(No Model.)

E. THACHER.

BRIDGE TRUSS.

No. 310,747. Patented Jan. 13, 1885.

Fig. 1.

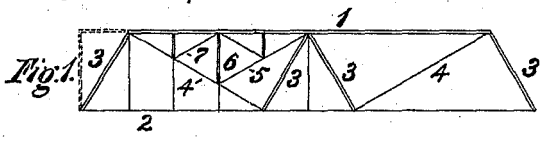


Fig. 2.

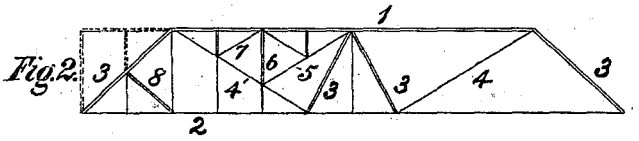


Fig. 3.

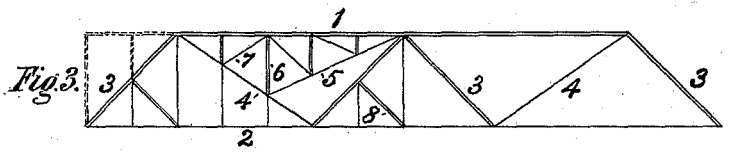


Fig. 4.

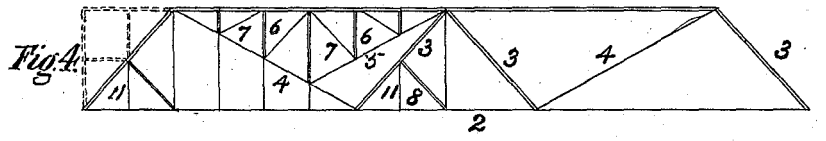


Fig. 5.

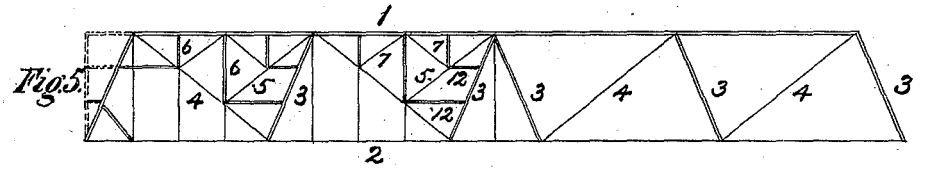


Fig. 6.

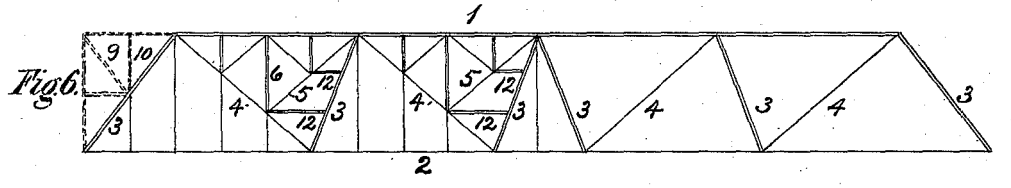


Fig. 7.

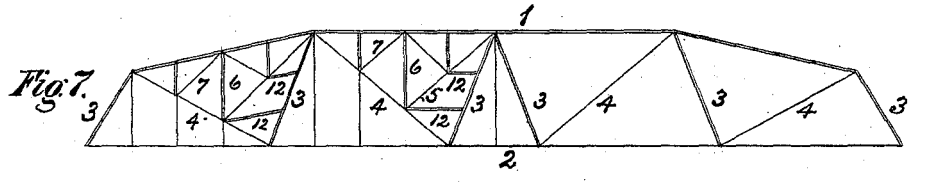
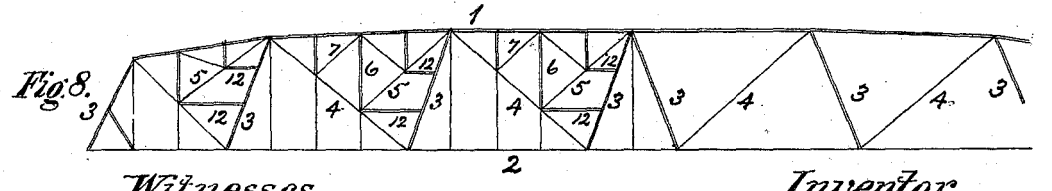


Fig. 8.



