4 Sheets--Sheet 1.

F. A. WILLIAMS.

Elevated Railways.

No. 160,249. Patented Feb. 23, 1875.

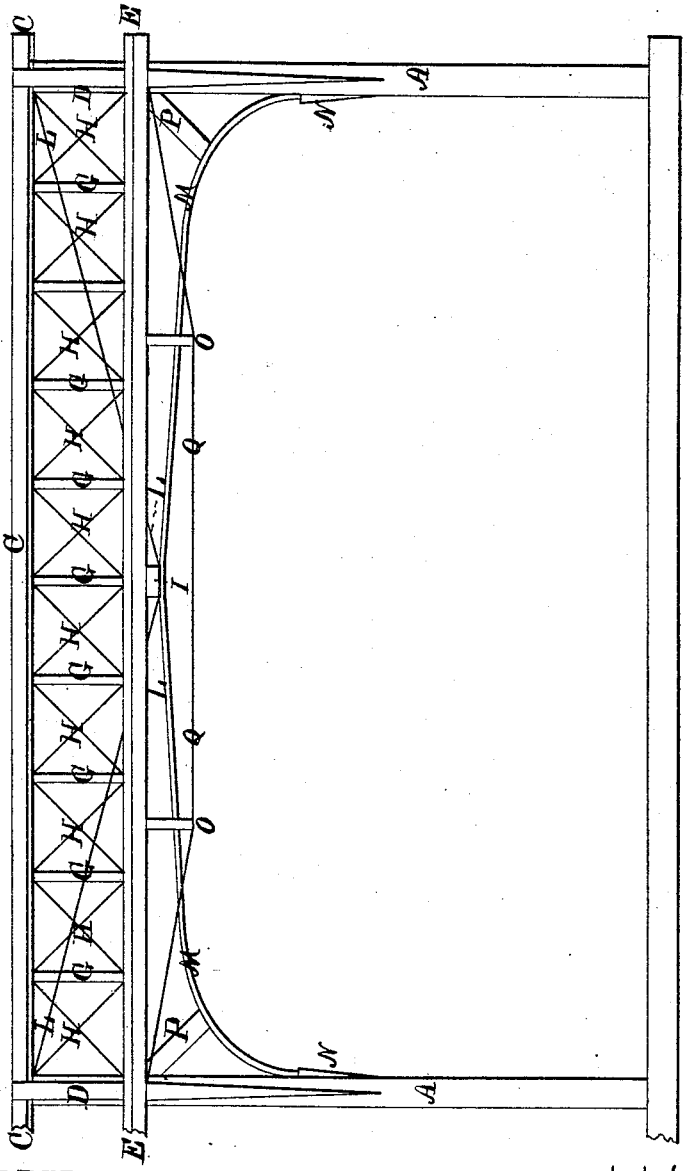

Fig. 1.

