

EDWARD W. SERRELL.

Improvement in Iron Viaducts.

No. 123,297.

Patented Jan. 30, 1872.

Fig. 1.

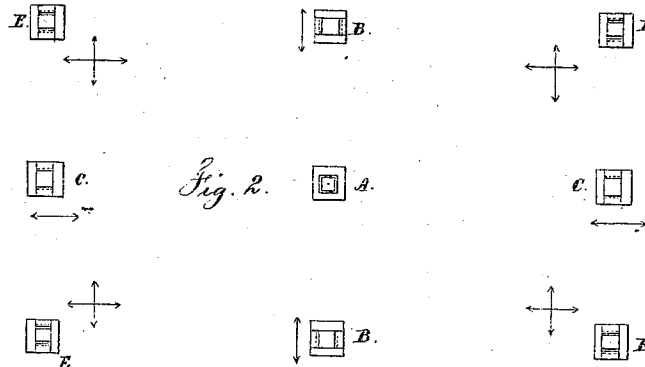
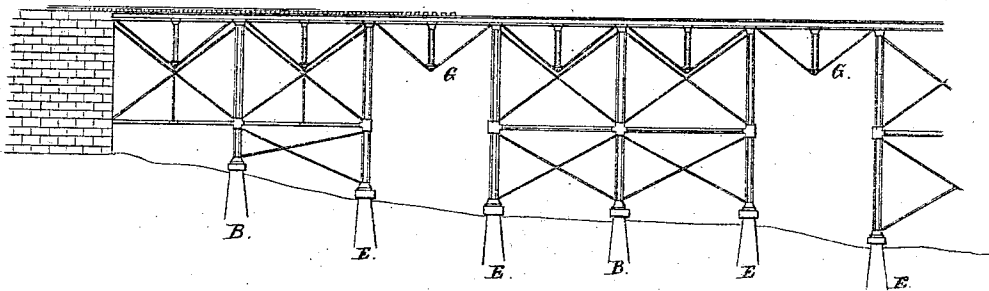


Fig. 2.

Fig. 3.

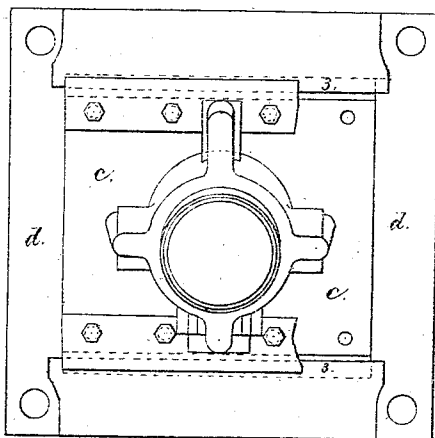
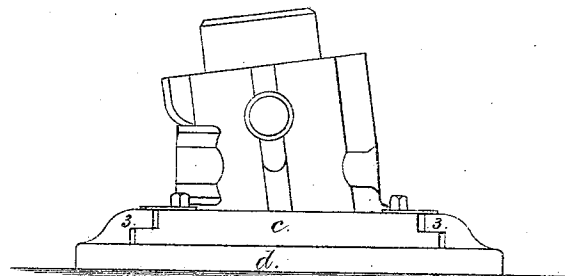


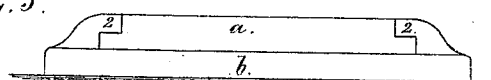
Fig. 4.



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Fig. 5.

Witnesses,
Chas. H. Smith
Harold Serrell



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3 Sheets--Sheet 2.

