

EQUALIZER FOR WIRE ROPE TRANSPORTATION.

Patented Nov. 22, 1910.

976,463.



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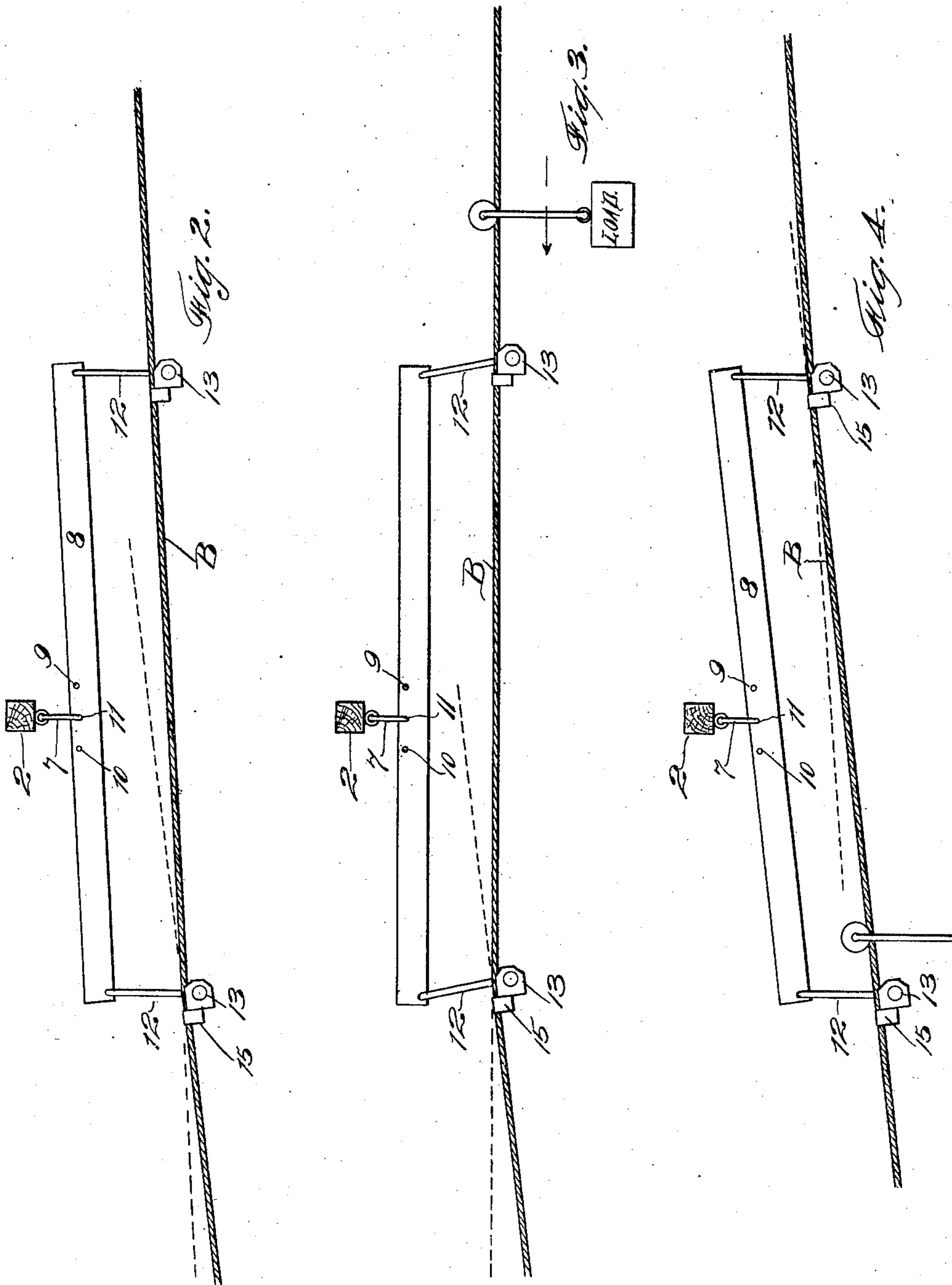
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2 SHEETS—SHEET 2.



