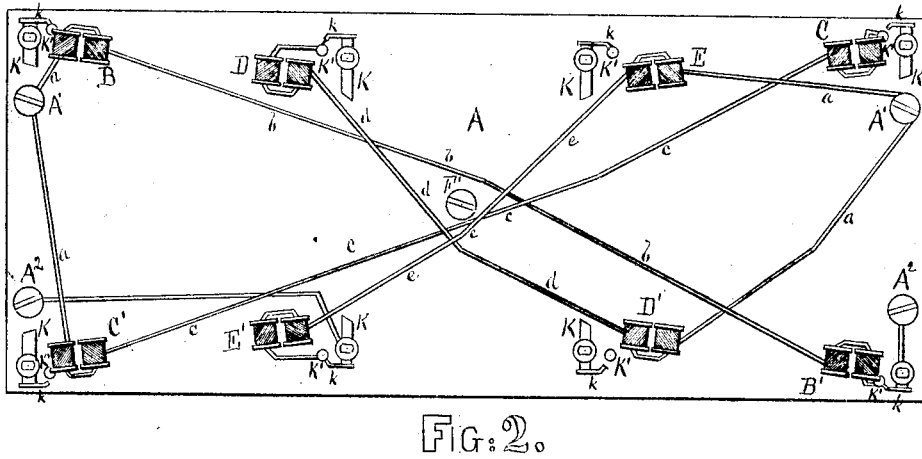
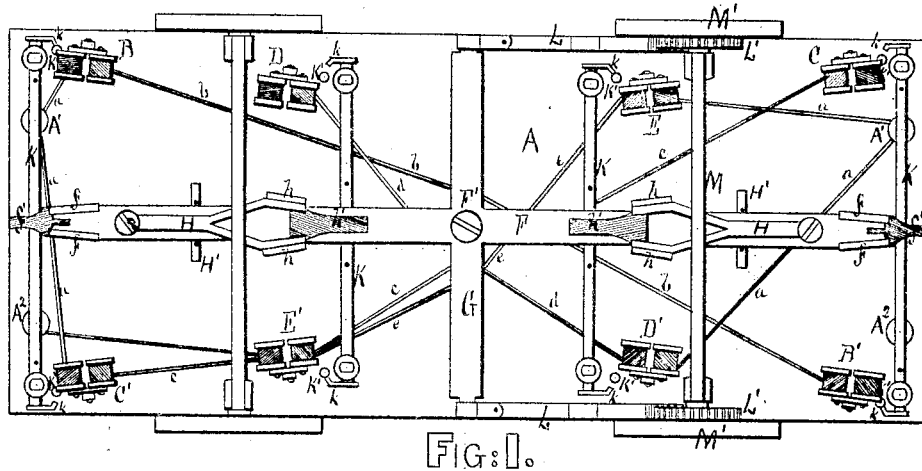


S. JONES.
ELECTROMOTOR FOR CARS.

No. 111,348.

Patented Jan. 31, 1871.



WITNESSES.

Edwin James.
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SOLOMON JONES, OF NEW ORLEANS, LOUISIANA.

Letters Patent No. 111,348, dated January 31, 1871.

IMPROVEMENT IN ELECTRO-MOTORS FOR CARS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SOLOMON JONES, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Electro-Motors for Cars and other Machinery; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a bottom view of a car with the electro-motor attached.

Figure 2 is a bottom view of a car, parts of the electro-motor being detached in order to show the wires connecting the different batteries.

The object of my invention is to furnish an improved electro-motor, which, while it is represented as an agent to be used in propelling railroad-cars, is also admirably adapted to drive any other class of machinery.

The nature of my invention is as follows:

To the under surface of the car, and at the center thereof, on a suitable bearing, I so pivot a long horizontal lever that the utmost freedom of an oscillating movement may be had.

On suitable centers, which are at points near the ends of the main lever, I pivot two short levers, which, like the main lever, are so secured on their bearings as to also allow to them a free vibratory or oscillating movement.