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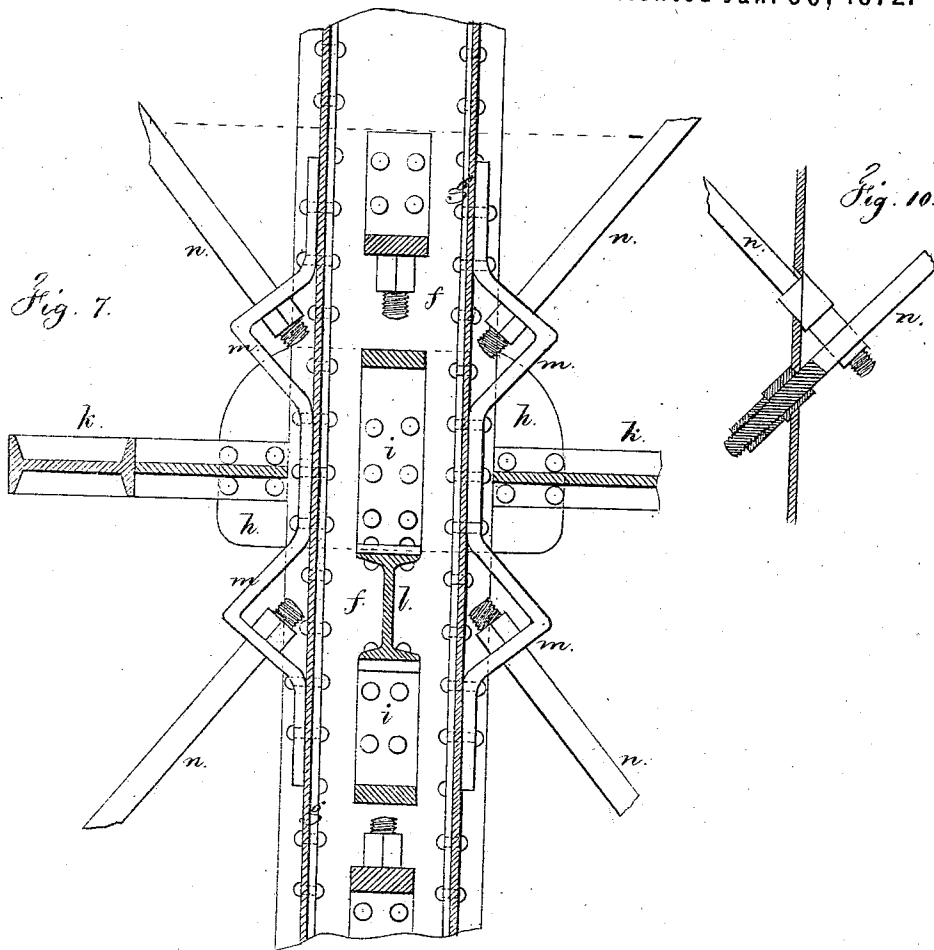
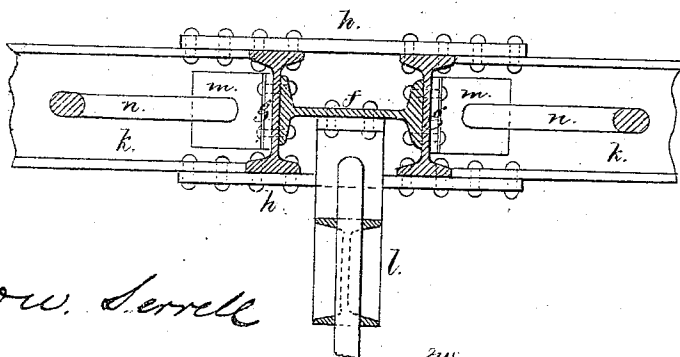


Fig. 6.



