

(No Model.)

3 Sheets—Sheet 1.

H. PAIGE.
ELEVATED CABLE RAILWAY.

No. 395,073.

Patented Dec. 25, 1888.

Fig. I.

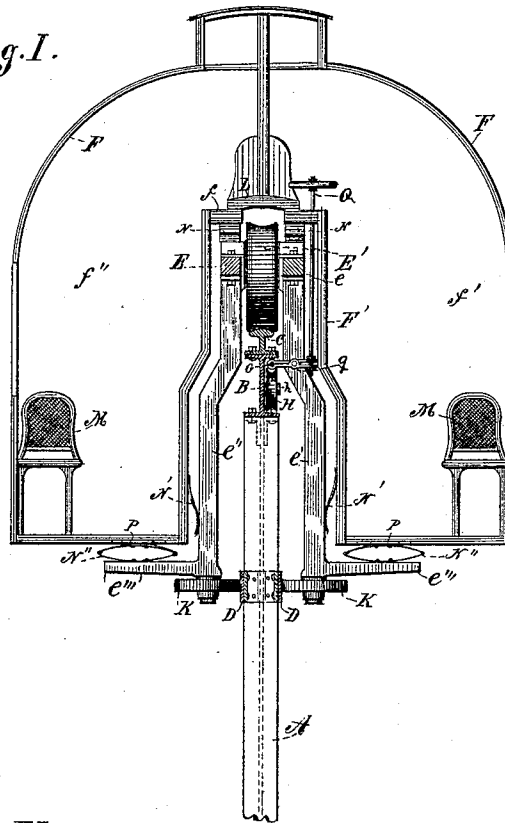
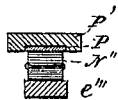


Fig IV.



Witnesses,

A. H. Osahl.
Emma F. Chino.

Inventor

Howe Paige

By his Attorney
Jas. F. Williamson

(No Model.)

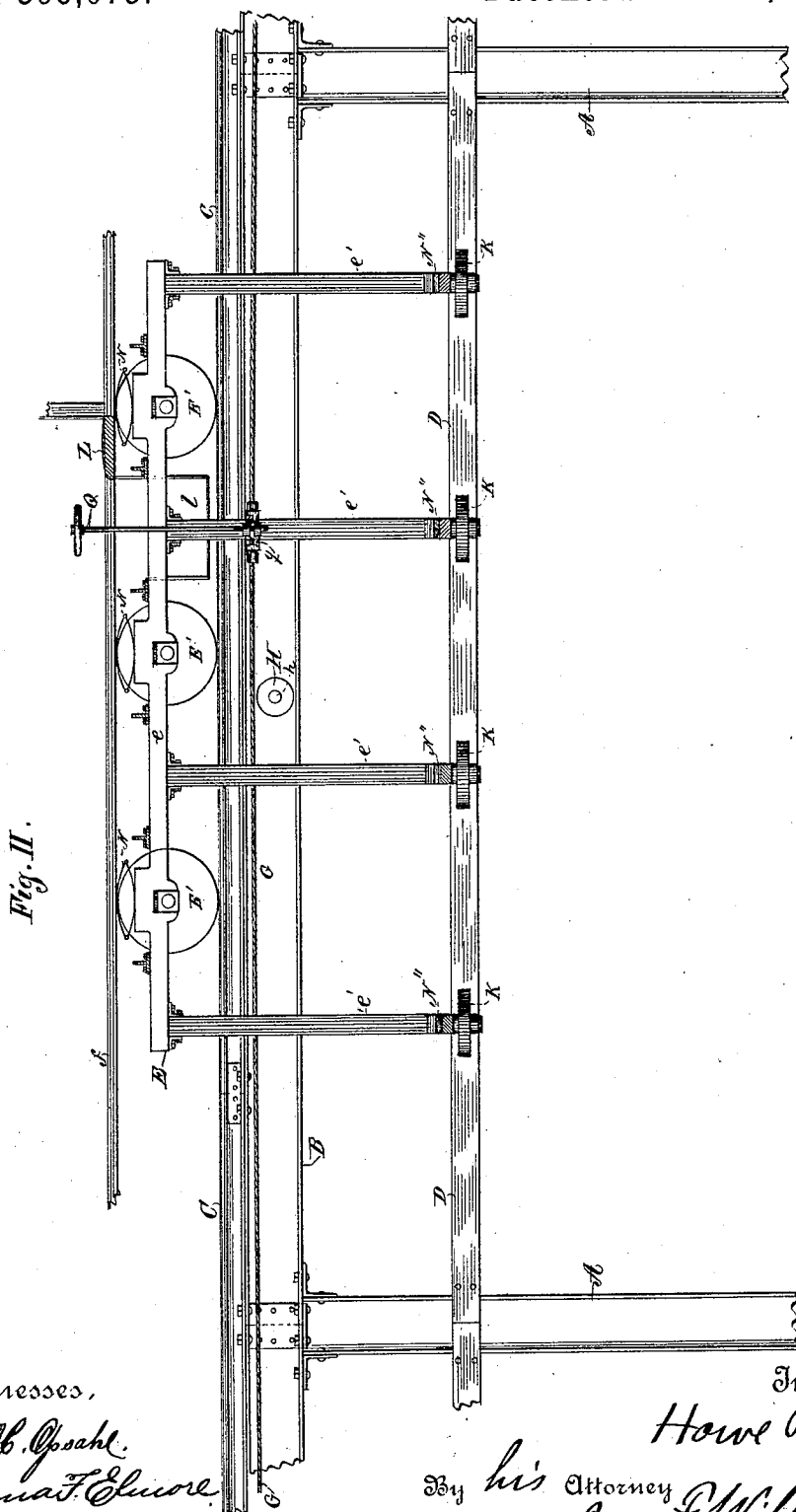
3 Sheets—Sheet 2.

