(No Model.) 3 Sheets—Sheet 1.

J. H. PENDLETON.

ELEVATED RAILWAY STRUCTURE.

No. 342,459. Patented May 25, 1886.

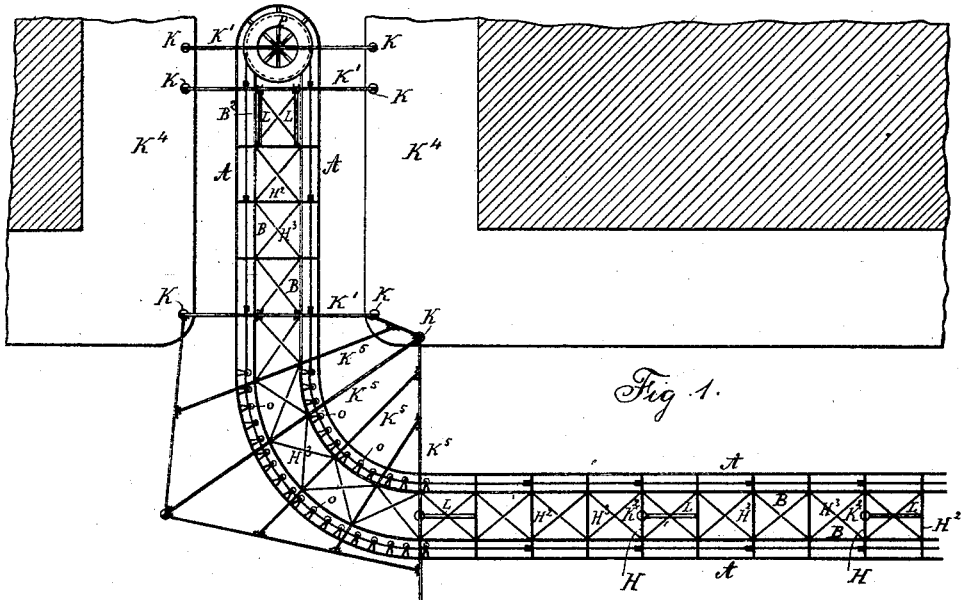

Fig. 1.

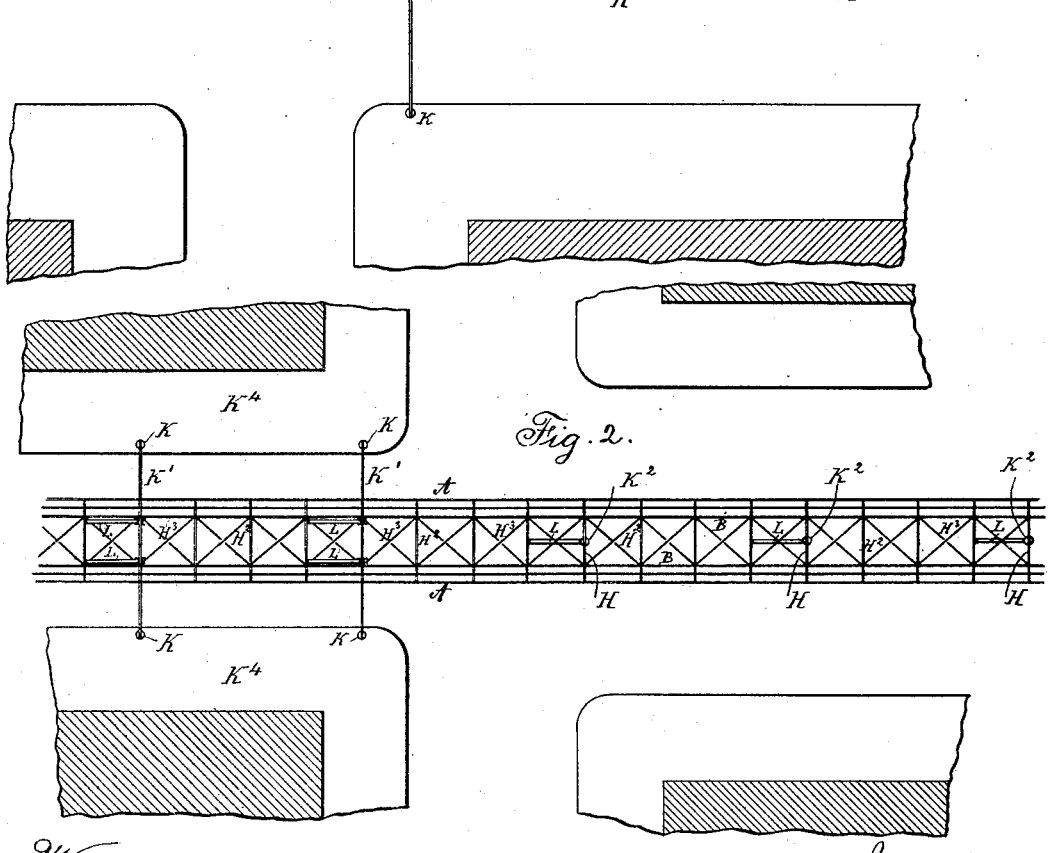

Fig. 2.

