No. 615,905. Patented Dec. 13, 1898.

W. F. RICHARDS.

ELECTRIC LIGHTING APPARATUS FOR RAILWAY CARS.

(Application filed July 9, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

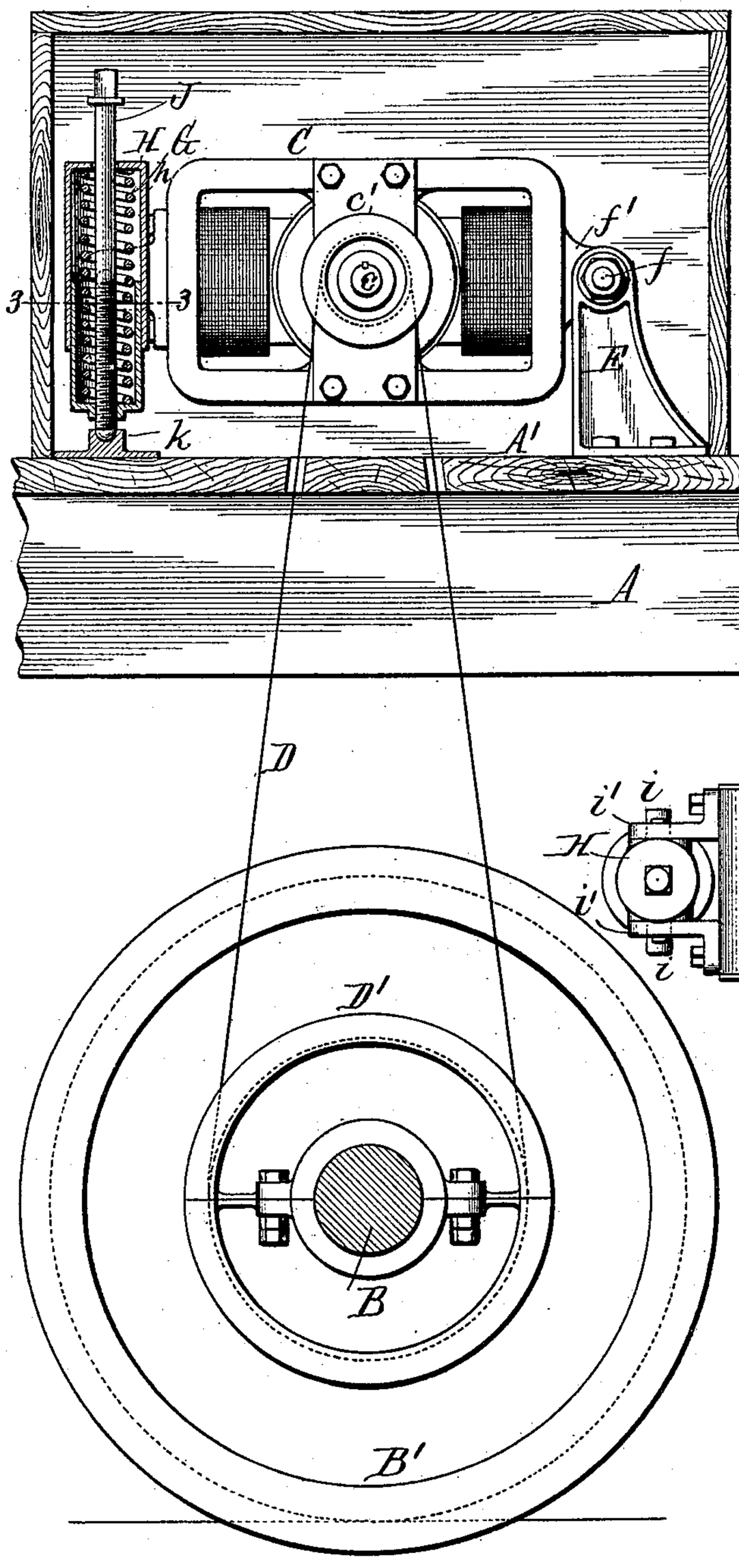


Fig. 2.