At the outer ends of the main and the inner ends of the short levers are secured armatures. These armatures are attached directly to the sides of the levers, and in such manner that their full surface shall be presented for the action or attraction of the electro-magnets; which are eight in number, and so arranged in pairs and so connected with the battery that those diagonally opposite shall at the same instant have their circuits completed by being brought in contact with the battery.

The circuits are alternately broken and completed, and the opposite sets of diagonal cross-magnets are excited, through the action of keys on the current-breaker bars being thrown against or freed from contact with the connecting-points, which are for this purpose so arranged that one shall be in communication with each set of diagonal magnets.

The keys that thus alternately render the magnets active are attached to the ends of the levers which form the current-breakers. These current-breakers are four in number, and are so secured as to allow of their free movement. They are moved to and fro in a longitudinal direction by the pins or stumps on their upper face being struck by the non-conductors at the ends of the oscillating levers.

The space between these pins or stumps must be such as to allow the necessary vibration of the lever to accomplish its work before its non-conductor is so pushed against the pin as to cause the current-breaker to break the contact with the magnet that has attracted the lever.

The power thus received from the battery through the electro-magnets is made to operate a lever, and is transmitted from the same to a cross-bar or motor-lever, secured at its center. In this lies the chief feature of my invention, and the one from which flows its greatest advantages, as I gain, as will readily be seen by any one at all familiar with mechanics, all the advantage of leverage which results from having the long arm of the lever, as in the crow-bar, between the power and the fulcrum. The power thus received is communicated through ratchet-pitmen attached to the cross-bar and suitable ratchet-gearing on the car-axle or wheel.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

A is a platform, on the under face of which the electro-magnets and the entire operating mechanism through which their power is communicated are secured.

This platform A may be an independent one, or, when the motor is used on railroads, the platform may be the floor of the car, the same being properly strengthened for the purpose.

B B' C C' D D' E E' are the electro-magnets, and are secured in suitable bearings on the under side of the platform A.

These are of the ordinary construction, and connected with the batteries, by means of the wires *a a* and the connecting-screws A' A' on the upper face of the platform, in the usual manner.

These magnets are arranged as shown, and those diagonally opposite, viz., B B', C C', D D', and E E', are united by means of the cross-wires *b c d e*, as clearly shown in fig. 2.

F is a long horizontal bar or lever, and is secured on the under side of the platform A and on a suitable bearing, F'.

This bar or lever is to be secured on its bearing in such manner as to allow of a free oscillating or vibratory movement.

f f are armatures secured near to, and *f' f'* are non-conductors secured at the ends of the lever F. These armatures *f f* are four in number, and are so attached on the sides of the lever F that their greatest surface shall be toward the electro-magnets B B' and C C'.

G is the motor-lever, and is firmly connected with the lever F at its point of bearing F', and running at right angles thereto. The connection of these levers

is such that the slightest oscillation of the one shall impart a like movement, but in the opposite direction, to the other.

H H are two short levers that are pivoted at suitable centers on the lever F. These levers are each provided with two armatures, one attached to the side of each prong of their forked heads, and opposite the electro-magnets D D' and E E'.

Between the prongs of the forked end of these levers are secured non-conductors *h' h'*.

The shank of these levers H H pass between pins on two short cross-arms, H' H', secured to the main lever F and at right angles thereto, and by which means, through the action alternately of the connected electro-magnets D D' and E E' on the armatures *h h* of the levers H H, the lever F is drawn in such relative position to the electro-magnets B B' and C C' as that, alternately, those diagonally opposite shall, through the armatures *f f*, communicate their full power to the lever F.

K K are four sliding bars or levers, which form the current-breakers, and are so secured in suitable bearings on the under side of the platform A as to allow them the necessary movement to complete and break the connection between the battery and the electro-magnets, which is done through the action of the keys *k k*, attached at the ends of the levers K K, on the connecting-points K' K', which are eight in number, four being attached to the electro-magnets and four independent.

Thus each set of diagonally-connected electro-magnets, such as B B', is furnished with both the positive and negative connecting-points, which enables the levers F and H H, through their non-conductors *f' f'* and *h' h'*, being forced against the bearing-pins on the upper face of the current-breakers K K, to so automatically move the sliding bars K K as to complete and interrupt the current that at the desired moment the batteries directly opposite shall be brought into action.

