A. P. Hale Jr.*  
*C. C. Fisher*

*Inventor*  
*John Boles Jr.*  
*by his attorney*  
*R. W. Sully*

# UNITED STATES PATENT OFFICE.

JOHN BOLES, 2D, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 47,920, dated May 30, 1865.

### *To all whom it may concern:*

Be it known that I, JOHN BOLES, 2d, of Boston, in the county of Suffolk and State of Massachusetts, have made a new and useful Invention having reference to Trusses for Bridges, Roofs, &c.; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figures 1 and 2 are side elevations of a truss exhibiting my invention. Fig. 3 is a transverse section, and Fig. 4 is a longitudinal section, of it.

The said truss has a top chord, A, a bottom chord, B, two posts, C C, and one or more series of vertical tie-rods, D D D, and it may or may not include an arched beam, E. It also has extending from chord to chord one or more series of curved braces, F F F F' F' F', each of which braces diverges from that next to it, one on either edge of it, the same being as shown in Figs. 1 and 2. One series of these branches, F F F, is arranged in front of and to stand in opposite directions with respect to those of the other series, and lays against them, side by side, the whole being as shown in Fig. 1; or, in other words, the braces may be semicircular or semi-elliptic, or be arcs of circles, ovals, or ellipses in form, and be arranged as shown in Fig. 2, in which they are not only shown as divergent, but as lapping one on another. In both these cases the divergence of the braces causes the overlaps of the braces to be closer together at or near the bottom chord than they are at or near the top chord, and in a manner to add greatly to the strength of the truss, where each brace, at its crossing with another, is to be secured to it by one or more bolts or pins extended through the two, or by being locked into or to one another. Through the middle of the bottom chord, and from one post to the other, I run an iron rod or cable, a, the same being as shown in Fig. 2, and also in Fig. 4. This rod or cable a is to be fastened at its ends to the posts or the bases thereof, it serving to strength-

en the truss. I also combine with the truss, as made with the two chords and their connecting-rods and braces, a lacing, b, of metallic wire, which I extend from post to post and interlace with the vertical tie-rods at or near their lower ends and just above the top chord. Such lacing may be carried as many times between and about the posts and tie-rods as may be necessary, in order to insure the requisite strength to the truss; and for further strengthening the truss I extend from the top of each post to the bottom of the other, or thereabout, a cable or rod, c, causing the two cables c c to cross one another at or about at the middle of the bottom chord. Each cable or rod, from its crossing with the other, descends below the bottom chord, and is supported by a series of struts, d d d, projecting down from such chord.

By the cables or rods c c so arranged and applied to the truss, I am enabled to add greatly to the strength of the truss. If desired, each post may be stayed by one or more rods carried back from or near its top and to and into the earth or abutment.

What I claim as my invention in the above-described truss is as follows, viz:

1. The combination as well as the arrangement of the lacing b with the truss composed of the posts, top and bottom chords, braces, and vertical tie-rods, as specified.

2. The construction of the truss with the arrangement of the several curved braces and the several curved counterbraces divergent with respect to each other, as described, whereby the crossings thereof are increased from the top to the bottom chord, as specified, and in combination therewith the two tension wires or cables c c, arranged as specified.

JOHN BOLES, 2D.

Witnesses:

R. H. EDDY,  
F. P. HALE, Jr.