(No Model.) 2 Sheets—Sheet 1.

E. WILHELM & W. F. RICHARDS.

ELECTRIC LIGHTING APPARATUS FOR CARS.

No. 604,101. Patented May 17, 1898.

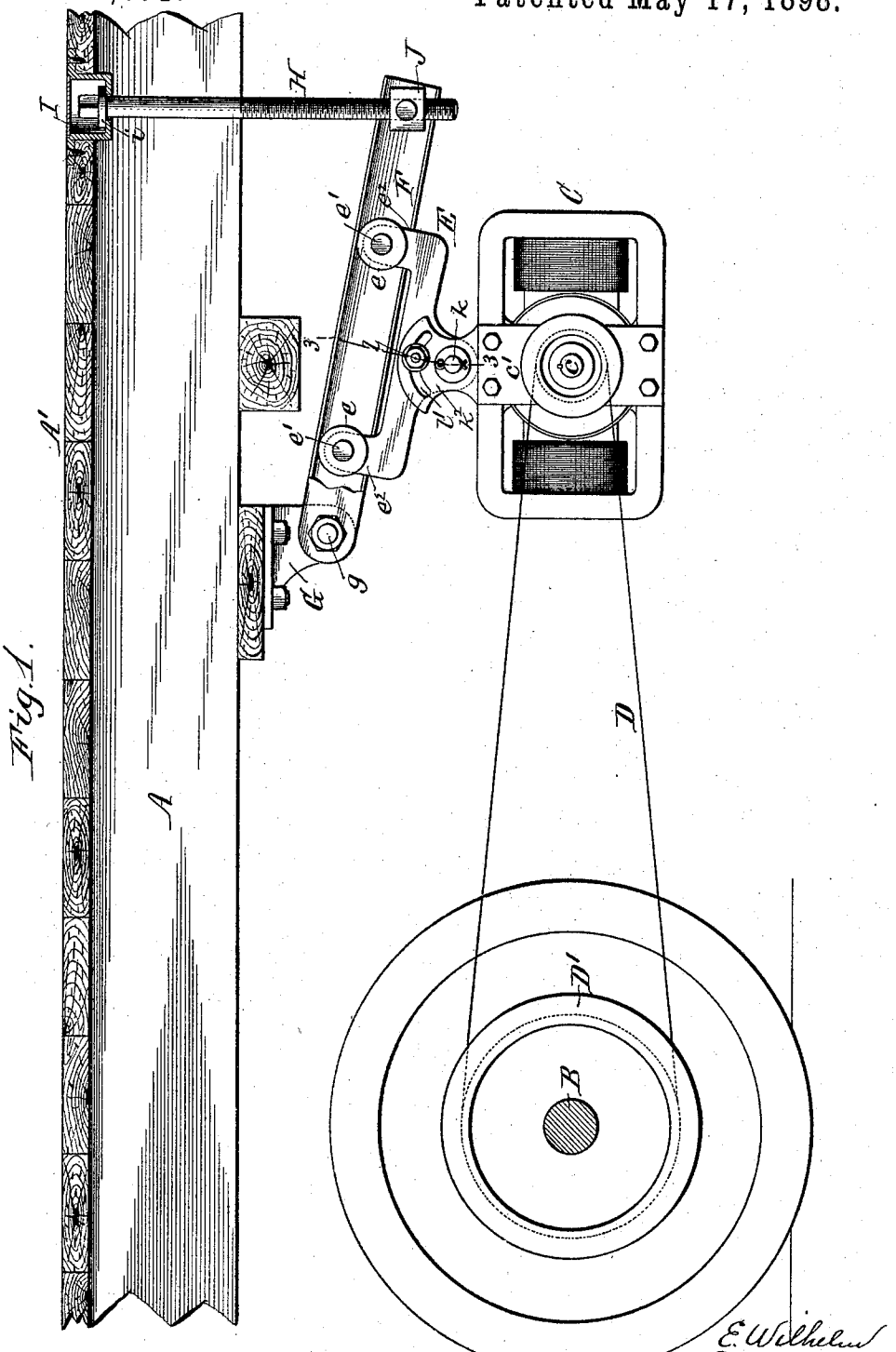


Fig. 1.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

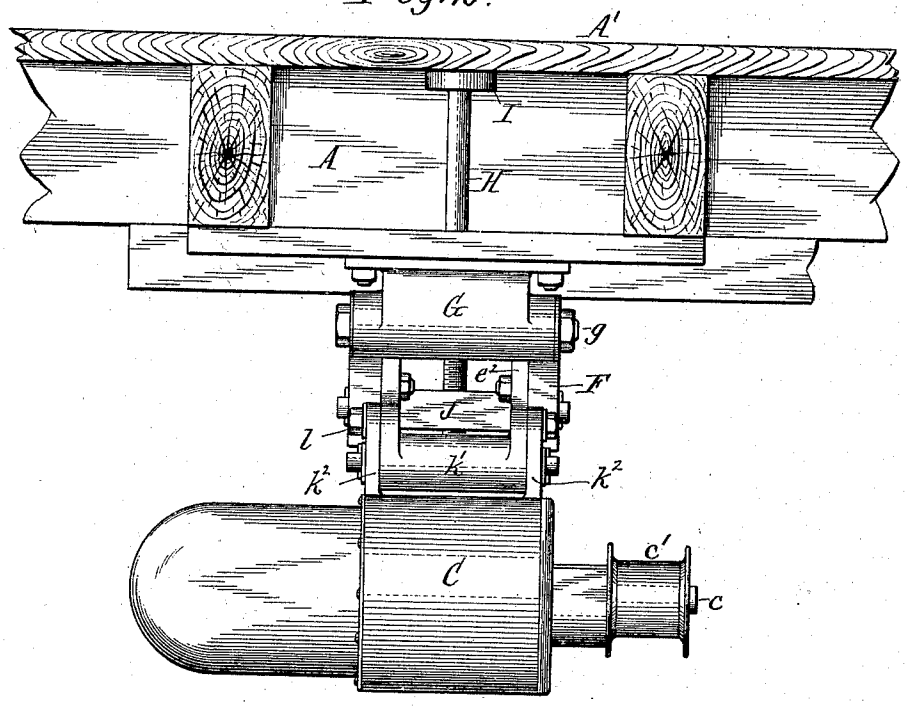
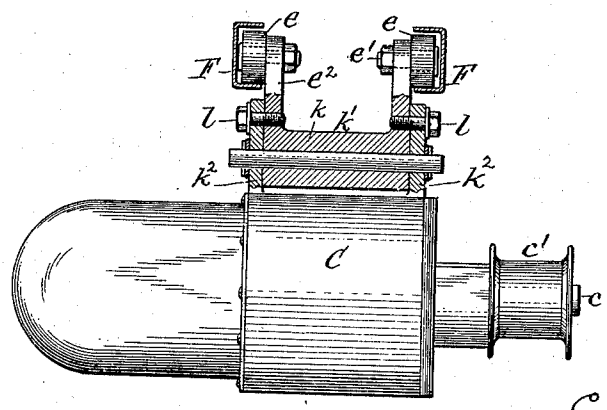


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD WILHELM AND WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNORS TO CHARLES M. GOULD, OF SAME PLACE.

ELECTRIC-LIGHTING APPARATUS FOR CARS.

SPECIFICATION forming part of Letters Patent No. 604,101, dated May 17, 1898.

Application filed October 23, 1897. Serial No. 656,160. (No model.)

To all whom it may concern:

Be it known that we, EDWARD WILHELM and WILLARD F. RICHARDS, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Electric-Lighting Apparatus for Railway-Cars, of which the following is a specification.

This invention relates to that class of electric-lighting apparatus for railway-cars in which the current is generated by a dynamo driven by a belt from one of the car-axles, and more particularly to an apparatus in which the dynamo is so mounted that it moves automatically toward and from the car-axle in maintaining a uniform speed.

The object of our invention is the provision of a simple support on which the dynamo can move toward and from the car-axle, and whereby the weight of the dynamo is rendered effective for causing such variations in the tension and friction of the belt as are necessary to maintain a practically uniform speed of the dynamo.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal sectional elevation of our improved apparatus applied to a railway-car. Fig. 2 is a front view of the apparatus. Fig. 3 is a transverse vertical section in line 3 3, Fig. 1.

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

A is the car-frame, A′ the floor of the car, and B one of the axles.

C is the dynamo, *c* the armature-shaft, having the driving-pulley *c′*, and D the driving-belt running around the pulley of the armature-shaft and a pulley D′, secured to the car-axle.

The dynamo is carried by a carriage E, which runs upon inclined tracks or ways F, arranged lengthwise on the under side of the railway-car and preferably supported by the car-body, as shown. The tracks preferably consist of channel-bars having their channels arranged to face each other. The carriage is provided with rollers *e*, which run upon the lower flanges of the channel-bars and which are journaled on studs or pivot-bolts *e′*, secured to ears e^2, arranged at the upper front and rear portions of the carriage.

