(No Model.)

S. H. SHORT.

ELECTRIC LOCOMOTIVE.

No. 473,674. Patented Apr. 26, 1892.

FIG. 1.

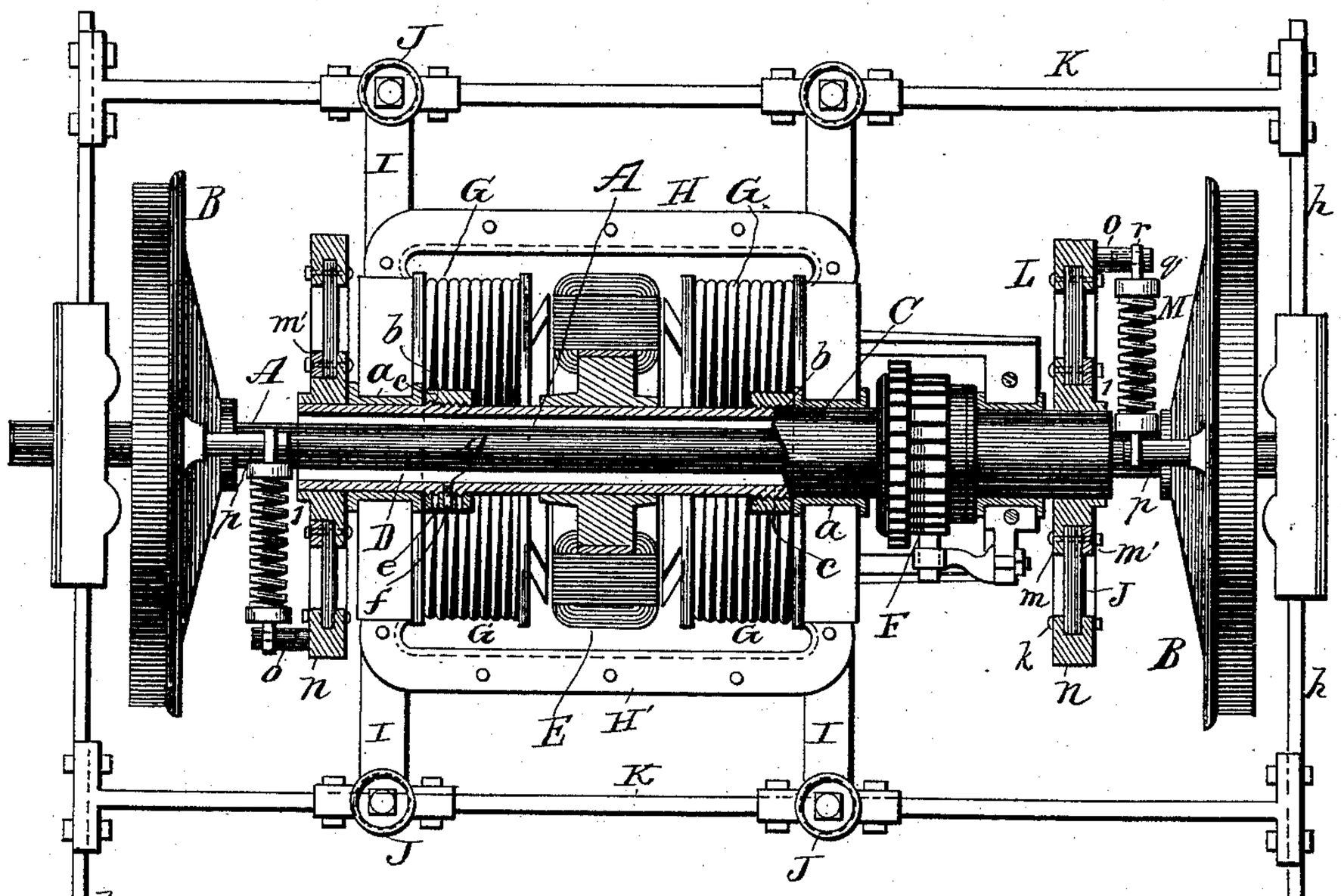
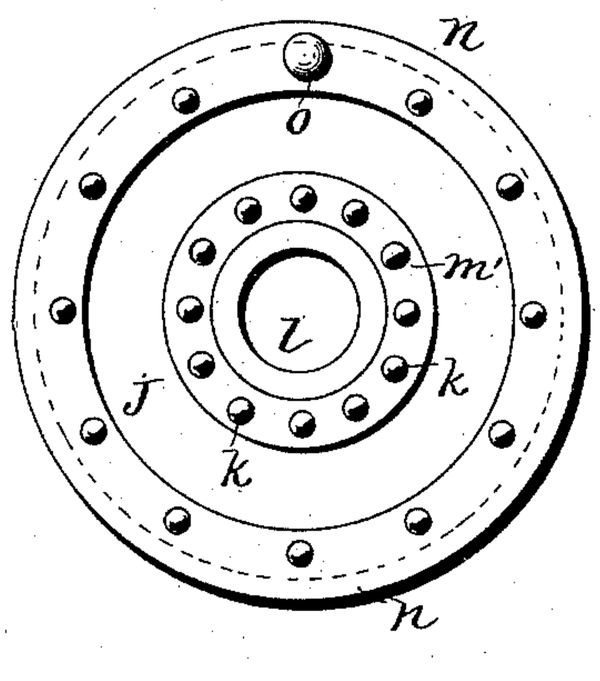


