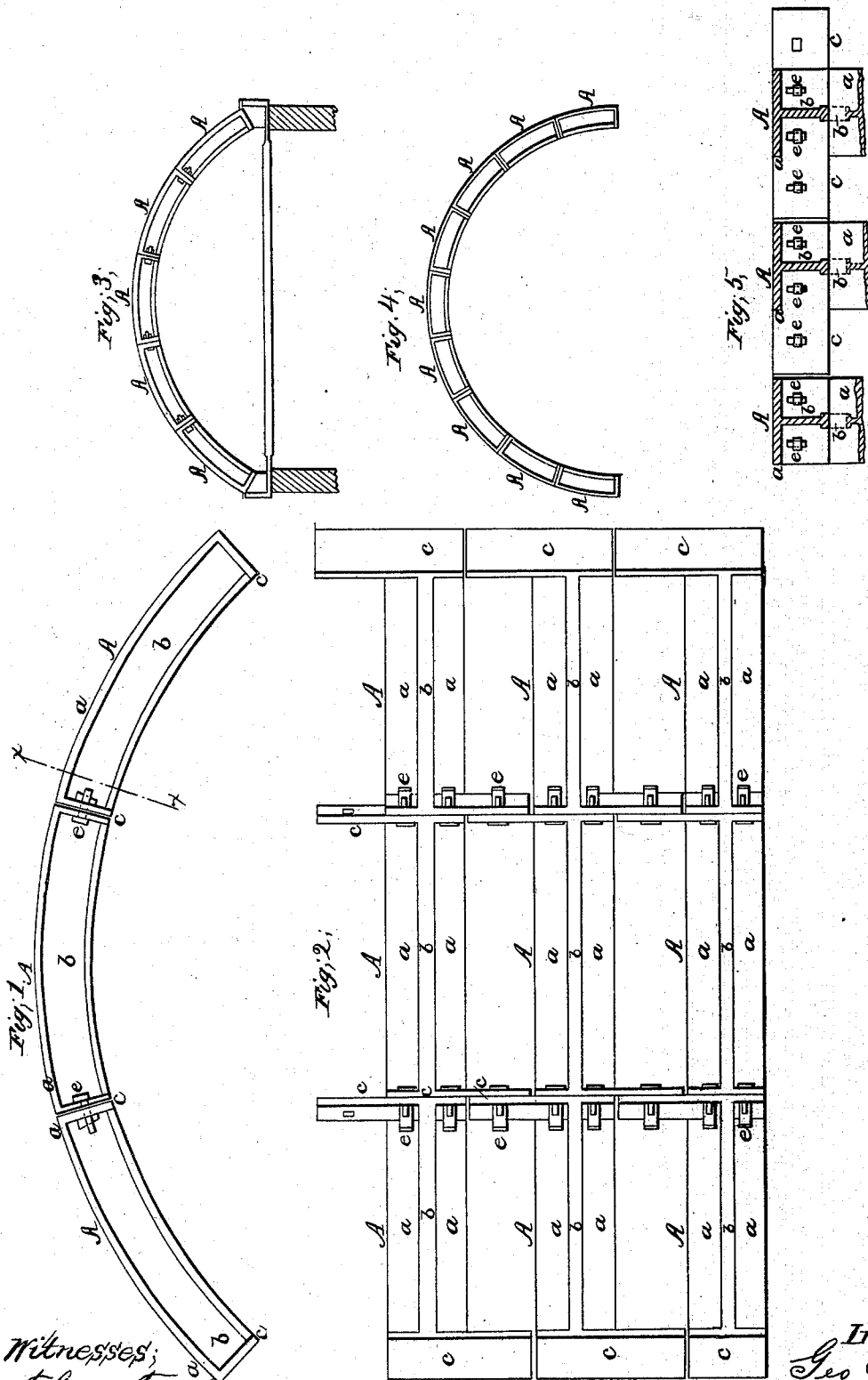


G. T. Lape. Truss Bridge.

N^o 60,199.

Patented Dec. 4, 1866.



Witnesses;
Thos. Fusch
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IMPROVED CAST-IRON ARCHES FOR BRIDGES, VAULTS, &c.

GEORGE T. LAPE, OF SUMMIT, NEW YORK.

Letters Patent No. 60,199, dated December 4, 1866.

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE T. LAPE, of Summit, in the county of Schoharie, and State of New York, have invented a new and useful improvement in Cast-Iron Arches and Vaults for Bridges, Tunnels, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end view of a segment of an arch formed according to my improved mode of construction.

Figure 2 is the under side view of the same.

Figure 3 is an end view of an arch formed according to my improved mode of construction, applied to a bridge, roof-trusses, or other purposes.

Figure 4 is an end view of a vault as applied to a railroad tunnel.

Figure 5 is a transverse section of the segment of an arch of my improved construction, taken in the plane of the line $x x$, fig. 1.

Similar letters of reference indicate like parts.

This invention relates to an improvement in cast-iron arches for building bridges, aqueducts, roof-trusses, and vaults for the subterranean railroad tunnels, and other similar purposes, and consists in making a cast-iron voussoir, or section of an arch, of such conformation that one voussoir shall constitute a unit of construction. The proportion and disposition of the parts of my improved voussoir are such as to combine a maximum of strength with a minimum of material in the structure. The voussoirs are connected by bolts. They may be made in adaptation to arches of any curve or dimension. They can be multiplied indefinitely for the construction of vaults or tunnels for subterranean railroads, and the work of putting them together can be accomplished with great rapidity and economy in labor. Each voussoir is a segment or arc of a circle; the transverse ends are planes in the line of the radii thereof, and the longitudinal sides are parallel to each other. The general dimensions and proportions for ordinary works will be about four feet long, two feet wide on the ends, and eighteen inches deep, with a centre rib or stem, as deep as the ends, three inches wide at the bottom, and half an inch thick in the web; the top plate may be made as wide as the ends for vaults, but for bridges and similar structures I propose to make them about fifteen inches wide and one inch thick, and extend the end out on one side. For convenience in handling I prefer to make the voussoirs in such proportions as to weigh about 450 to 500 pounds each, but for different purposes, size and weight will vary; and other proportions of the parts may be adopted as required for the character of the structure to which they are applied, without deviating from the principles and essential features of my invention.

A represents a voussoir cast in one piece. A transverse section resembles the capital letter T, as shown in fig. 5; a is the top, and b a rib or stem at right angles to the top, running lengthwise from end to end. The ends $c c$ are flat plates which lie or abut against each other in an arch or vault, and are fastened together by three links and keys, $e e e$, at each end; the ends may be secured together with links and keys, or screw-bolts and nuts. The ends extend further on one side of the stem or rib, b , than the other, in order to form laps for the middle bolt, and to break joints in the ends of the voussoirs.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

A cast-iron voussoir for the construction of arches and vaults for bridges, subterranean railroads, and similar purposes, formed of a top plate a , a rib or stem b , and abutting ends $c c$, and fastened with bolts e , substantially as herein described.

The above specification of my invention signed by me this 9th day of October, 1866.

GEO. T. LAPE.

Witnesses:

WM. F. McNAMARA,
ALEX. F. ROBERTS.