(No Model.)

G. W. DOUGLAS.

CABLE RAILWAY.

No. 367,137. Patented July 26, 1887.

Fig. 1.

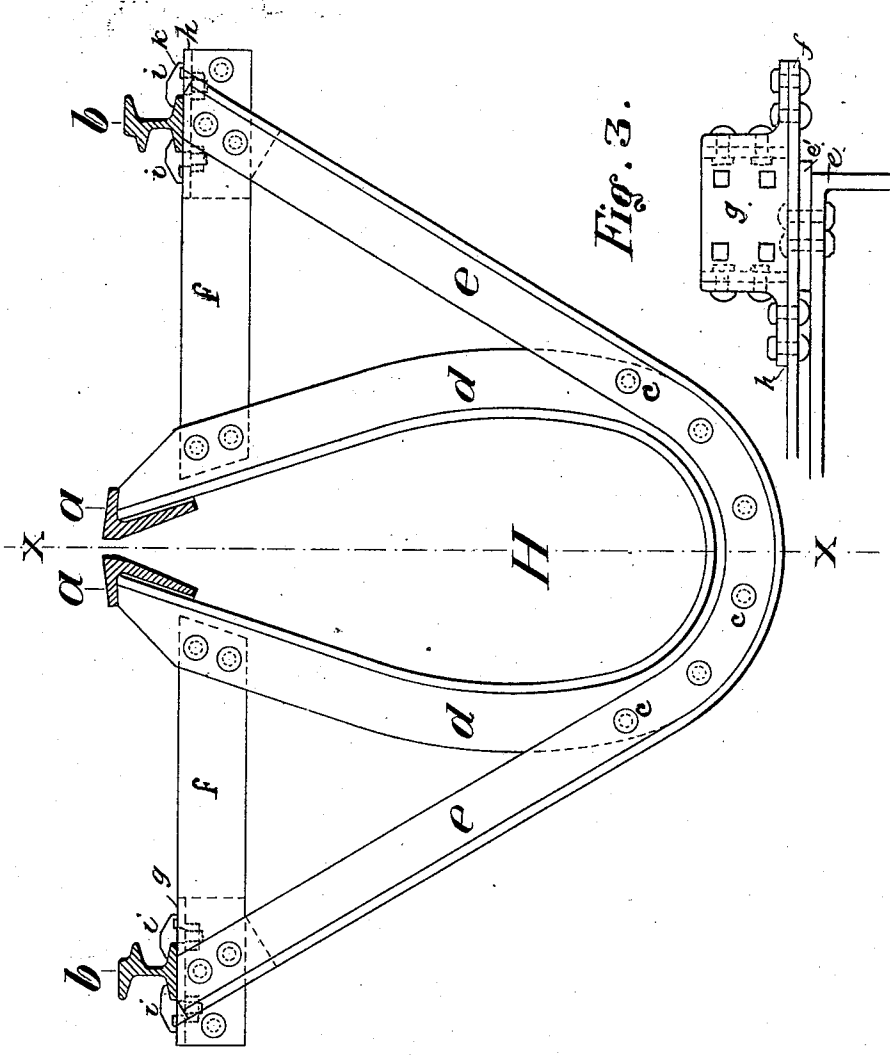
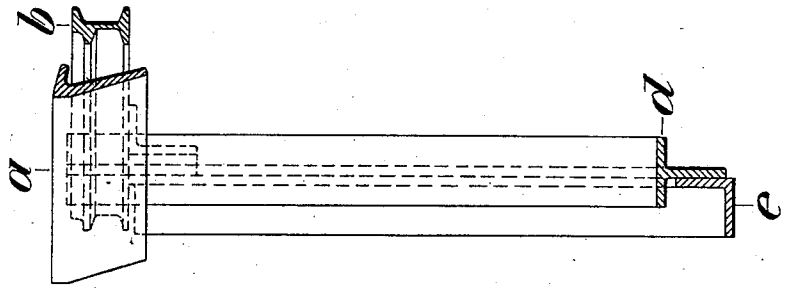


Fig. 3.

Fig. 2.



Witnesses:
Geo. H. Strong.
J. H. Fourke

Inventor:
G. W. Douglas
By Dewey & Co.
Attys.

UNITED STATES PATENT OFFICE.

GEORGE W. DOUGLAS, OF SAN FRANCISCO, CALIFORNIA.

CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 367,137, dated July 26, 1887.

Application filed March 15, 1887. Serial No. 231,032. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. DOUGLAS, of the city and county of San Francisco, State of California, have invented an Improvement in Cable Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in cable railways; and it consists in a novel construction of the transverse frames forming the loops and yokes which support the slot-irons and also the rails and unite the two together, and also in an improvement in the chairs and means for securing the rails to the frame-work, so that they will not tip over or get out of place.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view showing the transverse section of the rails and slot-irons, and showing one of the transverse yokes or frames to which they are secured and by which the tube is formed. Fig. 2 is a longitudinal vertical section taken through the lines X, Fig. 1, showing the construction and union of the frame-irons. Fig. 3 is a plan view showing the chair in which the rails are held.

