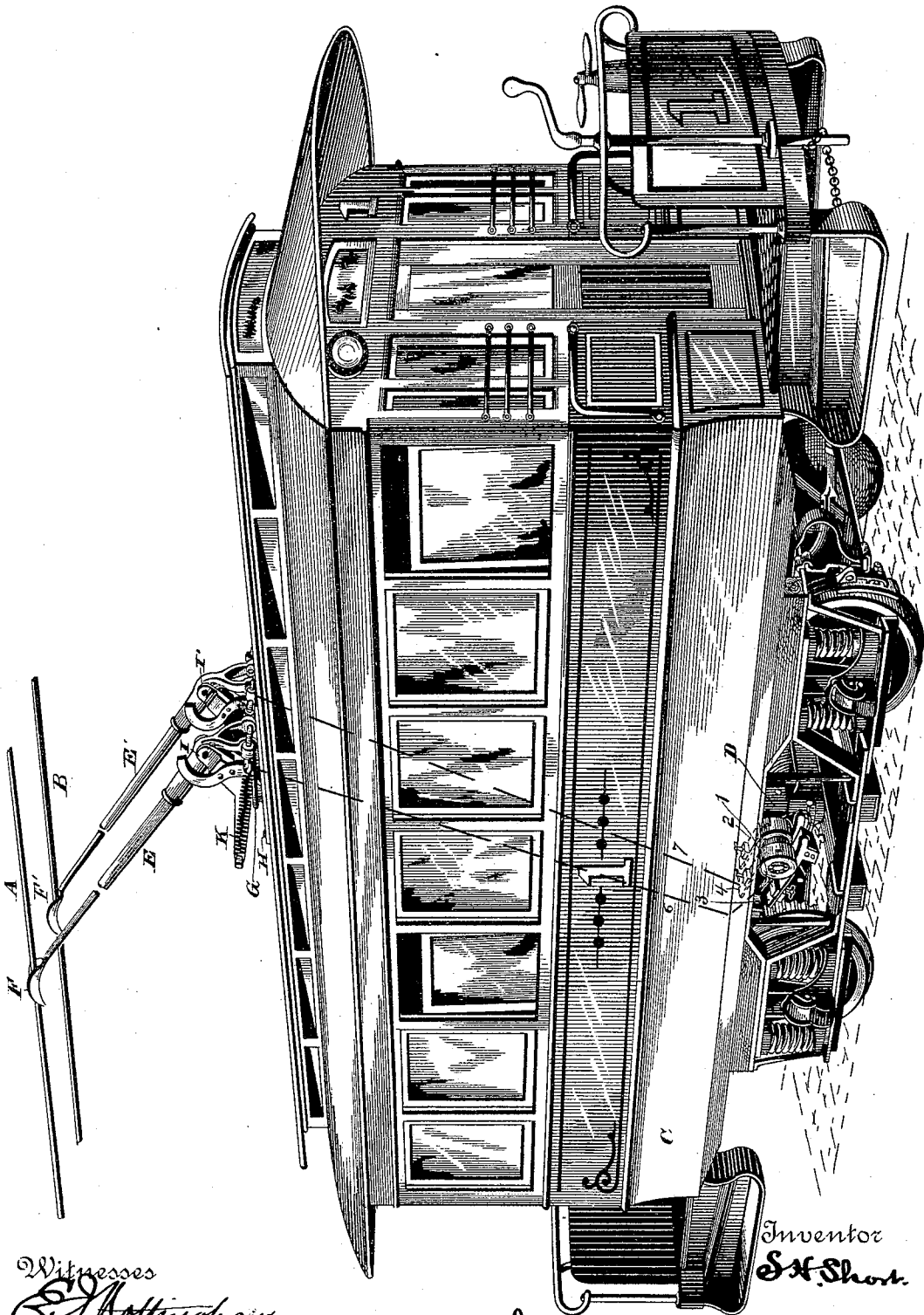


(No Model.)

S. H. SHORT.
ELECTRIC RAILWAY.

No. 461,690.

Patented Oct. 20, 1891.



Witnesses
E. J. Attridge
J. F. Downing

By *his* Attorney
W. A. Symmes

Inventor
S. H. Short.

UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO, ASSIGNOR TO THE SHORT ELECTRIC RAILWAY COMPANY, OF SAME PLACE.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 461,690, dated October 20, 1891.

