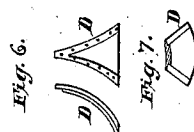
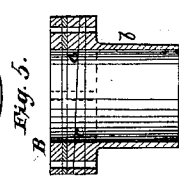
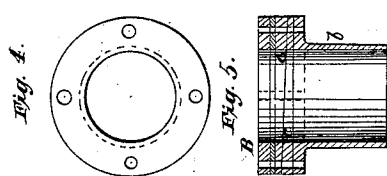
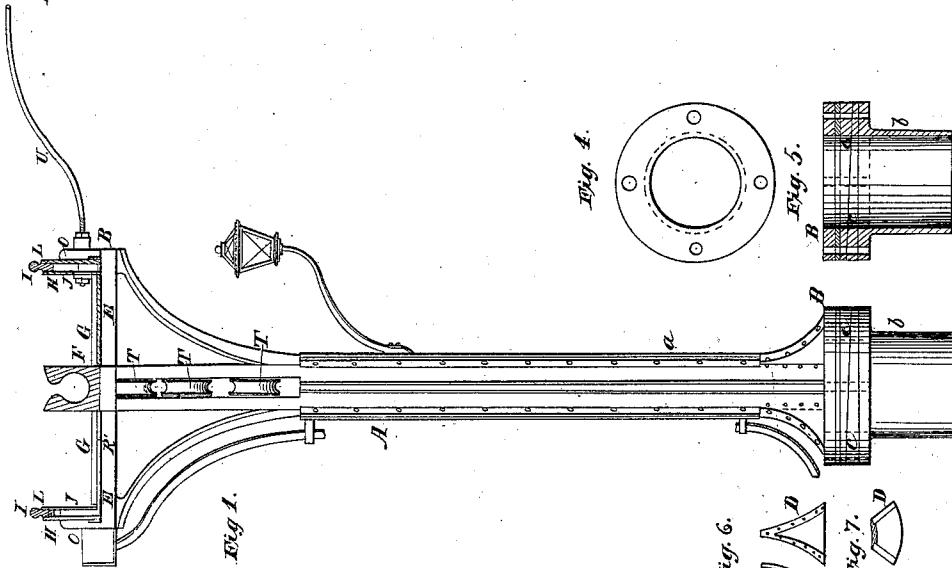
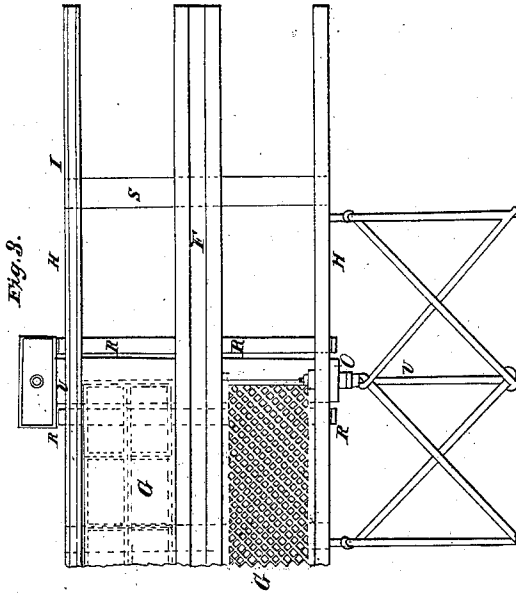
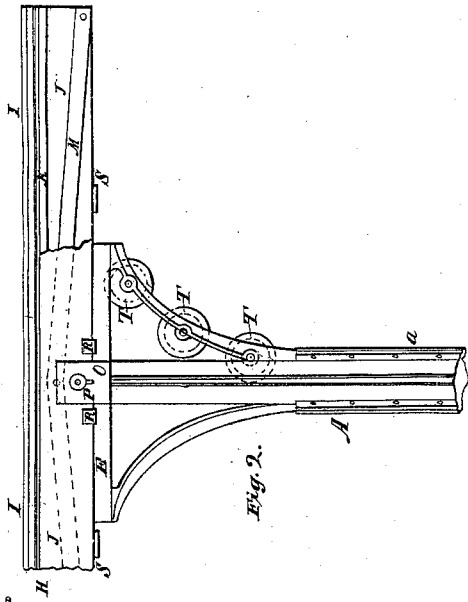


C. T. Harvey,
Elevated Railway,

No 65,909,

Patented June 18, 1867.



Witnesses:
Geo. F. Southern,
James Gros,

Inventor:
C. T. Harvey
By Paul Andrews & Hays
Attys

United States Patent Office.

CHARLES T. HARVEY, OF TARRYTOWN, NEW YORK.

Letters Patent No. 65,909, dated June 18, 1867.

