W. C. LAWSON.

ELEVATED TRAMWAY.

APPLICATION FILED JULY 28, 1908.

921,718.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

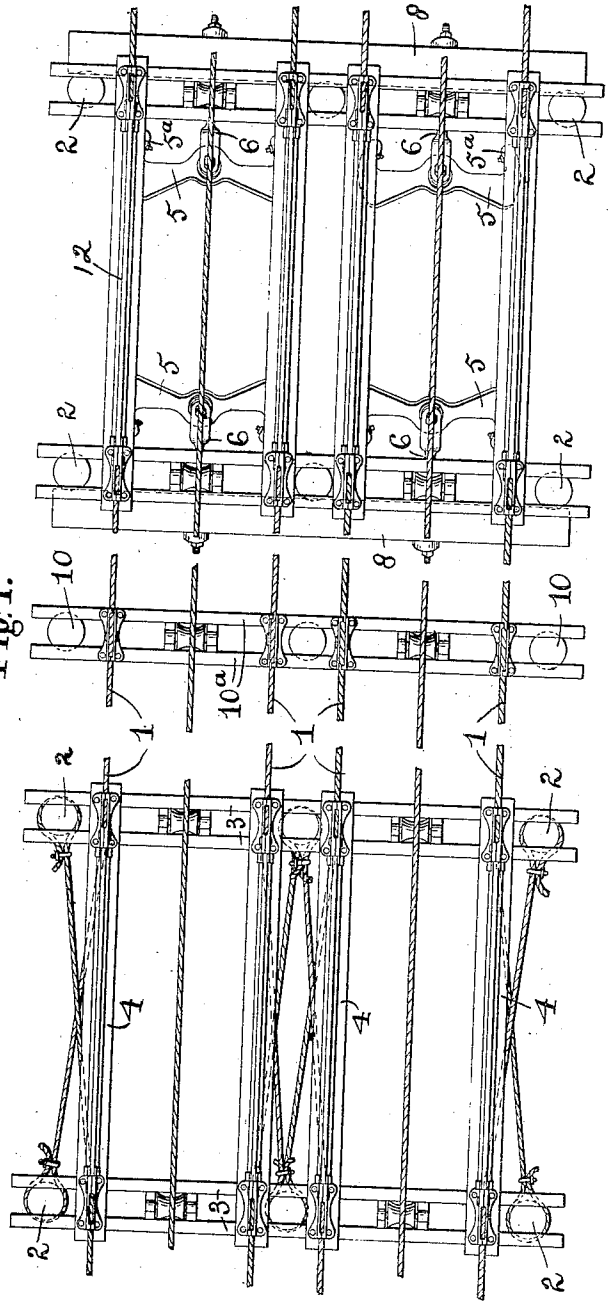
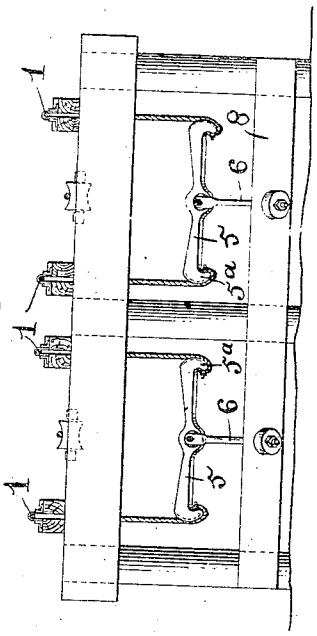


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 2.

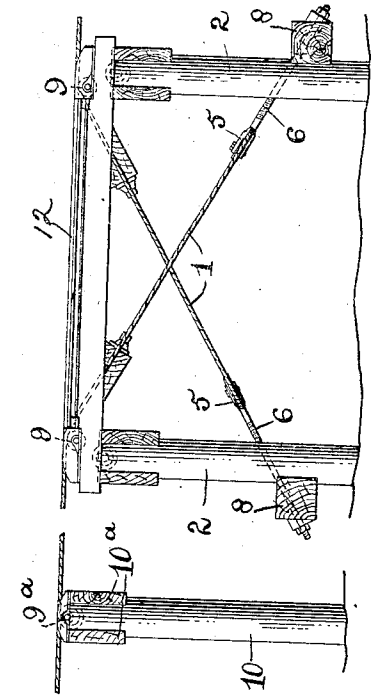


Fig. 6.