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Witnesses,

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Emma F. Elmore.

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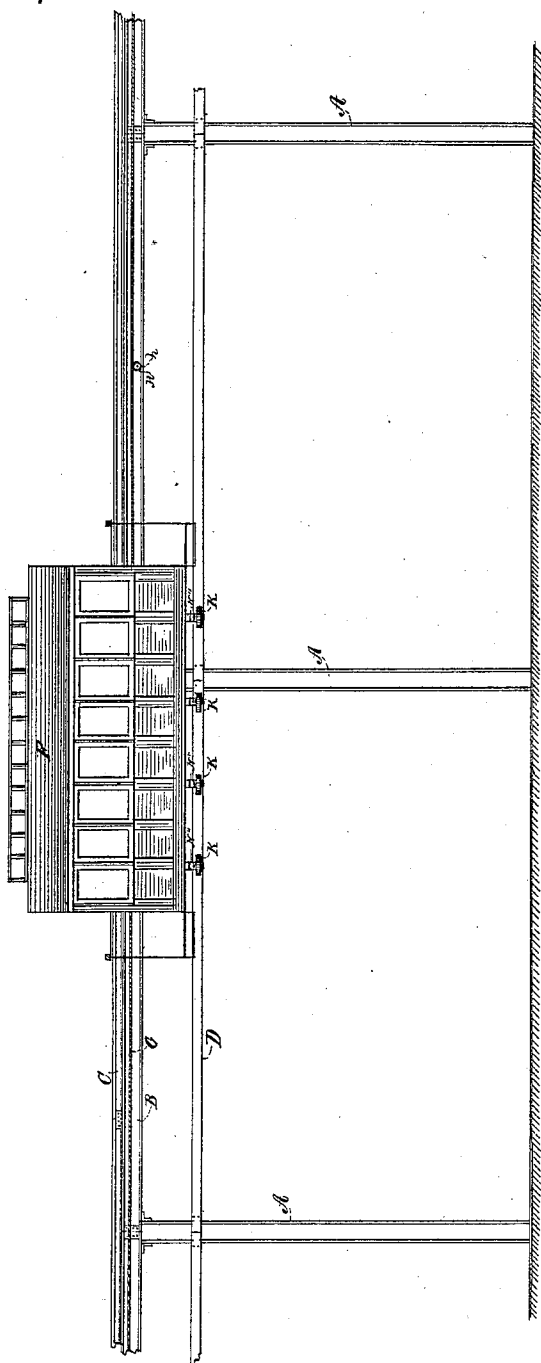
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Fig. III.