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 Attest

UNITED STATES PATENT OFFICE.

ALBERT HORNER, OF KUKAIAU, TERRITORY OF HAWAII.

EQUALIZER FOR WIRE-ROPE TRANSPORTATION.

976,463.

Specification of Letters Patent.

Patented Nov. 22, 1910.

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To all whom it may concern:

Be it known that I, ALBERT HORNER, citizen of the United States, residing at Kukaiau, in the Territory of Hawaii, have invented new and useful Improvements in Equalizers for Wire-Rope Transportation, of which the following is a specification.

This invention relates to aerial tramways for transporting cane, etc., such, for instance, as shown in my Patents Nos. 688,522, December 10, 1901, and 906,230, dated December 8, 1908, and pertains particularly to grade equalizers therefor.

In overhead gravity tramways, such as represented above, for example, the stationary or track rope is supported at suitable points by means of towers or frames, and where used in rolling or mountainous countries the angular inclination of the rope between the supports causes the formation of abrupt intersections at the points of support. Thus the angle of inclination on one side of the support may be twelve degrees and on the other side six degrees. This results, when the ordinary trolley hanger which carries the burden is employed, in its meeting a decided, abrupt corner which tends to make the traveling hanger jump and to be thrown off the track rope as the hanger rides rapidly over it.

It is, therefore, an object of my invention to provide an improved cable support or hanger having for its particular purpose the elimination of abrupt intersections of a tram cable; and to provide a means automatically adjustable to compensate and equalize variant grades of track rope at supports, which means shall be strong and reliable, and efficient in the preventing of the displacement or jumping of the traveling burden-carriers.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 shows an end view of the device as attached to a compensating hook and support. Figs. 2, 3 and 4 show the equalizer in side elevation under different conditions. Fig. 5 shows a form of cable clamp.

In the illustrated embodiment of my invention, A is a suitable frame having a cross-beam 2 upon which are mounted guide pulleys 3 and 4 supporting a tension wire 5 suitably weighted at one end, as at 6, and being provided with an eye or hook 7 under

the center of beam 2. Ordinarily a track rope B is in some manner secured to the hook 7, so that a suitable burden-carrier C, with trolley wheel suspended on the rope B, may freely run past the several supports.

It frequently occurs that on sloping ground the angle of the track rope will be different on the two sides of the support, and at the supporting points the intersections of the inclines form more or less abrupt angles or bumps which tend to throw or bounce off the carriers C. To obviate this objectional effect I have introduced between the suspending link or hook 7 and the track rope B, an equalizing device comprising a stiff, strong bar 8 of suitable length having a plurality of perforations 9—10—11, perforation 9 being in the center of the bar, and the holes 10—11 to one side of 9 and about six inches apart. The equalizer bar 8 may be of any suitable construction. The bar 8 in actual practice is made of metal one-half of an inch thick, six inches wide and about ten feet long, having the perforations near its upper edge. Where subject to heavy strain this bar may be reinforced on either side by 2 x 4 x 8½ feet timbers bolted to the bar by four ½ inch bolts 5½ inches long. The hole 10 nearer the left end of the bar is about four feet from that end, while the hole 11 is about four and one-half feet from the near end. The equalizer bar 8 is pivotally suspended from hook 7, in the plane of the rope or cable A; the central hole 9 being engaged with the hook where there is little or no change in the grade on the two sides of the support, and where the weight of the rope B is as heavy on one side as the other. It is hung on hook 7 at hole 10 only in exceptional cases where the grade at the support makes a sudden change, say from a four per cent. to a twelve per cent. grade; the shorter arm of bar 8 in such case being on the side of greater declivity. In grades varying from horizontal up to twelve per cent., successful results are attained when the equalizer is pivoted at the hole 11.

