

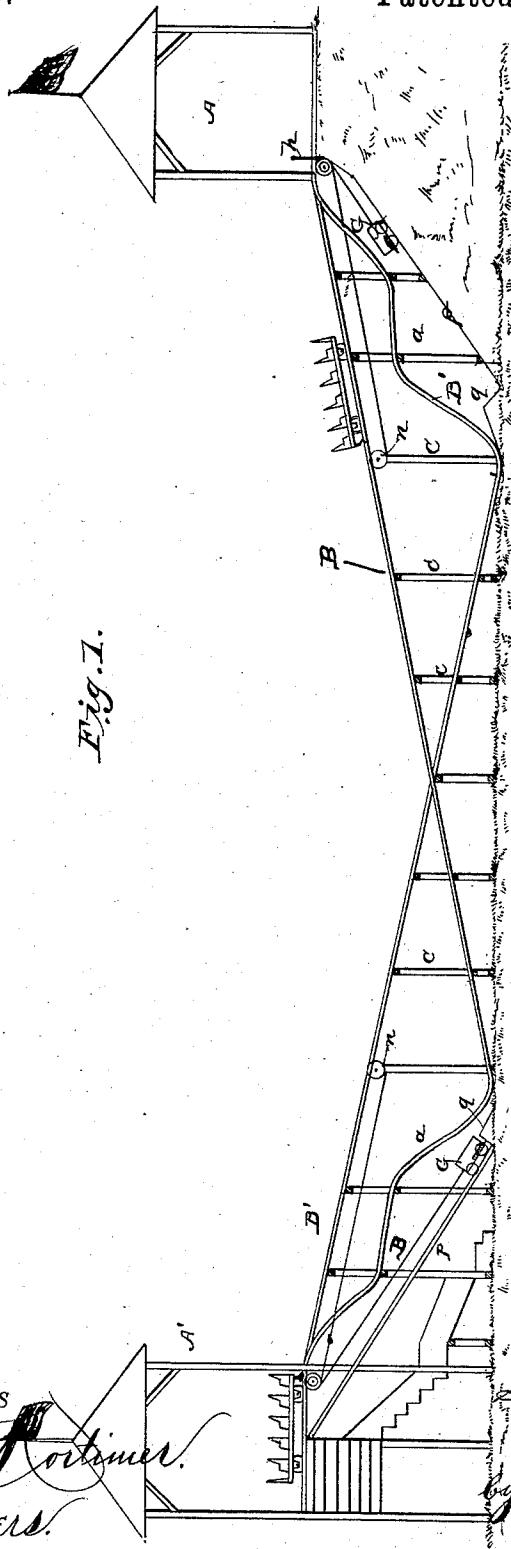
(No Model.)

4 Sheets—Sheet 1.

L. O. ROOT.  
ELEVATED RAILROAD.

No. 315,555.

Patented Apr. 14, 1885.



WITNESSES

*H. W. Mortimer.*  
*E. G. Siggers.*

*Lawrence O. Root*  
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(No Model.)

