(No Model.)

J. P. A. HANLON.

ELEVATED RAILWAY.

No. 342,088. Patented May 18, 1886.

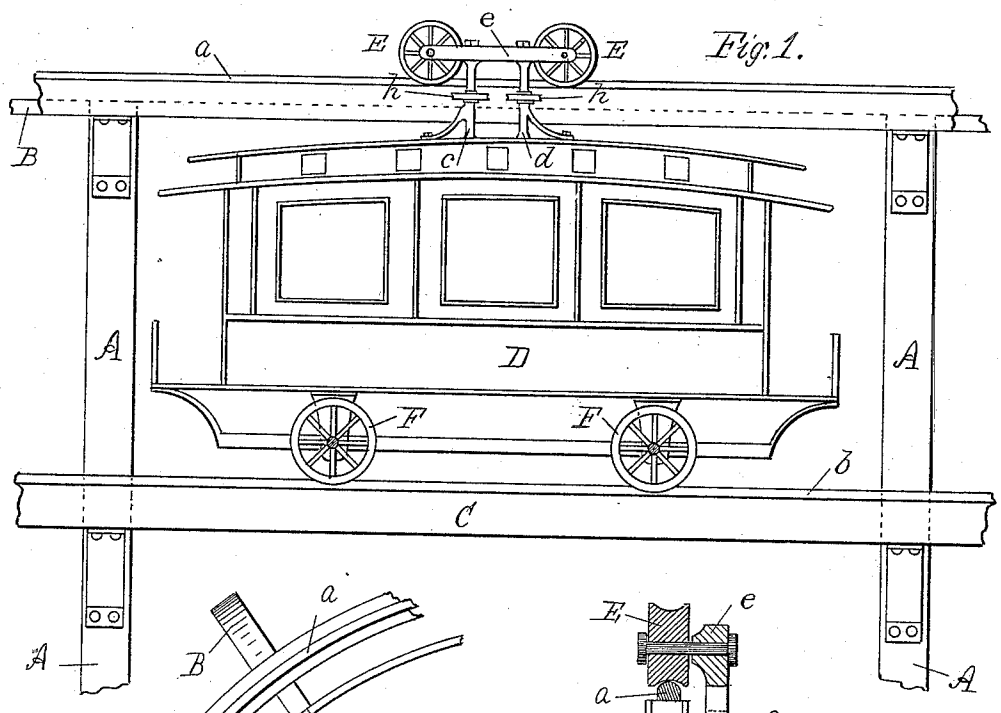

Fig. 1.

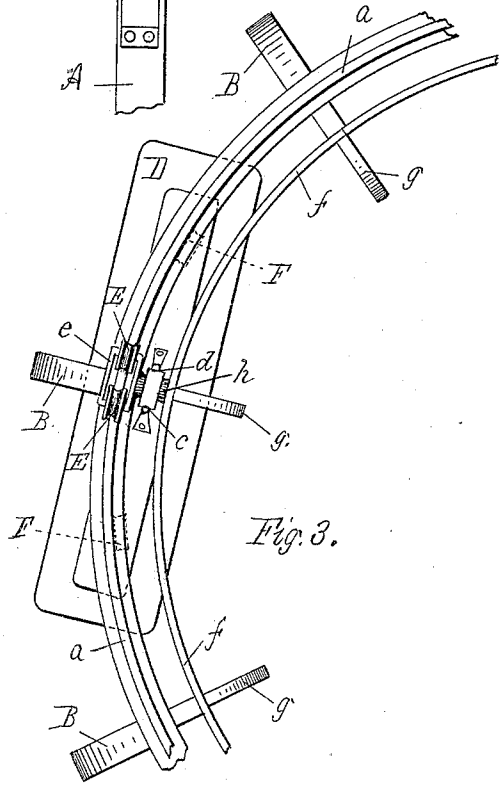

Fig. 3.

