

(No Model.)

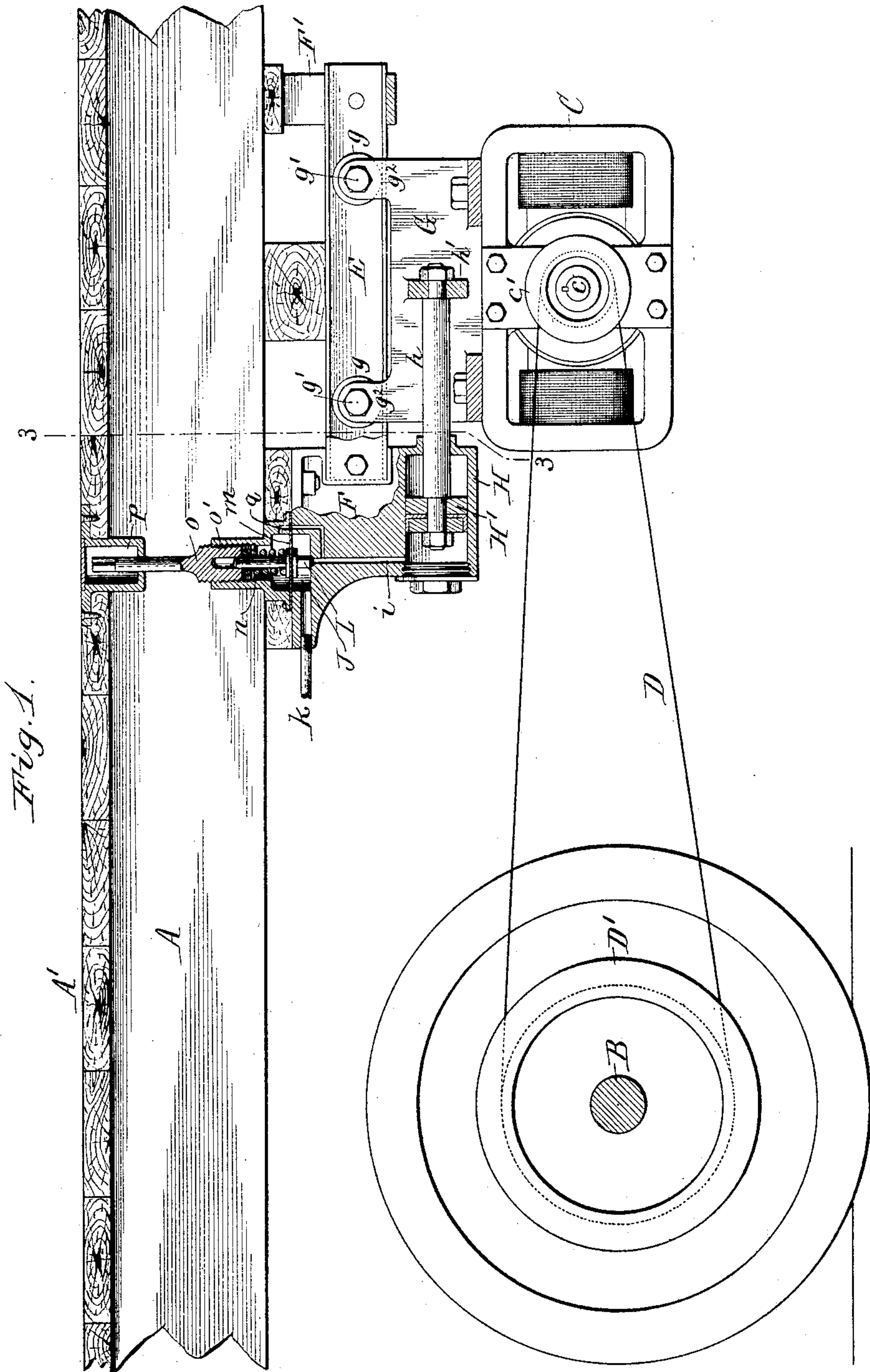
2 Sheets—Sheet 1.

