(No Model.)

D. H. SWARTZ.

BRIDGE.

No. 346,873. Patented Aug. 3, 1886.

Fig. 2.

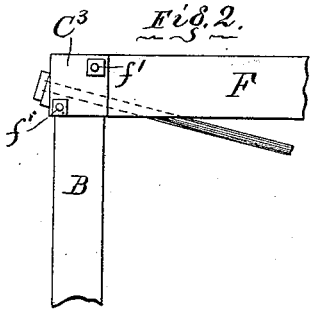


Fig. 3.

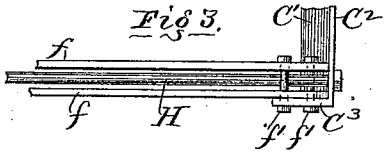


Fig. 4.

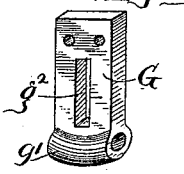
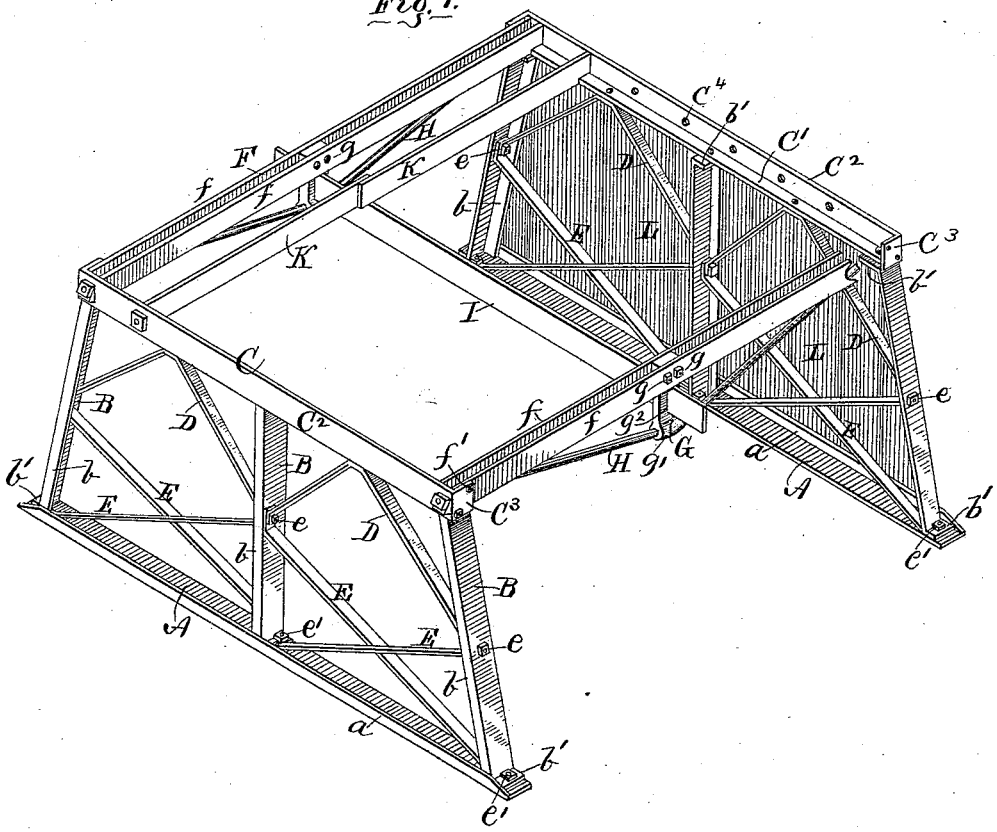


Fig. 1.



Witnesses:
E. R. Richards.
M. E. Brown.

Inventor:
Danl. H. Swartz.
By W. B. Richards,
Atty.

UNITED STATES PATENT OFFICE.

DANIEL H. SWARTZ, OF LONDON MILLS, ILLINOIS.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 346,873, dated August 3, 1886.

Application filed January 26, 1886. Serial No. 189,848. (No model.)

To all whom it may concern:

Be it known that I, DANIEL H. SWARTZ, a citizen of the United States, residing at London Mills, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Bridges, of which the following is a specification.

My invention relates to an improvement in bridges wherein trussed girders are supported upon trussed abutment-frames formed of angle-iron, and which are composed of separable parts that can be packed, shipped, and set up readily in a simple manner, to provide a safe, economical, and good bridge for moderate spans, and especially adapted for country-roads or small streams or ravines.

The improvement consists in trussed abutments of novel construction, in trussed girders secured to the abutments in a novel manner, and in a novel manner of supporting the flooring upon the trussed abutments and girders, as will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective of the frame-work of a bridge with a part of the flooring removed, and embodying my invention; Fig. 2, an elevation in detail, slightly enlarged, of the connection between one end of the girder and the abutment; Fig. 3, a plan of the parts shown in Fig. 2; Fig. 4, a perspective of the hanger-block which supports the ends of the floor-beam and tension-rod upon the girder in a novel manner.

Each of the trussed abutment-frames is formed of a base-plate, A, posts B, and cap-plate C, formed of angle-iron, and with quarter-struts D and tie-rods E, bolted, respectively, to the cap-plate and base-plate and to each of the posts in a novel manner.

