(No Model.)

D. J. MILLER.

DRIVING MECHANISM FOR CABLE RAILWAYS.

No. 329,757. Patented Nov. 3, 1885.

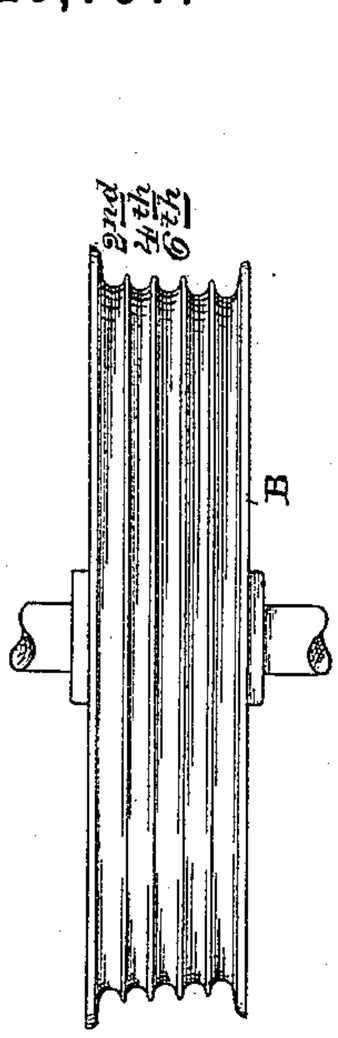


Fig 1.

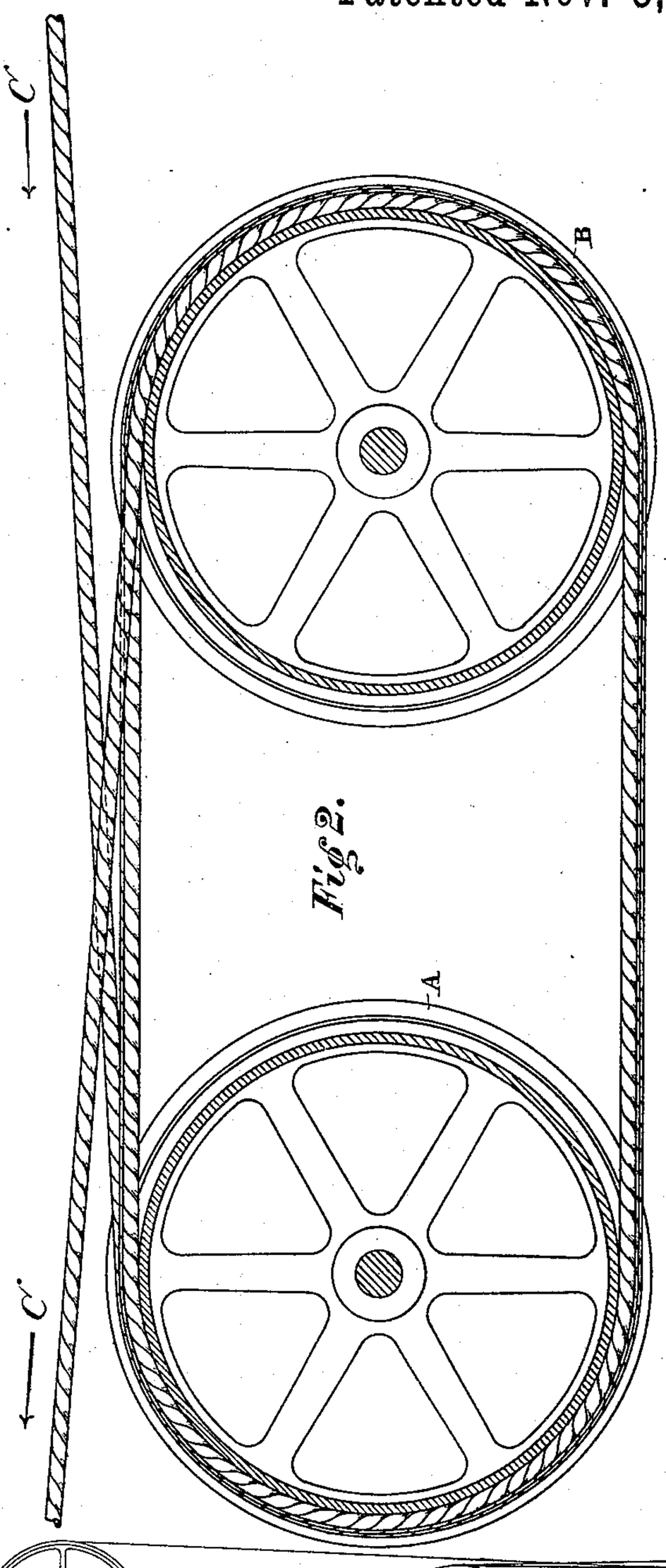
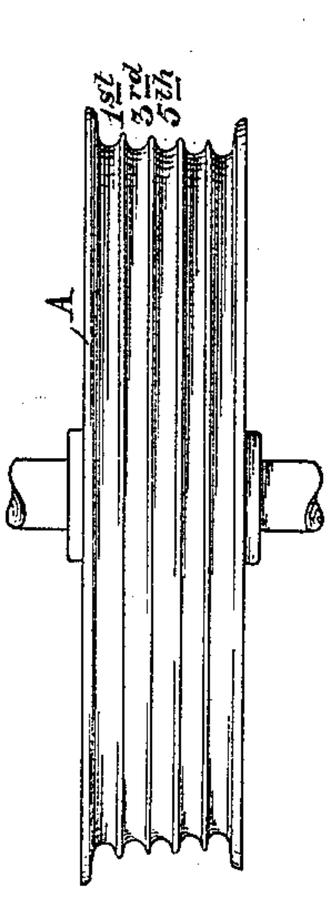