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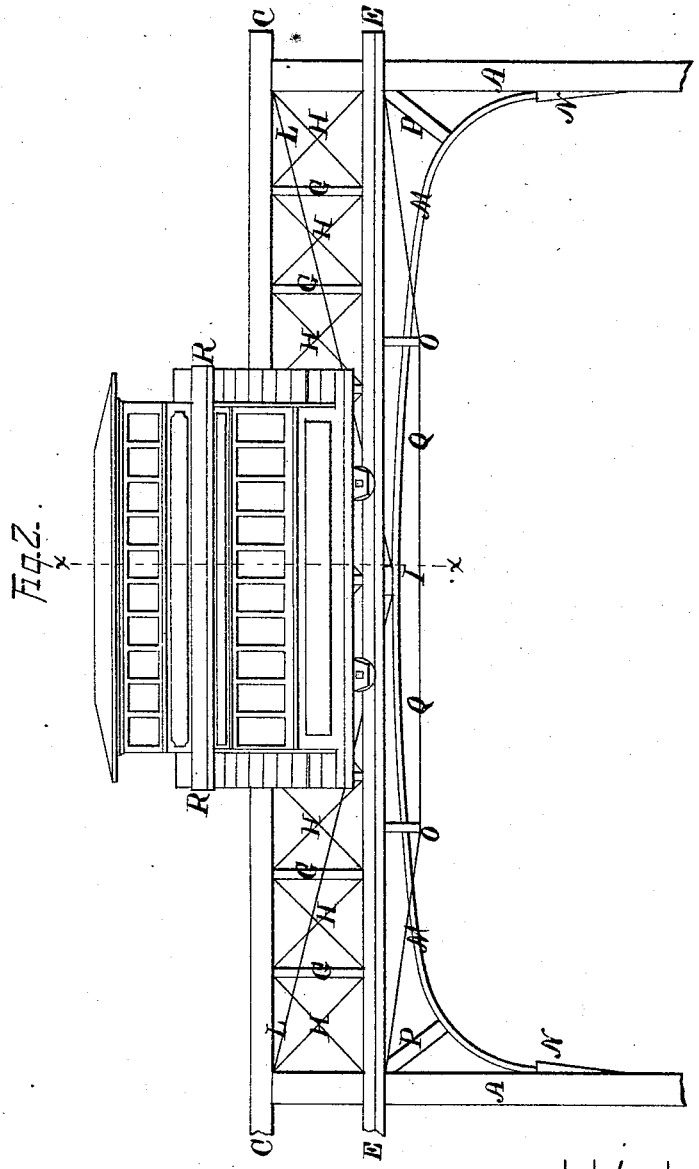

Fig 2.

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Fig. 3.