Witnesses.

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UNITED STATES PATENT OFFICE.

HOWE PAIGE, OF MINNEAPOLIS, MINNESOTA.

ELEVATED CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 395,073, dated December 25, 1888.

Application filed April 18, 1888. Serial No. 271,096. (No model.)

To all whom it may concern:

Be it known that I, HOWE PAIGE, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Elevated Cable Railways, of which the following is a specification, reference being had to the accompanying drawings.

Elevated railways as generally constructed take up much space in the public streets, and are a great nuisance to the adjacent property.

The general object of my invention is to reduce these objectionable features as far as possible. To this end I provide a car and a track of peculiar construction. I use a single rail mounted on a continuous iron girder supported on a single row of upright columns. The girder is made to serve as a conduit for the cable, and the car is supported from the single rail with its center of gravity below the point of support.

In the drawings, like letters referring to like parts throughout, Figure 1 is a vertical cross-section. Fig. 2 is a side elevation of the track and the car-supporting truck, the car itself being removed; and Fig. 3 is a general view, in side elevation, illustrating the system. Fig. 4 is a detail.

A are the metallic supporting-columns.

B is an I-shaped steel girder supported on and securely bolted to the tops of the upright columns.

C is the rail, of the ordinary construction, bolted to the top of the girder B, the rails being so placed as to break joints with the girders.

D D are horizontal guide-bars attached to the posts below the girder and extending the whole length of the track.

E E' is the truck, taken as a whole.

F is the car, and G is the cable. The cable is supported on idler-sheaves H, which are loosely mounted on short shafts *h*, secured to the girder between its upper and lower flanges. The truck E is in shape somewhat like a saddle, the horizontal yoke *e* corresponding to the seat and the pendent parts *e'* *e''* corresponding to the stirrups.

Directly under the yoke and between the pendent parts are the supporting-wheels E', journaled in suitable boxes secured to the op-

posite sides of the yoke. The pendent parts straddle the track, and are preferably provided with right-angled projections or arms *e'''* at their lower extremities, which serve as seats for springs. The pendent parts *e'* *e''* are farther apart at their lower than at their upper ends, being bent upon themselves outward and then downward at points directly opposite the girder when in position on the track.

To the pendent parts *e'* and *e''* are attached horizontal rollers K in proper position to bear against the guide-bars D whenever the truck swings the least bit to either side. As there is one set of rollers on each side of the guide-bar, only a very limited oscillation is allowed to the truck. The car F has its central part cut away, conforming in shape to the truck-frame E, and is mounted on the truck as a rider sits in a saddle. The car is thus divided by the part of its frame F' which fits over the truck into right and left compartments, *f'* *f''*, suitable for passengers or freight. The top piece or yoke-bar, *f*, of the center frame, F', is provided with a seat, L, and the truck-frame E is provided between two wheels with a foot-board, *l*, affording a place for the operator of the car. The compartments *f'* *f''* may be provided with seats M for passengers.

Springs N and N' are interposed between the yoke *f* and the truck-frame, both at the top and on the sides. The springs at the side should be attached either to the car alone or to the truck alone, so as to allow freedom of oscillation.