Application filed April 24, 1890. Serial No. 349,292. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electric Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electric railways in which two conductors are employed to supply the electricity through separate contacts to the motor or electro-dynamic machine on large vehicles to be propelled by said electricity. The two conductors may form part of the system described in my patent, No. 394,139, dated December 4, 1888, or they may be otherwise arranged so long as the current may pass from one of them through the motor to the other. Such would be a system with one wire arranged as the direct and the other as the return wire of a metallic supply-circuit including the dynamo-electric machine and with the motors of the various vehicles along the line connected, electrically speaking, abreast of one another or in multiple are between the conductors. Heretofore in the systems employing in connection with such double conductors trolley or traveler contacts mounted on poles for taking off the current from said conductors it has been customary to mount on the same pole the separate contacts insulated from each other and provided with their individual wires leading to the motor.

According to the present invention separate trolley-poles are employed, each with its individual contact for the appropriate supply-conductor, and these poles are independently connected with the car each by its individual hinge and swivel-spring mountings, the word "hinge" in this connection (and elsewhere in this specification) referring to a flexible connection which allows the trolley-pole to move up and down, and the word "swivel" to a flexible connection which permits the trolley-pole to move from side to side, while the spring referred to tends to press the pole in the direction to bring the

contact at or near its outer end against the supply-conductor.

The accompanying drawing, which forms part of this specification, is a perspective view of a motor-car provided with the new or improved means for establishing the electrical connection with the double conductors. The said conductors A and B are supported in any ordinary or suitable way for permitting trolleys to travel along them. The car or vehicle C is provided with one or more motors D, which may be of any ordinary or suitable description; but, as shown, there is one motor of the Brush type with two sets of commutator-brushes 1 and 2 and 3 and 4, and the brushes 2 and 3 are electrically connected with each other, as indicated by the dotted line 5. The motor or motors may be supported and the armature or armatures connected with the driving axle or axles in any convenient way. The arrangement shown is like that shown in my patent, No. 415,070, dated November 12, 1889.

On the car C are the two trolley-poles E E', each with its contact F F', respectively, and with its individual hinge and swivel spring mounting. This mounting, as shown, comprises in each case a turn-table G, (or G'), swiveled or connected by a vertical pivot with the base H (or H') and provided with a bracket or pedestal I, (or I'), to which the trolley-pole is hinged or connected by a longitudinal pivot, and a spiral tension-spring K, (or K'), connected at one end with the lower end of the trolley-pole and at the other with the turn-table. Other approved or suitable hinge and swivel spring mountings may be used—as, for example, that shown in my patent, No. 396,618, dated January 22, 1889.

The contacts F F' are shown as sliding grooved shoes; but other forms of contact may be used—as, for example, in ordinary wheel or roller. The sliding contact shown constitutes or embodies an invention of my own, which, however, is the subject-matter of a separate concurrent application. The claim of that application is of course not repeated here. The said contacts of whatever description are electrically connected with the poles 1 and 4 of the motor by the conductors, (indi-

cated by broken lines 6 and 7,) which may be separate from the trolley-pole and its mounting, or may be formed in part thereby, if the same be of conducting material suitably insulated.

The connection of the armature-coils in the circuit is not represented; but it will be understood that it is made in any suitable way, and it will also be understood that devices of approved or suitable construction are used for establishing, cutting off, and regulating the current.

The contacts F F' are pressed each against its appropriate conductor A or B by the corresponding springs K K', which act independently of each other. Each pole also may move up or down or from side to side independently of the other, and thus each has perfect freedom to follow its own wire and maintain the electrical connection therewith. Being entirely independent, one trolley-pole may be placed at one end and the other at the opposite end of the car, or they may be placed in the most convenient positions.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with two supply-conductors, a car or vehicle and a motor on said car for propelling the same, two independent pole trolleys or travelers on said car, comprising each its individual pole and its individual hinge and swivel spring mounting, and each having its contact independently pressed by the said spring against one of said conductors and electrically connected with a corresponding pole of said motor, substantially as described.

2. In combination with two supply-con-

ductors, an electrically-propelled car or vehicle provided with, first, two trolley-poles mounted to turn laterally each independently of the other; second, two trolleys or contacts on the outer ends of said poles, held by spring-pressure, one trolley or contact against one of said conductors and the other trolley or contact against the other of said conductors and adapted each to guide the end of its pole laterally to follow its own conductor, and, third, a propelling motor or motors on said car having its terminals connected one with each of said trolleys or contacts, so as to be included in the circuit between the conductors by said trolleys or contacts, which latter are both held against their respective conductors by the pressure of springs intermediate them and the car and are each guided and adjusted by contact with its own conductor to follow the same independently of the other conductor and the other trolley or contact, substantially as described.

3. The combination, with a car and conducting-wires, of an electric motor on said car, two independent trolley-poles mounted on the car and adapted to have a vibratory and pivotal movement independently of each other, and contacts carried by said poles, said contacts being connected independently with the motor, so as to place said motor in multiple are, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SIDNEY H. SHORT.

Witnesses:

A. B. CALHOUN,
C. J. LEEPHART.