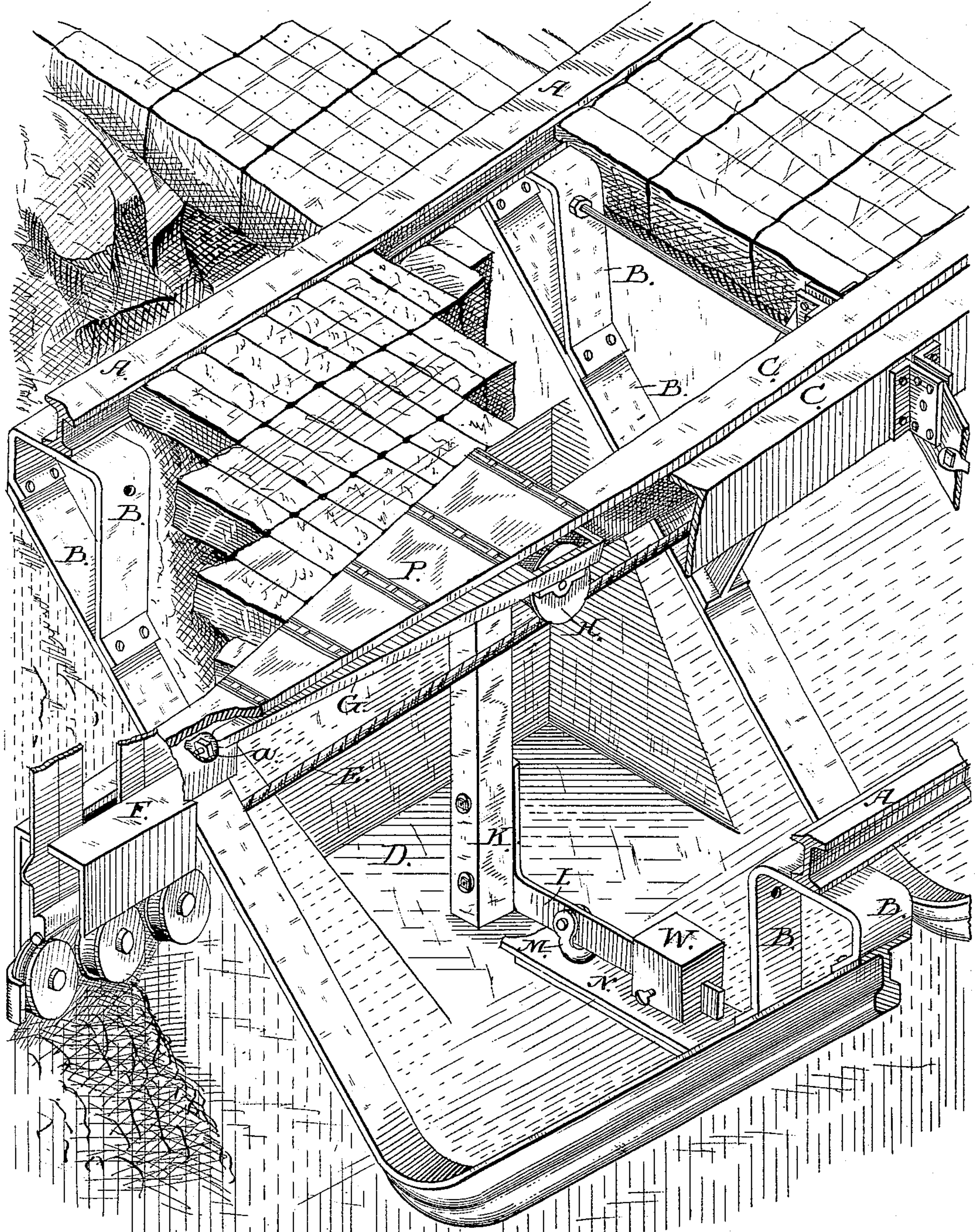


(No Model.)

H. ROOT.
DEPRESSION PULLEY IN CABLE ROADS.
No. 246,210. Patented Aug. 23, 1881.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY ROOT, OF SAN FRANCISCO, CALIFORNIA.

DEPRESSION-PULLEY IN CABLE-ROADS.

SPECIFICATION forming part of Letters Patent No. 246,210, dated August 23, 1881.

Application filed June 6, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY ROOT, of the city and county of San Francisco, State of California, have invented an Improvement in Depression-Pulleys in Cable-Roads; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in the construction of cable-roads, and more especially to what are known as "depression-pulleys," the function of which is to hold the traveling rope or cable down below the surface of the street and within the tunnel or tube at points where the grade changes, forming depressions in the track.