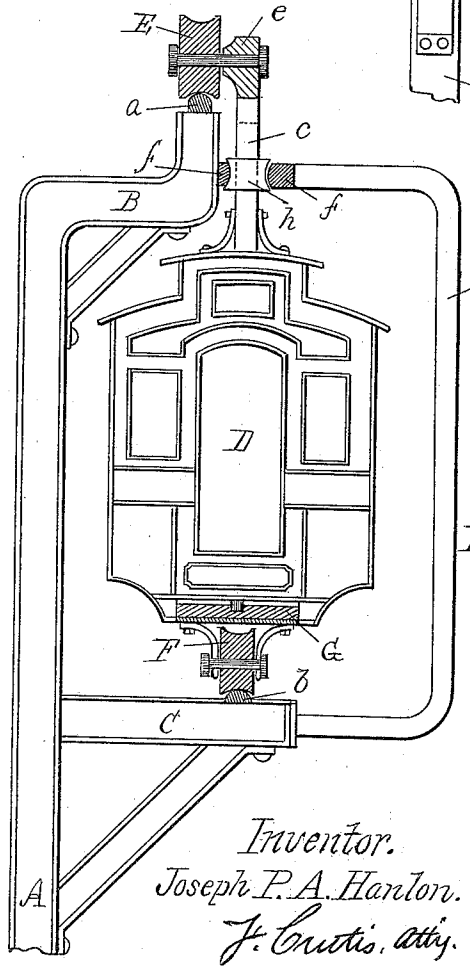

Fig. 2.

Witnesses.
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ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 342,088, dated May 18, 1886.

Application filed January 21, 1886. Serial No. 189,244. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. A. HANLON, a subject of the Queen of Great Britain, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Elevated Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention, which relates to elevated railways, consists in the peculiar mounting or method of maintaining the car or cars upon the rail-line, which extends along and is supported upon a single post structure.

The gist of my invention is embodied in the arrangement of two continuous rail-lines, vertically disposed with respect to each other, and extending horizontally or approximately so above and below the cars which move between them. Thus I propose to employ the top rail line as the main or supporting one, which thus sustains the weight of the car or cars. On the other hand, the lower rail is intended simply to prevent lateral oscillation of the car or any undue divergence from its proper path of travel, and such rail-line does not serve as a support for the car; hence by this system a single-post line for an elevated railway can be employed with the advantages of minimum friction due to the manner of supporting the car or cars upon the upper rails, while at the same time motion of the cars laterally is prevented by the action of the under or guiding rail, and the result is that the cars travel as steadily as if supported upon two rails laterally and horizontally disposed with respect to each other.

The motive power for propelling the cars may be supplied by any efficient economical prime motor which may be found most desirable for the purpose.

The drawings accompanying this specification represent, in Figure 1, a side elevation, and Fig. 2 an end sectional elevation, of a portion of an elevated railway and car embodying my invention. Fig. 3 is a plan and shows the construction of the supporting superstructure built on a curve.

In said drawings, A A represent a series of the main supports of a single-post line of an elevated railway. Such supports or columns are to be arranged along the curbing of the sidewalks or centrally of the street, as may be preferred, or as circumstances dictate. Laterally disposed thereof and suitably braced and strengthened are secured side struts or brackets, B C, vertically situated with respect to each other. Upon them are located and fastened a continuous length of rail-lines, *a b*. The uppermost of such rail-lines is much heavier than the lower, since it is adapted to support the entire weight of the cars composing the train, and hence it must necessarily be adapted to resist the shocks and strains incident to the passage of cars over the line when actively employed. The lower rail line, *b*, is supported upon a series of side struts, C C, and, as shown, is arranged in vertical alignment, or thereabout, with relation to the top rail line, *a*.

The car is shown at D as an entirety and of any suitable design or construction. In the present instance the top portion is shown as arched both transversely and longitudinally, and may be braced after the manner of a truss, to more readily adapt it to be supported.

