(No Model.) 3 Sheets—Sheet 1.

W. W. THOMAS.

ELEVATED RAILWAY.

No. 563,818. Patented July 14, 1896.

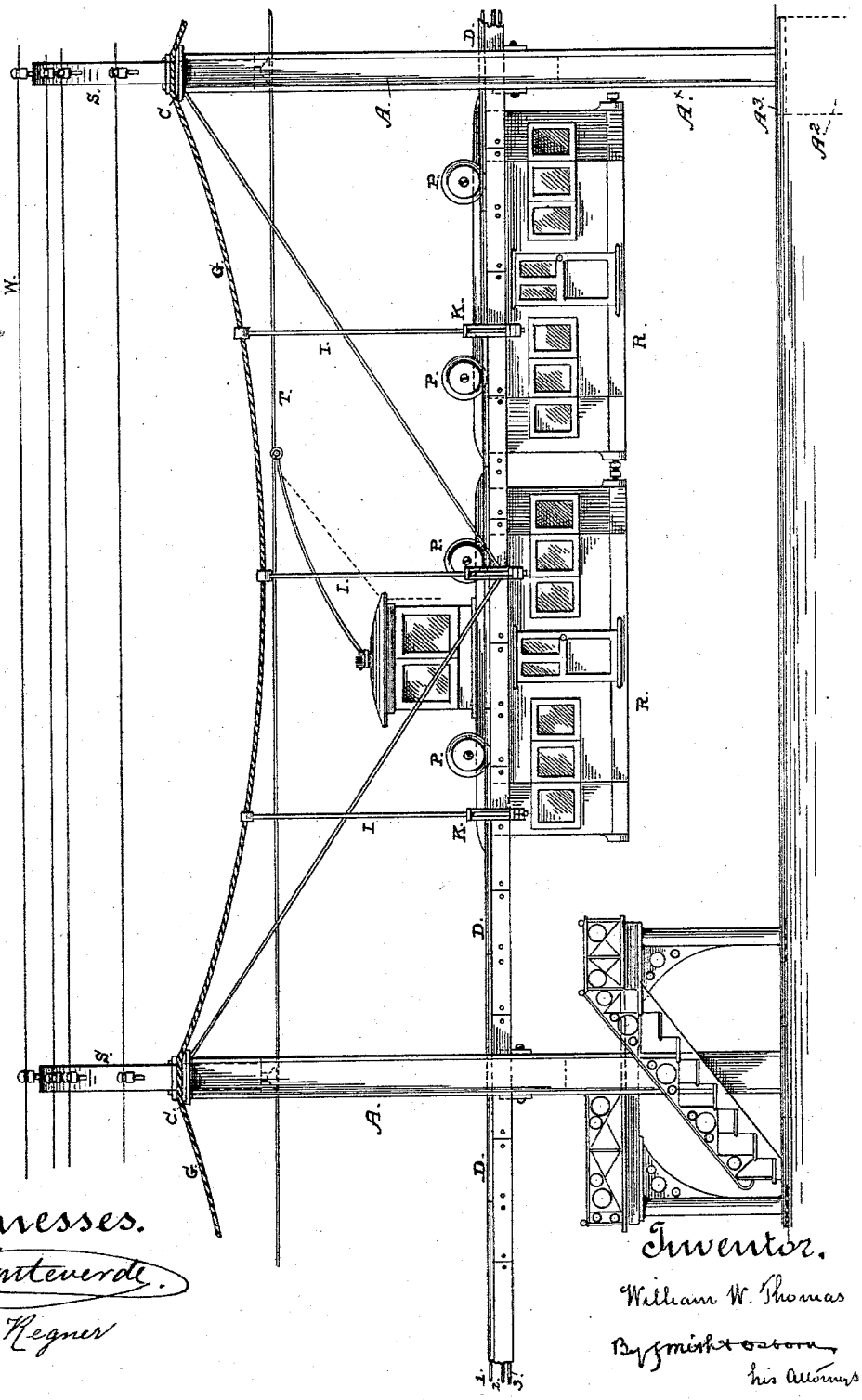

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

