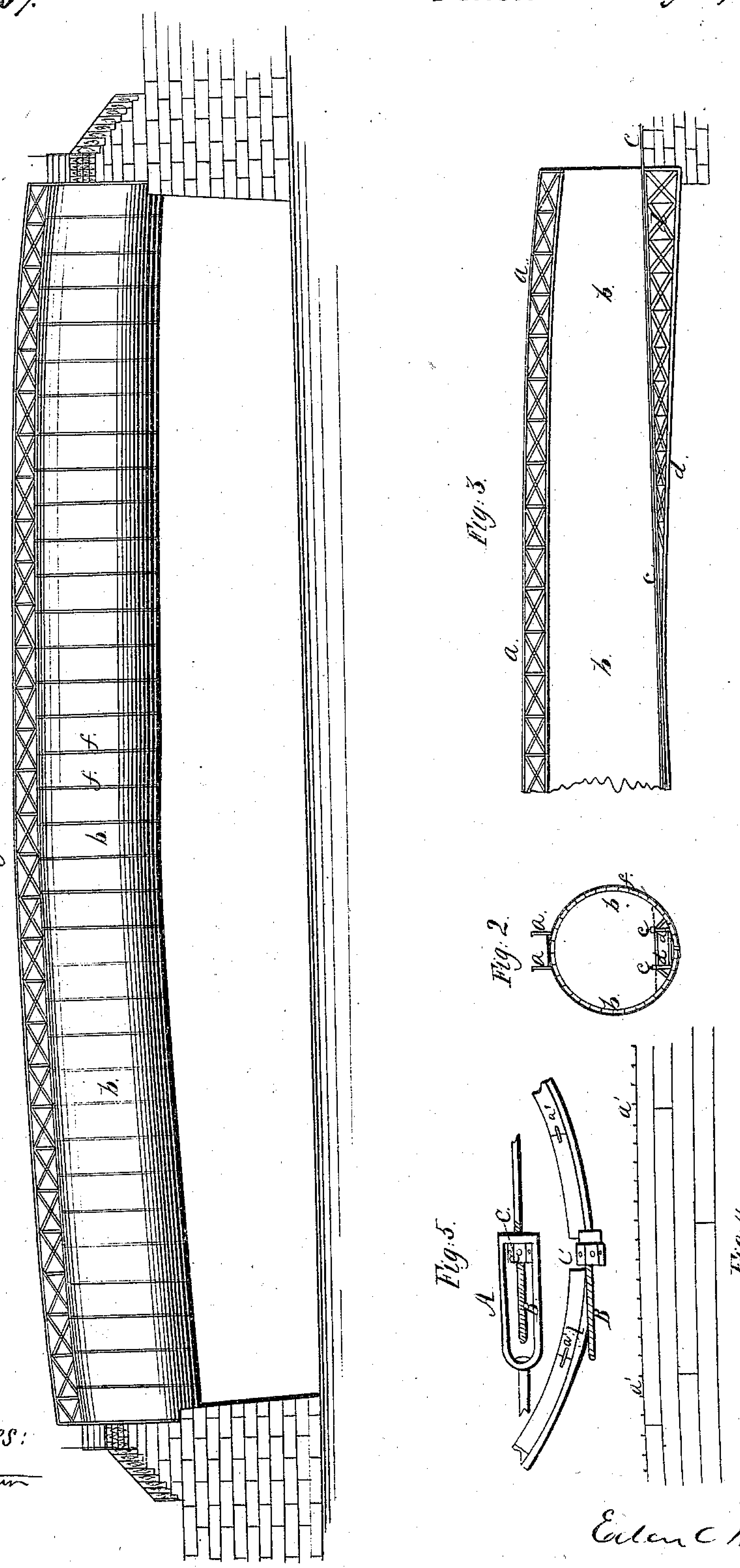
E. A. Baldwin.

Truss Bridge.

No. 11,467. Patented Aug. 8, 1854.