The inclined tracks F slope away from the driving-axle B, so that the carriage in tending constantly to run down the tracks by gravity tends to move the dynamo away from the driving-axle and tightens the driving-belt. The tracks are preferably made adjustable, so that their pitch or inclination can be varied for regulating the pressure exerted by the dynamo against the driving-belt. In the construction shown in the drawings the upper ends of the tracks are pivoted by a transverse bolt *g* to a bracket G, secured to the car-frame, while their lower ends are supported and made vertically adjustable by an upright bolt or screw H, which connects the tracks with the car frame or body. This bolt is supported near its upper end in a bearing I, secured in an opening of the car-floor, while its lower portion engages with a swiveling-nut J, pivoted between the lower ends of the tracks. The adjusting-screw is supported in its bearing by a flange or collar *i*, and its upper end is made square or flat-sided to receive a suitable wrench for turning it.

The bearing of the adjusting-screw is preferably constructed in the form of a countersunk housing or casing having a removable cover which is flush with the car-floor, as shown in Fig. 1. Upon turning the adjusting-screw H in one or the other direction the swiveling-nut is caused to move up or down on the screw, thereby raising or lowering the lower ends of the tracks and changing their inclination accordingly.

In order to permit the dynamo to maintain a level or horizontal position irrespective of the adjustments of the inclined tracks, the dynamo is adjustably attached to the carriage. For this purpose the dynamo is pivoted to the carriage by a transverse pin *k*, which passes through a lug *k′*, depending from the carriage, and through lugs k^2, arranged centrally on the upper portion of the dynamo-frame, so that the dynamo may either assume a level position by gravity or be adjusted to that position. The dynamo is preferably secured in this position after the track has been adjusted by horizontal clamping-bolts *l*, which are secured to the carriage and pass through segmental slots *l′*, formed in the lugs of the dynamo-frame. When the dynamo has been so se-

cured to the carriage, it forms a rigid structure therewith and moves up and down on the inclined track without changing its position relatively to the carriage and track.

In the use of this apparatus power is transmitted from the car-axle to the armature-shaft by the adhesion of the driving-belt. The speed of the car-axle when the train is running at its ordinary speed is much higher than that which is required for driving the dynamo. The angle of the dynamo-support is so adjusted that the full adhesion of the belt and the full speed of the dynamo are reached at a comparatively low speed of the axle. As the speed of the axle increases beyond this point by the increase in the speed of the train as the latter gathers headway, the pull of the belt increases accordingly and draws the dynamo slightly toward the axle and up the inclined track. This slackens the belt, reduces its adhesion correspondingly, and so prevents the belt from imparting a correspondingly-increased speed to the armature-shaft. When the speed of the axle decreases, the dynamo moves down the inclined track and again tightens the belt. In this manner the increased pull of the belt, resulting from an increased speed of the axle, causes the dynamo to move up the incline, and this causes a slackening of the belt and a corresponding slipping of the same on its pulleys, so that the desired speed of the armature-shaft is maintained, although the driving-axle rotates at a much higher speed than that which is required for driving the dynamo, and is maintained practically uniform, although this high speed of the axle may vary considerably.

This lighting apparatus is designed for use in a well-known manner in connection with an auxiliary storage battery which is charged from the dynamo and supplies the current when the car is standing still or running below the speed at which the dynamo is effective.

We claim as our invention—

1. The combination with a railway-vehicle and its axle, of an inclined track or way arranged on the under side of the vehicle, a dynamo supported on said track and capable of moving thereon toward and from said axle, and a frictional driving mechanism whereby the dynamo is driven from said axle, substantially as set forth.

2. The combination with a railway-vehicle and its axle, of an inclined track or way arranged on the under side of the vehicle, means whereby the inclination of the track or way can be adjusted, a dynamo supported on said track or way and capable of moving thereon toward and from the axle, and a frictional driving mechanism whereby the dynamo is driven from said axle, substantially as set forth.

3. The combination with a railway-vehicle and its axle, of an inclined track or way arranged on the under side of the vehicle and pivoted at one end thereto, means for adjusting the opposite end of the track vertically, a dynamo supported on said track and capable of moving toward and from said axle, and a frictional driving mechanism whereby the dynamo is driven from said axle, substantially as set forth.

4. The combination with a railway-vehicle and its axle, of an inclined track or way arranged lengthwise on the under side of the vehicle, a carriage mounted on said track, a dynamo adjustably attached to said carriage, and a frictional driving mechanism whereby the dynamo is driven from said axle, substantially as set forth.

Witness our hands this 12th day of October, 1897.

EDWARD WILHELM.
WILLARD F. RICHARDS.

Witnesses:
JNO. J. BONNER,
ELLA R. DEAN.