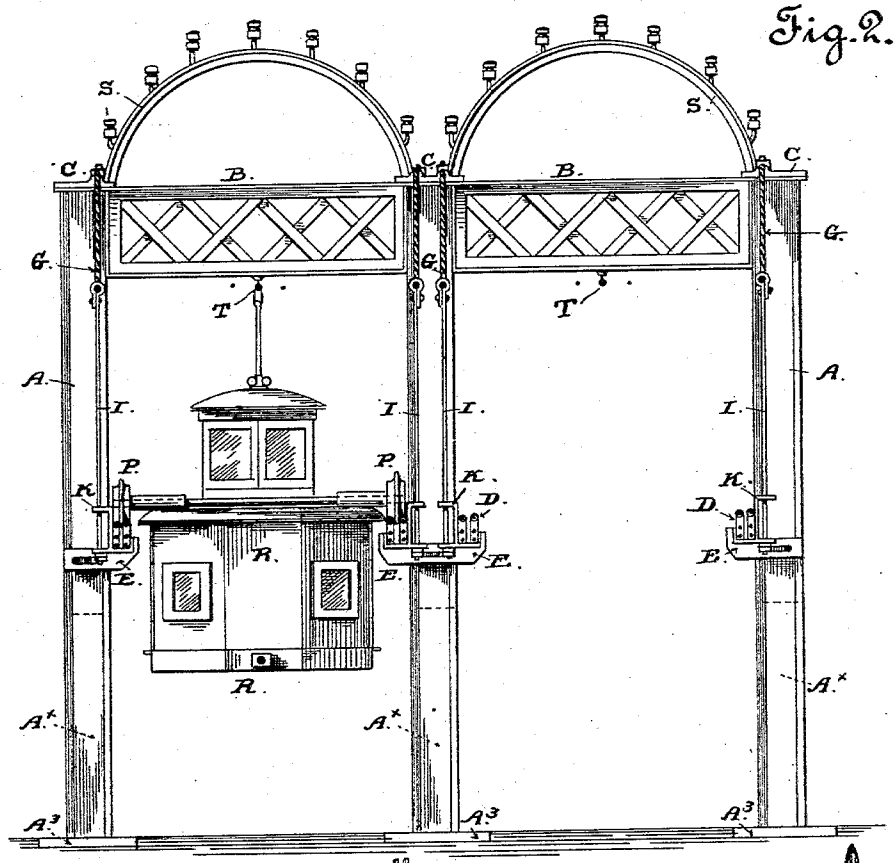

Fig. 3.

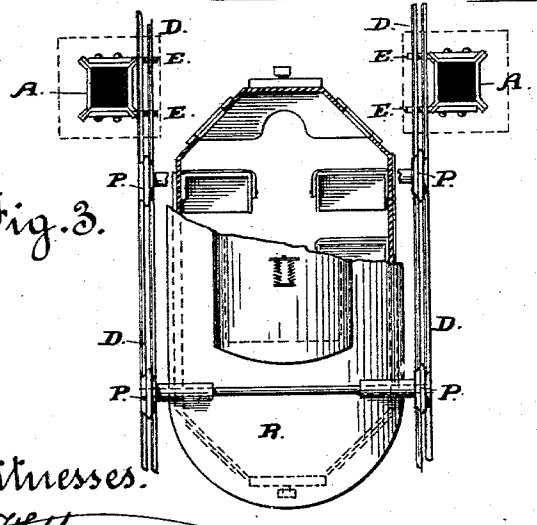

Fig. 4.

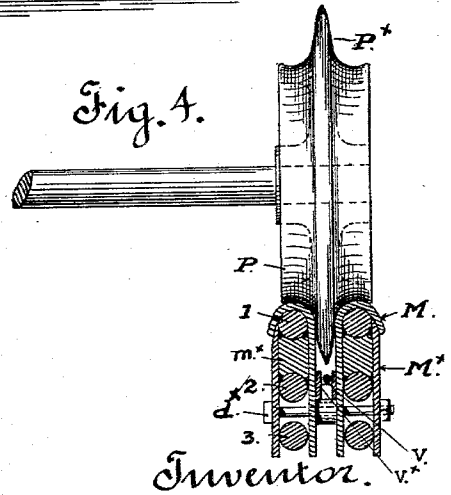

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Fig. 5.