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Fig. 3.

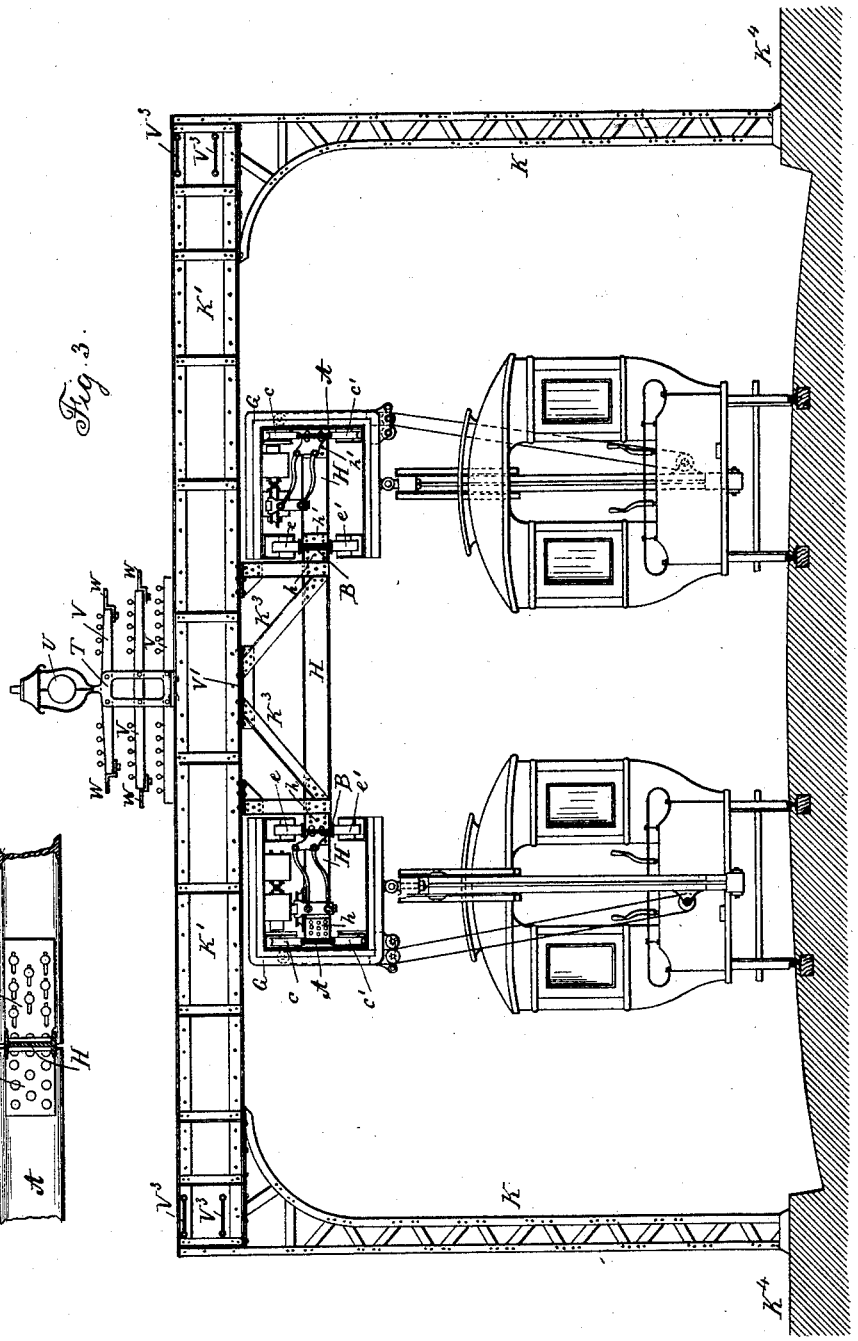
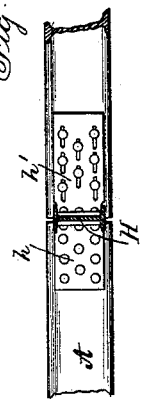


Fig. 7.



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ELEVATED RAILWAY STRUCTURE.

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Fig. 4.