L L are ratchet-pitmen which are attached at the ends of the motor-lever G, and which gear with the wheels L' L', which may be attached either to the axle M or car-wheels M'.

Instead of two ratchet-pitmen, L L, four may be used, two running in the opposite direction and gearing in wheels secured on the other axle, but not shown in the drawing. This arrangement enables the car to be run in either direction with equal facility. When the mechanism is thus arranged the pitmen are to be so connected that those in the rear may be rendered inoperative, and instead of a single oscillating bar, F, two or more may be used, being so connected that they shall work on a common center.

Two batteries are used, which are connected by their positive and negative poles to the binding screws A' and A' respectively.

The operation is as follows:

The connection with the battery is completed with any two of the electro-magnets. To illustrate, say D D', which attract the armatures *h h* on the bars H H, which face them, or to which they are opposite. This draws the bars H H against the pins on the cross-arms H' H' of the bar F, and by this means moves the bar or lever F sufficiently far out of the true horizontal line of its bearing as to bring two of its armatures, *f f*, in such relative position to the electro-magnets B B' that their full power shall be exerted on the end of the lever F. But the electro-magnets D D', in thus drawing the armatures *h h* to them, necessarily so move the bars H H that their non-conductors *h' h'* shall be thrown against the pins on the sliding bars of the current-breakers K K, which so changes their relative position as instantly to cause them to interrupt the positive connection between the electro-mag-

nets D D', and to complete it with the electro-magnets E E', which are now in condition, through the armatures *h h* on which they act, to move the bars H H in an exactly opposite direction.

Action precisely similar in every respect to that described as alternately exciting the electro-magnets D D' and E E', the bar F, through the action of its non-conductor, accomplishes with the electro-magnets B B' and C C'.

It will be observed that the armatures on the levers H H are acted upon by the electro-magnets D D', that these levers, by pressing against the pins on the arms H' H', so move the lever F as to subject two of its armatures to the direct action of the electro-magnets B B'. These electro-magnets now being connected with the battery will so draw the armatures that the lever F is so moved that its non-conductors *f' f'* shall be thrown against the pins on the sliding bars K K of the outer current-breakers with such force as to move these bars sufficiently far to interrupt the connection between the battery and the electro-magnets B B', and which is instantly completed with the electro-magnets C C'.

The electro-magnets E E' and C C' are now in condition to repeat exactly the operation by which the armatures first on the levers H H were brought against the electro-magnets D D', and then those at the ends of the lever F against the electro-magnets B B'.

As these changes by the non-conductors are effected instantaneously through the current-breakers, a uniform and continuous oscillating or vibratory motion is imparted to the lever F, which of course is, at the center bearing F', communicated to the motor-lever G, which in turn is oscillated, and through the ratchet-pitmen L L, or their equivalents, communicates its power alternately to the wheels L' L', and by which the car or other machinery to which the motor is applied is propelled.

Thus it will be observed that I receive the power at the extreme ends of the lever and communicate at its center, thus gaining all the advantage of the leverage.

Having thus fully described my invention,

What I claim therein as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the pivoted bar or lever F, the electro-magnets B B', C C', D D', and E E', so arranged and connected by diagonal wires *b c* that the necessary power to impart the oscillating motion to the lever shall at the same instant be communicated to its opposite sides and at its extreme ends, and lever G and the mechanism by which power is communicated from its center, substantially as described, as and for the purpose specified.

2. The levers F and H H, with armatures attached, and electro-magnets B B', C C', D D', and E E', when the same are united by the diagonal connecting-wires *b c d e*, and the whole is so combined and arranged as to operate substantially as described and for the purpose specified.

3. The sliding current-breaker bars K K, each having keys *k k*, and the connecting-points K' K', when the same are so arranged in relation to the levers that the non-conductors *f' f'* and *h' h'* shall automatically complete and interrupt the currents with different sets of electro-magnets, substantially as described, as and for the purpose specified.

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

SOLOMON JONES.

Witnesses:

JOS. T. K. PLANT,
J. E. F. HOLMEAD