C. L. HORACK.

Elevated-Railway.

No. 162,751. Patented May 4, 1875.

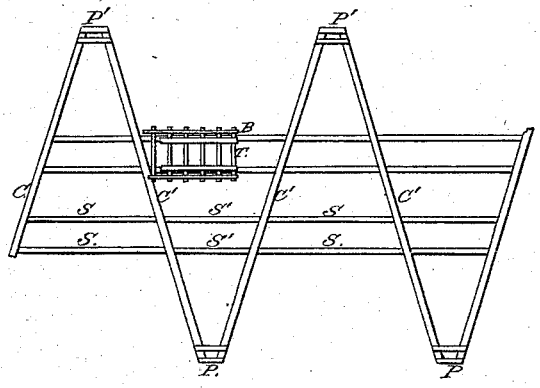


Fig 1.

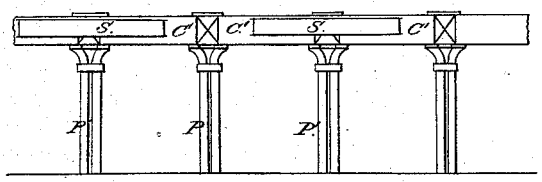


Fig 2.

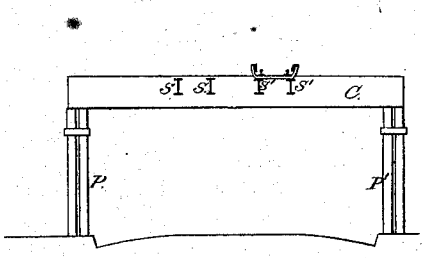


Fig 3.

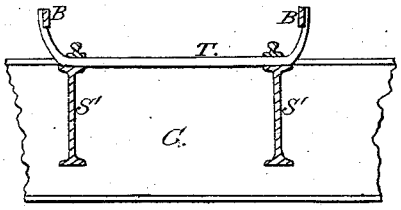


Fig 4

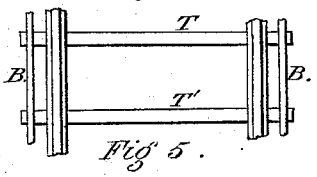


Fig 5.

Witnesses:
P. L. Arnold
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# UNITED STATES PATENT OFFICE.

CARL L. HORACK, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN ELEVATED RAILWAYS.

Specification forming part of Letters Patent No. **162,751**, dated May 4, 1875; application filed April 6, 1875.

*To all whom it may concern:*

Be it known that I, CARL L. HORACK, of the city of Brooklyn, State of New York, have invented an Improvement on Elevated Railroads, of which the following is a specification:

The object of my invention is to so arrange in an economical way the posts, cross-beams, track-stringers, and ties on an elevated railroad, as to greatly reduce the danger to trains resulting from their accidentally leaving the track, and to impart additional strength and stiffness to the structure without increase of material.

The accompanying drawing shows the structure as invented by me.

Figure 1 is a ground plan of several spans; Fig. 2, a side elevation of the same; Fig. 3, a vertical section of the structure. Fig. 4 is an elevation, and Fig. 5 a ground plan, of ties under the rails, and their connection with each other, both drawn on a larger scale than Figs. 1, 2, and 3.

The posts P P′ supporting the structure are placed in two rows, so that the posts on one side are opposite the spaces between the posts on the other side of the structure. Each post is connected with the two nearest opposite ones by cross-beams C C′, and between the latter the track-stringers S S′ are securely fastened. Their tops are somewhat below or nearly level with those of the cross-beams. The ties T T′, supposed to be of iron, are fastened in a suitable manner on top of the track-stringers. Their ends are bent upward, as shown in Fig. 4, and connected with each other by a bar, B, securely fastened to them, as indicated in Figs. 4 and 5.

Fastening the track-stringers between the cross-beams, as proposed by me, is preferable to laying them on top of the cross-beams in the usual manner, as, owing to the different lengths of such track-stringers, they may vary in height, and this is the easiest way of getting their tops level.

Comparing my elevated railroad with one constructed as usual with cross-beams at or near right angles to the line of the road, it is evident that, as the number of cross-beams is doubled, the average length of the track-stringers is reduced one-half.

This circumstance, in combination with the peculiar construction of the ties and their connection, materially lessens the danger attending the derailment of trains on elevated railroads.

If such an accident should take place, the wheels on one side of the train would strike the bar B fastened to the ties T T′, and by it be prevented from further motion sideward. The danger still remaining would be the dropping down of the wheels on the other side between the ties, thereby breaking the ties and spreading the track. The laying of string-pieces along the rails on top of the ties, or placing the ties close together, might prevent this, but would contribute to darkening the street underneath.

The arrangement, and the increased number of the cross-beams, as proposed by me, will have the consequence that in most such cases of accident, the car which has left the track will come to rest on one of the cross-beams C C′, which, on an elevated railroad, constructed with posts opposite each other, could only be accomplished by placing the latter very close together, thereby largely increasing the expense.

A further advantage of this structure is the increased rigidity and stiffness which it possesses.

The ends of every two adjoining cross-beams being connected makes them act as lateral braces, which fact may do away entirely with the necessity of providing additional lateral bracing.

Another and very important advantage of this structure is that, providing the distances between the posts on one side of the structure are not very much in excess of the lengths of the cross-beams, a considerable saving in the cost of the track-stringers may be accomplished, and although the cost of the cross-girders is somewhat increased, owing to their greater length, the total reduction in the cost of the structure will, as calculations have shown, under certain circumstances, amount to ten per cent.

I claim as my invention—

1. The combination, in an elevated railroad, of the posts P P′, cross-beams or their equivalent C C′, and the track-stringers S S′, when

the arrangement is such that the posts on one side of the structure are placed opposite the spaces between the posts on the other side, one cross-beam running from each post to each of the two nearest posts on the other side.

2. The combination described, when the arrangement is such that the track-stringers are fastened between the cross-beams, the tops of the former remaining below or level with the tops of the latter.

CARL L. HORACK.

Witnesses:
FRANCIS MILLER,
WM. HENRY SMITH.