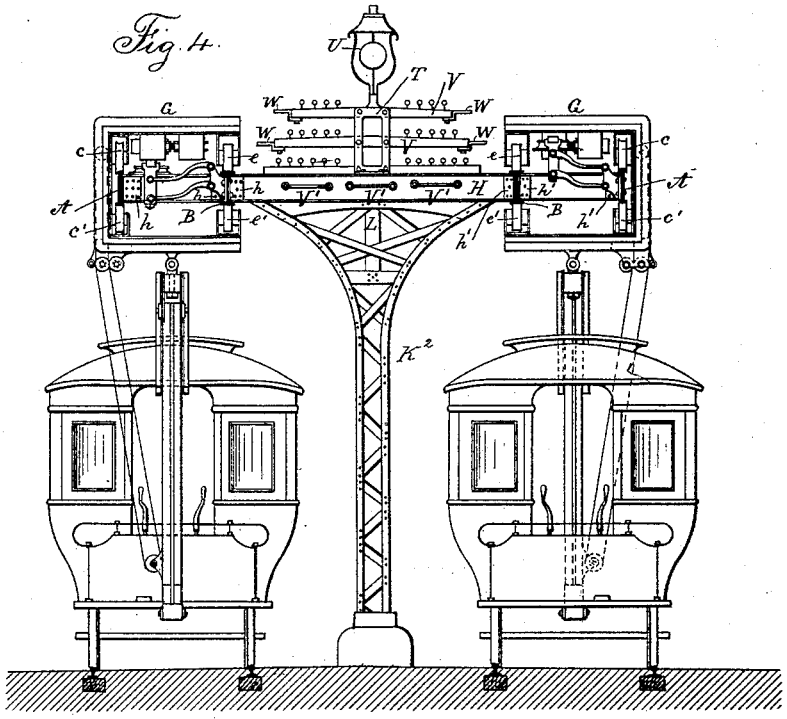


Fig. 6.

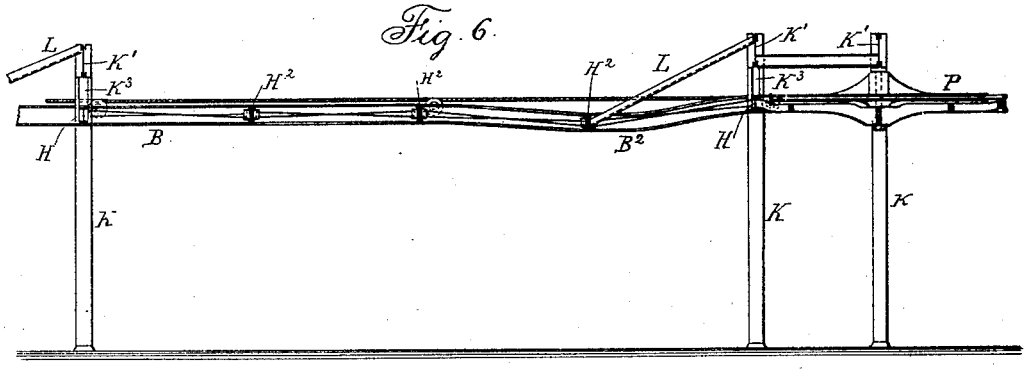
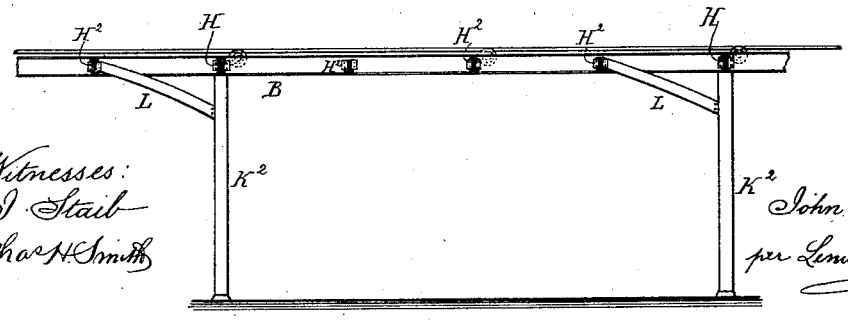


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, CORNELIUS TIERS, ALEXANDER H. TIERS, ROBERT I. SLOAN, AND LINCOLN MOSS, ALL OF NEW YORK, N. Y., AND THOMAS NAST, OF MORRISTOWN, NEW JERSEY.

ELEVATED-RAILWAY STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 342,459, dated May 25, 1886.

Application filed August 6, 1885. Serial No. 173,677. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PENDLETON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Elevated-Railway Structures, of which the following is a specification.

