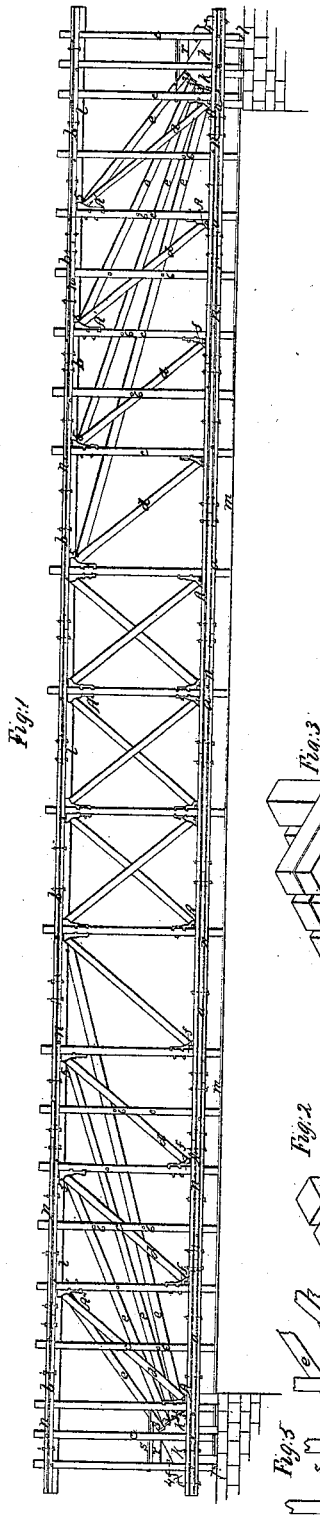
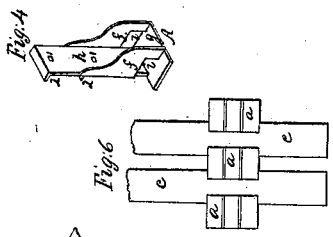
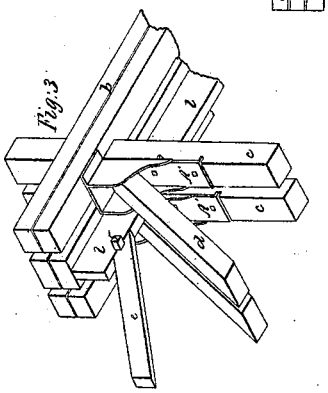
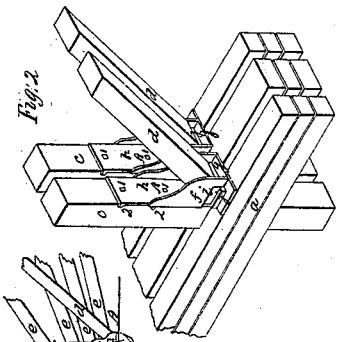
T. Hassard.
Truss Bridge.

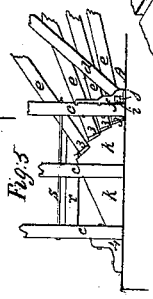
No. 4,359. Patented Jan. 15, 1846.











Witnesses
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James E. Gerrell

Inventor
Thos. Hassard

UNITED STATES PATENT OFFICE.

THOMAS HASSARD, OF NEW YORK, N. Y.

TRUSS-BRIDGE.

Specification of Letters Patent No. 4,359, dated January 15, 1846.

To all whom it may concern:

Be it known that I, THOMAS HASSARD, of the city, county, and State of New York, engineer and railroad-bridge builder, have invented certain new and useful Improvements in the Construction of Timber Bridges, Which are Particularly Applicable to Railroad Purposes, such improvements being designed to attain a ready means of compensating for any shrinkage in the parts connected with the inclined braces, which I effect by introducing wedges through a shoe at the foot of each brace, and, secondly, to increase the stability of the structure by the maner in which I combine the arch-pieces therewith, so as to give an equal strain on all parts of the bridge; and I do hereby declare that the said improvements and the mode of constructing and arranging the respective parts of the same are fully set forth and shown in the following description and in the drawing annexed to and making part of this specification, wherein—

Figure 1 is an elevation of the frame work of the bridge; Fig. 2 is a perspective view of the junction of the lower chord, posts and braces; Fig. 3 is a view of the junction of the upper chord, posts and braces, and arch piece; Fig. 4 is a perspective representation of the shoes that take the lower part of each brace. Fig. 5 represents the maner of sustaining the arch pieces and Fig. 6 is a sectional representation of the manner of combining the posts and string pieces with each other; the letters and numbers as marks of reference apply to the like parts in all the several figures.

