R. H. DAVIES.

TRUSS BRIDGE.

No. 190,562. Patented May 8, 1877.

Fig. 1

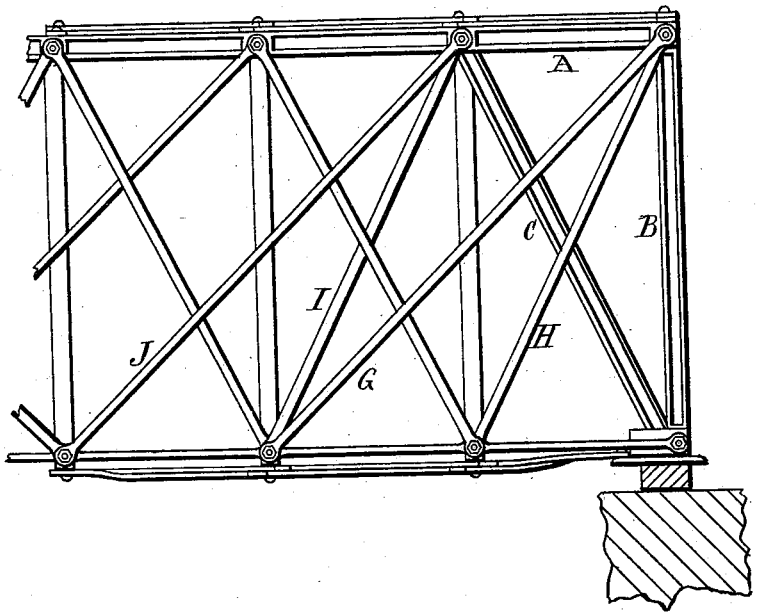
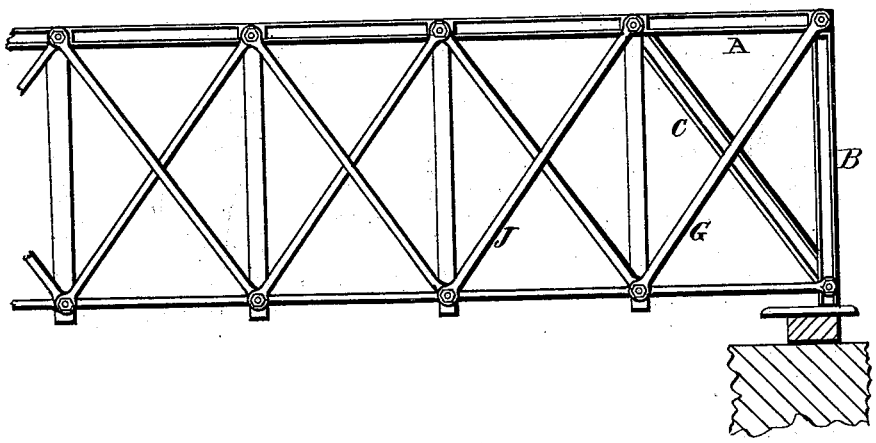


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT H. DAVIES, OF PHŒNIXVILLE, PENNSYLVANIA.

IMPROVEMENT IN TRUSS-BRIDGES.

Specification forming part of Letters Patent No. **190,562**, dated May 8, 1877; application filed March 27, 1877.

To all whom it may concern:

Be it known that I, ROBERT H. DAVIES, of Phœnixville, Pennsylvania, have invented a new and useful Improvement in Truss-Bridge of the kind known as "Whipple" or "Pratt," which improvement is fully set forth in the following specification and accompanying drawing, in which—

Figure 1 is an elevation of a double triangulated Whipple or Pratt truss-girder with my improvement. Fig. 2 is an elevation of a single triangulated Whipple or Pratt truss-girder with my improvement.

The object of my invention is to do away with one of the chief causes of accidents to truss-bridges, such as the Whipple, constructed with vertical intermediate posts and diagonal tie-rods. This cause lies in the fact that inasmuch as all the strains upon the different members accumulate in the end posts, the destruction of that post by being struck by a locomotive or car, or from any other cause, results inevitably in the wreck of the whole bridge.

All the strains, in like manner, accumulate in the end tie-rods, which are usually in pairs, one on each side of the truss. Sometimes they are single and placed central. When in pairs the breaking of both will cause the destruction of the entire truss, and inasmuch as each end tie-rod is usually proportioned so as to carry only one-half the accumulated strain, it is most likely that the breaking of only one of these end tie-rods would destroy the truss, for the reason that the breaking of one would throw so much additional strain upon the other that in all probability it would give way under the increased strain, and thus cause the entire bridge to fall.

It is this fact that causes the much greater number of failures of truss-bridges built on the Whipple system than of lattice-girders; for in the latter the accumulated strains are distributed among several members of the end panel, and consequently the entire panel must be destroyed before the bridge will fall. As a consequence of this defect in the principle of the Whipple truss-bridge many engineers are advocating the use of lattice-girders, notwithstanding the fact that they require much more material, and are in other respects inferior to truss-bridges, it being held that safety is the paramount consideration in a bridge.

By my invention the Whipple truss-bridge is made as safe as the lattice-girder.

Figure 1 shows the application of my invention to a double triangulated Whipple or Pratt truss-girder, by which it will be seen that I have introduced two end posts, B and C, and two sets of end tie-rods, G H and I J, either pair with the corresponding post, be it the vertical or the leaning one, will transmit the accumulated strains to the abutment.

The post B and the leaning post C are connected together by the extension A of the upper chord.

Fig. 2 shows the application of the invention to a single triangulated Whipple or Pratt truss-girder used for bridges of shorter span. B and C are the two end posts, one upright and the other leaning. There are also two end tie-rods, G and J, in pairs, either pair with the corresponding post will transmit the accumulated strains, and consequently the entire end panel must be swept away before the truss will fall.

In the case of a Whipple or Pratt truss of ordinary construction without my invention, and made with a leaning end post, there is only one end post, C, and one set of end tie-rods, I J. (See Fig. 1.)

If this said truss is made with a vertical end post instead of a leaning post, there is only one end post, B, and one set of end tie-rods, G H.

In both of these cases the destruction of any one of these end members would result in the destruction of the bridge; but by my invention, in which there is a combination of two end posts and two sets of end tie-rods, it is obvious that the bridge is made doubly secure at the end where it is most needed, and that with very little proportionate increase of material.

I claim—

In a truss-girder constructed with vertical intermediate posts and diagonal tie-rods, the combination of the extension A of the upper chord, the end posts B and C, and two sets of end tie-rods, when arranged as herein described.

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