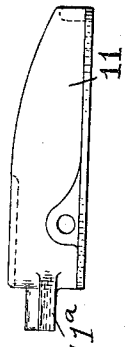


Fig. 8.

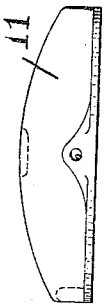


Fig. 5.

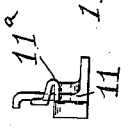
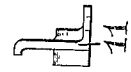


Fig. 7.



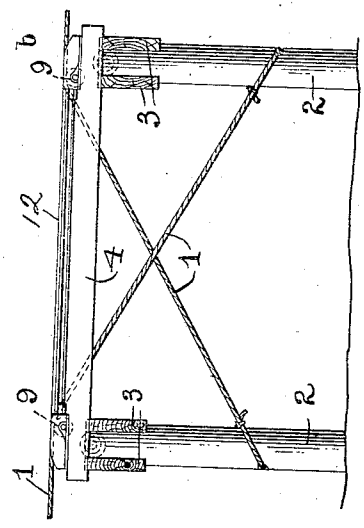
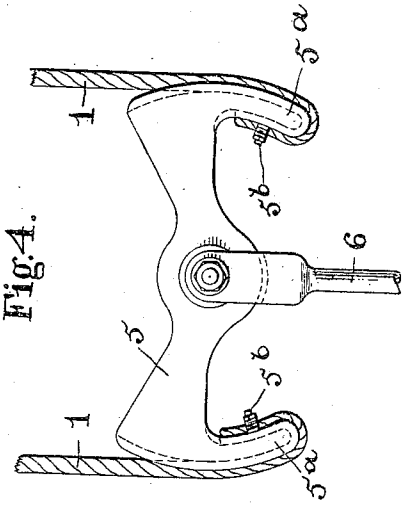


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM C. LAWSON, OF ROANOKE, VIRGINIA.

ELEVATED TRAMWAY.

No. 921,718. Specification of Letters Patent. Patented May 18, 1909.

Application filed July 28, 1908. Serial No. 445,803.

To all whom it may concern:

Be it known that I, WILLIAM C. LAWSON, a citizen of the United States, residing at Roanoke, Virginia, have invented certain new and useful Improvements in Elevated Tramways, of which the following is a specification.

This invention relates to improvements in tramways of the type known as "elevated cable rail". It is desirable for many reasons, to provide a tramway of this character upon which a carriage having a plurality of pairs of supporting wheels may travel, the car with its load being carried above the track in contradistinction to the suspended carriers heretofore exclusively used.

The depending load system has been found objectionable in the cost of installation and maintenance, as owing to the swaying of the load under wind action and other causes there is danger of the load striking the support, thus necessitating special and expensive forms of supporting towers. Further, the swaying of the load rocks the supporting wheels on the cable causing the latter to wear rapidly. The two rail track with its load carried above the track is free from these disadvantages and possesses the further important advantage that it may be built as a continuation of the ordinary surface road. Thus for example, cars coming from a mine tunnel may be run directly from the tunnel track onto an elevated two rail cable way without interruption. The use of such an elevated cable road has heretofore been impracticable by reason of the fact that it was impossible to maintain the two cable rails at exactly equal tension, while the slightest difference in tension in the long stretches of track necessarily used would cause one rail to sag so much below the other as to tip the car with disastrous results. No two cables are exactly alike in their ability to withstand heavy strains and in fact different portions of the same cable differ, especially after having been in use for a time in their amount of sag or deflection, under the weight of the load. Thus no matter how carefully the two rails may be initially stretched to an exactly equal tension, such a road could not continue long in operation, and an occasional readjustment of the tension is not practicable as the necessity for such readjustment might, and probably would not, be apparent until a load had tipped over and the contents wasted.

In devising the present invention, I have aimed to provide a construction in which the cables forming the rails will be automatically constantly maintained at exactly equal tension and each rail absolutely prevented from sagging at any time below the other, and thus all liability of the tipping of the car avoided.

An embodiment of the invention is shown in the accompanying drawings, in which I have illustrated as an example a double track elevated road employing a traction cable as a means of propulsion, though it will be obvious that the invention may be applied with equal advantages to a road in which the cars are propelled by any other means, or by gravity only.

In these drawings,—Figure 1 is a plan view of a portion of an elevated tramway. Fig. 2 is a side elevation. Fig. 3 an end view, and Figs. 4 to 8 are detail views.