W. F. RICHARDS.

ELECTRIC LIGHTING APPARATUS FOR RAILWAY CARS.

No. 604,085.

Patented May 17, 1898.



WITNESSES:

Chas. F. Burkhardt.
Henry L. Deck.

W. F. Richards INVENTOR.
By Wilhelm H. Borned.
ATTORNEYS.

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Fig. 2.

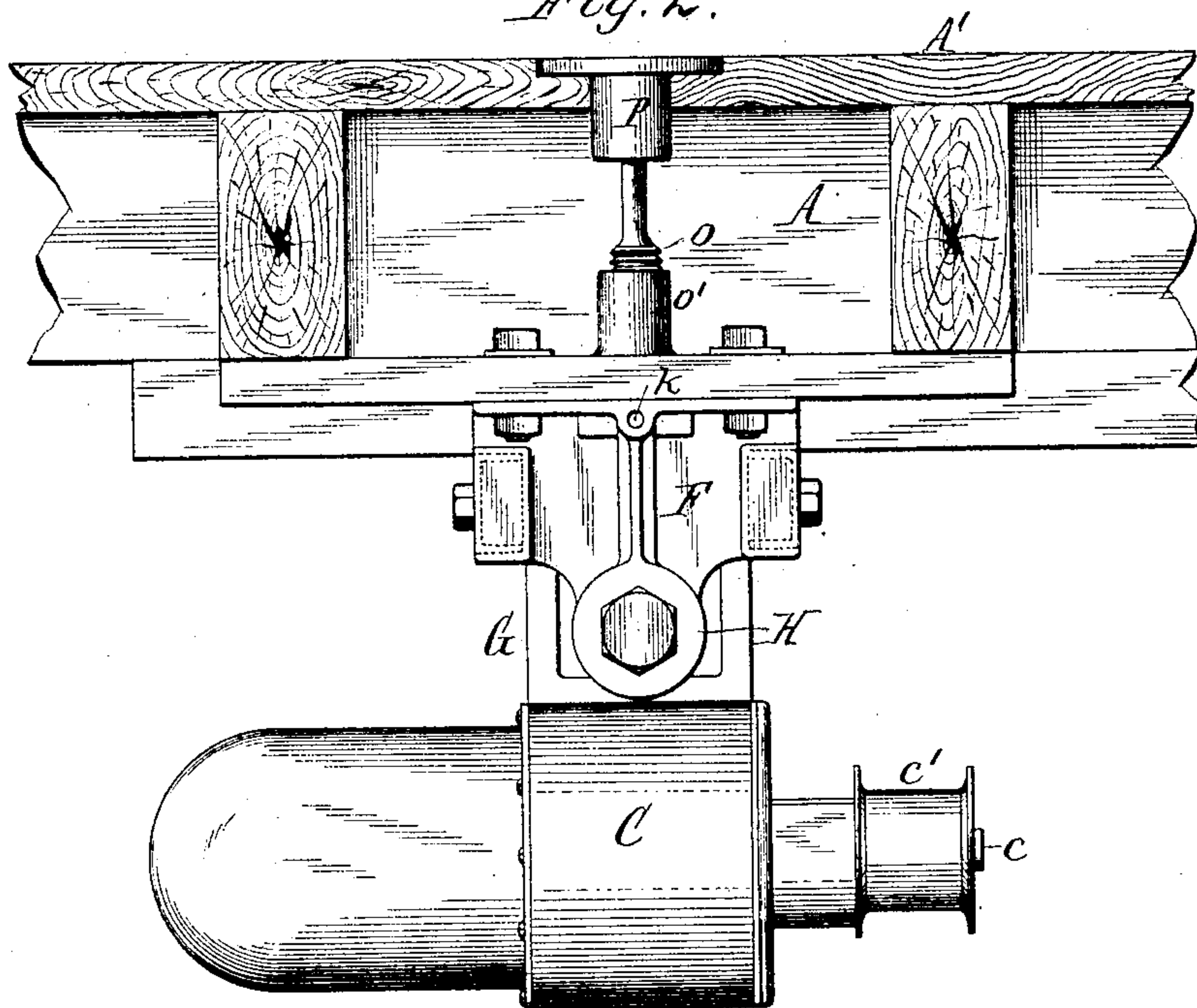
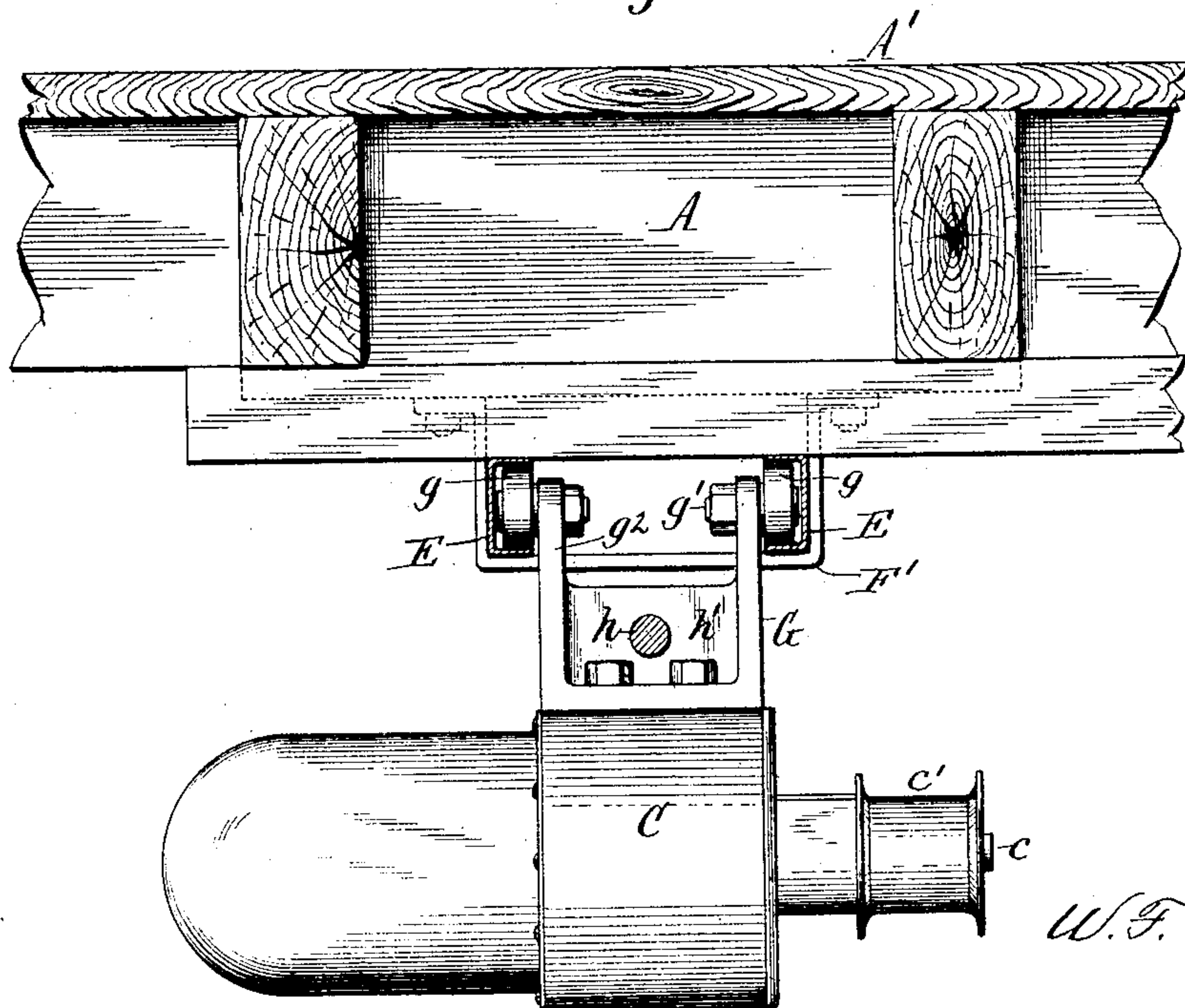


Fig. 3.



