

(No Model.)

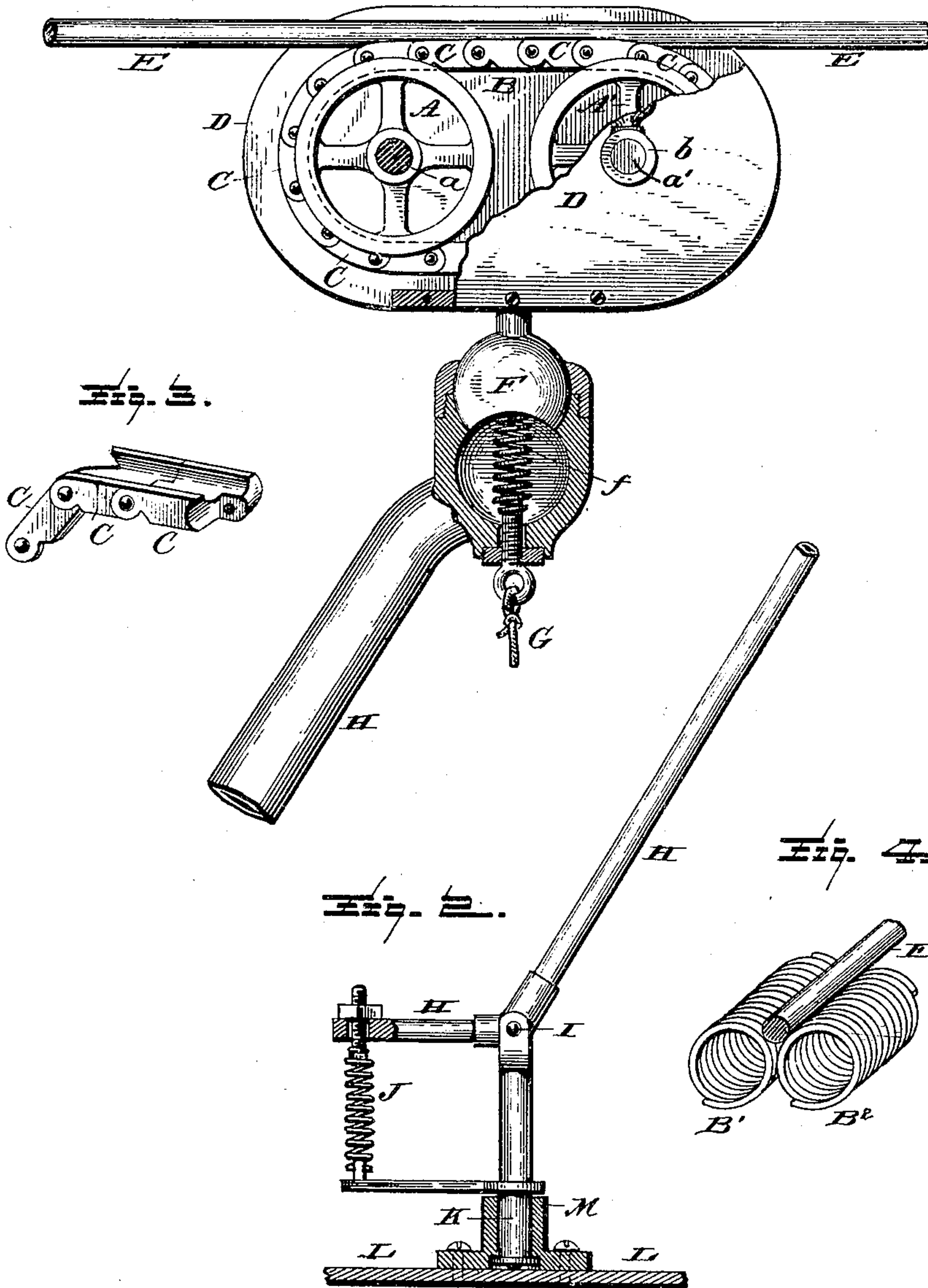
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MOVING CONTACT FOR ELECTRIC RAILWAYS.

No. 442,002.

Patented Dec. 2, 1890.

Fig. 1.



Witnesses

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MOVING CONTACT FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 442,002, dated December 2, 1890.