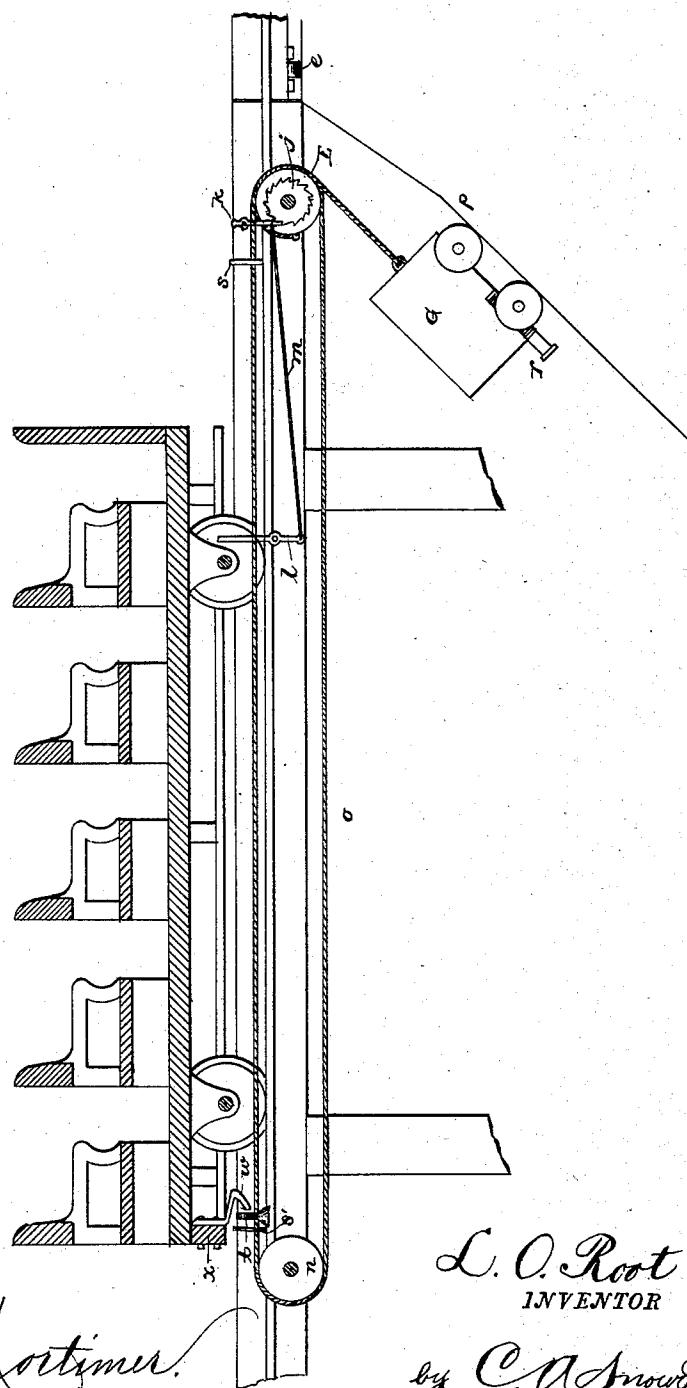
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Fig. 2.



WITNESSES

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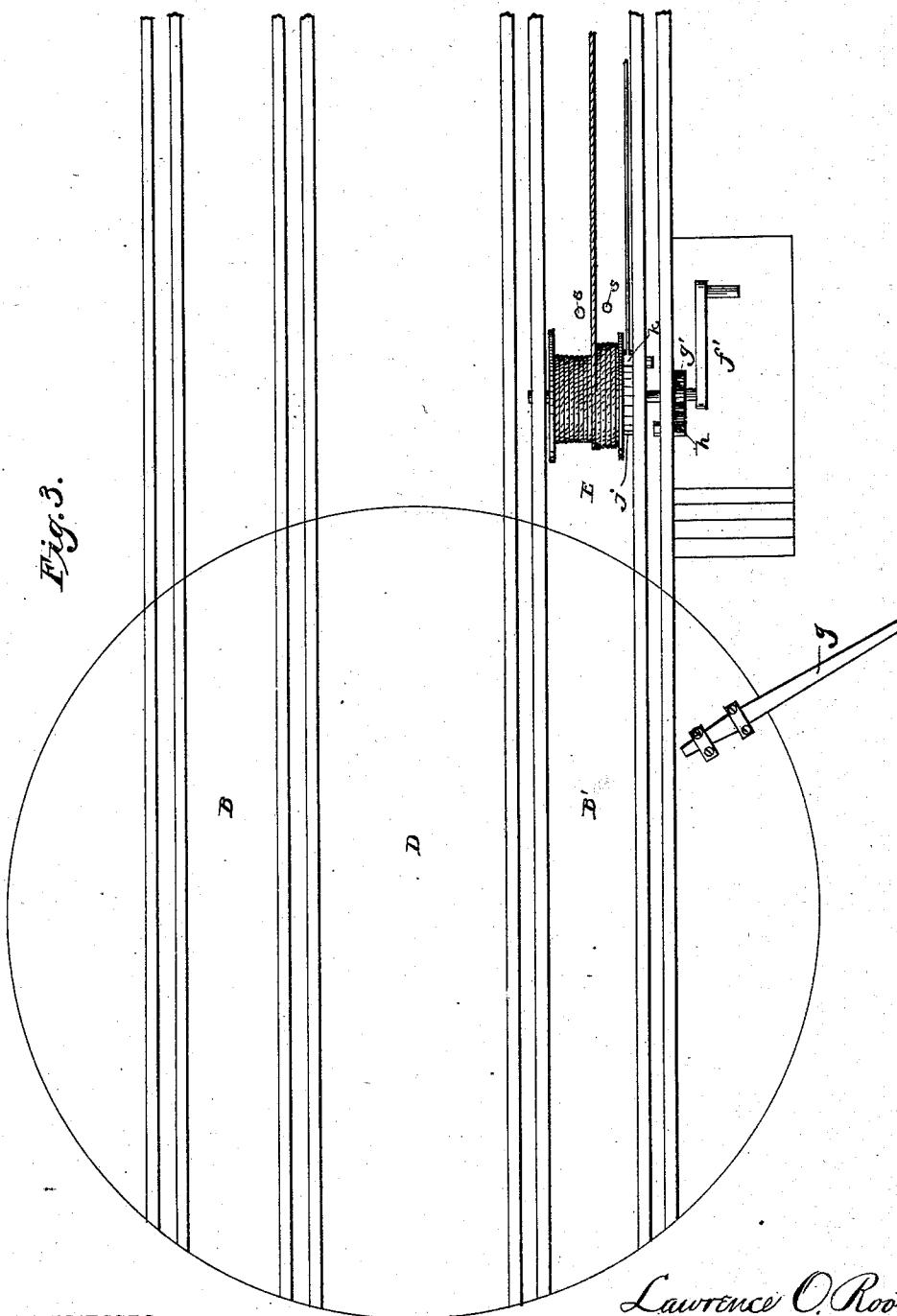
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WITNESSES