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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. 604,085, dated May 17, 1898.

Application filed October 14, 1897. Serial No. 655,135. (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 electric-lighting apparatus for railway-cars in which the current is generated by a dynamo driven from one of the car-axles, and more particularly to an apparatus in which the dynamo is capable of moving toward and from the car-axle and driven by a belt which slips on the driving-pulley of the dynamo when the speed of the machine exceeds a predetermined degree, so as to maintain a practically constant speed and output of the dynamo. An apparatus of this kind is shown and described in another application for patent filed by me on or about the 20th day of September, 1897, Serial No. 652,511.

The object of my present invention is to provide a simple and compact device for tensioning the frictional driving mechanism by which the dynamo is driven from the car-axle.

In the accompanying drawings, consisting of two sheets, Figure 1 is a sectional side elevation of my improved apparatus applied to a railway-car. Fig. 2 is a front view of the apparatus. Fig. 3 is a transverse vertical section thereof 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 a driving-belt running around the pulley of the armature-shaft and a pulley D', secured to the axle.

E represents parallel horizontal tracks or ways arranged lengthwise on the under side of the car-body in rear of the car-axle and firmly connected with the body. In the construction shown in the drawings the tracks consist of channel-bars having their channeled sides arranged to face each other and secured at their front ends to a bracket F and at their

rear ends to a strap or bracket F', which brackets are bolted to cross-pieces fastened to the car-sills.

G is a carriage running upon the tracks E and carrying the dynamo, which latter is secured to base-flanges of the carriage.

g represents the wheels or rollers of the carriage, which run upon the lower flanges of the tracks E and are journaled upon transverse pivot-bolts *g'*, secured to lugs *g²*, arranged at the upper front and rear portions of the carriage. The carriage is free to roll on its tracks, and the same and the dynamo are constantly moved away from the car-axle for tensioning the belt by the following mechanism:

H is a horizontal cylinder arranged in front of the dynamo-carriage and formed on or secured to the bracket F or otherwise supported independently of the carriage.

H' is a piston arranged in the cylinder H, and *h* is a rod which connects the piston with the carriage, said rod being secured at its rear end to a web or cross-piece *h'* of the carriage. The cylinder is provided on the rear side of the piston with an inlet port or passage *i*, through which fluid under pressure, such as compressed air, is supplied to the same, so as to force the piston rearwardly in the cylinder, thereby causing the same to move the carriage and the dynamo away from the car-axle and tensioning the driving-belt.

J is a valve-chamber preferably arranged on the bracket F and having its lower portion connected with the pressure-cylinder by the passage *i*, and *k* is a fluid-supply pipe leading to the lower portion of said valve-chamber and preferably connected with the usual air or storage tank of the air-brakes.

L is an automatic regulating or reducing valve arranged in the valve-chamber J and applied to a seat at the upper end of the connecting-passage *i*. This valve is carried by a flexible diaphragm *m*, which extends across the valve-chamber above the inlet of the latter, so that the pressure of the air against the under side of the diaphragm raises or deflects its central portion upwardly, thus opening the reducing-valve and allowing the air to enter the cylinder H and exert its pressure against the rear side of the piston H'.

n is a spring which is arranged in the valve-chamber J above the diaphragm m and which resists the upward deflection of the same, causing the valve to act as a reducing-valve, whereby the air-pressure upon the piston is diminished. This spring surrounds the stem of the reducing-valve between the diaphragm and an adjusting screw or plug o , which latter engages with an internally-screw-threaded neck o' , extending upwardly from the valve-chamber. The stem of this screw-plug preferably extends into a countersunk casing P , arranged in an opening of the car-floor, so that the plug can be turned from the inside of the car, the stem of the plug being formed to receive a suitable detachable wrench. By adjusting the screw-plug o up or down the resistance of the spring n is varied accordingly, and the air-pressure upon the piston is regulated correspondingly, the pressure being increased as the tension of the spring is diminished and reduced as the tension of the spring is increased, thus changing the tension or resistance of the air-cushion in the cylinder in the same measure.

