(No Model.)

H. ROOT.

CONSTRUCTION OF CABLE RAILWAYS.

No. 262,126. Patented Aug. 1, 1882.

Fig. 2

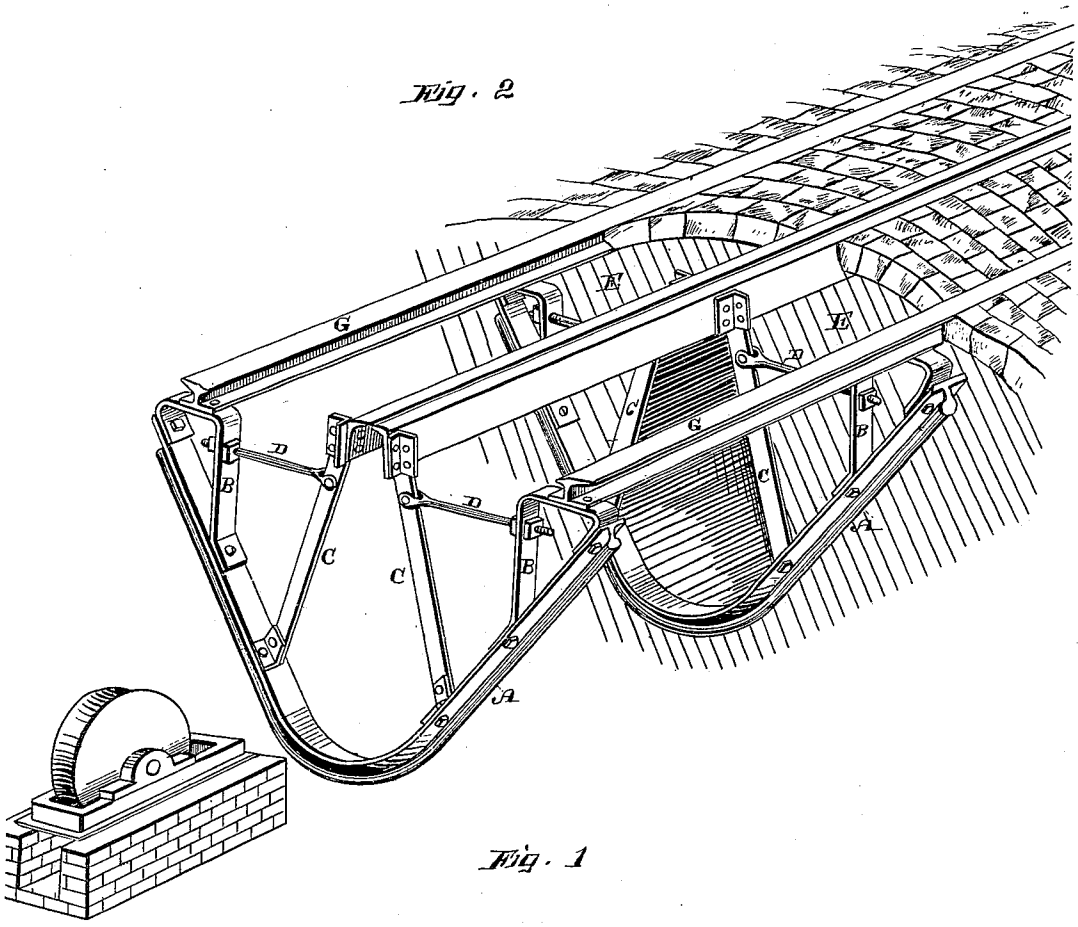
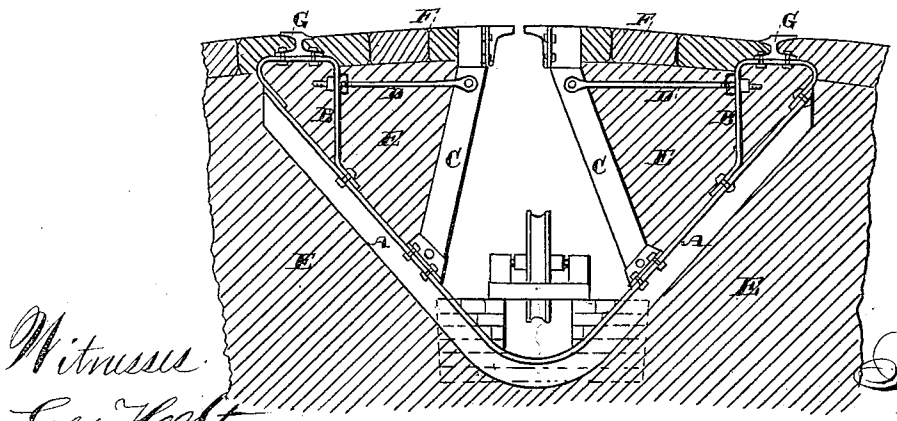


Fig. 1



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY ROOT, OF SAN FRANCISCO, CALIFORNIA.

