3 Sheets—Sheet 1.

A. FINK.

TRUSS BRIDGE.

No. 10,887. Patented May 9, 1854.

Plate II.

Fig. 1.

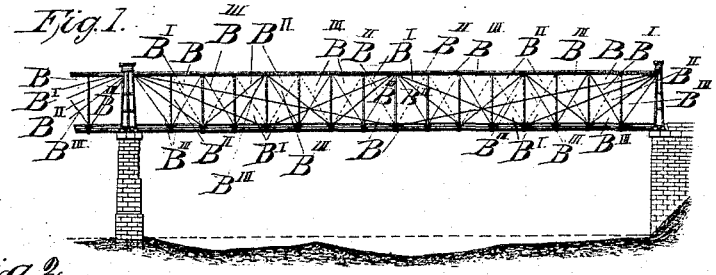


Fig. 2.

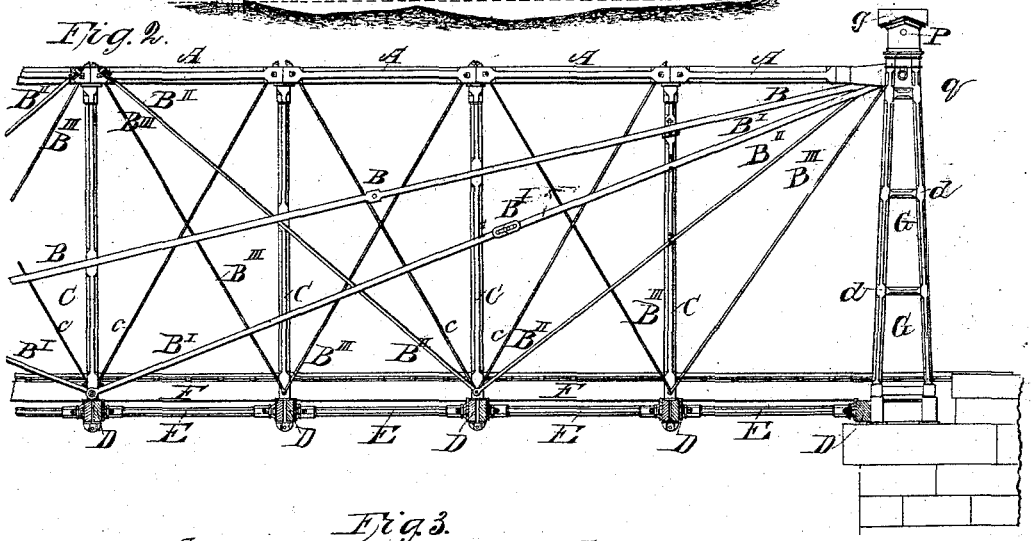


Fig. 3.

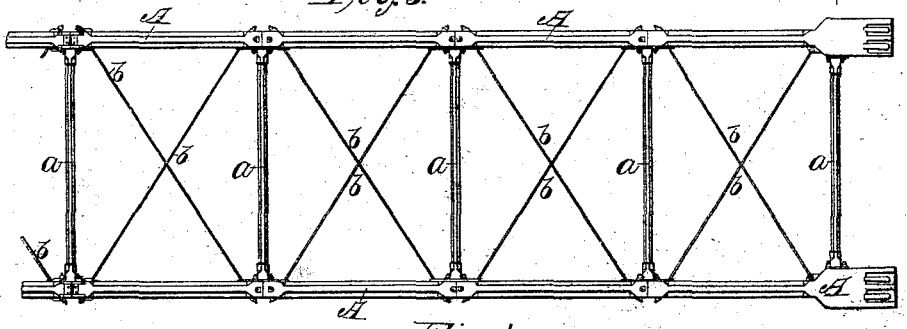
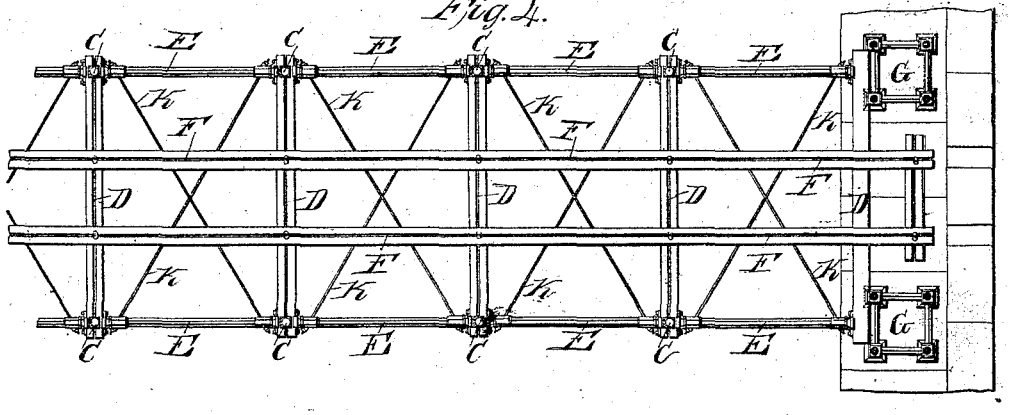


Fig. 4.