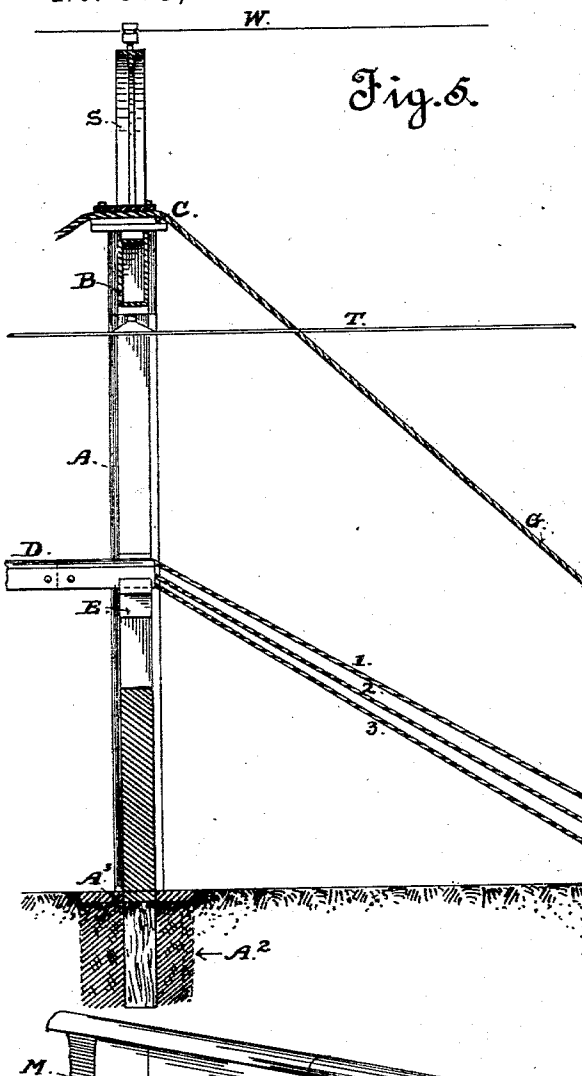


Fig. 7.

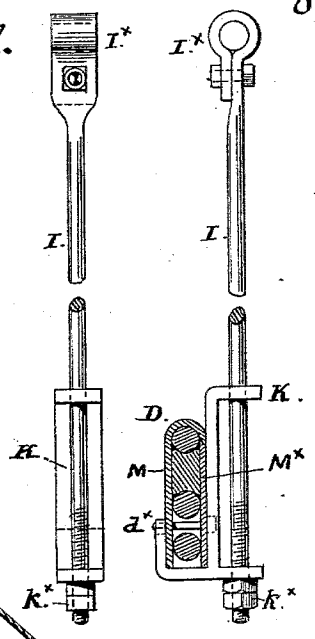
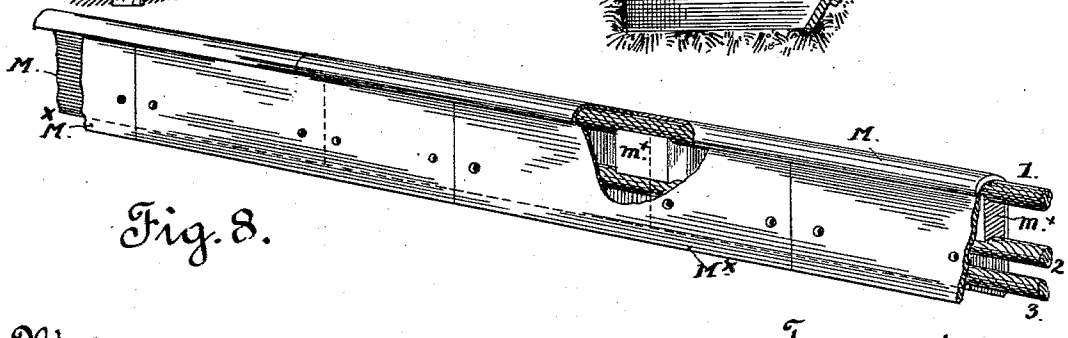


Fig. 6.

Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM W. THOMAS, OF OWEGO, NEW YORK.

ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 563,818, dated July 14, 1896.

Application filed July 6, 1895. Serial No. 555,172. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. THOMAS, a citizen of the United States, residing at Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Elevated Railways, of which the following is a specification.

My invention relates to improvements made in the construction of elevated tracks or roadways for operating overhead or elevated railways; and my invention comprises a rail and track of novel construction, and certain details of construction producing an improved roadway for operating cars above the level of the ground, as hereinafter explained.

The nature of the said improvements and the manner in which I proceed to construct, apply, and carry out the same will be understood from the following description, in which reference is had by figures and letters to the accompanying drawings, forming part of this specification.

Figure 1 is a side elevation of a single-track elevated railway embodying my improvements. Fig. 2 is a vertical cross-section of a double-track roadway. Fig. 3 is a top view of a portion of the track, showing the posts in horizontal section. Fig. 4 is a vertical cross-section, on an enlarged scale, through one of the rails. Fig. 5 is a side elevation of the structure at the end of the road, showing the manner of anchoring the cables. Fig. 6 is a front view, and Fig. 7 is a side view, of one of the suspension rods and hangers. Fig. 8 is a detail view in perspective of a portion of one of the rails.

Similar letters and numerals of reference indicate corresponding parts.

The novel points or features of the present invention consist, mainly, in a rail and track formed of wire cables stretched between and supported by posts and suspension-cables in elevated position at suitable height above the surface. The track-cables are stretched at suitable tension by proper mechanical means at the ends of the road and the cables are sheathed or covered by metal plates that form the bearing-surface for the wheels of the cars and afford protection from wear. These rails are supported at the posts by brackets, and at points between the spans or sections by means of vertical rods and suspension-cables laid over the tops of the posts similar to bridge construction.

The details of construction include a single-rail track for light traffic and branches and a double-rail track for roads where the traffic is heavy and the cars are run at high rate of speed.

The cars used are of that kind or construction in which the trucks are situated on the top or roof and the car-body is suspended or hangs down between the rails. This construction is preferred on the score of greater safety and as being better adapted to this character of roadway.

For the posts and framework to carry and support the track I prefer the following construction: Wooden posts $A^{\times}$ are set in concrete A^{2}, with a metal base-plate A^{3} topping the concrete. This furnishes a stable foundation and support for the hollow metal posts A, which are constructed of flanged plates riveted together at the angles where the flanges are located. The metal posts are set down over the wooden posts after the latter are placed in position.

The tops of the wooden posts $A^{\times}$ within the metal columns are indicated by dotted lines in Fig. 2.

When placed in pairs, as shown in the drawings, the two posts forming a pair, if it be a single-track construction, are joined together at the top by a trussed beam B. For a double-track road, a double arch is made by setting two outer posts in line with a single central post, as represented in Fig. 2.

C C are saddle-plates on the tops of the posts to take the suspension-cables G G, that are laid from one pair or set of posts to the next, the intervals of distance between the posts being regulated by the weight to be carried, but usually one hundred feet is recommended as a medium span between the supports.

The suspension-cables G are anchored at H at the ends of the road, and from each section or length between the supports A the rails D D are suspended by vertical rods I and hangers K K. The construction of the hangers is shown in the detail drawings, Figs. 6 and 7.

The rod I is attached to the cradle by the open eye or strap $I^{\times}$, formed on the upper end, and is threaded and fitted with nuts $k^{\times}$ on the lower end, on which is fitted the hanger K, having an open cradle to receive the rail. This construction is intended to afford such adjustment of the hanger in a vertical direc-

tion as is required to keep the track level and true.