CONSTRUCTION OF CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 262,126, dated August 1, 1882.

Application filed September 3, 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 the Construction of Cable Railways; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to cable railways; and it consists in the employment of a connecting-tie for the rails and supports for the slot-irons, by which both are rigidly supported from the tie and united to each other. In combination with this construction I employ a substratum of concrete or equivalent material, which will set or solidify and unite the whole into a continuous rigid structure, no part of which is liable to be displaced from its relation to the other, and also provide a support for the roadway.

Previous to my invention all cable railways had been constructed of iron ribs of the form of the tube, set at suitable intervals, to which the slot-iron or timber, as the case may be, was bolted, and the spaces between these ribs filled with wood to form a continuous tube. Outside and independent of this tube the rails were laid supported on short ties or other foundations, and were connected horizontally with the iron ribs by short bolts or rods, but were liable to settle by the undermining of their foundation without regard to the tube or the other rail of the track. This would frequently occur by the renewal of the paving outside of the track, the introduction of house-connections with the main sewer, or other disturbances of the street. This settling would cause great inconvenience, as the gripping apparatus, which is carried by the rails through the medium of the car or dummy, must travel in a fixed position in the tube, thus making a frequent adjustment of the rails to the tube necessary. The space between the rails and sides of the tube was filled with sand, which could not be securely confined, as the joints in the tube were liable to open by settling, so as to require a frequent relaying of the paving or planking, and making the whole insecure and expensive to maintain. In my invention the whole forms a single rigid structure.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a cross-section, and Fig. 2 is a perspective view.

A is the main tie, bent so as to embrace the tube, and it has fastened to the ends suitably-formed plates or chairs B, to which the rails G are fastened; or, if stringers are used, they may be fastened directly to the ties. The ties may be of various shapes; but in this case I have used old T-rail turned bottom up, with but one curve or bend, as this requires but one heat, and is thus cheaper.

C are upright supports for the slot-irons, having one end secured to the tie at points each side of the bend, sufficiently separated to form the necessary width for the tube.

D are tie-rods connecting said supports with the main ties or frames through the chairs, rails, or stringers, as the case may be. The rods D may be fixed, or may be screw-bolts having two nuts at one end for the adjustment of the slot-irons to or from each other during construction; or other equivalent means may be employed.

E is the concrete, in which the ties or frames are bedded at suitable distances to support the rails and slot-irons, which form the top of the tube. This concrete forms a support for the iron-work, the bottom and sides of the tube, and a foundation for the paving F, which fills the space between the rails and slot-iron, thus forming an even and durable roadway, which cannot settle below the level of the rails or slot-irons or cause a side pressure on the tube, as is the case where the roadway is supported on sand or other independent foundation. As nearly all the weight of the traffic is on the rails, the tendency of the rails to go down is resisted by a deep girder, of which the bent tie forms the top and this continuous mass of concrete forms the bottom.

I am aware that concrete as a material for foundations, underground sewers, and conduits has long been well known, and that concrete, brick-work, or iron-stone pipe might be used to form the tube between the iron ribs of the well-known construction without any particular invention, as these materials are as well known as wood; but it would be still subjected to all the danger of unequal settlement, and the short tie and stringer of wood require frequent

renewal and adjustment to the level of the tube.

It will be seen that a distinguishing feature of my invention is the connecting of the rails in the same structure as the slot-irons and the tube, so that all the parts are maintained in their relative position, and whatever may occur to alter the place of one will have no effect unless the change is sufficient to affect the whole structure.

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

1. In a cable railway, the tie connecting the rails and the upright supports for the slot-irons, in combination with a concrete foundation, substantially as and for the purpose herein described.

2. In a cable railway, the track-supporting ties A, in combination with the concrete foundation, substantially as and for the purpose herein described.

3. The combination of the rails G, ties A, and the tube formed of concrete or equivalent material, substantially as herein described.

4. In a cable railway, the rails and slot-irons supported and united by the ties A, in combination with a continuous surrounding mass of concrete or equivalent material, forming a bond and a support for the roadway, substantially as and for the purpose herein described.

5. In an underground cable railway, a structure consisting of the rails, the slot-irons, and connecting-ties, consisting of bent bars embracing and supporting the tube, substantially as set forth.

6. The combined rails, slot-irons, and connections, supported by a masonry foundation built to form the tube or part thereof, substantially as set forth.

7. In a tramway-track for wire-rope railroads, a tube to receive the rope or cable, made of concrete or equivalent material, open at the top, and combined with iron ribs, substantially as set forth.

In witness whereof I have hereunto set my hand.

HENRY ROOT.

Witnesses:
S. H. NOURSE,
FRANK A. BROOKS.