

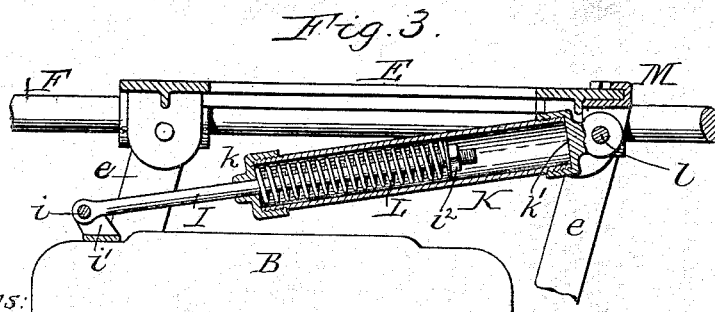
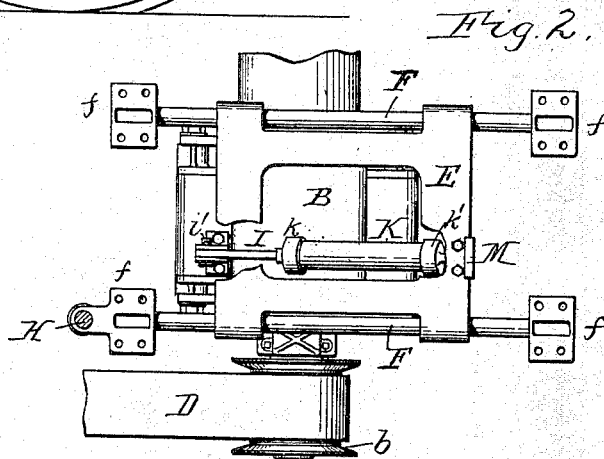
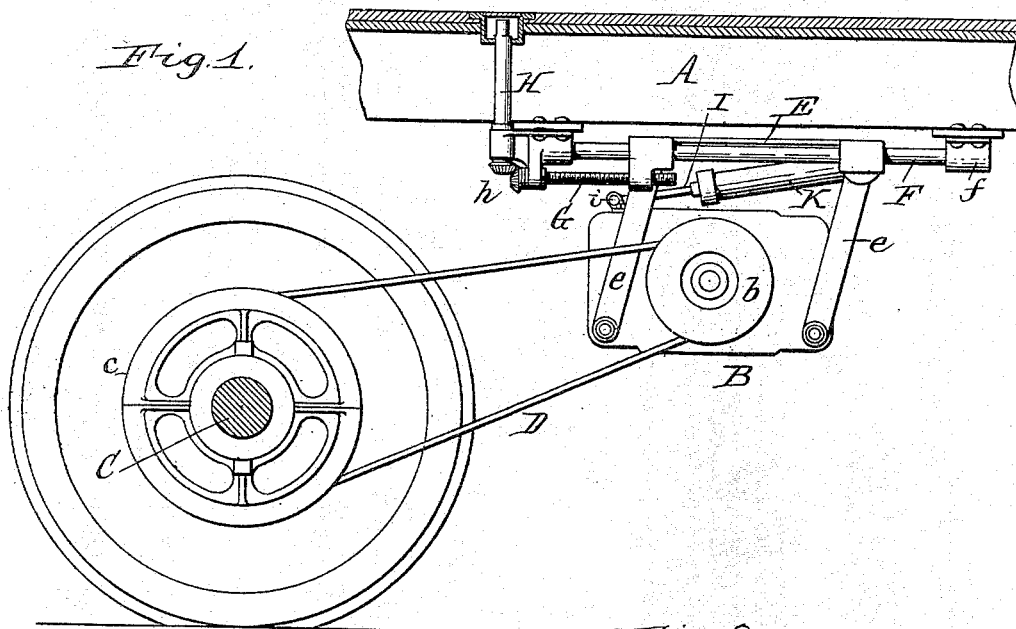
No. 647,634.

Patented Apr. 17, 1900.

W. F. RICHARDS.
ELECTRIC LIGHTING APPARATUS FOR RAILWAY CARS.

(Application filed Jan. 18, 1900.)

(No Model.)



Witnesses:

E. A. Volk.

F. F. Scherzinger.

W. F. Richards Inventor.

By Wilhelm H. Bonner.
Attorneys.

UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNOR TO CHARLES M. GOULD, OF NEW YORK, N. Y.

ELECTRIC-LIGHTING APPARATUS FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 647,634, dated April 17, 1900.

Application filed January 19, 1900. Serial No. 2,020. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen of the United States, and a resident of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Electric-Lighting Apparatus for Railway-Cars, of which the following is a specification.

This invention relates to an electric-lighting apparatus for railroad-cars in which the dynamo is driven from one of the car-axes by a belt and the dynamo is suspended by inclined links from a carriage which is adjustable toward and from the driving-axle to change the angle or inclination of the links, thereby regulating the gravity action of the dynamo upon the driving-belt accordingly. An apparatus of this kind is described and claimed in my allowed application for Letters Patent, Serial No. 737,154, filed November 16, 1899. The adhesion of the driving-belt in an apparatus of this kind differs greatly at different seasons of the year and in different kinds of weather, because the belt and pulleys are exposed to and affected by the weather. In dry summer weather the adhesion is comparatively great and the gravity action of the dynamo is ample for giving the belt the tractive power necessary for producing an output of the dynamo which will supply the lights required for the satisfactory illumination of a large car, such as are used on this continent. In wet weather, and particularly in the winter, when the belt and pulleys are covered with sleet or snow, the adhesion is much less and a much heavier dynamo would be required to produce the belt adhesion necessary for the required output of the dynamo. If the dynamo is made so heavy that it will produce, by its gravity action, the normal adhesion of the belt under the most unfavorable conditions, the dynamo is much heavier than required in ordinary weather and the car carries an objectionable dead-weight during the greater part of the year.