Witnesses.
J. Snowden Bell.
J. C. McClarke.

Inventor.
Edwin Thacher

UNITED STATES PATENT OFFICE.

EDWIN THACHER, OF PITTSBURG, PENNSYLVANIA.

BRIDGE-TRUSS.

SPECIFICATION forming part of Letters Patent No. 310,747, dated January 13, 1885.

Application filed August 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWIN THACHER, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Bridge-Trusses, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figures 1 to 8 are diagrammatic side views, in elevation, of bridge-trusses embodying my invention.

The objects of my invention are to provide a bridge-truss which shall be economical in material and inexpensive in workmanship, and which shall be exempt from temperature strains in its members, and from ambiguity in strains, and which shall not involve in its construction the use of counter ties or adjustments of any description.

To these ends my invention, generally stated, consists in the combination of a primary single-system triangular truss and secondary trussing forming a series of secondary triangles within those of the primary truss.

The improvements claimed are hereinafter fully set forth.

In the practice of my invention I provide a primary truss which is formed of a top chord, 1, a bottom chord, 2, and a web of inclined struts, 3, and ties 4, connected at their opposite ends to the top and bottom chords, respectively, and forming therewith a series of triangles which are free to change their figure under the influence of temperature changes. Each of the center ties, 4, extends over not less than three panel-lengths of the truss, and each of the struts 3 over not more than two panel-lengths. The secondary trussing, which, in connection with the primary truss, supports the loads at panel points intermediate between the apices of the triangles of the primary truss, and transmits the strain of the loads to said points, is of the following construction: Secondary ties 5 lead from the top chord, 1, at the apices of the triangles of the primary truss to the primary ties 4, which form the bases of said triangles at an intermediate point in the length of said ties, the secondary ties 5 forming, with the top chords, 1, and primary ties 4, triangles, which are subdivided by a secondary trussing of posts 6 and ties 7, connected at panel-lengths into a series of smaller or secondary triangles, each having, as shown, a length of one panel. For points subtended by the primary struts, a strut, 8, leading from the bottom chord, 2, or a tie, 9, leading from the top chord, 1, is connected with the primary strut at an intermediate point, from which the load above or below is supported directly by posts 10 or suspenders 11, as the case may be. The primary struts 3 may be supported by horizontal or inclined struts 12, leading from points in the secondary ties 5, as shown in Figs. 5 to 8, or by other means.

In the several figures the primary trusses only are shown on the right, and both the primary trusses and the secondary trussing are shown on the left. The top chords, 1, may either be straight, as in Figs. 1 to 6, inclusive, or broken, as in Figs. 7 and 8, and for deck-bridges the top chord may be extended as shown in dotted lines on the left of the figures.

Bridge-trusses constructed in accordance with my invention will be found to present the following advantages: They are free from the temperature-strains, which are exerted to a greater or less extent in counterbraced or quadrangular trusses, and which are due to the unequal size or exposure of the various members, or to a difference in the character of the materials employed.

My improved truss contains no confined quadrangles, and each triangle of which it is composed can freely change its figure under the action of temperature. Trusses composed of two or more complete systems of bracing of the ordinary construction are subject to ambiguity in strains—that is to say, the strains in the members are such as not to admit of exact calculation. This is particularly the case where the chords are curved or broken, and to some extent with straight chords.

In my improved truss the strain on each and every member can be accurately calculated. The weight at any intermediate panel point can be conveyed to the joints of the primary truss in a single route, and as the primary truss consists of a single system of triangular figures, the weight of every joint is borne to the masonry or supports by one

route only, and consequently no ambiguity in strains can exist. The absence of counter ties or adjustments reduces the expense of manufacture, and obviates the overstraining to which counter-ties are subjected by unskilled or careless workmen. My construction is likewise economical in material proportionate to its capacity for supporting loads, and involves no expensive workmanship in its construction.

I claim herein as my invention—

In a bridge-truss, the combination of a top chord, a bottom chord, and a web of struts and ties connected to said top and bottom chords, respectively, and forming therewith a series of triangles free to change figure under the action of temperature, the center ties extending over not less than three panel-lengths, and the struts over not more than two, and a secondary trussing connecting the top chord and the ties of the primary truss, substantially as set forth.

In testimony whereof I have hereunto set my hand.

EDWIN THACHER.

Witnesses:

J. SNOWDEN BELL,

DARWIN S. WOLCUTT.