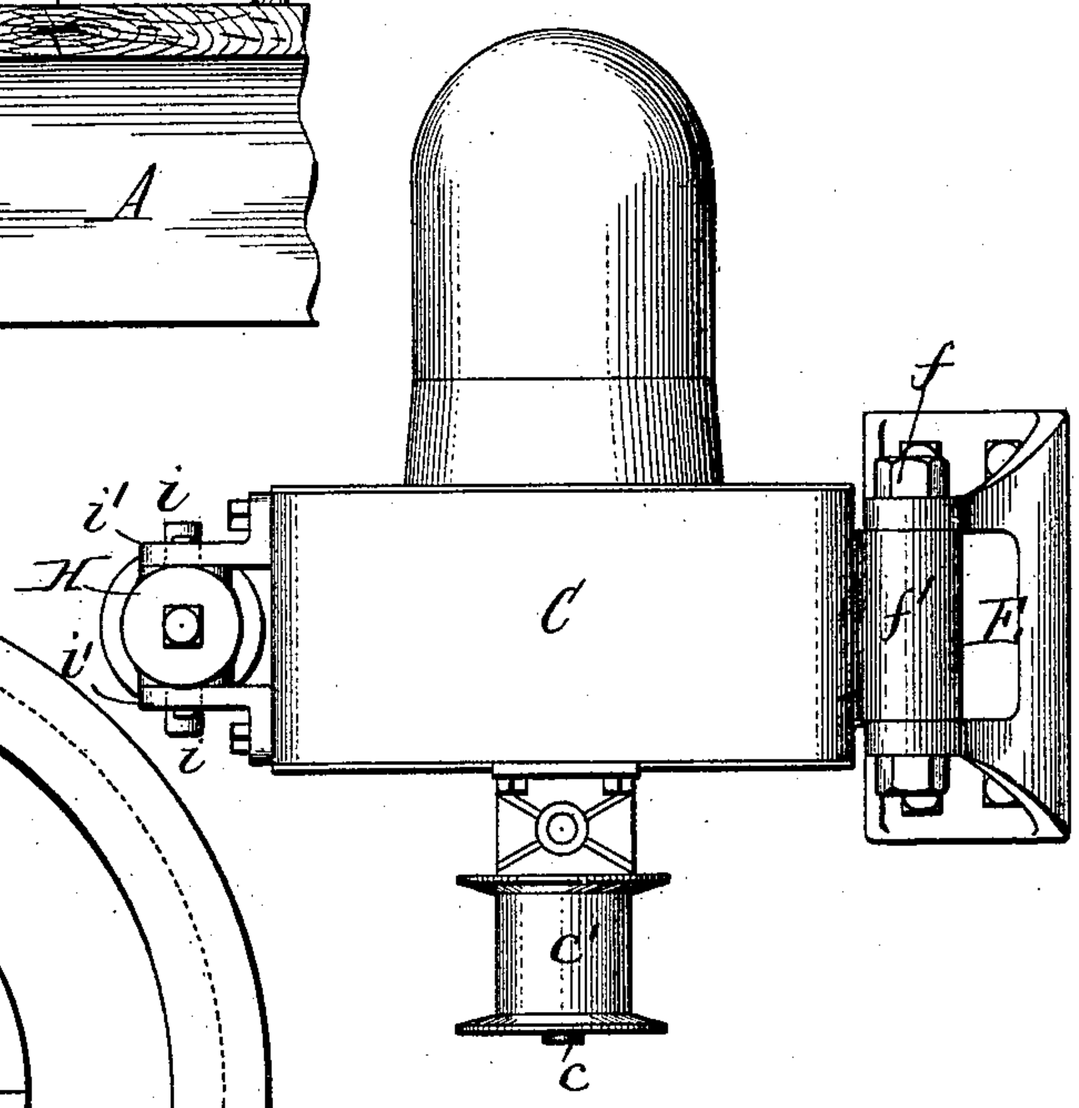
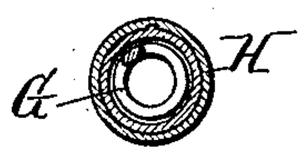


Fig. 3.