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Witnesses,

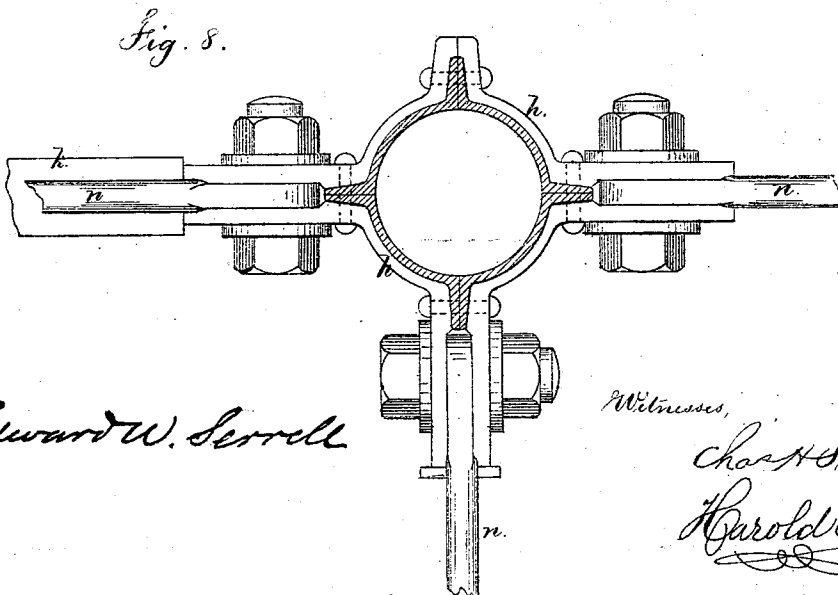
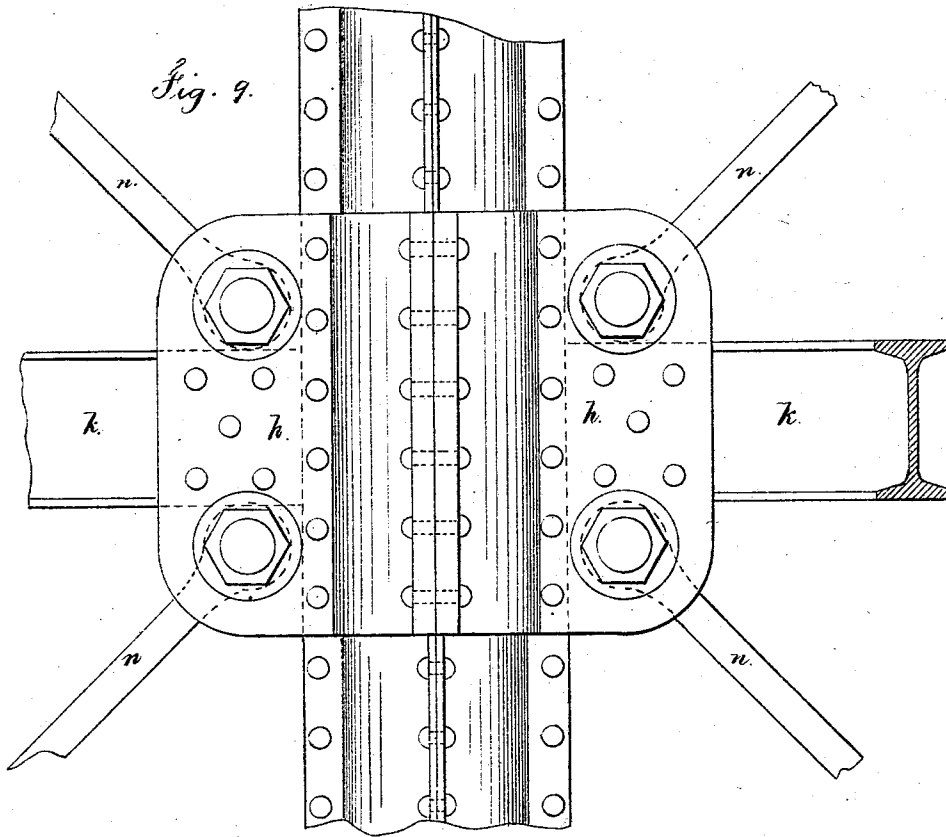
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Harold Serrell

UNITED STATES PATENT OFFICE.

EDWARD W. SERRELL, OF NEW YORK, N. Y.

IMPROVEMENT IN IRON VIADUCTS.

Specification forming part of Letters Patent No. 123,297, dated January 30, 1872.

To all whom it may concern:

Be it known that I, EDWARD W. SERRELL, of the city and State of New York, have invented an Improvement in Iron Viaducts; and the following is declared to be a correct description thereof.

