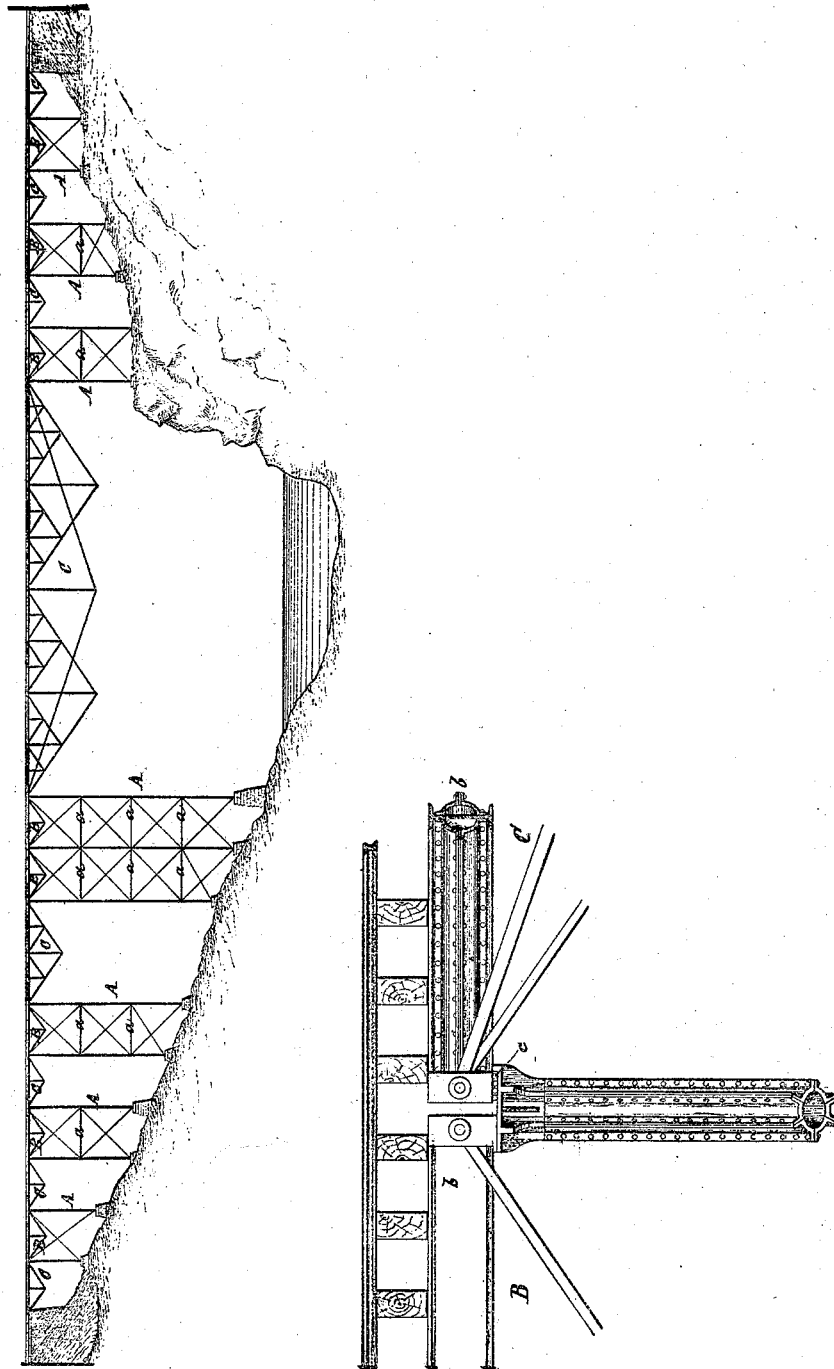


*C. S. Smith,*  
*Truss Bridge.*  
*No. 111,010. Patented Jan. 17. 1871.*



*C. S. Smith*  
*by atty. A. W. Cook*

*Witnesses:* *Wm. Bailey*  
*J. Buckley*

# UNITED STATES PATENT OFFICE.

C. SHALER SMITH, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE  
BALTIMORE BRIDGE COMPANY, OF SAME PLACE.

## IMPROVEMENT IN IRON VIADUCTS.

Specification forming part of Letters Patent No. **111,010**, dated January 17, 1871.

*To whom it may concern:*

Be it known that I, C. SHALER SMITH, of the city and county of Baltimore, and State of Maryland, have invented certain new and useful Improvements in Bridges, of which the following is a specification:

My invention relates to trestle bridges or viaducts, and its object is to make such structures entirely of iron.

In Letters Patent No. 97,975, granted to Smith, Latrobe & Smith on the 14th December, 1869, is described a bridge composed of continuous trestle; and in order to avoid the injurious effects consequent upon the expansion or contraction of metal-top members and the system of longitudinal struts, both the chord-sticks and the struts are made of wood.

It is my desire to avoid the use of wood and to make the bridge or viaduct all iron; and to this end I make the trestle entirely of iron, and provide for expansion and contraction by leaving out the longitudinal braces and struts in certain panels of the structure, and by making the truss spanning these panels with an expansion-joint—that is to say, the truss has one or both of its ends loose, so as to permit of expansion or contraction of any one part of the bridge without deranging the rest of the trestle.

The bridge is thus made up of fixed piers composed of any number of panels of trestle alternating with spans of truss, having one or both ends loose, so as to permit of contraction or expansion. By this means I can make all parts of the structure of iron, rendering it unnecessary to use wood, and producing a strong and very durable viaduct.

The manner in which my invention is or may be carried into effect will be understood by reference to the accompanying drawing, in which—

Figure 1 is an elevation of a bridge made in accordance with my invention. Fig. 2 is a like view, on an enlarged scale, of the joint between the fast and loose spans.

The general arrangement of the bridge requires but little explanation.

The trestling is shown at A, the fixed spans or top members at B, and the loose spans at C.

The system of bracing represented in the drawing is that employed in the bridge de-

scribed in the said Letters Patent, and *a a* are the longitudinal struts, which, in the continuous trestle heretofore employed, have been made of wood.

It will be observed, however, that in the present structure the trestle is not continuous; but the braces and struts have been removed at intervals from some of the panels or bents, leaving a series of piers composed of one or more panels of trestle and connected by spans of truss of greater or lesser length, according to the distance intervening between the piers.

The chords *b b* are made also of metal, both in the fast and the loose spans, as shown more plainly in Fig. 2.

The spans or other superstructure B are fixed to the trestle. The spans C, composed of any suitable system of truss, rest at their ends upon the piers, forming a continuation of the fixed spans, and have either one or both of their ends loose, so that it or they may slide upon the pier or piers, thus allowing for contraction or expansion without deranging the system.

The expansion-joint between the piers and the loose spans may be of any suitable construction.

In the drawing the end of the chord is represented as resting on rollers *c* on the top of the cap of one of the columns making part of the pier.

The expansion panels and spans may be at regular or irregular intervals, alternating with one or more panels of fixed trestle.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

An all-iron trestle formed of fixed piers composed of any number of panels of trestle, as described, alternating with spans of truss, each having one or both ends loose to permit of expansion and contraction, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

C. SHALER SMITH.

Witnesses:

JOS. H. ALEXANDER,  
HENRY B. DENKER.