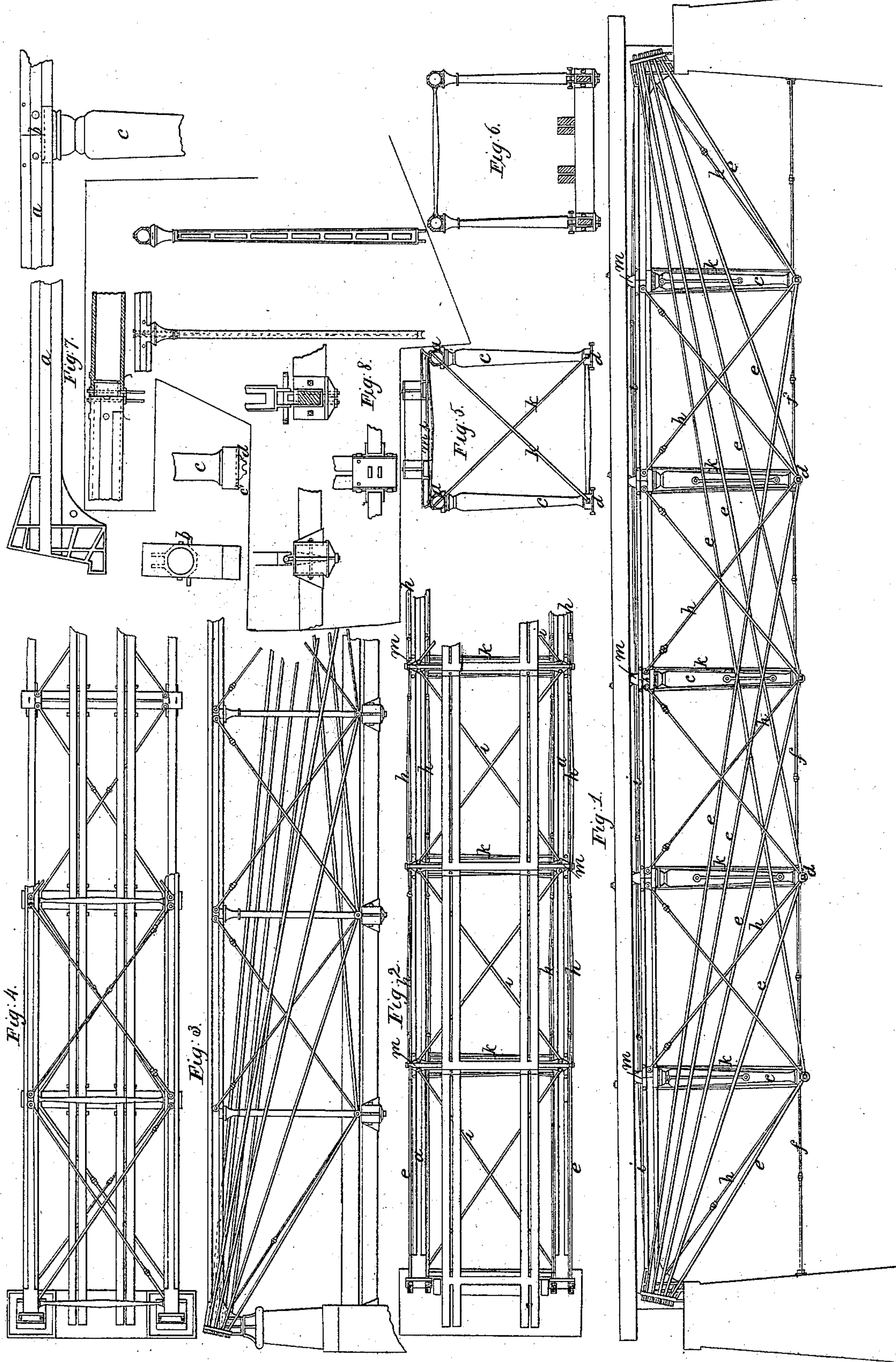


W. Bollman.
Suspension Bridge.

Nº 8,624.