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(No Model.)

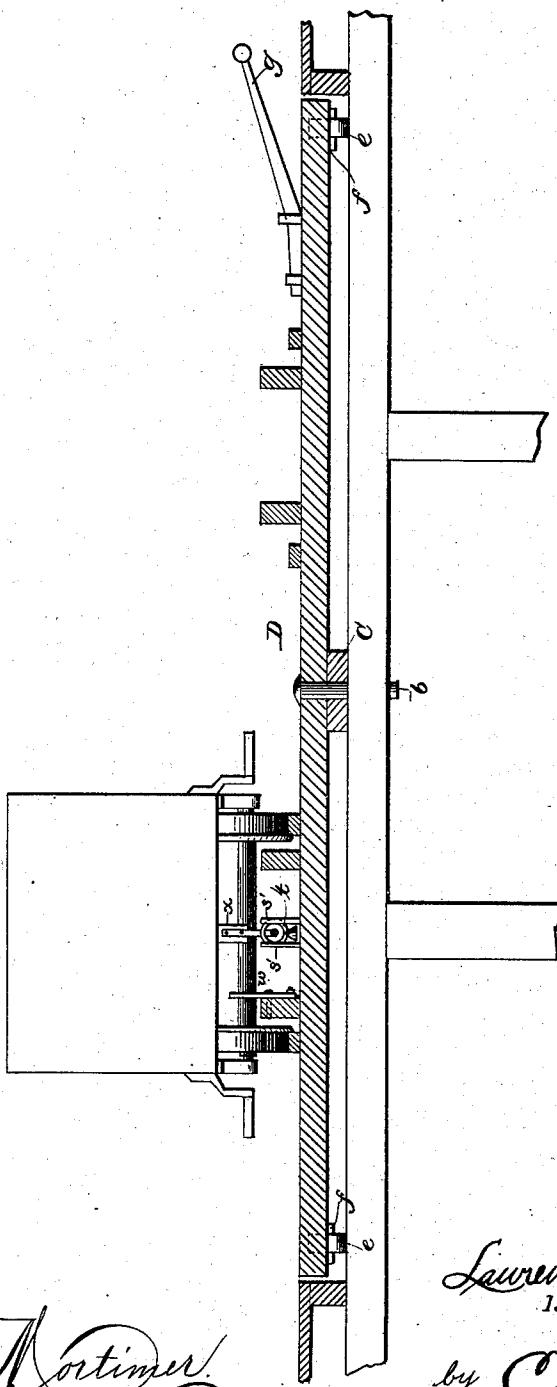
4 Sheets—Sheet 4.

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Fig. 4.



WITNESSES

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# UNITED STATES PATENT OFFICE.

LAWRENCE ODELL ROOT, OF MINNEAPOLIS, MINNESOTA.

## ELEVATED RAILROAD.

SPECIFICATION forming part of Letters Patent No. 315,555, dated April 14, 1885.

Application filed September 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE O. Root, a citizen of the United States, residing at East Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Elevated Railroads, of which the following is a specification, reference being had to the accompanying drawings.