In these drawings, the numerals 1—1 designate the pairs of cable rails of the double track road. These are formed of sections of wire cables, the opposite ends being held by what I term "equalizing section supports" and "anchor section supports" respectively, and the cables being sustained between these points at suitable intervals by "intermediate supports", as indicated in the drawings. It will of course be understood that as many of these sections may be used as the length of the road requires, and the lengths of the sections may be varied as the topography of the country may require.

The anchor section and equalizing section supports are each preferably composed of four uprights or posts 2 disposed at the corners of a rectangle of sufficient width to accommodate the double track, the upper ends of these posts being tied together by cross bars 3 and longitudinal bars 4. The cables forming the pair of rails for one section of track are secured at one end to the ends of a rocking lever 5 which is connected by adjustable means, such for example as a screw rod 6, pivotally connected at one end to the center of the rocking lever and having its other end passed through a hole in the cross bar 8 carried by the lower portions of the two more remote uprights or posts 2. From the ends of this locking lever the two cables pass upward over pulleys 9 and thence over similar pulleys 9^a on the intermediate supports and 9^b on the "anchor section support". These intermediate supports may conveniently be formed by uprights, posts or standards 10 connected at the top by cross

bars 10^a. At the anchor section support the ends of the cable pass over pulleys 9^b and thence down to the lower portions of the more remote posts 2 to which they are secured in any suitable manner. By this arrangement of securing the cables to the anchor and equalizing section supports, it will be seen that the end or securing portions of the cables of adjoining sections cross each other and thus brace the section support, and the strain of one section offsets that of the other.

As the cables are connected to the rocking lever 5 at exactly equal distances from the pivot point or axis thereof, and this lever is free to rock at all times, the cables will be automatically and constantly maintained under equal tension. The lever, in other words, acts as a tension equalizer and any stretch or expansion in one cable in excess of that in the other is at once automatically equalized by the lever, the cables being held against longitudinal movement only at their anchoring ends, at the anchor section support.

I prefer to make each rocking lever 5 of the shape shown in Fig. 4, in which it is provided with rearwardly turned curved arms 5^a. The outer edges or faces of these are curved on arcs of circles concentric with the axis of the lever so that the ends of the cables are maintained at an equal distance apart.

I prefer to provide concave seats or grooves in the curved edges of the arms of the lever to receive the cable and these grooves or channels may be extended around the ends of the arms and along the inner faces thereof where the cables are secured by suitable clips. A convenient form of fastening clip is shown in the drawing in which threaded bolts 5^b are cast in place in the arms on each side of the channel and a clamping plate 5^c slipped over these and secured in place by nuts after the cable end is in position. The channel is preferably serrated to secure a better gripping action.

The guide pulleys 9, 9^a, and 9^b are preferably journaled between plates 11 which have curved upper edges, the top portions of which curve inward over the upper surface of the cable to prevent any accidental displacement of the cable from the pulleys. The curve of the said upper edges is such that as the car approaches the pulley and the cable is deflected under the weight thereof the cable lies in a true tangent to the circle of which the curved edge of the plate forms an arc, and thus the wheels strike the plates and ride over the same, with a minimum amount of shock. The spaces between the guide pulleys of the anchor and equalizing section supports where the track is discontinued by reason of the downward deflection of the cables is occupied by complementary track sections or rails, 12 held between the projecting portions 11^a of the plates 11.

Having thus described my invention, what I claim is:—

1. In an elevated tramway, a track comprising a pair of suspended cable rails and means for automatically maintaining said rails constantly at an equal tension, substantially as described.

2. In an elevated tramway, a track comprising a pair of suspended cable rails, a car having a wheel or wheels running upon each rail and with its load supported above the rails, and means for automatically maintaining said rails constantly at an even tension to prevent tipping of the car, substantially as described.

3. In an elevated tramway, a track composed of a pair of parallel suspended cable rails suitably anchored at one end, and a rocking lever having its ends connected to the ends of said rails at the opposite end, substantially as described.

4. In an elevated tramway, a track composed of a pair of suspended cable rails, a rocking lever at one end having arc shaped ends to which said cables are secured at one end, and means for rigidly anchoring said cables at the opposite end, substantially as described.

5. In an elevated tramway, a track composed of a pair of suspended cable rails suitably anchored at one end, and an equalizing device interposed between and sustaining said cables at the opposite end for maintaining an equal tension thereon, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

WILLIAM C. LAWSON.

Witnesses:
J. T. DAVENPORT,
GEO. H. P. COLE.