IMPROVED ELEVATED RAILWAY.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES THOMPSON HARVEY, of Tarrytown, in the county of Westchester, and State of New York, have invented a new and useful Improvement in Elevated Railways or Railroads; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 is an elevation of one of the columns which supports the track, the track being shown in cross-section.

Figure 2 is a side view of the track and of the upper part of one of the columns.

Figure 3 is a plan view of a portion of the track, the portion selected being over a column.

Figure 4 is a top or plan view of the lower division *b* of a column.

Figure 5 is an axial section of such lower division, also of the adjusting plates, and of the bottom plate or flange of the upper section of the column.

Figure 6 is a front view, and a view of a longitudinal section of one of the panels at the front of the column.

Figure 7 is a horizontal section of said panel.

The letter A designates a supporting column, one of a series which sustains the track of the railway. It is made in divisions *a* *b*, an upper one and a lower one, to enable me to adjust the upper division to a vertical position without disturbing the foundation of the column or the position of the lower division. Said divisions are united to each other by means of broad flanges formed at the bottom of one and at the top of the other. The columns are hollow to admit the ascent or descent through them of a propelling cable or chain, when such a device is used to propel one or more cars on the track. The upper division *a* of the column is made in several longitudinal sections, and I prefer to make them of wrought iron rolled into proper shape, their ends being flared outwards, as shown in the drawing, so that when the sections are joined together, their upper ends form bearings for the track, and their lower ends form a wide or expanded support for the said upper division of the column. Said lower flaring ends are properly secured to a flat base-plate, B, which, in this example, is circular. The lower division *b* of the column goes through or is embedded in a mass or block of stone or other suitable material, built or placed immovably in the ground. Its upper end is expanded into a flange of the same size and shape as the base-plate B of the upper division of said column, and they (said flange and plate) are securely fastened together by bolts or other suitable devices. In order to adjust the column to a vertical position without being compelled to disturb its foundation, I interpose between its divisions two rings C C, which taper or are made thinner at one side than at the other, the decrease in thickness being gradual, so that they form annular wedges. In placing them between the divisions of the column, I set them conversely, so that the thicker part or side of one is over the thinner part of the other, when they together form a combined ring of equal thickness throughout. If the upper division *a* is not then vertical, I make it so by turning one of the rings to the right or left until the division is brought to the proper position, said division being first lifted by jack-screws or other devices to allow the rings to be turned. The bolts which unite the base-plate B to the flange of division *a* go through curved slots in said rings C C, so that the latter are allowed to be turned and are yet prevented from slipping from between said divisions. The height, also, of the column A can be at any time increased by inserting below it an annular washer, one or more. I also pack the joints, or one of them, between the base-plate B and the adjusting plates, with rubber or other suitable material to prevent unpleasant jars from the passage of cars thereon, and to secure, as far as possible, a noiseless movement. The longitudinal sections of divisions *a* are firmly united by bolting together flanges formed on their edges, as shown in the drawing. The openings which are left at the bottom of division *a*, between the flaring ends of its sections, are closed by panels D, which are accurately fitted beneath the shoulders or lower ends of the flanges or ribs of the sections, and rest on the base-plate B, so that they contribute to the strength of the column, and at the same time close up said openings. Said panels are fastened by buttons or bolts or other convenient devices. The upper end of each of the columns of the railway supports a cross-frame, E, or other suitable platform, which supports the rails and other portions of the track, and also the cable-guide. One part of the platform E, which is parallel with the track, comes directly beneath and supports the cable-guide F. The space between the cable-guide and the rails is occupied

by a strong floor or grating, G, of lattice-work, or of glass or other transparent material, extending the whole length of the railway, so as to permit the passage of light and to strengthen and stiffen the track. This floor, if made in the form of a grating, may be of metal or of wood, and it serves to sustain the weight of persons walking thereon, and of workmen who may be employed in repairs, and to intercept falling objects, and also to strengthen and stiffen the track and prevent the rails both from spreading apart and from approaching each other, the rails being strongly secured to the outer edges of said grating or floor in any suitable way, either by rigid fastenings which will compel the grating or floor to move up and down with the rails, or by fastenings which permit the rails to move up and down independently of the grating or floor.

