

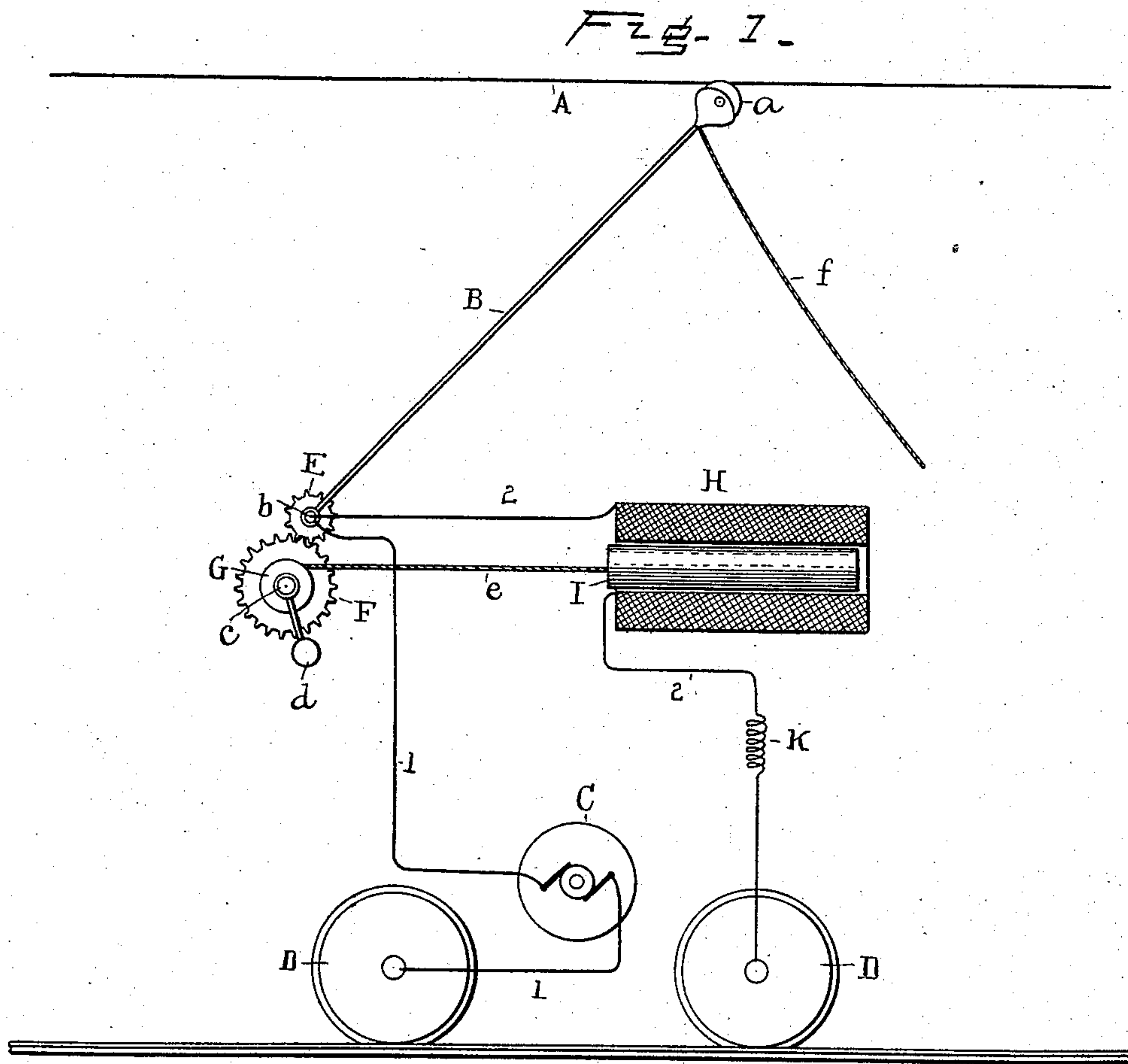
(No Model.)

2 Sheets—Sheet 1.

R. N. DYER.  
ELECTRIC RAILWAY TROLLEY.

No. 567,306.

Patented Sept. 8, 1896.



Witnesses  
Norris A. Clark.  
John R. Taylor.

Inventor  
Richard N. Dyer,  
By his Attorneys  
Dyer & Driscoll.