Patented Jan. 6, 1852.



UNITED STATES PATENT OFFICE.

WENDEL BOLLMAN, OF BALTIMORE, MARYLAND.

CONSTRUCTION OF BRIDGES.

Specification of Letters Patent No. 8,624, dated January 6, 1852.

To all whom it may concern:

Be it known that I, WENDEL BOLLMAN, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Bridges, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing, making a part thereof.

My improvement consists in the mode of bracing bridges and constructing the trusses, by which I carry the whole load upon the bridge, at any given point at the center or either side thereof directly back to the abutments, and at the same time retain all the forces of thrust and tension within the truss frame, resting the weight merely upon abutments or piers, without any anchors or other similar device.

The construction is as follows: I prepare a cast iron structure (*a*) (or the stretcher may be made of wood when that material is to be used); if of cast iron I prefer to make it a hollow tube, cast in sections of proper length, and securely fastened in the manner shown at (*b*) in the drawing; at sufficient intervals I place a cast iron or wooden strut (*c*) pendent from and securely affixed to the stretcher (*a*); at the bottom of each strut there is a recess (*c'*), into which fits a shoe (*d*), which has space enough to slide longitudinally of the frame; this shoe has a recess of semicircular form into which an eye bolt fits standing out from either side, by means of which it is connected with tension rods (*e*), that run from this point; at the bottom of the strut, in a straight line, up to the end of the structure at the abutment; one tension rod, or pair of tension rods, being carried up to each abutment; each strut is furnished with independent tension rods (*e*), that lead directly back to the abutment, where they are connected with the ends of the stretcher. It will thus be seen that any load that each and every one of the struts are required to bear, will be directly transferred to the abutment, without the intermediate action of any

other strut or tension rod; and the longitudinal force is resisted by the stretcher without bringing any lateral strain upon the abutment. The sliding shoe (*d*) will be free to move on the foot of the strut to compensate for any unequal expansion in the tension rods and stretchers. To steady the struts in their upright position, braces or tension rods (*f*) may be attached to their lower ends; and when the latter are employed, they are connected with the abutments. As a further security, especially to prevent the stretcher from rising at one point when a heavy weight is thrown on to another, I employ diagonal rods (*h*), extending from the top of each strut on either side down to the bottom of the next adjacent strut. These diagonal rods not only give greater stability to the bridge, but they, also serve as an additional security to the bridge, in case the tension rods, in case of a flaw, should be ruptured, in which case the diagonals carry back the weight to the strut on either side, and divide the load between them. Horizontal diagonal rods (*i*) should be introduced, and where the road way is above the stretchers, as in Figure 1, there may be cross braces (*k*) in the vertical cross section: the floor cross ties (*m*), are connected, as shown in the drawing, or in any other convenient way. If the road way is at the bottom of the struts, as in Fig. 3, then the diagonal cross braces (*k*) must be omitted, and in place of the sliding shoe above named, there may be a short bolt attached to the lower end of the strut, as seen in Figs. 3 and 4, that have the equivalent to the shoe, with the further advantage of furnishing a convenient mode of connecting the road way with the side frame.

This bridge has the advantage of great strength and perfect security, with very little weight of metal; all the forces can be calculated with absolute certainty, and without complicating the problem; and the structure is so simple, that all the wrought iron work can be executed by the commonest blacksmith. The bridge has been thoroughly tested, and fully proves the correctness of the principles upon which it is based.

Having thus fully described my improved construction of bridges, what I claim therein

as new, and which I desire to secure by Letters Patent, is

The combination of the tension rods *e* connecting the foot of each strut with each
5 end of the stretcher, substantially as described, by which an independent support is given to the strut carried back directly to

the abutment, while at the same time no lateral force or strain is brought upon the abutment, as herein fully set forth.

WENDEL BOLLMAN.

Witnesses:

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