Application filed December 23, 1889. Serial No. 334,621. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR WELLINGTON ADAMS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new, improved, and useful Moving Contact for Electric Railways, of which the following is a true and complete specification.

Heretofore in constructing and operating electric railroads employing an overhead system of electric conductors it has been customary to resort to either a "sliding contact" or a "revolving trolley-wheel" moving along the under side of the electric conductor for the purpose of conveying the electricity from said conductor to the electric motor which is carried upon the car. While both these methods have been demonstrated to be capable of accomplishing the end in view, they are, nevertheless, both open to some serious objections. For instance, the sliding contact, while it offers less electrical resistance and affords greater surface contact and therefore requires a lighter pressure against the conductor, causes so much wear upon the conductor that its use is objectionable. On the other hand the rolling or trolley wheel contact offers great electrical resistance, and owing to the fact of its making only a line of contact with the electric conductor it must be pressed very strongly against said conductor, which in turn induces a great and rapid wear of the conductor and the trolley-wheel journals. Indeed, in order to secure sufficient contact surface with this form of moving contact the roller or trolley-wheel must be pressed up against the wire conductor with sufficient pressure to in a measure cause the wire to partially bend around the said wheel, so as to thus increase the area of the surface contact. Again, the wheel runs off of the electric conductor quite frequently, which induces sparking, and thus in turn roughens up the surface of the wheel and renders it inoperative. Another objection to the roller or trolley-wheel contact arises from the fact that the point of contact is never stationary for any appreciable length of time, but is constantly changing every hundredth part of a second. To overcome these objections to

both these present systems, and yet secure the combined advantages of both, is the object of the present invention, which consists in the provision of an "endless belt" or band mounted upon suitable pulleys and traveling upon the surface of the conductor, said endless belt or band being mounted as an "idler" and having no positive driving mechanism for communicating motion to its supporting-pulleys, but moving solely by reason of its frictional contact with the conductor against which it is held with yielding pressure. In this way I secure any desired number of inches of surface contact, which is stationary as between the moving contact and the conductor for the number of inches of contact arranged for by the length of the belt, thus effecting the same result as in a sliding contact without the latter's attendant wear upon the conductor. With such a contact but slight pressure upon the conductor is required, so that but little wear of the journals of the pulleys over which the belt runs is induced. Such a contact will not run off of the electric conductor as readily as will a rolling contact, since there is no wheel to climb the electric conductor. The endless belt or band designed to be used as a contact may be made of copper or other conducting material arranged in the form of a flexible band or of links; or it may consist of two or more spiral springs made of spring-brass or phosphor-bronze wire. This mechanism is held in contact with the wire, rod, or rail serving as the electric conductor by means of a lever-arm and an arrangement of springs similar in principle to those used in other similar devices, although the one here shown differs somewhat in detail from any of these.

The invention is fully and clearly illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of the complete apparatus with the upper portion of its attached lever-arm. Fig. 2 represents, on smaller scale, the lower portion of the lever-arm with its supports and suitable spring-connections for maintaining contact with the electric conductor. In Fig. 1 part of one of the retaining sides is broken out to show

the endless belt and one of its rollers or pulleys. The universal joint is also shown in section. Fig. 3 represents several links of a suitable link-belt. Fig. 4 shows a modification of the endless belt, in which a spiral spring is used instead of either a flexible band or a chain made up of links.

Similar letters of reference indicate corresponding parts throughout the figures.

10 A and A', Fig. 1, represent the rollers for carrying the endless belt or band. *a* and *a'* represent their axes, and *b* one of the bearings for said axes.

15 B represents the endless belt made up of links C C C.

D represents one of the two removable side guards designed to support the journals and also to keep the device in place upon the electric conductor.

20 E represents the electric conductor, against which the endless belt or band is designed to be pressed.

25 F represents a universal or ball-and-socket joint with spring attachment *f* (shown in section) and designed to maintain universal parallelism between the endless belt or band and the electric conductor.

G represents the conductor's cord for manipulating the moving contact.

30 H H represent an angular lever-arm designed to support the contact device; I, Fig. 2, its fulcrum; J, a suitable spring for holding said angular lever-arm against the electric conductor; and K, a swivel-pin, upon which said lever-arm is mounted.