Witnesses:

Chas. F. Burkhardt

Henry L. Decker

W. F. Richards Inventor.

By Wilhelm & Bonner

Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 615,905. Patented Dec. 13, 1898.

W. F. RICHARDS.

ELECTRIC LIGHTING APPARATUS FOR RAILWAY CARS.

(Application filed July 9, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

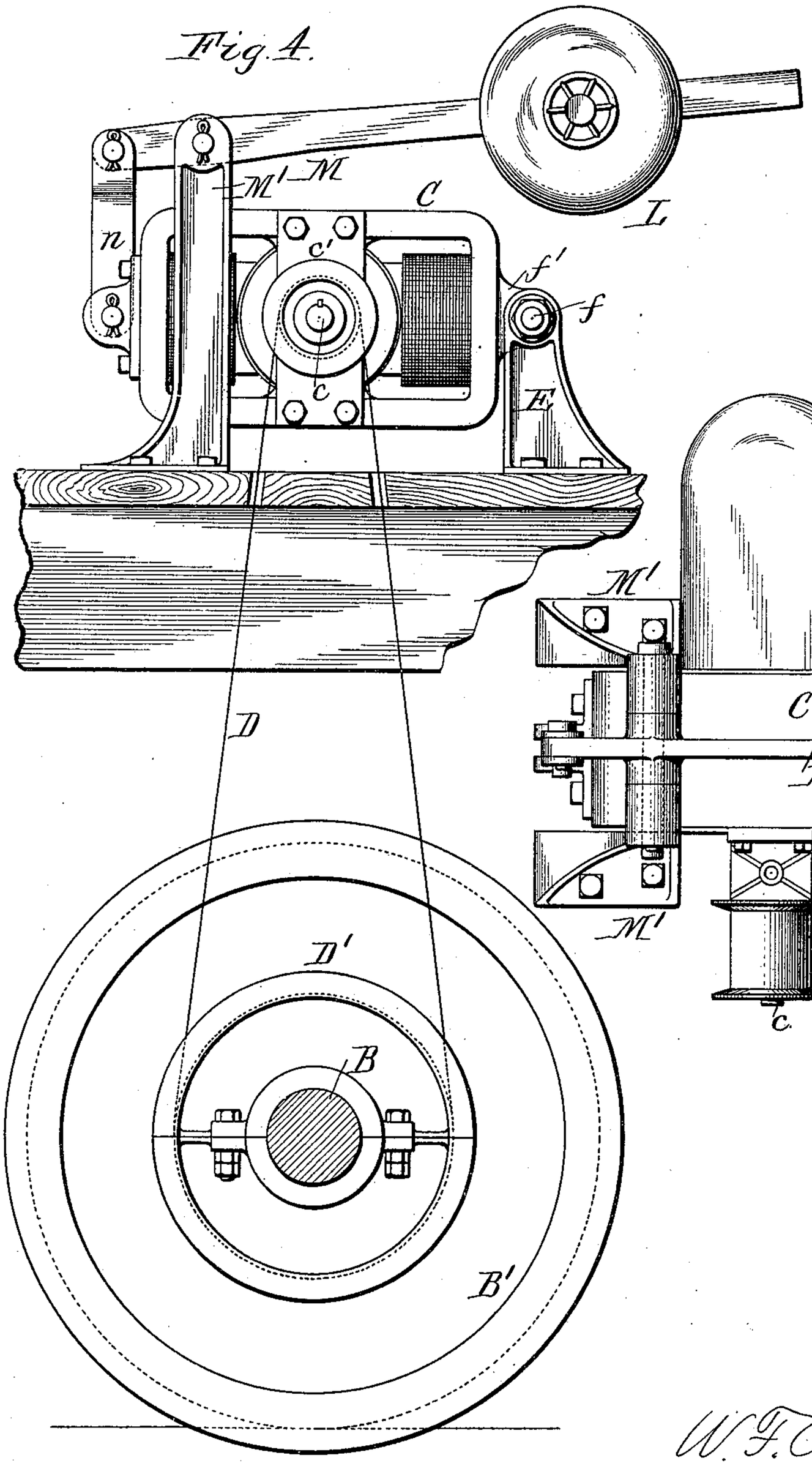
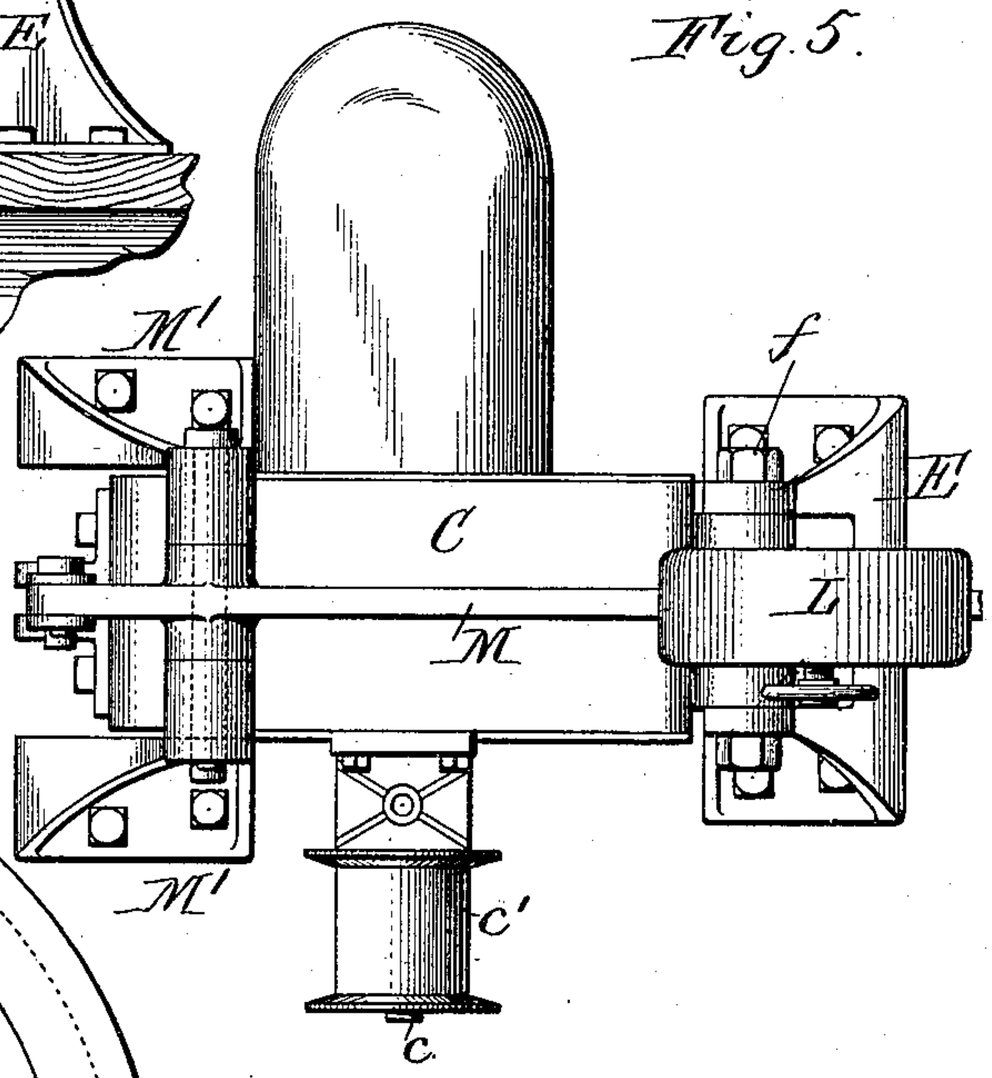


Fig. 5.