On the arms *e'''* may also be placed springs N'' directly under the floor of the compartments *f'* and *f''*. These springs, if used, are made fast to the arm *e'''*, and are not connected to the car. As shown, the floors of the compartments are provided with grooves or guides P, in which is a movable cross-head, *p*, which is bolted to the top of the spring. By this construction the car is allowed to oscillate on the springs, the groove and cross-head allowing the necessary lateral motion to the car without disturbing the spring. The groove and cross-head may, however, be dispensed with and the car be allowed to rest freely on the spring and move over the same. The cross-head and guide are preferred, as they

allow the lateral motion without danger of displacing the spring by movement lengthwise of the car.

Q is a grip, of any suitable construction, which is mounted on the truck-frame adjacent to the operator's seat, and is provided at its lower end with jaws *q* for grasping the cable. The cable is driven from a source of power at a central station in the customary manner.

The operation is evident from the description already given.

The special advantages of my construction, in addition to minimizing the obstruction in the streets and the nuisance to adjacent property, are low first cost, economy of operation, ease of repair, protection from snow and dirt, security against derailment, and accessibility for passengers. The structure is simple and requires little material. The one girder supports both the rail and the cable, obviating the necessity of any other conduit. Owing to its elevated and exposed position, the cable can be readily reached for repairs, and is never obstructed by snow, ice, or dirt. The center of gravity of the car is below the point of support, and hence derailment is practically impossible.

The passenger-compartments of the car may be brought comparatively near the street-level without interfering with objects, thus affording convenience of access without climbing long flights of stairways. The car is free to rise and fall or swing laterally without any tendency to displace the truck; and economy of power is effected by applying the cable substantially on a line with the car's center of gravity.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination, with a single-rail elevated track, of a saddle-shaped truck supported from said track with its pendent portions on the opposite sides thereof, a saddle-shaped car mounted on said truck, and springs interposed between the truck and the car, the springs between the yoke-pieces of the car and truck being fast to both, and the springs between the pendent portions of the car and truck being fast to one part only, substantially as described, whereby the car is free to oscillate on the truck.

2. The combination, with the car-truck E, consisting of the parts E' *e* *e*', having the lateral arms *e*', of the car F F' *f* *f*', having the guides P, the cross-heads P', movable in

said guides, and the springs N'', rigidly secured to said arms and to said cross-heads, substantially as described.

3. In an elevated railway, the combination, with a single rail and a single row of supporting-columns, of an I-shaped girder adapted to tie together the columns, support the rail, and serve as a cable-conduit, idler-sheaves secured to said girder between its upper and lower flanges, and an endless cable supported on said sheaves, substantially as described.

4. The combination, with a single-rail elevated track having an I-shaped girder for supporting the rails, of a car-propelling cable mounted on said girder in the space between its upper and lower flanges, a car depending from said rail with its center of gravity below the point of support, and a grip for connecting the car to the cable, substantially as described.

5. In a single-rail elevated railway, the combination, with an I-shaped girder adapted to tie together the supporting-columns, support the rail, and serve as a cable-conduit, of a cable mounted on said girder between its upper and lower flanges, a saddle-shaped truck supported from the single rail with its pendent parts on the opposite sides of the track, a saddle-shaped car mounted on said truck, the center of gravity of the truck and car taken together being below the point of support, and a grip mounted on said car and truck for detachably connecting the same to the cable, substantially as described.

6. The combination, with a single series of fixed upright posts, of I-shaped girders secured to the tops of said posts, I-shaped rails secured to the tops of said girders, a saddle-shaped truck supported from said rail with its depending parts on the opposite sides of the track, a saddle-shaped car mounted on said truck with its dependent parts on the same horizontal level with the dependent parts of the truck, a cable mounted on said girder between its upper and lower flanges, a grip on the car and truck for connecting to said cable, a horizontal guide-bar secured to said posts, and horizontal anti-friction rollers secured to the dependent portions of said truck adapted to bear against said guide-bar and limit the lateral motion of the truck, substantially as described.

HOWE PAIGE.

In presence of—

EMMA F. ELMORE,
JAS. F. WILLIAMSON.