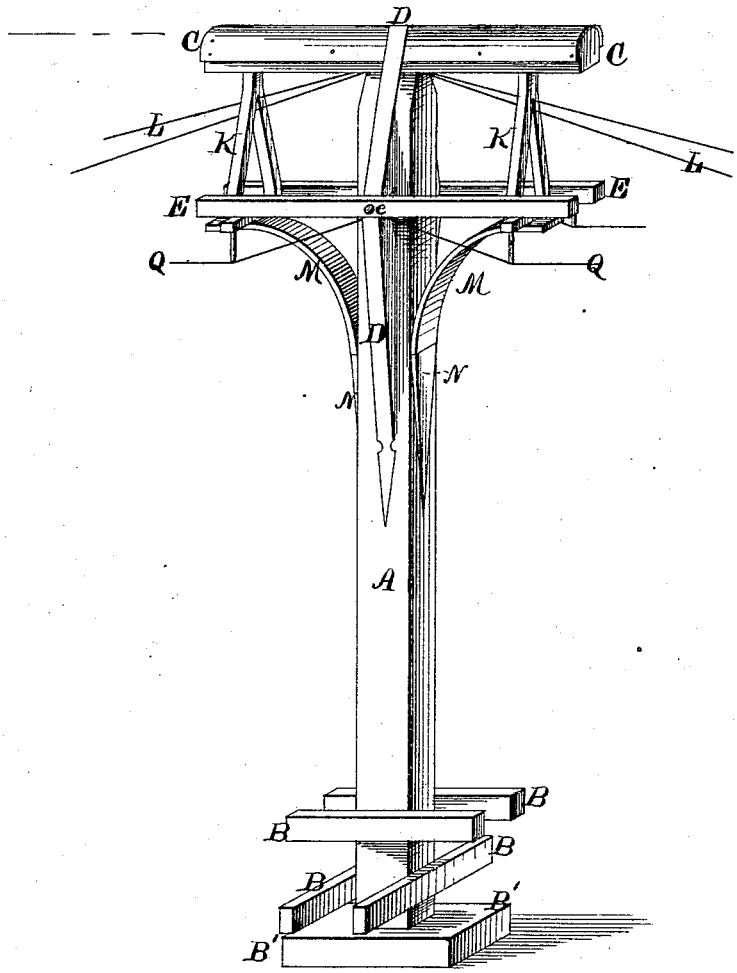

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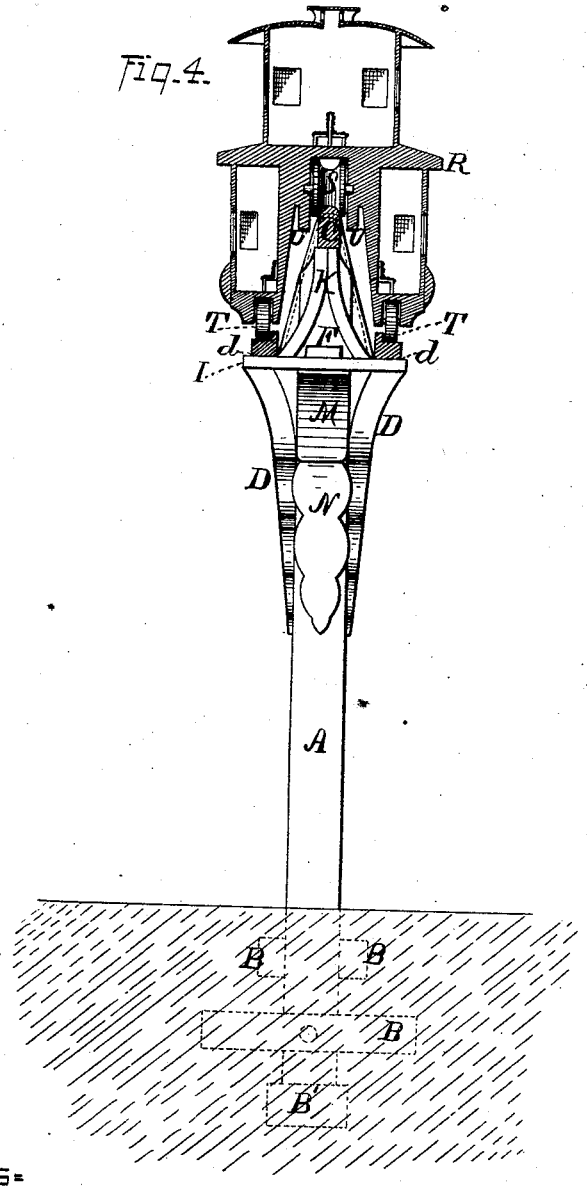
Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANCIS A. WILLIAMS, OF KANSAS CITY, MISSOURI.

IMPROVEMENT IN ELEVATED RAILWAYS.

Specification forming part of Letters Patent No. **160,249**, dated February 23, 1875; application filed February 16, 1875.

To all whom it may concern:

Be it known that I, FRANCIS A. WILLIAMS, of Kansas City, in the county of Jackson and in the State of Missouri, have invented certain new and useful Improvements in Elevated Railways; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my improved railway as erected for use. Fig. 2 is a like view of the same with a car in position. Fig. 3 is an enlarged perspective view of one of the supporting-posts, and Fig. 4 is a vertical transverse section upon line *x x* of Fig. 2.

Letters of like name and kind refer to like parts in each of the figures.

My invention is an improvement in the construction of elevated railroads, whereby greater strength and safety are secured; and to this end it consists, principally, in the connection of the rails with their supporting-posts, by means of which wood is rendered available for constructing said posts, substantially as and for the purpose hereinafter specified. It consists, further, in the means employed for strengthening the upper center rail between the supporting-posts, substantially as is hereinafter shown. It consists, further, in the means employed for combining the lower outer rails with the supporting-posts and with the upper center rail, substantially as and for the purpose hereinafter set forth. It consists, further, in the means employed for strengthening the outer rails, substantially as is hereinafter shown and described.