3 Sheets—Sheet 2.

A. FINK.

TRUSS BRIDGE.

No. 10,887. Patented May 9, 1854.

Plate II.

Fig. 5.

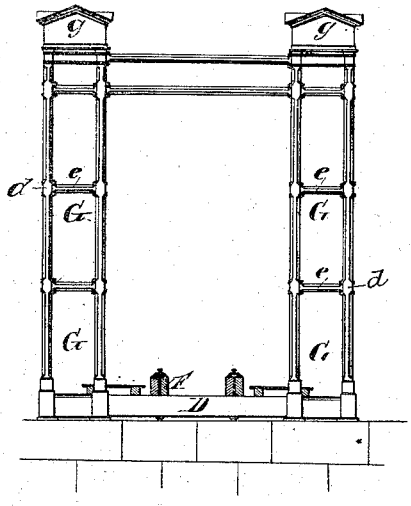


Fig. 6.

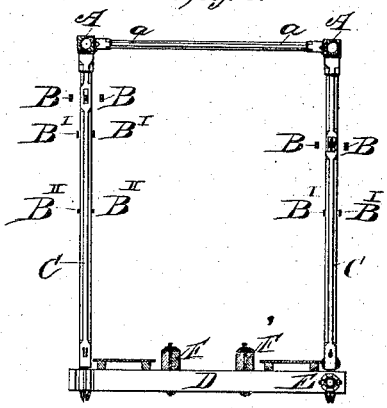


Fig. 7.

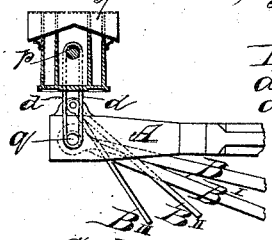


Fig. 8.

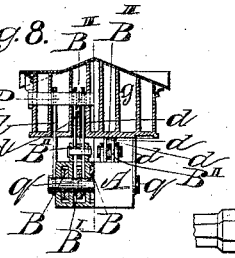


Fig. 11.

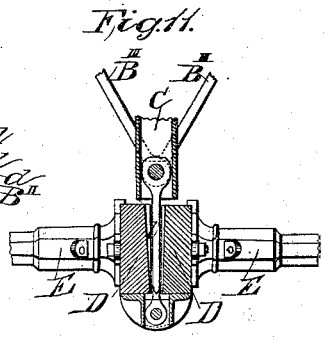


Fig. 9.

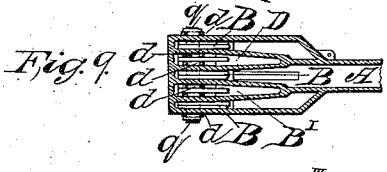


Fig. 10.

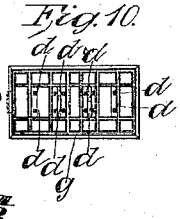


Fig. 12.

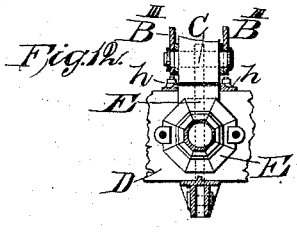
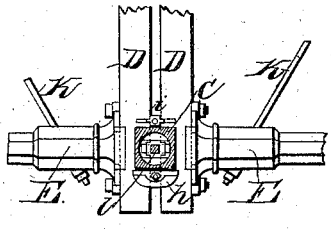


Fig. 13.