Witnesses:
Chas. F. Burkhart.
Henry L. Deck.

W. F. Richards
Inventor.
By Wilhelm Bonner
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNOR TO CHARLES M. GOULD, OF SAME PLACE.

ELECTRIC-LIGHTING APPARATUS FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 615,905, dated December 13, 1898.

Application filed July 9, 1898. Serial No. 685,473. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen 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 dynamo is driven from the car-axle by a belt and the dynamo is movable toward and from the driving-axle, so that the belt slips when the speed of the driving-axle exceeds that which is necessary to properly drive the dynamo, thereby compensating for any excess of speed and maintaining a practically uniform normal speed of the dynamo. An apparatus of this general character is described and shown in Letters Patent of the United States No. 604,081, issued to me May 17, 1898. To enable the dynamo to be effectually stopped, it is necessary to arrange the belt so that the same extends upwardly from the driving-axle in order to allow the belt to move out of contact with the under side of the pulley on the driving-axle upon loosening the belt. When the belt is arranged in this manner, it is alternately stretched and loosened by the vertical vibrations of the car, which causes the dynamo to be driven at a variable speed and produces an unsteady light.

My invention has for its object to so mount the dynamo that it is unaffected by the vibrations of the car, thereby maintaining a uniform tension of the belt and a uniform normal speed of the dynamo.

In the accompanying drawings, Figure 1 is fragmentary longitudinal section of a railway-car equipped with a dynamo mounted in accordance with my invention. Fig. 2 is a top plan view thereof. Fig. 3 is a cross-section of the tension device in line 3 3, Fig. 1. Fig. 4 is a view similar to Fig. 1, showing a modified construction of the improvement. Fig. 5 is a top plan view of the same.

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

A is the car-frame; A′, the floor of the car; B, one of the car-axles, and B′ one of the wheels mounted thereon.

C is the dynamo, mounted on the car-body above the axle B and preferably arranged within the car.

c is the armature-shaft, having the driving-pulley *c*′, and D the upright driving-belt, running around the pulley of the armature-shaft and a pulley D′, secured to the car-axle B, and passing through openings in the car-floor, as shown.

The dynamo is supported at one end by a standard E, which is secured to the car-floor and to which it is pivoted by a transverse pin or bolt *f*, passing through a lug *f*′ at the end of the dynamo-frame and through the bifurcated upper end of the standard, so that the dynamo is capable of swinging on this pivot toward and from the driving-axle B. The opposite end of the dynamo is yieldingly supported by an upright spring G, which in the construction shown in the drawings is incased in a telescopic cylinder H. The upper section *h* of this cylinder is swiveled to the dynamo by means of horizontal trunnions *i*, projecting laterally from opposite sides of said section and journaled in openings formed in perforate ears *i*′, projecting from the adjacent end of the dynamo-frame. The upper end of this swiveling cylinder-section is closed and rests upon the spring G, and the latter in turn rests upon the closed lower end of the lower section. This lower section is open at its upper end and fits into the upper section, while its lower end is vertically movable on an upright adjusting-screw J, which engages with a screw-threaded opening formed in the lower end of said section. This screw has a rounded or hemispherical lower end, which is loosely seated in a step-bearing *k*, secured to the car-floor, the screw being held in its bearing by the weight of the dynamo. The screw passes upwardly through an opening formed in the head of the upper cylinder-section, and its projecting end is made square or flat-sided to receive a suitable wrench for turning it. The upper cylinder-section is free to slide vertically on the lower section; but the latter is held against turning in the upper section by a longitudi-