In the annexed drawings, A represents a post, constructed preferably of wood, and provided near its lower end, below the point where it is intended to insert said post in the ground, with a number of horizontal bars, B and B, that are securely fastened in place, extended to equal distances in each direction, and form anchors, which give strength and solidity to the position of said post. At the lower end of said post is secured a block, B′, that has any desired horizontal dimensions, and increases correspondingly its capacity to resist downward pressure. The posts A and A being set at proper distances apart, a rail, C, is placed upon and extends between their upper ends, where it is secured in position by means of metal straps D and D, that are each attached to opposite sides of a post and extend over said rail, a suitable recess being provided within the latter for the reception of said strap, so as to leave the sides and top of said rail plane and without obstruction. At suitable points below the rail C the straps or saddles D and D, which are extended laterally outward, as shown, are provided upon each side with a step or bearing, *d*, that receives a rail, E, which rail is parallel with that before named, and is, at its point of contact with said saddle, secured in lateral position by means of a bolt, *e*, that passes transversely through the same, through said saddle, the post A, and the opposite rail E. Directly beneath the rail C, upon a line horizontally with the side rails E and E, is placed a beam, F, which extends between the posts A and A, and is connected with said rail C by means of a series of posts, G and G, that extend vertically between and are connected to said parts. Wire-ropes or metal rods H and H extend diagonally in opposite directions within each space formed by said rail, beam, and posts, and, being secured within the former and made tense, form of said parts a trussed span. At the longitudinal center of each span a cross-beam, I, is placed beneath the rails E and E and beam F, and securely bolted to each of said parts. From a point just inside of each of said side rails a brace, K, extends upward and inward, and is connected at its upper end with the rail C, and with the contiguous post G, said brace, in connection with a like brace upon the opposite side, operating to unite the rails C, E, and E, and to preserve their relative positions. Similar braces K and K are placed at suitable points between the center of the span and the posts A and A, as may be required to give the necessary lateral rigidity. A rope or rod, L, is secured to the upper end of each post, and, passing downward beneath each end of the cross-beam I, and thence upward to the next post, operates to strengthen the center of the span, and to throw a portion of any weight placed thereon directly upon the posts A and A. The beam F is further strengthened by means of an arch-beam, M, constructed

preferably from wood, which, at its ends, is stepped upon suitable brackets N and N, attached to each post A, and its longitudinal center bears upon or against the lower side of the cross-beam I at suitable points between the center of the span and each post. Other cross-beams O and O are inserted between said arch-beam and said beam F, which cross-beams extend laterally outward beneath and give strength to the side rails E and E. From the angle formed by the intersection of each end of the beam F with a post, A, a brace, P, extends downward and inward, and at its lower end bears against the upper side of the arch-beam M, and prevents the same from being sprung upward at such point by pressure upon its center. The span is further strengthened vertically by two rods or cables, Q and Q, one of which is secured at its ends to each rail E at its intersection with the posts A and A, or to said posts, and from thence extends downward and toward the center of said span, and passes beneath the projecting ends of two of the cross-beams O and O.

The track is now complete, and receives saddle-shaped cars R, which span the same, and are provided with one central and four side wheels, S T T, &c., which, respectively, bear upon the central and side rails C, E, and E. It is intended that the central or upper rail shall sustain the weight of the cars and their loads, while the side rails operate to steady said cars and prevent rocking; but, if desired, the lower rails may sustain a portion or the whole of the weight and the upper rail operate merely as a guard to prevent the cars from leaving the track.

In order that the central wheel S may be caused to seat itself upon its rail C in case the car is raised by passing over obstructions upon the side rails, guard-flanges U and U depend from the sides of said wheel, and prevent any side motion other than such as is necessary to the proper operation of the car.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the post A and rails C, E, and E, the strap or saddle D, provided with the steps *d* and *d*, substantially as and for the purpose specified.

2. In combination with the rail C and posts A and A, the beam F, posts G and G, brace-rods H and H, cross-beam I, braces K and K, and truss-rods L and L, substantially as and for the purpose shown.

3. In combination with the rail C and beam F and their connecting parts, and with the posts A and A, the arch-beam M, cross-beams O and O, and braces P and P, substantially as and for the purpose set forth.

4. In combination with the rails E and E, the posts A and A, and the rail C, the saddles D, D, *d*, and *d*, the cross-beams I, O, and O, and braces K and K, substantially as and for the purpose shown and described.

5. In combination with the rails E and E, and with the posts A and A, the cross-beams O and O and tension-rods Q and Q, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of February, 1875.

F. A. WILLIAMS.

Witnesses:
GEO. S. PRINDLE,
WILLIAM FITCH.