Fig 2.



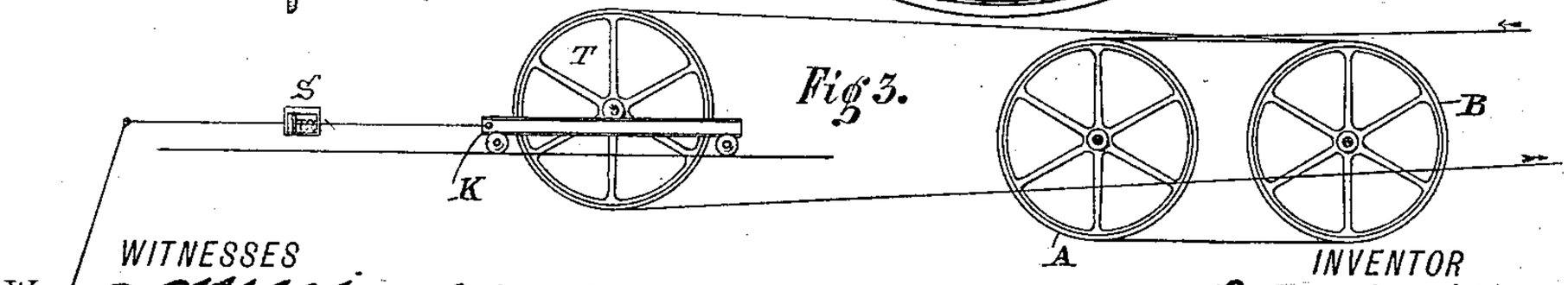


Fig 3.

WITNESSES

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DRIVING MECHANISM FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 329,757, dated November 3, 1885.

Application filed April 4, 1885. Serial No. 161,239. (No model.)

To all whom it may concern:

Be it known that I, DANIEL J. MILLER, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Driving Machinery for Cable Railways, of which the following is a specification.