FIG. 2.



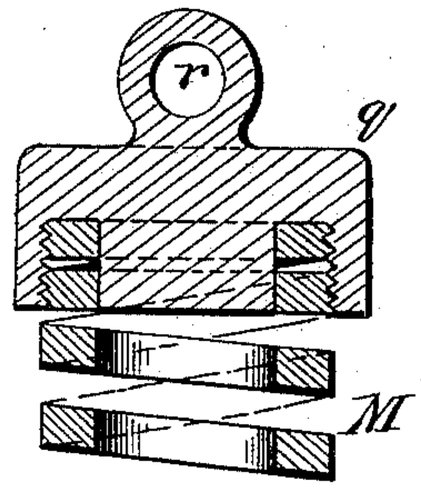


FIG. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRIC LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 473,674, dated April 26, 1892.

Application filed May 26, 1891. Serial No. 394,163. (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 Locomotives; 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-motor cars in which the armature of a propelling-motor is mounted axially with reference to a driving-axle and is directly connected with the driving wheel or wheels, so as to make one revolution to each revolution of the driving-wheels.

The object of the invention is to provide a simple and efficient construction of motor which may be directly applied to the driving-axle of an electric car and connected therewith in such a manner that it shall be protected against any sudden shocks or jars and, further, shall be insulated from the car-frame and driving-axle.

With these ends in view the invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of an electric motor connected with the driving-axle of an electric car, portions of the motor being represented in transverse section. Fig. 2 is a view in side elevation of one of the insulating driving-disks, and Fig. 3 is a detached view of one of the spring-fastenings.

A represents the driving-axle of an electric-motor car, and B B are the driving-wheels rigidly secured to the axle. Encircling the driving-axle is a long sleeve C, the inner diameter of which is considerably greater than the diameter of the axle, so as to insure an annular space D between the sleeve and the axle through which air may pass freely from one end of the sleeve to the other. Upon the sleeve is rigidly secured the armature E and commutator F. Field-magnets G G are secured to the field-magnet frames H H′, each of which is provided with a bearing *a*, within which is supported the sleeve C, which freely rotates therein. Sleeve C is screw-threaded at *b b* for the reception of locking-nuts *c c*, each of which is provided with a series of holes *e*, for the reception of a fastening-screw *f*, while the sleeve C is provided at points adjacent to the locking-nuts with a screw-threaded hole *g*. By rotating the locking-nuts, so as to disengage them from the bearings *a*, the sleeve C may be adjusted longitudinally, and thereby impart a lateral adjustment to the armature, and when the latter has been moved to the proper point the locking-sleeves are screwed snugly against the bearings *a* and retained in position by the fastening-screws referred to.

To the field-magnet frame are secured the four supporting-brackets I, each of which is provided at its outer end with an inverted cup-shaped socket, which receives the upper end of a rubber cushion J, the lower ends of which are supported in correspondingly-shaped metal sockets fastened to the channel-bars K K, the opposite ends of the latter being secured to axle-box extensions *h h*.