The letters H H designate compound rails, which are the subject of another application for Letters Patent, the rails I being those which come in contact with the car-wheels, and J J being supplementary or side rails that rest on the supporting platform E. The bottom flange R comes between the side rails J J, and the lateral flanges rest on their upper edges. Rails M are also combined with the side rails. The side rails J are partly embraced by angle pieces O (having slots P) turned up at the ends of the transverse bars of platform E. In addition to these provisions I put springs, R, between the track and platform. The two lines of rails that compose the track, and the said grating or floor, are partly sustained between the supporting columns by transverse bars S, fastened to the under surface of the cable-guide, and extending as far as the outside of the rails. The springs R R serve also to sustain the grating or floor wherever they occur. The said grating or floor may extend from rail to rail of the track, going beneath the cable-guide if desired. Those columns of the railway which are not used to conduct the propelling cable between the cable-guide and the driving or other drums of the railway are filled up with wood or other suitable material for the purpose of stiffening or strengthening them, and to counteract any injurious effect which frost may have on the columns in making them brittle. It is desirable that the propelling cable or chain, in going between the cable-guide and the driving or other drums, be conducted by means of large wheels or by means of curves of the largest possible radius.

By my invention I avoid the expense and inconvenience of large wheels or pulleys, and accomplish the desired result by slotting one of those flaring upper arms or ends of the columns which is under the cable-guide, and inserting therein small wheels or pulleys T, (three such being shown in this example,) whose peripheries project far enough beyond the convex surface of the said flaring arm to keep the cable clear of the said flaring arm and conduct it properly to the cable-guide. By this means I am enabled to use the columns both to obtain bearings for the journals of said wheels or pulleys, and to obtain an easy and suitable curve by which to conduct the cable or chain past angles, both in taking it up to the cable-guide and leading it down therefrom. The line of railway is connected to the line of buildings, or to other means of lateral support along a street, by stay-rods U, which may extend from each column A, or from the track itself, at suitable points. These rods are connected to each other by diagonal braces, and their outer ends are attached to the columns or to the ends O of the cross-plates E, or also to the rails H, by extending the rods through the same, and placing on the rods nuts with rubber or other elastic washers on their sides next to the cross-plate or column. The outer ends of the rods are secured to the buildings or other side support, and unpleasant vibrations of such buildings from the movements of cars or trains are prevented by means of the elastic washers, and also by placing the nuts a little distance from the sides of the said parts O, or of the column and rails, so that the stay-rods can have a little play before the nuts come in contact with the sides of the part or object to which the rods are secured. The rods may also be allowed some play endwise at the ends which are connected to the buildings. Instead of the mode of connecting the rods to the railway which is here shown, their ends may be attached to elliptic or other springs, so as to give them elastic bearings with the railway, and thereby avoid rigid and unyielding connections. These stay-rods can be used also as frames or as supports for the frames of awnings for stores or sidewalks. The supporting columns A are also used as lamp-posts, the gas pipes through which the lamps are supplied being conducted upwards through the hollow space of the columns, emerging therefrom at a suitable point, where the lamp and its frame can be supported by suitable brackets extending from the columns. This arrangement of combining the office of a lamp-post with a supporting column is shown in fig. 1. Said supporting columns also sustain water pipes, which conduct to the ground the water collected from the roofs of the cars, and also from the flooring of the track when glass or other transparent material is used. The water is received in troughs x, of suitable length, which are secured to the columns, to the side of one of the rails, or to any other part of the elevated railway at or near each station, or other places where they are required, and the water is taken from them by means of pipes fastened to the sides of the columns, as shown in fig. 1, and terminating at or near the gutters of the street. The water from the flooring of the railway (when an open grating is not used) is conducted to the troughs by pipes or channels, or it may be led into the pipes that go from such troughs. The manner of collecting or receiving in said troughs the water from the cars is shown in another application.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the track of an elevated railroad, of an open or transparent floor between the rails, so as to allow the transmission of light to the space beneath the railroad, substantially as set forth and described.
2. I also claim the panels D in the columns A, for the purpose of closing the openings in the lower part of the said columns, and also to strengthen the columns, substantially as set forth and described.
3. I also claim the adjustable column A made in two divisions, *a b*, substantially as described.
4. I also claim the wedge-shaped rings C, or their equivalents, in combination with the adjustable column A, substantially as described.
5. I also claim the hollow supporting column A, in combination with an elevated railroad, substantially as and for the purposes described.

6. I also claim the pulleys T, in combination with the supporting columns A, substantially as and for the purposes described.

7. I also claim the combination of the stay-rods U with the elevated railway, said stay-rods connecting said railway to the buildings or other supports on the street, and forming also awning-frame supports, substantially as set forth.

8. I also claim a filling of wood, or equivalent material, in combination with said columns, substantially as and for the purposes described.

9. I also claim the water-trough along the track and its discharge pipe in combination with an elevated railway, substantially as and for the purposes described.

The above specification signed by me this sixteenth day of January, 1867.

CHARLES T. HARVEY.

Witnesses:

HERBT. G. HULL,
GEO. F. SOUTHERN.