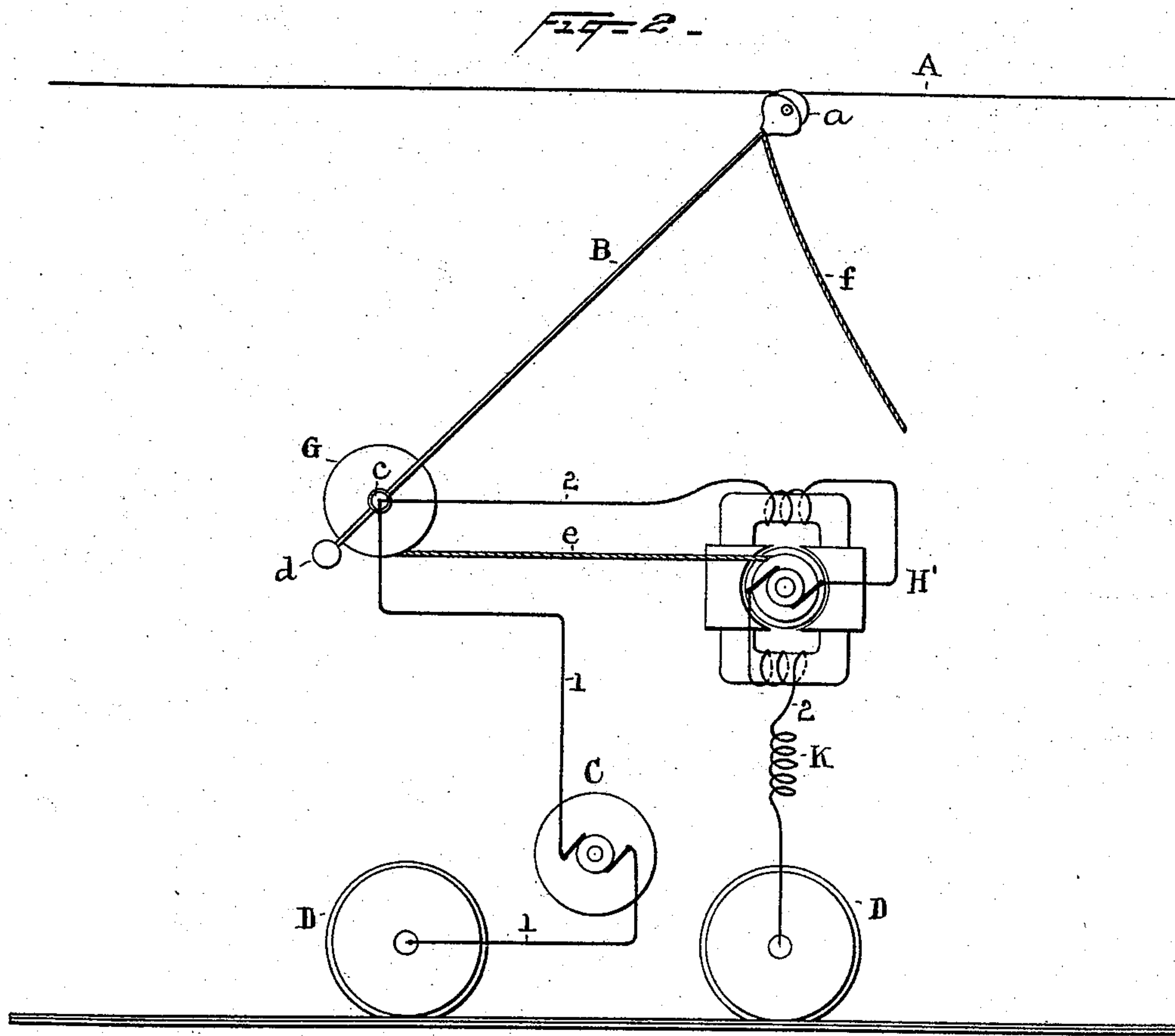
(No Model.)

2 Sheets—Sheet 2.

R. N. DYER.  
ELECTRIC RAILWAY TROLLEY.

No. 567,306.

Patented Sept. 8, 1896.



Witnesses  
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Richard N. Dyer  
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# UNITED STATES PATENT OFFICE.

RICHARD N. DYER, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE  
GENERAL ELECTRIC COMPANY, OF NEW YORK.

## ELECTRIC-RAILWAY TROLLEY.

SPECIFICATION forming part of Letters Patent No. 567,306, dated September 8, 1896.