The rails of my track are constructed of wire cables 1 2 3, laid perpendicularly one below another and strained under tension sufficiently great to bring the cables taut and smooth between the supports. The ends of these cables are anchored at the ends of the road, or at the points where the track terminates, and suitable means, such as turnbuckles L, are used to stretch the cables.

Over the cables 1 2 3 are laid plates M $M^{\times}$, inclosing the sides of the cables and covering the top cable, the inner plates M being bent to set over the top cable and overlap the outer plate $M^{\times}$. The two plates are secured by bolts and nuts, or by rivets passing through them between the bottom cable and middle cable.

In some cases spacing-blocks $m^{\times}$ are inserted between the top cable and the one next below it to keep the top cable in true horizontal line, these blocks being set at intervals of greater or less distance.

The same construction is followed for a double rail, in which case two sets of cables are laid in such close relation, the one set to the other set, that an open space or slot of uniform width is left between the two single rails, when the covering-plates are placed and fixed in position. This slot is maintained by long bolts $d^{\times}$ and thimbles placed at intervals through the two rails and across the slot between the lowest cables and those next above.

At each post the rails D are supported by horizontal brackets E, projecting from the sides of the post, and secured by suitable fastenings, such as slots and bolts, that will afford horizontal adjustment of the bracket from the face of the post.

The wheels of the trucks to run on these rails should have a wide tread and a deep flange to prevent accident from derailing or jumping the track, and greater safety in this respect is secured by the use of the double-rail track and wheels P constructed especially for it with a central flange $P^{\times}$ and double treads.

A rail of this construction allows a long or deep flange to be used except in the case of very short curves existing in the road.

When electricity is used as the propelling power, the conductor is suspended over the track from the beams B, as shown at T, to take an overhead trolley. But such electrical conductor can be laid along the track between the rails, as illustrated in Fig. 4, where V indicates such a conductor, to which the motor on the car may be connected by a contact-bar or trolley of suitable character carried on the truck and traveling on the conductor. In such location and arrangement of the conductor it is readily insulated from adjacent metal by insulating-plates $V^{\times}$.

It should be mentioned that I contemplate using single wires instead of laid and twisted cables in all cases where the rails formed of wires will furnish the required strength.

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

1. A continuous track for elevated railways comprising the spaced cables arranged one below the other in the same plane, the spacing-blocks inserted between cables, the wearing-plate covering the top cable and extending downward and covering the cables in one side the covering-plate on the opposite side and the bolts passing between the cables and uniting said plates, as shown and described.

2. In an elevated railway, the combination of the towers or upright supports A, A, the rails formed of a series of spaced wire cables stretched between points of anchorage at the ends of the road and in the same plane one above the other, the spacing-blocks inserted between the top cable and the one next below in the series, the covering-plates on the sides of the cables, united by bolts passing between the cables, the suspension-cables G, and the adjustable hanger extending from the suspension-cable down to the rail-cables, and provided with an adjustable stirrup on the lower end as shown and described.

3. A rail for elevated railways consisting of several spaced cables stretched between points of anchorage at the ends of the road in the same plane one below the other, wearing-plates covering the top one of said cables and extending downward and closing in the sides of the cables below, as shown and described.

4. A rail for elevated railways comprising separate spaced cables stretched between points of anchorage at the end of the roadway, one below the other, a wearing-plate covering the top cable, the spacing-blocks inserted at intervals apart between the top cable and the one next below it, and the side plates and bolts uniting the same, as shown and described.

5. A grooved or channeled rail for elevated railways adapted to take a central-flange wheel comprising two sets of a series of cables stretched between points of anchorage at the end of the road, the cables of each set being in the same vertical plane, and the two sets being parallel with each other, spacing-blocks inserted at intervals apart between the top cable and the one next below in each set, wearing-plates covering the top cables, the plates closing in the sides of the cables in each set and the spacing-bolts inserted through said plates and uniting the two sets of cables together.

In testimony that I claim the foregoing I have hereunto set my had and seal.

his
WILLIAM W. × THOMAS. [L. S.]
mark

Witnesses:
CLAYTON L. SCOTT,
WILLIS D. KINNEY.