This improvement is especially intended for an endless cable traveling over head between tracks upon which tracks carriages are employed having gripping devices for seizing the cable or releasing the same, and to which carriages pendent traction-arms are applied for drawing the cars along upon the surface-rails. Devices of this general character are shown in my Patent, No. 312,009, granted February 10, 1885.

My present invention relates, primarily, to the structure which is specially adapted to the elevated tracks, so that the carriages upon such tracks may be supported in a reliable manner and the longitudinal strain upon the structure resulting from drawing the car along at the surface of the ground may not displace any portion of the elevated structure.

In the drawings, Figure 1 is a plan view of a track passing along a wide street and turning the corner into a narrow street. Fig. 2 is a similar plan view showing a straight track with supporting-columns at the edge of the sidewalk in a narrow street, and central columns for supporting the track in a wide street. Fig. 3 is an elevation of the girder on columns at the edges of the sidewalk. Fig. 4 is a similar view with a central column supporting the tracks. Fig. 5 represents the tracks and the manner of bracing to allow for expansion and contraction. Fig. 6 is a longitudinal section representing the depression in the tracks where the cable is to be dropped. Fig. 7 is an elevation of part of the track-beam and a section of the transverse bearer.

The elevated track is composed of longitudinal rails A B, between which the cable is to run, and the outer rails, A, are to have upper and lower heads, upon and below which are the wheels *c c'* of the track-carriage, which wheels are grooved to fit the edges of said rails, and the wheels *e e'*, that rest against the top and bottom edges of the inner rail, B, are to be cylindrical, and these wheels are supported by and held in the frame G; but as this part of my improvement forms the subject of a separate application filed simultaneously it is not further herein described.

One of the peculiarities of my present invention relates to the manner in which the rails A B are supported. These rails A B are of suitable length, so as to extend from one column to the next, and across the tracks between the ends of the rails A B are cross-bearers H, that are of a length to extend from one outer track-rail A to the other outer track-rail A, and bearers H are united to the rails A by angle-irons *h h'*, Fig. 7, that are riveted firmly to the sides of the cross-bearer H, near the ends, and to the rails A, respectively; but the holes in either the rail or the angle-plate are elongated to allow for expansion and contraction, as shown at *h'*, Fig. 7. The cross-bearer H is narrower than the width of the rails A, and the ends of the rails A are notched for the passage of the flanges of the bearer H, so that the top and bottom portions of the rails A lap upon the bearer and form continuous tracks for the wheels of the carriage. The track-bars B B are the same length as the track-bars A, and the ends of these bars B are notched in a similar manner to the bars A, so that the bearer H passes across between the ends of the rails B, and there are similar angle-irons to the angle-irons *h h'*, and they are riveted up in the manner before described, and the holes for the rivets at one end of each bar are elongated to allow for changes of the temperature.

When the street is narrow, it is preferable to place at the edge of the sidewalks K^4 the columns K with transverse bearing-girders K' for the support of the elevated tracks; but where the street is wide a central range of columns, K^2, is preferable, the upper portions of the iron-work of the columns being spread to form supports for the cross-bearer H. These cross-bearers H are firmly riveted to the columns K^2 or to the pendent frame K^3 below the girder K'. In each case, however, a diagonal

brace, L, is made use of between the columns or girders and the track-rails B or cross-bearers. If the cross-bearer is supported upon the column K^2 the brace L passes down to such column, and where the cross-bearer is sustained by the pendent frame K^3 the braces L pass down from above, as indicated in Fig. 6. These braces are applied at the side where the angle-irons *h* connect the track-rails to the cross-bearer, so that the cross-bearer and the tracks form a right angle with the column, and the expansion and contraction is allowed for at the distant ends of the track-rail by elongated holes for the rivets. By this construction the track-rails become levers for holding the columns in a vertical position, and they prevent the columns being displaced by the strain upon the structure in drawing the cars along by the endless cable.

It will be apparent upon reference to Figs. 2, 3, and 4 that the elevated structure is made continuous whether the columns K^2 occupy the middle of the street or the columns K the edges of the sidewalk, and this structure may be carried in a straight line from a narrow street to a wide street, as seen in Fig. 2, or the same may turn around a corner from a narrow street into a wide one, as indicated in Fig. 1. Cross-girders K^5 should be made use of at the curvature from one street to the other, the tracks and cables being supported below the same, and where the endless cable passes around the curve there are to be guide-rollers O for said cable; but these and the devices for supporting the same form the subject of a separate application. At P the endless cable passes around a grooved wheel, and to the wheel P the driving power for the cable may be applied.