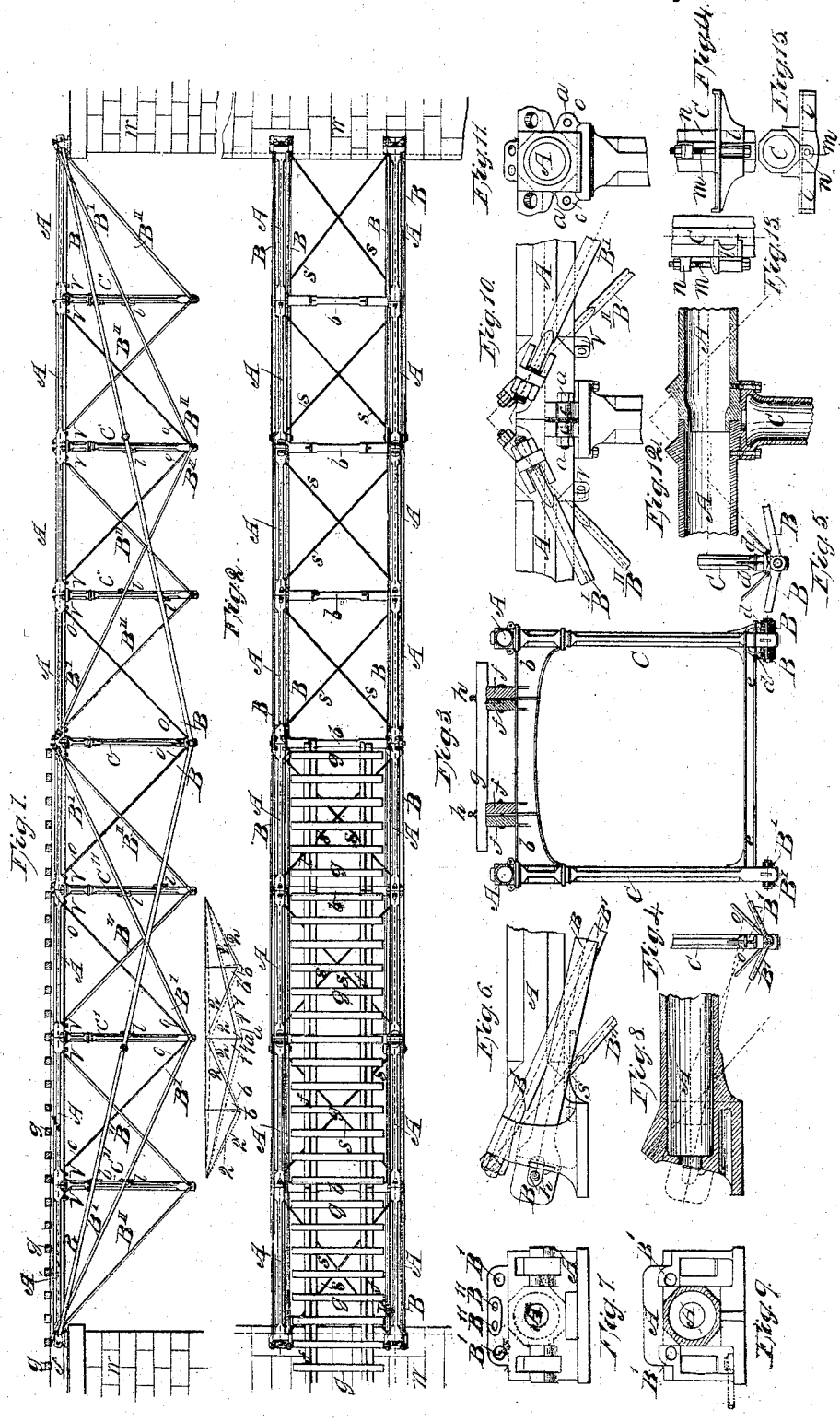
3 Sheets—Sheet 3.

A. FINK.

TRUSS BRIDGE.

No. 10,887. Patented May 9, 1854.

Plate 1.



UNITED STATES PATENT OFFICE.

ALBERT FINK, OF BALTIMORE, MARYLAND.

BRIDGE.

Specification of Letters Patent No. 10,887, dated May 9, 1854.

To all whom it may concern:

Be it known that I, ALBERT FINK, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Bridge-Trusses; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, forming part of this specification, in which—

Plate 1 shows the application of my improvement to bridges where the roadway is above the truss, Figure 1 representing a side elevation. Fig. 2 a plan. Fig. 3 a cross section and Figs. 4 to 15 details of different parts. Plate 2 shows the application of my improvement to bridges where the truss is above the roadway, Fig. 1 representing a diagram of the whole truss. Fig. 2 an elevation of a part of the truss. Fig. 3 a plan of the top of that part. Fig. 4 a plan of floor. Fig. 5 a front view. Fig. 6 a cross section and Figs. 7 to 13 details of the bridge.

In each plate similar letters of reference in the several figures denote the same part of the bridge.

The nature of my invention consists in combining different systems of triangular bracings in the manner hereafter to be described, so that a weight coming on one of the systems of the truss is not only carried over one or more other systems before it is carried back to the abutment, but the foot of the post of each triangle shall be capable of settling vertically or moving to the side, so that the tension rods of each system of the triangular bracings will be strained equally when the bridge settles under a superincumbent weight.