The base-plate A rests upon a suitable foundation, with its upturned flange *a* upon the outside of the lower ends of the posts. The flange *b* of each of the posts B is cut away at the ends thereof, and the latter are turned or bent at right angles, or nearly so, to the body of the plate, to provide feet *b'*, for attaching the posts to the base-plate A and to a cap-plate, C. The cap-plate C is also formed of angle-iron, one of the sides, C', of which rests upon the upper ends of the posts B, and the other side, C^2, is held vertically, to provide an abutment for the ends of the girders and joists of the roadway and flooring. The quarter-struts D are each formed of a single piece of metal bent approximately at right angles, and bolted at its ends to the post B, and at its middle portion to the under side of the cap-plate C, midway between the middle and end posts. The struts and posts are each held together at their bases by tie-rods E, arranged to cross each other beneath the struts, and are secured at their upper ends to the ends of the struts and to the posts by bolts *e*, and are similarly secured at their lower ends by bolts *e'*, which pass through the ends of the tie-rods, through the feet *b'* of the posts, and through the base-plate A.

The horizontal portion C' of the cap-plate is cut away to leave a projecting end, C^3, upon the vertical portion C^2 of said plate, and the said projecting end C^3 is bent at right angles and transversely across the end of the cap-plate, to provide suitable means for securely bolting the end of the cap-plate to the girder, as shown.

The girder F is formed of parallel longitudinal bars *f f*, a hanger-block, G, secured at its upper end between the said bars by bolts *g g*, and provided with a segmental sheath, *g'*, at its lower end, through which a tension-rod, H, passes and extends upwardly to the ends of the bars *f f*. The ends of the bars *f f* rest upon the ends of the cap-plate C, and are secured thereto by bolts *f' f'*, which pass through the bent end C^3 of said cap-plate and through the ends of the bars *f f*. The end of the tension-rod H passes up between the bolts *f' f'* and through the vertical portion C^2 of the cap-plate, and securely holds the end of the cap-plate to the end of the girder.

The hanger-block G is formed with a vertical slot, g^2, located between the girder-bars *f f*, and the tension-rod H, and the end of a beam or bar, I, is passed through the slot g^2, and is securely supported thereby in a simple manner.

The outer ends of the joists or floor-strips K respectively rest upon and abut against the sides C' and C^2 of the cap-plate, and the inner ends of said strips K rest upon the beam I, and may be secured by spikes driven through holes C^4 in the vertical side C^2 of the cap-plate. The flooring rests upon and is nailed to the

joists in the usual manner, and side rails may be secured to the flooring in any well-known or preferred manner.

The abutment-frames are sheathed with either metal or wooden strips L, which serve to stiffen them, and also to form a bulk-head against which earth and stone may be packed at the excavated terminus of the road-bed.

The abutment-frames and girders may be compactly stored for shipment, and may be easily and quickly bolted together to form the frame-work of a bridge by an ordinary unskilled person.

I claim as my invention and desire to secure by Letters Patent—

1. A trussed frame for bridges, formed of the base-plate A, cap-plate C, and posts B, all formed of angle-iron, in combination with the converging quarter-struts D, secured between the posts, and the tie-rods arranged to cross each other at the base of the quarter-struts, substantially as described.

2. The abutment-frame formed of a base-plate, A, cap-plate C, posts B, struts D, and tie-rods E, all formed of angle-iron, and sheathing L, combined with and arranged to support the girders of a bridge, substantially as described.

3. The combination, with the trussed frame composed of bar-iron tie-rods, base-plate, posts, and cap-plate, all formed of angle-iron, said cap-plate supported upon the posts, of a trussed girder, F, composed of parallel plates resting upon and a tension-rod, H, secured to the cap-plate, substantially as and for the purpose described.

4. The combination, with the trussed frame composed of a base-plate, posts, tie-rods, and an angle-iron cap-plate supported upon the posts and provided with ends C^3, bent transversely to its base, of a trussed girder secured at its ends to the three contiguous sides of the cap-plate, substantially as described.

5. The trussed abutment-frame provided with an angle-iron cap-plate, C, the ends C^3 of the vertical side of which are bent transversely to the base, in combination with a trussed girder, F, formed of parallel plates $f\,f$, secured to the ends C^3 by bolts $f'\,f'$, and the tension-rod H, arranged to pass between said bolts and secured to the vertical side of the cap-plate C, substantially as and for the purpose described.

6. The combination, in a floor for bridges and similar structures, of the trussed girder F, provided with a slotted hanger-block, G, and a beam, I, passed through and supported in the slot of said hanger-block, and flooring supported upon said beam, substantially as and for the purpose described.

7. The combination, with the trussed abutment-frame provided with an angle-iron cap-plate, of trussed girders F, provided with slotted hanger-blocks G and supported at their ends upon the angle-iron cap-plate, a transverse beam, I, supported at its ends in the hanger-blocks, and the flooring-joists K, supported upon the beam and cap-plate, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL H. SWARTZ.

Witnesses:
WM. A. RYAN,
B. F. HOLCOMB.