It is necessary to disconnect the cable from the clamping device at the end of the route and to pick up the same in order to move the car in the other direction on the other track. To accomplish this object, the wheel P around which the cable passes, is made with a broad flat upper surface upon the same level as the top of the track B. When the car is going toward the pulley P on the right-hand track, the gripping device is opened to allow the cable to drop, and thereby become disconnected from the car, and the car may be run around upon a semicircular track, the same being pushed by hand or drawn by horses, and the car will usually be disconnected from the pendent traction-bar, so that the carriage G may be passed around the semicircular end of the elevated track, the wheels *c c'* continuing to rest upon and below the rail A, which rail A is a semicircle around the outside of and concentric with the pulley P, and the wheels *e* rest upon the upper surface of the wheel P. When the elevated carriage G has passed around the pulley P, it is necessary to again connect the cable with such carriage. To accomplish this object, the track-bars A B are curved downwardly, as seen at B^2, Figs. 1 and 6, and the carriage G is thereby caused to descend sufficiently for the traction-cable to assume its proper position between the clamps and guide-wheels of the traveling carriage G, and when the car is started in its new direction the carriage G in running up the incline from the depression B^2 to the ordinary level of the track raises the cable, so that the parts that grasp the cable are above and out of the way of the vertical wheels which support the cable.

The clamping devices are of any suitable character; but reference is hereby made to my Patent No. 312,009, dated February 10, 1885, a description of a traveling carriage and clamping adapted to be used with the depressed track herein described. I remark that the cross-ties shown at H^2, Figs. 1, 2, 5, and 6, do not pass through the rails A B; but are simply ties to keep the tracks at the proper distances apart, and the diagonal brace H^3, Figs. 1 and 2, between the ties H^2, stiffen the tracks laterally and maintain the alignment.

Difficulty has been heretofore experienced in placing electric-light and telephone wires without interfering with the access to the front of the buildings in cases of fire. I make my elevated structure so that the same also carries electric conductors and lamps, and access is easily obtained to these. With this object in view, I attach a frame, T, at the top of the column or cross-girder in the middle of the street, and I support an electric light at U upon the top of this frame T, and I also provide cross-bars V, bolted to the frame T and provided with insulators, as usual for conductors, and I place stirrups W at the ends of the cross-bars V, so that the attendant can use the central columns, K^2, as ladders, and pass up the same to the rung or stand V', upon which he can stand when adjusting the carbons in the electric light. Where the frame T is supported by the girder K' the columns K are used as ladders, and the rungs V^3 allow the attendant to reach the top of the girder K', and pass across the same and over the stirrups or steps W to the electric lamp, the open-work stand V' being upon the side of the girder K'.

I claim as my invention—

1. An elevated-railway section composed of a column, cross-bearers, and longitudinal tracks rigidly connected together and forming a right-angle lever, in combination with an expansion joint between one section and the next, whereby the parts are free to expand, and one section holds up the free ends of the next section, substantially as set forth.

2. An elevated-railway section composed of a column, cross-bearers, and longitudinal tracks rigidly connected together, and forming a right-angle lever, in combination with an expansion-joint between one section and the next, whereby the parts are free to expand, and one section holds up the free end of the next section and track-rails.

3. In an elevated-railway structure, cross-bearers and means for supporting the same, in combination with four track-rails, the outer

ones being connected with the ends of the cross-bearers, and the inner track-rails being notched at their ends to allow the cross-bearers to pass in between them, and angle-iron for fastening the same, substantially as specified.

4. The combination, in an elevated structure, of columns, cross-girders, cross-bearers, and hanging supports between the cross-girders and cross-bearers, track-rails at and between the ends of the cross-bearers, and a cable for actuating a car-truck upon the tracks, and pulleys for supporting the cable, substantially as set forth.

5. In an elevated-railway structure, the combination, with the columns placed at the edges of the sidewalks and the cross-girders carried by the same, and a range of columns in the center of the street, of cross-bearers and connections for supporting or suspending the cross-bearers, longitudinal track-bars attached to the cross-bearers, and an endless rope and pulleys upon the structure, substantially as set forth.

6. The combination, with a range of columns and elevated tracks, of the frames T, electric lamps supported by the frames, arms V, extending at each side of the frames T, and insulators carried by such frames for the electric conductors, and ladders formed by or attached to the columns, substantially as specified.

7. The combination, with ranges, of columns, cross-girders, frames, electric lamps supported by the frames, arms, insulators, steps at the ends of the arms, ladders on the columns, and an open-work stand at the base of the frame.

Signed by me this 3d day of August, A. D. 1885.

J. H. PENDLETON.

Witnesses:
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WILLIAM G. MOTT.