My invention relates to the driving mechanism of cable railways, and more particularly to the arrangement and construction of the driving wheels or drums around which the cable is wound as it enters the building in which the driving mechanism is located and from which it is fed as it leaves said building to make the circuit of the road. It has been customary heretofore to construct these driving wheels or drums with grooves upon their peripheries for the accommodation of the cable, and to arrange said drums or wheels in pairs, so that the moving cable, in proceeding from one to the other and winding about them both, may gradually and evenly distribute the stress or tension on both of said drums at each successive wrap of the cable. By means of such an arrangement the incoming cable with a stress, say, of five tons will gradually be relieved of it as it moves around the drums, and it will when it leaves them and commences the circuit of the road have practically none at all, except what it receives from the tension-wheel. That portion of the cable which is subjected to a pull of five or six tons will of course be stretched or drawn out to some extent and distorted from its normal condition. As soon, however, as this pull decreases and the aforesaid tension is gradually relaxed, the tendency of the cable, which is more or less elastic, will be to return to its former state and assume, as fast as the stress is removed, its original structure; hence as soon as the cable is drawn upon the drums it commences to shrink, and the same amount of cable will require less linear space upon the drums than off. This change of structure is not, however, abrupt, but gradual, and the condition of a certain imaginary section of cable after the initial revolution on the first drum, though modified relatively to its condition before it entered upon the drum, is still further modified when it leaves the second drum. The linear measurement of this section of cable is therefore considerably less when it occupies the second than when it occupies the initial groove of the first drum. This decrease in the length of the cable continues throughout the whole series of grooves. With these facts in view it is obvious that a system which employs a pair of driving wheels or drums of the same diameter, the said drums having grooves for the purpose described whose circumferential measurements are identical, will not operate effectively or economically, inasmuch as no differentiation is made in the construction of the drums to compensate for the changing nature of the cable as it moves around them. In other words, the grooves of any one drum being of the same peripheral measurement, and revolving of course at the same speed, will act differently upon the different sections of the cable which are occupying them at any one time. That portion of the cable which occupies the initial groove of the drum will have shrunken considerably by the time it reaches the second groove, and the cable, if it does not slip upon the drum, (a thing it seldom does,) will be restretched, and this operation will imperil both the cable and the driving machinery. In some instances in cable-railway practice the latter has been totally demolished for the reasons above given. It is to remedy these defects that I have devised the present system of driving machinery for cable railways.

My invention consists in arranging the driving drums or wheels (preferably two in number) as shown in my Letters Patent of the United States No. 304,017, dated August 26, 1884, and constructing the grooves of different sizes, starting at first with the largest and graduating them down to the last, which is the smallest. Such a plan will obviate the difficulties and dangers I have hereinbefore recited and provide a perfect system of wheels or drums for the driving machinery of cable or traction railways.

In order that my invention may be better understood, I will describe it with relation to the accompanying drawings, of which—

Figure 1 is a plan view; Fig. 2, a side elevation of my invention. Fig. 3 is a diagrammatic view, on a smaller scale, showing the cable as it passes from the driving-sheaves

around the tension-sheave, and thence out in the line.

A represents the driving drum or wheel on which the incoming cable C is first wound. From the initial groove of the drum A it proceeds to the drum B, and is received in the groove marked 2. From thence it goes to the second groove of the drum A, and so on till the end. The circumferential measurement of the first groove in the drum B is slightly less (say one-eighth of an inch) than the first groove in the drum A, and the second groove of the latter has a correspondingly-smaller linear measurement than the first groove in B. They are numbered in the drawings according to their size. The drum A is provided with the grooves 1 3 5, &c., and the drum B with the corresponding intermediate grooves, 2 4 6, &c. By means of such an arrangement it will easily be seen that the lessening of the tension in the cable is met by a corresponding decrease in the size of the groove, and the movement of the cable on the successive grooves of the drums will be perfectly smooth and even.

In Fig. 3 I have shown a diagrammatic view on a smaller scale, of the driving wheels or drums, as actually employed in connection with the tension-wheel T. This latter is journaled in a car, K, which is adapted to travel back and forth upon suitable tracks or ways as the pull upon the cable increases or decreases. It will be seen from this figure that after the cable finally leaves the driving-drums it proceeds to the tension-wheel and from the tension-wheel to the road.

W is the counter-balance, which has connection, *x*, with the tension-car, and S is a dynamometer or other weighing device of any desired construction incorporated within said connection, whereby the amount of strain upon the cable may be ascertained and said strain regulated by varying the extent of the counterbalancing strain.

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

1. In a cable railway, a system of driving drums or wheels provided with grooves upon their peripheries, said grooves gradually decreasing in circumferential measurement, as and for the purposes set forth.

2. In a cable railway, the combination of the driving drum or wheel A, having grooves 1 3 5 7 upon its periphery, and the drum B, having grooves 2 4 6 8, as set forth.

3. In a cable railway, the combination of the cable with the driving-drums A and B, the said driving-drums being provided with grooves, as described, each successive groove over which the cable travels having a slightly-decreasing circumferential measurement, as set forth.

4. In a cable railway, the combination, with a tension-car, of a counter-balance, connection between said counter-balance and car, and a dynamometer or other weighing device incorporated within said connection, substantially as and for the purposes set forth.

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