10 My invention relates to an elevated railroad designed for use as a source of amusement and pleasure; and it consists in the construction and combinations of parts hereinafter fully described, and pointed out in the claims.

15 In the drawings, Figure 1 is a longitudinal vertical section showing my improved track and the means for operating the cars thereon. Fig. 2 is a view of the car employed, showing the means for drawing the same to the top 20 of the incline. Fig. 3 is a plan view taken at one end of the line; and Fig. 4 is a rear elevation of a car.

25 In the accompanying drawings, in which like letters of reference indicate corresponding parts in all the figures, A A' represents two towers or stations, one of which, A, is shown arranged upon a hill or height of ground, while the other is supported at an elevation on uprights. These stations are located any de- 30 sired distance apart, and the one supported on uprights is provided with steps leading to the top of the same. There are two tracks, B B', connecting said stations, said tracks being sup- 35 ported upon a trestle work, C, and are pro- vided with beams or guard-rails running their entire length to prevent the cars while in transit from jumping the track. The tracks B B' are provided with two very steep de- 40 scents, a, from the point where they leave the towers A A'. At the end of these descents or inclines they reach a short level, and from this point the tracks gradually incline in oppo- 45 site directions toward the opposite stations.

At each station A A' is arranged a turn- 45 table, D, by which a car may be shifted from one track to the other. These turn-tables D are pivoted to the floor of the stations by means of a bolt, b, upon which is a washer, c, said washer being arranged between the under 50 side of the turn-table and the floor to which it is pivoted. Upon the under side of the turn-table are arranged rollers e, a portion of each

of which bear or rest in recesses on the under side of the turn-tables D, the ends of the shafts of said rollers bearing in brackets f, secured 55 upon the under side of the turn-tables. A lever, g, is secured to each of the turn-tables at any suitable point. It will thus be seen that by the arrangement shown and described the tables may be turned with but little power 60 or exertion.

I have mentioned that there were guard-rails to prevent the cars from jumping the track. These guard-rails are arranged between the two rails composing the track. At 65 the point where the track enters the station, which point is adjacent to the turn-table, is provided a drum, E, the shaft of which has bearing in the guard rails or beams. One end of this shaft of the drum E extends through 70 and beyond the outer track, and is provided at its end, which is squared, with a crank or operating-handle, f'.

Upon the shaft of the drum E, just outside of the guard-rail, is provided a disk, g', which 75 is rigid thereon and is adapted to be engaged by a braké-lever, h, carrying a shoe, said lever being pivoted to the rail. Upon the shaft of the drum adjacent to the inner side of the outer guard-rail is provided a ratchet-disk, j. 80 Pivoted to the inner side of the guard-rail adjacent to the ratchet-disk is a pawl, k, the lower end of which engages any one of the teeth upon the ratchet-disk.

A short distance down the track toward the 85 opposite station is an arm or lever, l, which is pivoted to the inner side of the outer guard-rail. The lower end of this arm or lever ex- 90 tends below the track-bed, while the other or upper end extends a slight distance above the top of the rails. A rod, m, connects the lower end of this arm or lever with the lower end of the pivoted pawl. It will thus be seen that should the upper end of the pivoted lever be pushed toward the said pawl it will, through the medium of the connecting-rod, raise the lower end of the pawl from engagement with the ratchet-disk. Between the guard-rails, about sixty-five feet from the drum E, is mounted a drum, n. A rope, o, is secured to the drum E, and is wound around the same. The end of this rope is then passed under the road to the drum n, where it passes over the same, and is carried over the drum E.

Under track B, at the point where it leaves the station A, is a track, *p*, which has a very steep incline. At the bottom of this track is arranged a bumper, *q*.

5 G represents a weighted car, which is adapted to travel on the track *p*. This car has a spring-bumper, *r*, at its end, which strikes against the bumper *q*, thus preventing the car from being damaged by striking against the bumper *q*. The end of the rope *o* is shown secured to this car, and said car is shown in position at the top of the incline for a descent.

Just in rear of the drum *E* are secured to the road-bed two uprights or posts, *s*, while 15 just in front of the drum *n* are arranged similar uprights or posts, *s'*.

Secured to the rope *o* is a loop, *t*, which is held in an upright or vertical position by means of a weight, *u*, which is cast integral 20 therewith. The loop *t* is rigidly secured to the rope *o*, and when said rope is in its normal position the said loop occupies a position just in front of the uprights *s*, and bears against the same with its rear side. Upon the 25 under rear side of the car is a hook, *w*, which is bolted to a cross or tie beam, *x*, about midway between the ends of the same, said hook being substantially V shape in form.