Application filed April 30, 1896. Serial No. 589,639. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD N. DYER, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Electric-Railway Trolleys, (Case A,) of which the following is a specification.

The object I have in view is to devise electrically-operated means for producing and maintaining the contact of an under-running trolley with the overhead working conductor, which means will be independent of the operation and regulation of the car-motors and will be efficient in action.

In carrying out my invention I provide a solenoid and core or other suitable electromagnetic or electrically-operated device for exerting an upward pressure upon the trolley and producing and maintaining the required contact for supplying the car motor or motors, which electromagnetic or electrically-operated device is located in a circuit independent of that of the car-motors or in multiple-arc relation therewith between the two sides of the circuit. The core of the solenoid (when that is the electrically-operated device employed) is connected with the trolley by suitable means, preferably through a speed-multiplying gear, whereby the minimum movement of the solenoid-core will be required and, as nearly as practicable with such a device, the conditions of maximum efficiency of the solenoid and a nearly uniform pull will be secured throughout the range of movement of the trolley. Instead of a solenoid or other electromagnetic device, an electrodynamic device, such as an electric motor, may be employed to exert the upward pressure upon the trolley, such motor being, like the solenoid, located in a circuit independent of or in multiple arc with the car-motors; but, except as such a device is included within the broad invention hereinafter claimed, it is reserved for a separate application for patent, (Serial No. 589,640, filed April 30, 1896.) The initial upward movement of the trolley into contact with the working conductor may be secured in any suitable way, as by overbalancing the trolley by a weight or otherwise.

In the accompanying drawings, Figure 1 is

a view, largely in diagram, representing an arrangement of parts embodying my invention; and Fig. 2 is a similar view representing a modified form of apparatus.

Referring particularly to Fig. 1, A is the working conductor, B is the trolley-pole with its contact-wheel *a*, C represents the car motor or motors, and D represents the car-wheels. The trolley-pole is carried by a shaft *b*, carrying a pinion E, which meshes with a gear-wheel F, carried by a shaft *c*, on which is a drum G. A weight *d* may be used to overbalance the trolley, to give an initial contact between the wheel *a* and the working conductor A, sufficient to set the electrically-operated device into action. The car-motors are located in the circuit 1, between the trolley and the car-wheels. H is a solenoid, and I is its core. The core I is connected by a cord *e* with the drum G, whereby the attraction of the core by the solenoid will exert an upward pressure upon the trolley sufficient to produce and maintain the contact required for the operation of the car-motors. The solenoid is located in the circuit 2, between the trolley and the car-wheels, which circuit is independent of or in multiple-arc relation to the circuit 1, through the car-motors, and may include lamps or other resistance K or the solenoid may be wound to take the entire line pressure. The pulling-cord for the trolley is shown at *f*.

By locating the electrically-operated device in a circuit independent of that including the car-motors, that device exerts a constant pressure upon the trolley unaffected by the operation and regulation of the car-motors. The multiplying-gear also enables the solenoid to do its work with a minimum movement of its core and as nearly as practicable with a maximum and uniform effect.

In Fig. 2 is represented the modification before referred to, in which an electrodynamic motor H' is substituted for the solenoid H. The cord *e* passes around a drum on the shaft of the motor.

What I claim is—

1. In electric railways, the combination with an upward-pressure trolley, of an electrically-operated device for producing and maintaining the necessary contact between the trolley

and the working conductor, such electrically-operated device being independent of the operation and regulation of the car-motors, substantially as set forth.

5     2. In electric railways, the combination with an upward-pressure trolley, of an electrically-operated device for producing and maintaining the necessary contact between the trolley and the working conductor, such electrically-  
10 operated device being located in a circuit independent of the car-motors, substantially as set forth.

15     3. In electric railways, the combination with an upward-pressure trolley, of the car motor or motors, a solenoid located in a circuit in-

dependent of the car-motors, and a solenoid-core connected with the trolley and acting to move it upwardly, substantially as set forth.

4. In electric railways, the combination with an upward-pressure trolley, of a solenoid and 20 core for moving the trolley upwardly and a multiplying-gear connecting the solenoid-core with the trolley, substantially as set forth.

This specification signed and witnessed this 25th day of April, 1896.

RICHARD N. DYER.

Witnesses:

EUGENE CONRAN,  
JOHN R. TAYLOR.