J. JOHNSON.

TUBULAR-GIRDERS AND BEAMS.

No. 192,170. Patented June 19, 1877.

Fig. 2.

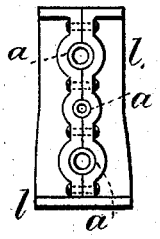


Fig. 3.

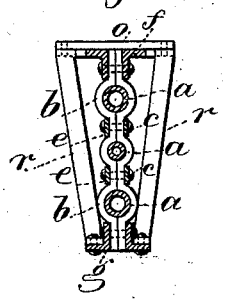
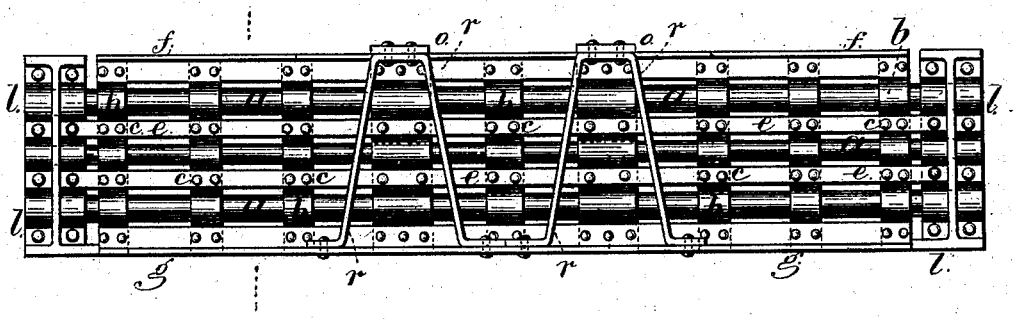


Fig. 1.



Witnesses

Chas. F. Smith

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Inventor.

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per Samuel W. Serrell

Atty

UNITED STATES PATENT OFFICE.

JOB JOHNSON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN TUBULAR GIRDERS AND BEAMS.

Specification forming part of Letters Patent No. **192,170**, dated June 19, 1877; application filed May 23, 1877.

To all whom it may concern:

Be it known that I, JOB JOHNSON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Metallic Tubular Girders or Beams, of which the following is a specification:

This invention is an improvement upon the beam or girder shown in Letters Patent No. 184,968, granted to me.

I employ longitudinal tubes placed one above the other, and connected by vertical truss-plates that are recessed to fit the sides of the tubes, and there are longitudinal tie-bars at each side of the truss-plates that serve to connect said truss-plates and retain them in position upon the tubes, and these truss-plates are connected at the top or bottom, or both, by angle-iron bars running longitudinally and forming top and bottom chords to the beam or girder, and at the ends of the girder there are bearing-blocks that connect the tubes, and these feet of the girder are suspended from a cable, as in a bridge, or rest upon columns or piers.

In the drawing, Figure 1 is a side elevation of the girder. Fig. 2 is an end view; and Fig. 3 is a cross-section at the line *x x*.

The tubes *a a* are of steel or iron, and at their sides are the truss-plates *b b* that are recessed to correspond in shape to the tubes *a* of the truss, and these plates *b* come together between the tubes *a a*, so as to be riveted or bolted together firmly. The same rivets or bolts at *c* are employed to connect the longitudinal tie-bars *e e* that are of iron or steel, and run like webs along at each side of the truss-plates *b* to connect them together longitudinally, and prevent either of such plates *b* moving longitudinally of the tubes *a*.

The truss-plates *b b* are still further connected by the angle-iron bars *f f* above, and *g g* below, the tubes, said bars *f* forming a top chord, and the bars *g* a bottom chord, to the girder. The vertical portions of the angle-iron bars are riveted or bolted to the truss-plates at or near their ends.

The bearing-blocks *l* are adapted to receive the ends of the tubes *a*, and of the longitudinal bars *e*, the parts being firmly connected by rivets or bolts, and the top or bottom parts of the end bearing-blocks are made with flanges to form feet that rest upon the supporting columns, piers, or beams, and it is preferable to bolt the parts in place.

The central part of the top chord is under the greatest pressure. I therefore prefer to make the angle-iron bars *f* the widest or heaviest in the center, and upon these angle-iron bars the plates *o o* rest to receive the ends of transverse beams or girders in cases where the beam or girder shown receives beams or girders for an elevated railway. These plates *o o* are braced by the diagonal bars *r* that connect them to the bottom chord *g*, which serve to distribute the load upon the girder.

I claim as my invention—

1. The combination, with the tubes *a* and truss-plates *b*, of the angle-iron bars *f* and *g*, forming the top and bottom chords of the truss or girder, substantially as set forth.

2. The combination, with the chords *f* and *g*, tubes *a*, and truss-plates *b*, of the braces *r* and plates *o o*, as and for the purposes set forth.

Signed by me this 18th day of May, A. D. 1877.

JOB JOHNSON.

Witnesses:

GEO. T. PINCKNEY,

HAROLD SERRELL.