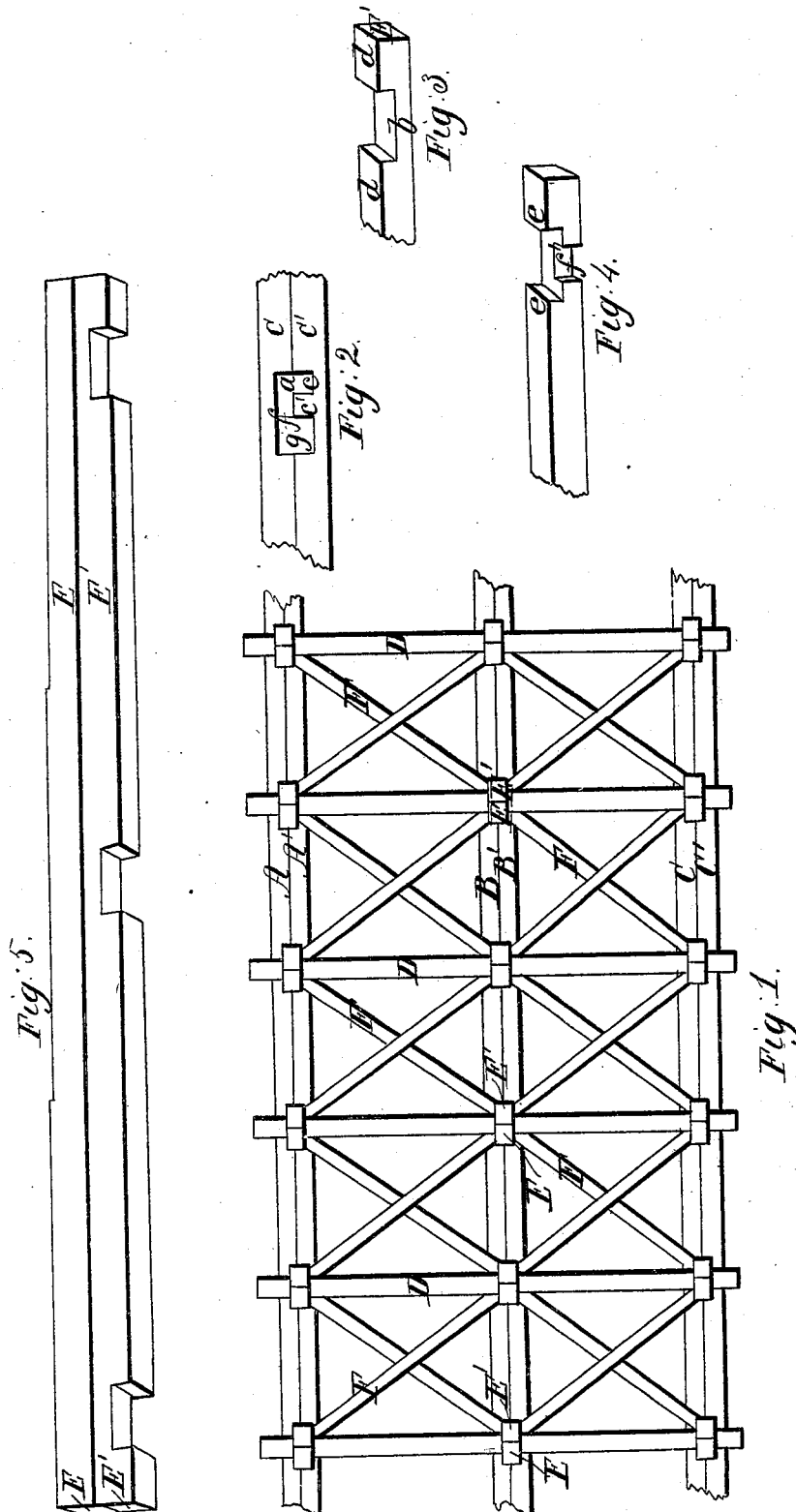


Price & Phillips.

Truss Bridge.

N^o 1,994.

Patented Feb. 23, 1841.



UNITED STATES PATENT OFFICE.

JEHU PRICE AND JAS. T. PHILLIPS, OF GOLDEN, MARYLAND.

MANNER OF FASTENING AND COMBINING THE TRUSS-FRAMES OF BRIDGES, &c.

Specification of Letters Patent No. 1,994, dated February 23, 1841.

To all whom it may concern:

Be it known that we, JEHU PRICE and JAMES T. PHILLIPS, residing near Golden post-office, in the State of Maryland, have made an Improvement in the Manner of Fastening and Combining the Truss-Frames of Bridges, and which manner of Fastening May be Applied to Truss-Frames for other Purposes; and we do hereby declare that the following is a full and exact description thereof.