q is an equalizing port or passage which connects the cylinder H with the portion of the valve-chamber J above the diaphragm m and whereby the pressure above and below the diaphragm is balanced. Upon admitting air to the cylinder the pressure raises the diaphragm and opens the valve, when the air enters the cylinder and also passes through the equalizing-passage q into the chamber above the diaphragm. As soon as the pressure in the cylinder and said chamber is balanced the spring n depresses the diaphragm and closes the valve. The air-pressure in the cylinder will now be equal to the difference between the initial pressure in the supply-pipe and the resistance offered by the diaphragm-spring. When any leakage of air from the cylinder takes place, the loss is followed by a reduction of pressure in the chamber above the diaphragm as well as in the cylinder, and the initial pressure now overcomes the resistance of the diaphragm and raises it and opens the valve, whereupon air enters the cylinder and said chamber until the loss of air and the normal air-pressure are restored, when the spring, owing to the balancing of the pressure above and below the diaphragm, is allowed to again close the valve. The loss of air is thus restored automatically.

The motion of the car-axle is transmitted to the armature-shaft of the dynamo so long as the speed of the latter remains at or below the normal; but as soon as the speed rises above the normal by the increased speed of the train the increased pull of the belt resulting therefrom overcomes the weight of the suspended dynamo and the resistance of the tensioning device and draws the dynamo toward the car-axle from which it is driven, thereby slackening the driving-belt, allowing

it to slip on the driving-pulley of the dynamo and permitting the speed of the dynamo to fall to the normal, when the dynamo will again move away from the driving-pulley under the force of the tension device and tighten the belt and so maintain the normal speed and output of the dynamo. By means of the adjusting screw or plug o the tension of the driving-belt can be regulated for obtaining the desired output of the dynamo.

I do not wish to claim, broadly, in this application the frictional driving mechanism for the dynamo in combination with a fluid-pressure mechanism for rendering said driving mechanism effective, as that is claimed in my previous application hereinbefore referred to.

I claim as my invention—

1. The combination with a railway-vehicle and its axle, of a longitudinal track or way arranged on the under side of the vehicle, a dynamo mounted on said track and capable of moving toward and from the car-axle, a frictional driving mechanism whereby the dynamo is driven from said car-axle, a horizontal cylinder supported by the vehicle, a piston arranged in said cylinder and connected with the dynamo, and means for delivering fluid under pressure to said cylinder, substantially as set forth.

2. The combination with a railway-vehicle and its axle, of a longitudinal track or way arranged on the under side of the vehicle, a dynamo-carriage mounted on said track and capable of moving toward and from the car-axle, a frictional driving mechanism whereby the dynamo is driven from said car-axle, a horizontal pressure-cylinder arranged between the car-axle, and the dynamo and supported by the vehicle, a piston arranged in said cylinder and having its rod connected directly with the dynamo-carriage and an inlet-valve controlling the admission of fluid to said pressure-cylinder, substantially as set forth.

3. The combination with a railway-vehicle, its axle and a movable dynamo adapted to be driven from the car-axle by a frictional driving mechanism, of a longitudinal track or way arranged on the under side of the vehicle and supporting the dynamo, a bracket supporting the front end of said track and carrying a horizontal pressure-cylinder and a valve-chamber communicating with said cylinder, a piston arranged in said cylinder and connected with the dynamo, and an inlet-valve arranged in said chamber and controlling the admission of fluid to the same, substantially as set forth.

Witness my hand this 5th day of October, 1897.

WILLARD F. RICHARDS.

Witnesses:

KATHRYN ELMORE,
G. R. DEAN.