The object of my invention is to overcome this difficulty, and this object is attained by supplementing the gravity action of the dynamo by that of a spring-tension device, which can be called into action to a greater or less extent, as may be necessary, to produce the

desired adhesion of the belt, and which does not materially increase the weight of the apparatus.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a dynamo suspended by my improved suspension device. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal sectional view of the spring-tension device on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

A represents the bottom frame of the car; B, the dynamo; *b*, its pulley; C, the car-axle, from which the dynamo is driven; *c*, the pulley on the same, and D the driving-belt.

E represents the carriage or sliding frame, from which the dynamo is suspended by links *e*.

F represents the horizontal guide-bars, on which the carriage is mounted and which are secured to the bottom frame of the car by sockets *f*.

G represents the horizontal screw, by which the carriage is adjusted toward and from the driving-axle, and H the upright shaft, which is connected with said screw by bevel-wheels *h* and which terminates in the car-floor for conveniently turning the adjusting-screw.

The spring-tension device connects the dynamo with the carriage and is constructed as follows: I represents a rod which is pivoted to the upper part of the dynamo near that end thereof which is nearest the driving-axle. I will call this end the "front" end of the dynamo. This rod is preferably connected with the dynamo by a transverse pivot *i*, which passes through a lug *i'* on the dynamo. This rod extends rearwardly from this pivot and into a tubular casing K. L represents a spring which is applied to the rod I in this casing between the front head *k* of the casing and a screw-nut or other stop *i''*, secured to the rear end of the rod. The rear end of the tubular casing is provided with a head *k'*, which is pivoted to the rear end of the carriage by a horizontal bolt *l*, so that the spring-tension device can follow the vertical movement of the dynamo as the latter swings on the suspension-links. The pivot-bolt *l* is removably seated in a bracket M, which is secured to the rear portion of the carriage. The heads *k* *k'*

are secured to the tubular casing by screw-threads for convenience in assembling the parts.

The spring-tension device is most conveniently connected with the dynamo and carriage when the latter has been moved forwardly until the suspension-links hang perpendicularly. In this position of the dynamo there is practically no tension on the spring. 5
10 When the carriage is moved away from the driving-axle, in order to incline the links and call the gravity action of the dynamo into play, the lower ends of the links do not change their position materially, because the belt 15 holds the dynamo, to which the lower ends of the links are attached, against movement away from the driving-axle; but the carriage and the upper ends of the links move rearwardly or away from the driving-axle. The 20 spring-casing being attached to the carriage moves rearwardly with the same, and the front head $\frac{1}{2}$ of the spring-casing, moving rearwardly along the rod I, compresses the spring. In this manner the spring tension is 25 produced at the same time that the gravity action is produced, and this tension is produced to a greater or less extent as a greater or less gravity action is produced. This spring-tension device does not materially increase the weight of the apparatus and renders it unnecessary to increase the weight of the dynamo beyond that which is necessary for producing the desired output under ordinary conditions, because by its means a considerable additional tension can be produced 35 on the driving-belt when unfavorable conditions require the same. Cars running on roads which present unfavorable conditions only during a short season of the year need 40 not be supplied with this spring-tension device except during the unfavorable seasons. The use of a spring-tension device of this kind enables dynamos of the same size and weight to be used on cars which are in service ex-

posed to unfavorable conditions and those 45 which are not.

I claim as my invention—

1. The combination with the driving-axle, a carriage which is adjustable toward and from the driving-axle, a dynamo flexibly suspended from said carriage, and the driving-belt and pulleys, of a spring-tension device which connects the carriage with the dynamo and which supplements the gravity action of the dynamo, substantially as set forth. 55

2. The combination with the driving-axle, a carriage which is adjustable toward and from the driving-axle, a dynamo flexibly suspended from said carriage, and the driving-belt and pulleys, of a spring-tension device 60 extending from the rear portion of the carriage to the front portion of the dynamo, substantially as set forth.

3. The combination with the driving-axle, the dynamo, the driving-belt and pulleys, a carriage which is adjustable toward and from the driving-axle, and suspension-links connecting the dynamo with the carriage, of a spring-tension device pivoted at one end to the carriage and at its opposite end to the 70 dynamo, substantially as set forth.

4. The combination with the driving-axle, the dynamo, the driving-belt and pulleys, a carriage which is adjustable toward and from the driving-axle, and suspension-links connecting the dynamo with the carriage, of a spring-tension device which connects the carriage with the dynamo and which consists of a spring-casing pivoted to the carriage, a rod 80 pivoted to the dynamo, and a spring mounted on said rod in said casing, substantially as set forth.

Witness my hand this 16th day of January, 1900.

WILLARD F. RICHARDS.

Witnesses:

JNO. J. BONNER,
CYESTA HORNBECK.