Apparatus of the same construction as that 30 already described is arranged at station A' upon the track B.

In operation, supposing the car to be at station A', ready for a start, the car is moved forward and strikes the incline and rapidly 35 descends upon the track B', and in its descent gathers sufficient force or momentum to carry it up the incline. The hook upon the under side of the car strikes the loop upon the rope *o*, and the instant that the hook has passed the 40 loop and the said loop has regained its normal position the forward axle of the car has struck the pivoted arm or lever *l*, which, through the medium of the rod *m*, raises the lower end of the pawl *k* from engagement with the ratchet- 45 disk *j*. The weighted car now starts, and in so doing brings the loop into engagement with the hook *w*. Thus, as the weighted car descends, it unwinds the rope from the drum and draws the car forward through the agency 50 of the hook on the car and the loop engaging the same. The instant that the weighted car has arrived at the bottom of the incline the loop on the rope *o* will have arrived at the 55 uprights *s*, adjacent to the drum *E*, and will stop at that point. The passenger-car, however, will have gathered sufficient momentum to have carried it into station A' and upon the turn-table, and is then turned half around and is ready to make a descent on track B.

60 I have mentioned that the shaft of the drum *E* was squared and provided with a crank or handle. By the use of this handle the drum may be turned to draw the car to the top of the hill. The pawl is then set and the apparatus 65 is in readiness for the car on its return trip.

Changes in the details of construction may be resorted to without departing from the

spirit of my invention; hence I wish to have it understood that I do not limit myself to the exact construction and precise arrangement 70 of parts shown and described, but reserve to myself the right to make all such slight changes and alterations as may properly fall within the scope of my invention.

Having fully described my invention, what 75 I claim as new, and desire to secure by Letters Patent, is—

1. In an inclined elevated railroad, the combination, with two stations located any suitable distance apart, of tracks B B', each having a steep descent and ascending incline, and inclined tracks G, as shown and described, and for the purpose set forth.

2. In an inclined elevated railroad, the combination, with two stations, of tracks B B', connecting the same, each of said tracks having a steep descent and an ascending incline at their opposite ends, and a track, G, located at each station, said tracks each having a steep incline, and running beneath the tracks 90 B B', as set forth.

3. In an inclined elevated railroad, the combination, with two stations, of a track connecting the same, drums arranged at one end of said track, a rope connecting said drums, a 95 weight attached to one end of said rope, and a loop adapted to engage a hook on the car, rigidly attached to said rope, substantially as set forth.

4. In an inclined elevated railroad, the combination, with two stations, of a track connecting the same, drums arranged at one end of said track, a rope connecting said drums, a weight attached to one end of said rope, and means, substantially as described, for effecting the release of the weight, for the purpose set forth.

5. In an inclined elevated railroad, the combination, with two stations, of a track connecting the same, drums arranged at one end 110 of said track, a rope connecting said drums, a weighted car attached to one end of said rope and adapted to travel on a steep incline, a loop rigidly secured to said rope, a hook on the rear under side of a car, and means, substantially as described, to effect the release of the weighted car, for the purpose set forth.

6. In an inclined elevated railroad, the combination, with two stations, of a track connecting the same, drums arranged at one end 120 of said track, a rope connecting said drums, a weight attached to one end of said rope, a ratchet-disk on the drum *E*, a pivoted pawl to engage the same, an arm or lever, *l*, a rod connecting the pawl and lever, a loop rigidly attached to said rope, and means, substantially as described, carried by the car for engaging said loop.

7. In an inclined elevated railroad, the combination, with two stations, of a track connecting the same, drums arranged at one end 130 of said track, a rope connecting said drums, a weight attached to one end of said rope, a ratchet-disk on the drum *E*, a pivoted pawl

to engage the same, an arm or lever, *l*, a rod connecting the pawl and lever, a loop rigidly attached to said rope, a hook secured to the rear end of the car, and uprights *s s'*, substantially as and for the purpose set forth.

8. The combination, with the traction-rope, of a loop secured thereto, said loop having a weighted end, whereby it is held in a vertical position, as set forth.

In testimony that I claim the foregoing as to my own I have hereto affixed my signature in presence of two witnesses.

LAWRENCE ODELL ROOT.

Witnesses:

R. W. CUMMINGS,  
C. E. SCHAFER.