To enable others skilled in the art to use my invention I will proceed to describe the same, and its operation.

In Plate 1, A A represent stretchers of cast iron consisting of a number of hollow pipes connected as shown in the drawing; their heads or ends resting on the abutments W. The middle point of the stretcher A (see Fig. 1 Plate 1) I support by the suspension bars B B through the post C, the details of the connection between the stretcher A, post C, and suspension bars B B being set forth in the drawing, and not being essential to the understanding of the invention, will not require here any particular description. I then by suspension rods B′ B′ and posts C′ support two points intermediate between the central point and the abutments, forming the second triangular systems. Then by rods B″ B″ and posts C″ I support four points between the abutments, posts C′, and post C; forming the third triangular systems, and in this manner I multiply the systems according to the span of the bridge, supporting first the central point by suspension rods running to the abutments, then making this central point a point of support for two other systems, which intermediate points in their turn may become points of support for other systems.

Plate 2 shows my invention as applied to bridges with the truss above the roadway where B B is the first system of suspension rods, B′ B′ the second system, B″ B″ the third system, and so on, the several systems being distinctly shown by the various colored lines in Fig. 1 of that plate.

The operation of my improved truss is as follows: The pressure of a load at any point of the truss, is diffused over the entire truss and transmitted through one or more of the various systems of which the truss is composed before being carried to the abutments. For instance a pressure coming upon the bridge X′ Fig. 1 Plate 1, will be received by system 3 and a portion of that pressure transmitted by suspension rods B″ to system 2, and a portion from thence by rod B′ to system 1, whence by suspension rods B B, it is carried to the abutments; the weight having been diffused over the entire span. The operation will be the same no matter how many triangular systems may be used in the truss.

The sinking of a portion of the truss by a superincumbent weight, or by changes in the condition of the materials used in construction from effects of temperature, will not cause the several parts of the truss to deviate from their mutual adjustments, as will readily be seen by reference to diagram X Plate 1, where the point *a* of system 1 settles as indicated by the red letter *a;* the two triangles of system 2 will change their position as shown by the red lines 2 2, the points *b b* of systems 2 not only settling vertically but moving horizontally as indicated in the diagram. Now although the position of the triangles of system 2 has changed, there have been no changes in the triangles themselves, and therefore their bearing ca-

pacity is still the same as it was before the settling of the point *a*. What is here illustrated for two systems is equally true for trusses composed of any number of triangular systems combined on my plan. This advantage of permitting the tension rods of each system to be equally strained when the bridge settles, would not obtain were the foot of the post in the 2d system to rest upon the tension chord of the post of the first system as heretofore used; the freedom of movement allowed to the foot of the post of each system producing the beneficial result due to my invention.

The constructions set forth in the drawings are but two of the applications of my invention, and must not be considered as confining it in any respect, as any suitable material may be used in construction, and a great variety of forms given to the parts. The stretchers may be octagon, square, round or of any other form, and either of wood or cast iron. The posts may be of any desired form of cross section; and the suspension bars may be either wire cables, or wrought iron bars. Moreover upright trusses may be constructed as above described for inverted ones by the substitution of struts for suspension bars, ties for the stretchers, and suspension rods for the posts; the same laws governing the combination in this case as will obtain in the cases described.

The points supported need not necessarily be arranged and chosen as above set forth, the general rule being to support a point at or near the middle of the span by system 1, the first intermediate points by system 2, whether these points are in the middle, between the first supported point and the abutment or not, and further intermediate points by system 3, and so on.

I do not claim as new, the manner in which the central post is supported; nor do I claim the combination of a series of triangular bracings, in such a manner, that one system of triangles is supported by and dependent on the other, merely, as I am aware that this has been done before, both in trusses for bridges and roofs. But

What I do claim as of my own invention, and as different from any other method of bracing and strengthening bridge trusses heretofore known, is—

The method of combining the different systems of triangular bracings, above described, so that a weight coming on one of the systems of the truss, is not only transferred over one or more other systems, before it is carried back to the abutments; but the foot of the post in each triangle, being unconnected with the tension rods of the other triangular bracings, can settle vertically, as well as move to the side; so that the tension rods of each system of the triangular bracings will be strained equally, when the bridge settles under a superincumbent weight. This would not be the case, if the foot of the post in the 2d system of triangular bracings rested on the tension chord of the post, in the first system, as heretofore used; and herein consists my improvement, for which I ask Letters Patent.

ALBERT FINK.

Witnesses:
Jos. T. Atkinson,
R. Van Winkle.