The suspension of the car, or the means by which the latter is supported upon and carried by the rails, is effected by and through two posts, *c d*, springing vertically from the roof of said car, and are united by a strong horizontally-disposed frame, *e*, in which are suitably journaled two wheels, E E, aligned with and resting upon the upper main rail-line, *a*. These wheels are independently journaled and pivoted, and can thus readily adjust themselves to any irregularities in the track. The advantage of this arrangement is more especially apparent when the car is in the act of traversing sharp curves. Now, it is evident that this manner of supporting the cars of an

elevated railway is the most efficient, since the supporting device is reduced almost to a single point or pivot, with the great consequent advantage that the cars can easily traverse short sharp curves, which must occur within the limits of a city; and, furthermore, the friction resulting from the movement of the cars upon the rails is reduced to a minimum. However, it is evident that when the points of support are above the car or cars lateral oscillation or transverse motion with respect to the right-line movement thereof would occur unless some method was adopted to prevent such motion. This lateral oscillation would necessarily be attended with great danger, owing to the excessive and sudden strains which would be brought to bear upon the various parts of the superstructure or upon the supports of the cars; hence I have disposed two wheels, F F, in alignment with each other, or one behind the other, and located them centrally of and beneath the car. Such wheels, when in proper position, are to engage with the lower rail line, *b*, and are not to receive very much, if any, vertical strain from the car, but are to prevent any lateral tendency of the car to diverge from its direct forward line of movement. The wheels further accomplish a second advantageous result—that is, they tend to steady the car longitudinally, for, owing to the single central point of support for the cars, the latter would tend to rock longitudinally in vertical planes; hence I have located the guide-wheels F F some distance apart toward either end of the car. Thus the combination of the supporting-wheels E E and guide-wheels F F produces the greatest steadiness of the car, combined with the least amount of friction.

In rounding or traversing curves, and to prevent any tendency of the cars from leaving the rail, I have provided "guard-rails" *f f*, so called, which are arranged concentric with the main rail-line *a*, and supported upon a series of strong braces or girders, *g g*. These latter are secured to the main superstructure A, or, as shown in the drawings, to the struts C C.

Upon the posts *c d* are arranged two horizontally-revolving loose anti-friction wheels, *h h*, which are so located as to impinge against the guard-rail when the car is traversing a curve, and thus counteract the strain then brought upon the wheels E E and their connecting parts. These wheels *h h* are represented at a point about midway between the top of the car and the journals of the wheels E E.

I do not confine myself to the particular disposition of the guard-rails upon curves alone, since they may be introduced continuously along the line with equally good results.

As shown in Fig. 3, since the car is turning in the direction shown the inner guard-rail *f* will be active, while if the curve should be reversed the outer guard-rail would then serve to resist the centrifugal force. Furthermore, in the same figure, but one anti-friction guard-wheel *h* is represented, while in Fig. 1 two such wheels are shown; and I do not desire to be limited strictly to the number or to their precise location.

In traversing curves it will be understood that each wheel of the sets E E F F is not only journaled separately, but also capable of motion within a pivotal truck, G, as is the case in ordinary railway-car trucks; hence it is obvious that each wheel will adjust itself to a curve of any radius, however small. As before premised, this system of elevated railways is adapted to the successful application of any motive power.

I am aware that it is not new to provide an elevated-railway car with two horizontal wheels which bear against the same rail or shell which is in contact with the supporting-wheel, and I therefore do not claim the same.

I claim—

1. The combination of car-supporting wheels arranged above a car, the guide-wheels beneath the same, and rails on which they run, with horizontal guard-wheels carried by said car and guard-rails against which said guard-wheels turn, substantially as set forth.

2. The rails *f f*, supported by the superstructure B and brackets *g g*, and the horizontal guard-wheel *h*, which turns between them, in combination with the car to which said guard-wheel is attached, substantially as described.

3. The combination of the supporting-wheels E and the guide-wheels F, the rails on which they run, the guard-wheel *h*, the rails *f f*, in contact therewith, and the car to which all of said wheels are attached, substantially as set forth.

4. A car for elevated railways, constructed, substantially as described, with a set of supporting-wheels arranged one behind the other and above the car, a similarly-disposed set of guide-wheels beneath the car, and the anti-friction guard-wheels, all substantially for the purposes explained.

5. In combination with the single-post superstructure A, the arms B B, upon which are secured the rails *a f*, the brackets C C, with guide-rail *b*, and the posts *g g*, carrying the second guard-rail *f*, for purposes stated.

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

JOSEPH P. A. HANLON.

Witnesses:
H. E. LODGE,
H. D. TEWKSBURY.