The lower chord *a a a* consist of three separate strings of timber and each string constructed of three tiers of timber, scarfed together as shown in Figs. 1 and 2, each end of this chord and intermediate parts resting as usual on foundation abutments or piers. Between these three strings of timber (at intervals which must be determined by the length of the bridge or of each span) are introduced parts of square upright posts *c*, rather wider than the intervals between the timbers, with laps cut in each side so that the shoulders formed by each lap may stop under and above without sensibly weakening the chords *a a;* there are to be bolts *n n* passed through the chords by the side of each post *c;* these give the means for removing the posts if they become unfit for use, by simply loosing the bolts, and prying or wedging the chords apart. Near the top of these posts *c* is the upper chord *b* which is made in the same way with the lower chord *a* except that generally this part may have but two tiers of timber instead of three except when crossing intermediate piers; the upright posts *c* are fitted between each string of timber in the same manner as the chord *a*. At the foot of each post toward the center of each span, are placed cast iron shoes A, having sides *f*, a bottom *g* and a back *h;* these shoes are held horizontally by bolts 1, 1, which simply confine them in place, but to relieve the bolts from vertical or lateral strain, lugs or coaks 2, 2, are formed on the back *h* so as to be inserted a small distance into the posts *c c;* these shoes take the feet of the braces *d* which may either be made continuously by half laps where they cross an intermediate post, or where one brace crosses another or they may be made to fay into shoulders on the posts as half lengths, but in any case the feet step into the shoes A and the tops fit into the metal cups A′ beneath the upper chord.

At *i* Fig. 4, in each shoe is an opening in each side *f*, and the lower end of each brace *d* being cut with a shoulder and lip somewhat smaller than this opening a pair of counter-wedges *j* Fig. 2 are so driven into each shoe that acting at the foot of each brace the wedges force the whole of the parts into the closest possible contact; this construction affords the means of closing up any shrinkage of the parts and also of removing any separate part to repair the effects of decay or extraneous injury. Fig. 6 is a sectional view in the line *x x* of Fig. 2 of the manner in which the posts and the chord pieces are scarfed together.

With the mode of construction so far described I combine an abutting block *k*, which I place above the pier or abutment; it is shown in larger size in Fig. 5; this abutting block is aided by a backing block 4 behind it and between two of the posts *c;* these blocks may be of wood, but I prefer, and generally use metal; a ledger piece *r* and stay bolt *s* complete the connection of these parts; the abutting block *k* is shown as made with four, but it may have more or fewer steps, or backstep landings, each of which receives the lower end of one of the arch pieces or braces *e e* which extend in diagonals successively rising above each other until each terminates at its top in contact with

an intermediate string piece or ribbon *l* placed the widest way vertical and between each pair of posts immediately below and in contact with the upper chord timbers *b b*.

At the points of contact cross keys 5, 5, connect the arch pieces *e e* and the string piece *l* and prevent any movement horizontally; the arch pieces *e e* are each to be sustained vertically in place by timber fillings next below them and between each pair of posts *c c* which are kept in place by bolts 6 6 so that the arch pieces can slide between the posts if needful. At the foot of each arch piece there are counter wedges 3 3, between the foot and the abutting block *k*. By means of these any shrinkage or subsidence is easily counteracted and the whole of these parts may be easily repaired, shifted and replaced when needful.

This mode of constructing bridges will be seen to differ with others, first, by the combination of the shoes formed as herein described and the counter wedges with the posts, chords and braces, and by the employment of the arch pieces *e* in combination with the intermediate ribbon piece *l*, abutments *k* and wedges 3 and keys 5, thus giving an effective adjustment for shrinkage and settlements, and adding the properties of the arch supporting itself at both ends to the diagonal framing of the body.

In placing the upper chord timbers *b* over intermediate piers it is my practice not to confine myself to two ranges of timber, but to make them of three ranges of timber for about one third the length of the span from each intermediate pier, because I have found in practice that in such cases the upper chord gives way first at this point if equal all through, and it therefore requires more strength at this point than elsewhere.

Having thus fully described the manner in which I construct my bridges and arrange the respective parts thereof, what I claim therein as new and desire to secure by Letters Patent is—

1. The manner in which I combine the braces *d d* with the chord timbers *a* and *b* by means of the shoes A and the caps A′ attached to the posts *c;* the shoes admitting wedges for keying up the structure and the whole combination being such as is herein set forth.

2. I do not claim the use of cast iron shoes, such having been used to receive both the vertical posts and the braces and not being capable of effecting the purpose for which I employ them in combination with posts that pass through the upper and lower chords.

THOS. HASSARD.

Witnesses:
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