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EDEN A. BALDWIN, OF ELMIRA, NEW YORK.

TUBULAR BRIDGE.

Specification of Letters Patent No. 11,467, dated August 8, 1854.

To all whom it may concern:

Be it known that I, EDEN A. BALDWIN, of Elmira, in the county of Chemung and State of New York, have invented a new and Improved Mode of Constructing Tubular Bridges for Railroads and other Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal elevation, Fig. 2 a transverse section, and Fig. 3 a longitudinal section.

The principle of my invention consists in constructing a tube of sufficient diameter for the passage of a railway train, using planks or other suitable timbers, placed longitudinally and doweled together, and the whole firmly bound with strong iron rods or hoops. For this purpose I propose to use oak plank two or three inches thick as the size or strength of the bridge may require and of uniform width. The hoops or bands to be made of $1\frac{1}{4}$ or $1\frac{1}{2}$ inch iron rods, which are first made of the necessary form and size and set up on trestle work at the distance of five feet apart. The planks are then laid in them, beginning at the bottom and proceeding on each side until they meet at the top and lengthwise at the same time, taking care that the ends shall break joints, something in the manner of mason work, as shown at Fig. 4. The joints are all formed on an exact radial angle, on the principle of an arch, and as an additional security against their becoming displaced by any strain. Each plank is doweled to the next one with strong wooden pins *a′*, *a′*, one foot apart. When a portion of the tube is complete, the bands are tightened, so as to render it secure, by an arrangement shown at Fig. 5. A is a swivel upon one end of the band. B is the opposite end passing through the swivel, and the screw-nut, C, which is round or octagon, and projects partly through the lowermost plank of the bridge in a mortise made for that purpose, through which a lever can be inserted in holes in the nut and by turning it thus, from the inside, draw up the bands to the utmost degree of tension required.

It may be found advantageous to use a framework in the interior, or ribs like those seen in the model, to facilitate the building, but if used they should be removed when the structure is complete. As they form no addition to the strength of the bridge and would prove a serious disadvantage by increasing the weight of material without filling any useful purpose, the ribs are used in the model solely because the proper proportion of construction required slats so extremely thin, that a slight shrinkage might displace one, and thereby weaken the whole structure. This liability, if it exists in one of large construction, is provided for by doweling each plank or strip of wood to the next as shown at *a′ a′*, Fig. 4.

Fig. 1 shows the general external appearance of a bridge of this construction twenty feet in diameter spanning a distance of two hundred feet. A railroad track runs through the interior, and a walk for footmen over the top. It is built slightly arching, to compensate for any deflection which might take place from the shrinkage of the timber or its contraction under the weight to which it is subjected.

Fig. 2 is a transverse and Fig. 3 a longitudinal section. The same letters refer to like parts. *a a* is the walk, *b b* the planks or timbers forming the tube, *c c* the railroad track, *d d* the framework for its support within the bridge. This is so braced that the weight of a passing train bears only on the part directly within the bands, so that the strain does not come upon any given point of the woodwork but is equalized generally, and the direct weight upon the bands *f* serves to bind the whole more firmly together. The railway track may be laid over the top, without diminishing its strength, in situations where it is more expedient to build it below the level of the road.

The advantages of my plan consist in the simplicity and economy of construction, the thorough equalization of the strain on all parts; it resists lateral vibration as well as vertical, thus adapting it peculiarly to situations exposed to strong wind and dispensing with piers, as its capacity for spanning long distances is limited only by the power of the material to resist the crushing force of its own weight and that which it is intended to sustain.

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

Constructing a pridge by the combination of the longitudinal strips of wood, the transverse iron bands and the arrangement for tightening the same from the inside by a screw and swivel, with the trestle or framework for supporting a railroad track and receiving the strain directly on the bands, whether the track be placed within the bridge or upon its top; the whole arranged and combined substantially as herein described, and forming a cylindrical or tubular bridge of great strength, durability and simplicity of construction.

EDEN A. BALDWIN.

Witnesses:

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