The peculiarity in the manner of fastening our truss frames, and of combining them with each other, consists in the employing of the pieces of timber last inserted in putting together the truss frame in such a way as to cause them to operate as keys, and to bind the whole frame together without its being necessary to use pins, treenails, bolts, wedges, or other devices analogous thereto, excepting for fastening down the floor timbers, or such as may be employed in covering in. From the circumstance of these last inserted timbers keying the whole together in a manner similar to the binding together of the toy sometimes called a puzzle knot, we have denominated our bridge the "puzzle keyed bridge."

In the accompanying drawing, Figure 1, is a representation of a part of a truss frame put together in our improved manner.

A, A', are two upper string pieces, placed one above the other; B, B', two similar string pieces, which sustain the floor timbers; and C, C', two lower string pieces, placed, like the others, one above the other.

D, D, are vertical posts, which are also double, embracing the respective string pieces between them.

E, E', are the ends of the cross ties, embraced between the string pieces, and forming, also, the keys by which the trusses are bound together.

F, F, are cross braces, which do not differ from those ordinarily used in truss frames, and other structures which require to be braced. These, instead of being crossed braces, may be single braces in each panel, if preferred.

The respective timbers may be of any size adapting them to the length of the bridge and the load it is to sustain, all of which must be determined by the builder according to his judgment. The respective cross ties, or key pieces, however, at every point where said cross ties pass through, and are com-

bined with, the string pieces, are similarly united therewith.

In building our bridges, the lower halves of the lower string pieces are first laid down, being sustained upon proper scaffolding; the first pair of cross ties, E, are then laid in place in each of the spaces prepared in the string pieces to receive them; the upper half of the lower string piece is then laid on, the first cross tie being embraced between the two parts. We then proceed in the same manner with the second string pieces, supporting their lower halves at a proper height above the lower string pieces, laying in, as before, the first of each pair of cross ties, and then placing upon them the upper halves of these string pieces; if a third string piece is required, as shown in Fig. 1, the same routine is followed; but, in general, there will not be cross ties extending from side to side of the bridge at the upper string piece, but mere short pieces of timber jointed together in the same manner with the cross ties where they extend through the truss frames; but if the upper panels are made of sufficient height for the loads intended to pass over the bridge, the cross ties may be extended across, as at the middle and lower string pieces. The respective string pieces and first cross ties being in place, the pairs of upright posts are next inserted, and the whole bound together by means of the second string pieces. The manner of notching the string pieces so as to admit the cross ties, and of notching the pairs of upright posts so as to embrace the string pieces, and be themselves embraced by the first placed cross tie, in such way as that the insertion of the second cross tie shall effectually bind the whole structure together may be varied according to the fancy, or the judgment of the workman, while the general principle of construction will remain unchanged, and the same beneficial result attained.

In Fig. 2, we have shown one of the combined string pieces C, C', giving a front view of the notches which are to admit the cross ties; the first cross tie E' occupies the end *a*, and it is to be notched out as shown in Fig. 3, the edge *b*, is placed so as to occupy the recess *c*, in the string piece C', and so that the face *d*, *d*, of the cross tie may be in a range with the dotted line *f*; the piece *c'*, of the lower string pieces serves to retain the first cross tie in place. The whole length of the notch in Fig. 3, is equal to the width

of the double upright posts. The upright posts are to be notched out at each joining of them with the respective string pieces and the cross ties, in the manner shown in Fig. 4; the string pieces being embraced between the ends of the notch *e, e*; and the notch *f'*, in each of the posts coinciding with the opening *g*, which is to receive the second cross tie by which the whole is keyed together.

The second cross ties may be made somewhat wedge formed, as shown at E, Fig. 5, where a pair of cross ties are represented; the effect of this will be such that when inserted they shall strain up on the first string piece, and effectually truss the whole of the frame-work together.

This plan of building bridges may, of course, be applied to double, or to triple truss frames; and to those with two string pieces only to each truss. In the drawing we have shown the timbers as notched through on half their thickness, and as consisting of square scantling; but in these particulars the builder will be governed by his own judgment in each particular case. We

have exhibited our manner of combining the truss frames, as applied to a straight bridge, such as is well adapted to rail-roads, as well as to other bridges of a span which is not so great as to render an arch necessary; but we do not intend to limit ourselves in the application of our principle, to a straight truss frame, or frames, as the same may be applied where the truss frames are arched, or otherwise made to rise in the center.

What we claim as our invention, and desire to secure by Letters Patent, is—

The within described manner of fastening, and combining together, the truss frames of bridges, or of other structures, by the insertion of timbers which constitute key pieces, or cross ties, as herein fully set forth, so as to obviate the necessity of using pins, tree-nails, screw bolts, or other analogous devices.

JEHU PRICE.
JAMES T. PHILLIPS.

Witnesses:

THOS. P. JONES,
GEORGE P. WEST.