nal feather and feather-way formed on the respective parts, as shown in Fig. 3. The spring presses the free end of the dynamo away from the driving-axle and thereby tightens the belt. Upon turning the screw J in one or the other direction the lower cylinder-section is caused to move vertically on the screw toward or from the upper section, thereby swinging the dynamo farther away from the driving-axle through the medium of the spring G or allowing the same to move toward the axle and increasing or diminishing the tension of the driving-belt accordingly. By means of this adjusting-screw the tension of the belt can be regulated to obtain the proper slippage of the belt for maintaining the desired normal speed and output of the dynamo. When it is desired to stop the dynamo, the belt is loosened sufficiently to allow it to leave the under side of the pulley on the driving-axle. This spring, while forming a tension device for the belt, also acts as a cushion which absorbs the vertical vibrations of the car and allows the dynamo to remain at all times practically in the same relative position to the driving-axle, thereby preventing variations in the tension of the belt and insuring a uniform output of the dynamo and a correspondingly steady illumination of the car.

The swiveling connection between the telescopic cylinder H and the dynamo-frame permits the cylinder, spring G, and adjusting-screw J to tilt and adapt themselves to the position of the dynamo when the latter assumes a more or less inclined position.

In the modified construction of my invention shown in Figs. 4 and 5 a weight is substituted for the spring of the first-described construction. In this case the weight L is adjustably mounted on the long overhanging arm of a longitudinal lever M, which is pivoted at the upper end of a pair of standards M′, arranged at the free end of the dynamo, and the short arm of this lever is connected with the adjacent end of the dynamo by a link *n*, so that the weight has a constant tendency to depress the long arm of the lever and thereby swing the dynamo away from the driving-axle, the pressure exerted by the weight being regulated by adjusting the weight toward or from the fulcrum of the lever. The free end of the dynamo is guided between the standards M′, as shown in Fig. 5.

I claim as my invention—

1. The combination with a railway-car having one of its axles provided with a pulley, of a dynamo pivotally supported at one end on the railway-car, whereby its opposite free end is capable of moving vertically with reference to said car-axle, a yielding support which carries the free end of the dynamo, and a frictional driving mechanism whereby the dynamo is driven from said axle, substantially as set forth.

2. The combination with a railway-car having one of its axles provided with a pulley, of a dynamo pivotally supported at one end on the railway-car, whereby its opposite free end is capable of moving vertically with reference to said car-axle, an adjustable pressure device which tends to move the opposite free end of the dynamo away from the driving-axle, and a frictional driving mechanism whereby the dynamo is driven from said car-axle, substantially as set forth.

3. The combination with a railway-car having one of its axles provided with a pulley, of a dynamo arranged above said axle and pivotally supported at one end on the railway-car, a spring which supports the opposite free end of the dynamo, an adjusting device for changing the tension of said spring, and a belt for driving the dynamo from the pulley of the driving-axle, substantially as set forth.

4. The combination with a railway-car having one of its axles provided with a pulley, of a dynamo arranged above said axle and pivotally supported at one end on the railway-car, an upright telescopic cylinder having one of its sections attached to the opposite free end of the dynamo, a vertical adjusting-screw for moving the other section of the cylinder lengthwise on the first-named section, and a spring arranged in said cylinder, substantially as set forth.

5. The combination with a railway-car having one of its axles provided with a pulley, of a dynamo arranged above said axle and pivotally supported at one end on the railway-car, an upright telescopic cylinder having its upper section attached to the opposite free end of the dynamo by a swiveling connection, an upright adjusting-screw extending through said cylinder and engaging with the lower section thereof, and a spring arranged in said cylinder and bearing against the ends of the same, substantially as set forth.

Witness my hand this 28th day of June, 1898.

WILLARD F. RICHARDS.

Witnesses:
JNO. J. BONNER,
KATHRYN ELMORE.