35 L represents a segment of the top of the car, (shown in section;) M, a socket for the swivel-pin, (also shown in section;) N, an arm projecting from the swivel-pin to serve as the fixed point of attachment for the spring J.

40 C C C, Fig. 2, represent three detached links of a suitable endless belt. These links may be made of copper, brass, phosphor-bronze, carbon, or any other suitable conducting material. I am disposed to favor a layer of carbon for the contact-surface of the belt, and I believe the use of carbon in this connection to be new, and I shall therefore claim it broadly, whether it be used in connection with
50 an "endless-belt contact," a "wheel-contact," or a sliding contact.

55 B' and B² represent segments of two spiral-spring belts suitably arranged side by side to serve as the endless belt in lieu of the link-belt or simple flexible band should such a belt be found more desirable. E of the same figure represents a segment of the conductor resting in the sulcus formed between the two belts.

60 Having thus fully and clearly described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

65 1. In an electric railway operated by means of a current of electricity transmitted to an electrically-propelled car while the latter is in

motion, the combination, with an electric conductor paralleling such road and designed to convey the propelling-current of electricity to the car, of an endless belt or flexible band 70 of some suitable conducting material mounted upon the car as an idler, to move by frictional contact with said conductor, and held against the conductor with yielding pressure, substantially as and for the purposes herein- 75 before set forth.

2. In an electric railway operated by means of a current of electricity transmitted to an electrically-propelled car while the latter is in motion, the combination of an electric con- 80 ductor paralleling such road and designed to convey the propelling-current of electricity to the cars upon said road, an endless belt or flexible band made of some suitable conducting material and properly mounted upon 85 rollers or spindles and arranged to run parallel to and in contact with said conductor, with a suitable lever-arm and springs supported upon the car in such manner as to maintain contact between said endless belt 90 and the said electric conductor, substantially as herein shown and set forth.

3. In an electric railway operated by means of a current of electricity transmitted to an electrically-propelled car while the latter is in motion, the combination of an electric con- 95 ductor paralleling such road and designed to convey the propelling-current of electricity to the cars upon said road, an endless belt or flexible band made of some suitable con- 100 ducting material properly mounted upon rollers or spindles and arranged to run parallel to and in electrical contact with said conductor, a universal or ball-and-socket joint for maintaining universal parallelism be- 105 tween said endless belt and the electric conductor, with a suitable lever-arm and springs supported upon the car in such manner as to maintain contact between said endless belt and the said electric conductor, substantially 110 as herein shown and set forth.

4. The combination of a vehicle designed to be electrically propelled, an electric motor carried upon said vehicle and designed to propel said vehicle, a stationary source of elec- 115 trical supply, an electric conductor arranged to convey an electric current from said source of supply to and along the route of said vehicle, a moving contact consisting of an end- 120 less belt or flexible band made of some conducting material suitably mounted to run as an idler upon proper rollers or spindles and arranged to run parallel to and in contact with said electrical conductor, and suitable mechanical means connected with said ve- 125 hicle for holding said moving contact against the said electric conductor with yielding pressure, with means for electrically connecting said moving contact with the said propelling-motor, substantially as herein shown and set 130 forth.

5. The combination of a vehicle designed

to be electrically propelled, an electric motor
carried upon said vehicle and designed to pro-
pel said vehicle, a stationary source of elec-
trical supply, an electric conductor arranged
5 to carry an electric current from said source
of supply to and along the route of said ve-
hicle, a moving contact consisting of an end-
less link belt made of some conducting mate-
rial suitably mounted to run as an idler upon
10 proper rollers or spindles and arranged to
run parallel to and in contact with said elec-
trical conductor, means for holding said mov-
ing contact against the said electric conductor
with yielding pressure, and means for electric-
15 ally connecting said moving contact with the

said propelling-motor, substantially as herein
shown and set forth.

6. The combination of the endless belt or
flexible band B with its supports, the electric
conductor E, the universal joint F, the angu- 20
lar lever-arm H H, the swivel-pin K, with its
projecting arm N, and the socket M for the
reception of the swivel-pin, with the spring
J for holding the contact against the con-
ductor, substantially as herein shown and set 25
forth.

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