It consists in a novel means of hanging and operating said pulleys, whereby they can be easily pushed to one side by the passing gripe, and will return when freed, their construction rendering them not liable to do injury if, for any reason, they refuse to work, and their position being such that they are at an angle with the line of travel of the gripe-shank, and thus enable me to run the cable either in the center of the tunnel or one side, to suit the gripping device. This will be more fully seen in the following description and accompanying drawing, reference to which is hereby made.

The figure shows a perspective of my device. Let A represent the rails set on appropriate supports B.

C represents the slot-irons, being here shown as made of angle-iron.

D represents the tunnel in which the cable E travels, and F the approaching gripe. Let it be supposed that at this point the grade of the street changes to an ascending grade. Now it is obvious that if no device were employed to hold the cable down it would try to extend in a straight line. Depression-pulleys are here used. They are usually common pulleys, upon the under side of which the cable presses, and which are placed to one side and passed by a peculiar gripe, or they may be adapted to move in some manner that the gripe may pass, and to return to place after it has passed.

The following is my device:

To the perpendicular side of the angled slot-iron C, I hinge an arm, G. This hinge consists of a staple, a, through which fits the end of the arm G, and is loosely secured by a nut. This

forms a practically universal joint, though any other form of universal hinge would do as well. The arm G widens toward its end and carries a pulley, H, properly journaled in its end. This is the depression-pulley and holds the cable down.

To the arm G is attached the upright arm K, the end of which does not touch the bottom of the tunnel, but is bolted to a horizontal arm, L, which is pivoted in a support or pivot-journal, M. The end of the arm L carries a weight, W. The pivot-journal M is pivoted to a base-piece, N, in such a manner as to be able to swing around, and thus is formed another practically universal joint. The weight W rests upon the piece N. The outer edge of the arm G is set at an angle with the slot and crosses it. It thus holds the rope in position for the gripe, and is yet adapted to swing out of line on the side on which it is hinged. The side of the angled slot-iron is cut away to allow the arm G to swing over, and a space is left in that side of the tunnel under the pavement for the same purpose. This space is covered by a metal plate, P. As the gripe approaches the depression or change of grade in the road the rope is pressed down by it, so as to be entirely free from the pulley. The gripe-shank presses against the arm G and pushes the pulley H away from the cable. The arm G in swinging to one side on its pivot-point or hinge, takes the arm K back with it out of the way. The arm K, in moving backward and around, raises the weight W, and swings it a little to one side free of the base-piece N. When the gripe has passed the weight W causes the arm G to swing back to its place. By pivoting the arms as I do I obtain resistance both to the upward strain and to the forward strain of the cable upon the pulley H; and by putting the whole frame at an angle with the line of travel of the gripe-shank I place the pulley in the proper place, and yet keep the other mechanism out of the way.

The method now in use is to place the cable some distance to one side of the slot in which the gripe travels. The gripe is then made L-shaped, so as to enable the shank to pass the depression-pulleys, as the cable is carried by the gripe at a fixed distance below the surface of the track. As the gripe approaches these

pulleys the cable is pressed down clear of them and the gripe-shank passes to one side of the pulleys. This method is objectionable from the fact that the draft being to one side it
5 causes a twisting strain on the gripe-shank.

A vibrating bracket carrying a depression-pulley, and set in the plane in which the gripe-shank travels, fastened at the bottom only, and operated by springs, has been tried and found
10 ineffective, because of the danger of the gripe being stopped abruptly by the breakage of any part of the mechanism. This results because when broken it presents an obstacle directly in the line of travel of the gripe.

15 By mounting my pulleys on a frame set at a small angle to the plane in which the gripe-shank travels, and hinged at two points with universal joints, I accomplish the objects of resisting both strains upon the pulley, and of
20 operating the cable either in the center of the tunnel or at a short distance to one side, as may best suit the construction of the gripping device, because the pulley will not interfere with the gripe-shank. If any part should break
25 it would fall over out of the way, because it is

not in the line of travel of the gripe-shank, and I thus avoid the danger described. If the change of grade in the road is very abrupt and the upward draft on the cable great, two or more pulleys may be mounted on the same
30 frame, so as to divide the work.

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

In a cable-railway having a tunnel and a
35 traveling cable, the depression-pulley H, journaled upon a frame consisting of a horizontal arm, G, pivoted by a universal joint at its rear end, the upright arm K, and horizontal arm L, pivoted at M by a universal joint, and having
40 a weight, W, said frame being set at an angle with the plane in which the gripping device travels, and operated as shown, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my
45 hand.

HENRY ROOT.

Witnesses:

S. H. NOURSE,
WM. F. BOOTH.