In the construction of cable railways various devices have been used, in the formation of the tube and road-bed, by which the slot-irons and the rails may be held rigidly apart, so that they will neither spread nor approach each other, as this is very important in the construction of railways. In one case old rail-road-rails have been bent up to form yokes, which are afterward united by bars bolted to the yokes and the slot-irons, and in other cases the frame-work has been made up of separate bars united in other forms.

My invention is designed to make a very light and strong construction.

It consists of a loop formed of iron, which is rolled so that in cross-section it is in the form of a letter T. This iron is bent, as shown in Fig. 1, so as to form the shape or outline H, which it is designed to give to the cable tube or tunnel, *d* representing this iron after it is bent into shape. The top or horizontal part of the T forms the inner portion of the curve, while the vertical flange or web forms the outer portion. Upon the upper ends of this loop *d* are suitably secured the slot-irons *a*.

e are triangularly-shaped yokes formed of angle-iron bent with the flat portion of the flange outward and the web or vertical portion inward. The lower part or bight of this yoke is curved, so as to fit the shape of the lower part of the loop *d*, and the vertical flange of the yoke *e* is bolted to the outwardly-projecting vertical flanged part of *d* by a series of bolts, *c*, which are put in at intervals around the curve. The upper ends of the triangular frames or yokes *e* extend up to a point just beneath the rails *b*, and have the transverse bars *f* extending from their upper ends to the sides of the loops *d* near the top, these bars being strongly riveted or bolted to the parts *e* and *d*, as shown. The whole frame is thus united very rigidly together, and is composed of but four pieces. By making the part *d* of T-iron and the part *e* of angle-iron bolted together, as before described, I not only have a very rigid frame, which it is impossible to spread, but I also form a base equal to the width of the two flanges—about five inches—which is supported upon the concrete bed in which these iron frames are fixed, and by reason of the breadth of this base it is very much more solid and enduring than any made of narrow iron. The part *d*, made of T-iron, and the part *e*, of angle-iron, are united at the top by the transverse bars *f*, and as the thickness of the vertical flange of the inner yoke, *d*, is interposed between the vertical plane of the flange of *e* where one end of *f* is fastened and the plane where its opposite end is fastened to *d*, it will be necessary either to introduce a fitting-piece, such as *e'*, between the ends *e* and *f*, or make an angular bend in the latter equal to the thickness of *d*. The chairs *g*, while being bolted to the upper ends of *e* for their real support, are separated from *e* by the thickness of this fitting-piece. This piece is preferable to making the angular bend.

In order to properly secure the rails upon which the cars travel, I have employed a chair, *g*, which has flanges *h*, through which bolts pass to fasten it firmly to the upper end of the yoke-irons *e* and the transverse uniting-bars *f*. Upon this chair the two meeting ends of the rails rest, and they are secured by peculiar bolts, *i*, which have a sort of double head. One side of this head rests upon the flange of

the rail, while the other side, *k*, is bent outward and downward, so that when the bolts are put into the holes in the chair and screwed down by means of nuts underneath the inner flanges will rest upon the bottom flange of the rail, while the outer ends, *k*, will rest upon the chair and keep the bolts upright, and insuring a strong pressure of the inner parts of the head upon the rail-flanges, thus keeping the rails from being tipped over or displaced, as is apt to be the case with ordinary methods of fastening. By this construction I am enabled to greatly strengthen the curve at the lower portion of the frame by reason of the union of the two parts of the yoke and the loop all the way around the curve, so that the frame is stronger than those made of bent rails, which are twice as heavy.

The combined breadth of the flanges which rest upon the concrete bed at the bottom form such a support as will prevent superincumbent weight displacing the frames and rendering the track uneven.

The tracks and slot-irons are more rigidly held in their relative positions and the rails of the tracks are prevented from tipping over or sinking at the ends by reason of the fastenings.

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

1. The transverse frame or section for cable railways, consisting of a loop formed of T-iron bent into the shape of the tube or tunnel with the horizontal flange inwardly, in combination with the yoke of angle-iron bent to fit the lower curve of the loop, having its vertical flange bolted to the vertical flange of the loop around the curve, and its ends extending upwardly to a point beneath the rails and connected with the upper ends of the loop by transverse tie-bars bolted to both, substantially as herein described.

2. The improved track and slot-iron supporting-frame for cable railways, consisting of a loop formed of T-iron and an exterior yoke of angle-iron, the two being bent into the same curve at the lower part and bolted together around the curve, so as to present a base comprising the two horizontal flanges, the upper ends of the loop and yoke diverging so as to support the slot and the track-rails, respectively, in combination with the uniting bars or braces, substantially as herein described.

3. The improvement in cable railways, consisting of the transverse slot-irons and track-supporting frames formed of T-iron and angle-iron, as shown, in combination with the rail-supporting chairs bolted to the frames, and having the double-headed bolts constructed to rest upon the flanges of the rail and the top of the chair, substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE W. DOUGLAS.

Witnesses:
S. H. NOURSE,
H. C. LEE.