Any appropriate device may be utilized for connecting the rope B to the equalizer, and I have provided at the extremities of the bar 8, curved drop-hooks 12; each hook being connected to the cable by a block 13 having an upper concaved edge 14 in which the rope rests, and the block having a forward or down-grade extension clamp 15 to em-

brace the rope, as shown in Fig. 5. This clamp 15 is made up of a portion somewhat thinner than the main portion 13 and of two removable, renewable jaw-plates 16 held in place by bolts 17; these jaws projecting up and overlapping the rope B so as to hold it from jumping from the grooved edge 14.

When the equalizer is in position on the support A, the longer end is always, except when suspended from the central hole 9, on the upper or mountain side of the cross-arm; the shorter end below. This extra length of equalizer on the upper side of the support allows the lighter weight of the wire, owing to lighter grade, to overcome and bear up the shorter end holding the heavier weight on the lower side, caused by the steeper grade; thus equalizing the grade at this point and allowing the bundle or bundles to pass over without any perceptible jar or bounce; the equalizer adjusting itself automatically to the change in grade as the bundles are approaching, passing and leaving the equalizer.

Fig. 2 represents the normal position of the equalizer and its connections when on support where the grade changes from six per cent. above, to twelve per cent. below.

Fig. 3 represents the position of the equalizer when bundles are approaching it on a six per cent. grade. It will be noticed that the lower or down-grade drop-hook 12 and wire-holder 15 is the point of change in grade; the weight of the approaching bundle or bundles having borne the equalizer down so that the grade between the two drop-hooks and wire-holders conforms to the six per cent. grade over which the bundles are approaching.

Fig. 4 shows the position of the equalizer and its connections after the bundles have passed the upper or right-hand drop-hook and wire-holder; and this point then being where the change in grade occurs, the weight of the passing bundle having borne the equalizer down on the lower side until the grade between the drop-hooks conforms to the steeper grade on the lower side of the support. Dotted lines indicate the position of the wire provided the respective grades were carried out.

I have found that when the equalizer is used in combination with the counterweight it forms a simple and sure combination, and no bundles jump as they are passing. I only use the counterweight, however, in combination with the equalizer, where there is an extraordinary change in grade. In most cases the equalizer is quite sufficient.

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

1. The combination of an overhead yielding track, a burden-carrier mounted for

travel on the track, supports for the track at intervals, and means for equalizing the grade of the two sections of the track on either side of one of said supports.

2. The combination of an overhead yielding track, a burden-carrier mounted for travel on the track, supports for the track at intervals, and means for equalizing the grade of the two sections of the track on either side of one of said supports, said last-named means including a lever pivoted between its ends and arranged in the plane of the track and projecting to each side of said support and upholding the track.

3. The combination of an overhead yielding track, a burden-carrier mounted for travel on the track, supports for the track at intervals, and means for equalizing the grade of the two sections of the track on either side of one of said supports, said last-named means including a lever pivoted between its ends and arranged in the plane of the track and projecting to each side of said support and upholding the track, and means for yieldingly supporting the lever.

4. In an aerial tramway, the combination with suitable supports, a track rope, and a bundle carrier, of means for equalizing the grade of the two sections of the track on either side of one of said supports, said means including a bar disposed lengthwise of and parallel with the track rope and supporting the rope to permit the travel of the burden carrier thereover, and a pivotal support for adjustably suspending the bar between its ends.

5. In a tramway, the combination of a track rope, spaced supporting towers, and freely suspended equalizers on the towers having supporting connections with the rope and operating to equalize the inclination of the rope on two sides of a supporting tower.

6. In a tramway, the combination with a track rope and a supporting tower, of a counterbalance device carried thereby to yieldingly support the rope, and a grade-equalizing mechanism supported on said counterbalancing device and sustaining said track rope.

7. In a tramway, the combination of a track rope, a suitable tower, a bar freely suspended from the tower in the plane of the rope and arranged to equalize the grade of the two sections of the track on either side of the two, and means on the opposite end portions of the bar for supporting the track rope.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALBERT HORNER.

Witnesses:

HENRY E. KELSEY,
C. H. SIEBERT.