From the foregoing it will be observed that the field-magnets are supported in a yielding manner on frame-work connected with the axle-boxes, and hence are retained thereby against rotation, while the rubber springs serve to cushion the field-magnets against sudden shocks or jars and further to insulate them from the frame-work of the car.

To the opposite ends of sleeve C are secured the driving-disks L L, each of which is constructed as follows: *l* is a metallic hub rigidly secured in any desired manner to the end of the sleeve. Encircling this hub is a wooden web *j*, which is secured to the hub by bolts *k*, passing through the web and the flanges *m m′*, the flange *m* being formed integral with the hub and the flange *m′* independently thereof and fastened in place by the bolts referred to. To the periphery of the wooden and insulating web is secured a metallic rim *n*, from which projects, laterally, a wrist-pin *o*. To the driving-wheels B B are secured in any desired manner the wrist-pins *p p*, the wrist-pin on one driving-wheel being located at one side of the axle and that on the other driving-wheel being located on the opposite side for a purpose I will presently explain.

M M are closely-wound spiral springs, which are preferably square in cross-section for the

purpose of economizing space. Within the opposite ends of each of the springs is fastened by screwing therein a metallic end piece *q*, which is constructed with an eye *r*. One end of the spring is connected by the eye-piece to the wrist-pin on the driving-disk by means of a pin passed through the latter, while its opposite end is connected in a similar manner with the wrist-pin on the driving-wheel. Thus it will be observed that the opposite ends of the driving-sleeve C are yieldingly connected with the driving-wheels in such a manner that power is transmitted from the driving-sleeve to one wheel through the compression of one spring and to the other driving-wheel through the expansion of the other spring, and vice versa.

By means of the connecting mechanism above described the power is equably transmitted to both driving-wheels through the yielding and elastic connections interposed between the armature-sleeve and driving-wheels, and by reason of such connections the armature and its connected parts are relieved from sudden shocks and undue strains. Again, the spring-driving connections will allow of the vertical and lateral and endwise movement of the axle without danger of injuring or disturbing the operation of the motor. The driving-disks, by means of their non-conducting webs, prevent any leakage of the current through the driving-wheels.

It is evident that I may dispense with the driving-disk and spring connection at one end of the driving-sleeve without departing from my invention, and it is further evident that many changes in the construction and relative arrangement of parts might be resorted to which would still involve the spirit and essence of the invention, and hence I do not restrict myself to the particular construction and arrangement of parts hereinbefore described; but,

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

1. In an electric locomotive, the combination, with a driving-axle and a field-magnet frame yieldingly supported on the truck-frame and independently of the car-body, of an armature-sleeve encircling the axle and journaled in the field-magnet frame, a driving-disk secured to each end of the armature-sleeve, and springs connecting said driving-disks and driving-wheels, substantially as set forth.

2. In an electric locomotive, the combination, with a driving-axle, an armature-supporting sleeve encircling the axle and mounted on bearings independent thereof, of a spiral spring connected at one end with the armature-sleeve and insulated therefrom and at the other end with the driving-wheel, substantially as and for the purpose set forth.

3. In an electric locomotive, the combination, with a driving-axle and field-magnets encircling the axle, of an armature-sleeve mounted in bearings formed in or connected with the field-magnet frame and means for adjusting the sleeve longitudinally within its bearings, substantially as and for the purpose set forth.

4. In an electric locomotive, the combination, with a driving-axle and an armature-sleeve encircling the axle, of an insulated driving-disk fastened to the armature-sleeve and a spring connecting the driving-disk and one of the driving-wheels, substantially as and for the purpose set forth.

5. In an electric locomotive, the combination, with a driving-axle and an armature-sleeve encircling the axle, of a driving-disk secured to each end of the armature-sleeve, the periphery of each disk being insulated from the sleeve, and springs connecting said disks with the driving-wheels, substantially as set forth.

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

SIDNEY H. SHORT.

Witnesses:
S. G. NOTTINGHAM,
GEORGE F. DOWNING.