Iron viaducts are liable to become twisted in consequence of the expansion and contraction due to different temperatures. The object of this invention is to allow for expansion and contraction in the various parts of the structure and in the structure as a whole, so that there will not be deflection from the proper line, nor undue strain on any of the parts: The viaduct, instead of being in a continuous structure, is formed of separate sections or towers, and each tower has an axial attachment permanently connected to the foundation, and around which the parts are free to expand and contract. The various towers support the road-way that is laid upon them, and hence the only change from expansion or contraction upon the road-way is a very slight vertical elevation or depression.

In the drawing, Figure 1 is an elevation of a portion of a viaduct constructed with my improvement. Fig. 2 is a plan of the foundations for the columns, illustrating the direction of movement from expansion or contraction. Fig. 3 is a plan in larger size of the base of the corner columns. Fig. 4 is a side view of the same. Fig. 5 is an elevation of the foot-plate for the middle column. Fig. 6 is a sectional plan, and Fig. 7 a vertical section of the connections between the parts of the column and braces; and Figs. 8 and 9 show modifications in the form of the columns and connections.

The center column A of each tower forms a stationary axis that is connected firmly to the foundation. The columns B B C C are moved by the expansion and contraction, either longitudinally or transversely, of the structure, while the columns E E at the angles move either diagonally or in the directions of the cross-arrows. The foot-plate *a* of each column B or C is set in or upon a shoe, *b*, that forms a slide to allow motion only in the direction of the column A toward or from the same; and the slide has lips 2 2 that prevent the parts separating and retain the bases of the columns B and C in the correct position longitudinally

and transversely of the structure. The foot-plates *c* of the columns E are upon the shoes *d*, (see Figs. 3 and 4,) and beneath the edges or flanges 3 3, to hold the foot down in place, but a clear space is left around the parts sufficient for the motion in any direction that may result from extremes of heat and cold. By this construction the tower is always kept properly in place, and the parts can expand freely without injury to the foundation; and I remark that these foot-plates and shoes, constructed as aforesaid, may be used with any desired character of column and metal braces; but I prefer those shown as being very strong and light. In Figs. 6 and 7 the column is shown as made of a series of H-bars of wrought-iron, the bar *f* being attached between the bars *g* and firmly riveted or bolted. The various lengths of bars are connected by the joint-plates *h*, which also receive the ends of the horizontal beams *k*, and the transverse beams *l* are attached to the vertical parts *f* of the columns by angle-irons *i*. The knees *m* are attached to the column and receive the diagonal tie-bolts *n*; and I remark that by this construction the successive sections of the tower can be put together and held firmly in place until the whole structure is erected, and then, by tightening up the nuts of the diagonal braces, all the parts can be brought correctly into line and each take its proper strain, and then the remainder of the rivets or bolts can be inserted and, the parts being entirely open, allow for the work being performed with ease, and also for painting the entire surface of the structure on nearly all the sides of all the parts. The diagonal tie-bolts may be secured by eyes at one end and pass diagonally through the H-bars and receive a triangular thimble and nut, as seen in Fig. 10. The joint-plates *h*, in Figs. 8 and 9, are similar to those in Figs. 6 and 7, only they are adapted to receive semicircular bars with ribs, which when set together form a hollow column. The diagonal tie-bars and the horizontal beams are connected at their ends by these joint-plates, and the expansion and contraction are allowed for at the feet of the columns, as before. These hollow columns may be filled with gravel and tar, mixed with ashes or other material that will harden and become entirely water-proof.

The material used, however, must itself be a preservative of iron. The superstructure is in the form of bridges, G G, extending from one tower to the next, and the road-way is to be made by cross-bearers and rails, or in any other convenient manner, according to the object for which the structure is built.

I claim as my invention—

1. A metallic tower made of columns around a central column that is permanently attached to the foundation, and the surrounding columns are provided with foot-plates in shoes that are attached to the foundation, and constructed as

set forth, to allow for expansion and contraction, but to hold the parts properly in position.

2. The joint-plates *h*, applied at the ends of the bars forming the columns, to connect the same and receive the beams and tie-rods, substantially as set forth.

Signed by me this 28th day of July, A. D. 1871.

EDWARD W. SERRELL.

Witnesses:

HENRY MEHLES,
E. R. WISWELL.