

(No Model.)

M. WHELESS.  
ELECTRIC RAILWAY SYSTEM.

No. 413,637.

Patented Oct. 22, 1889.

Fig. 2.

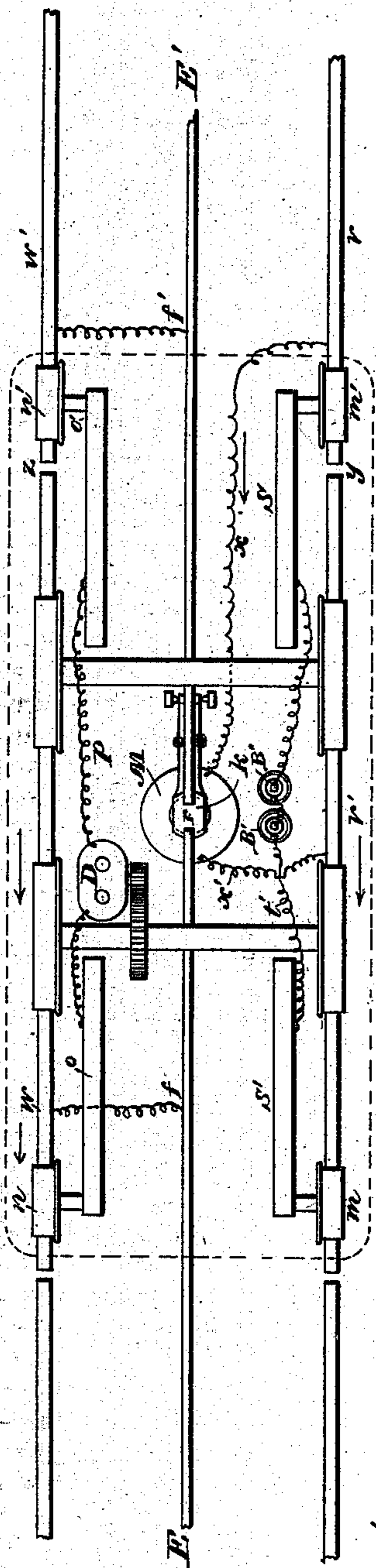


Fig. 1.

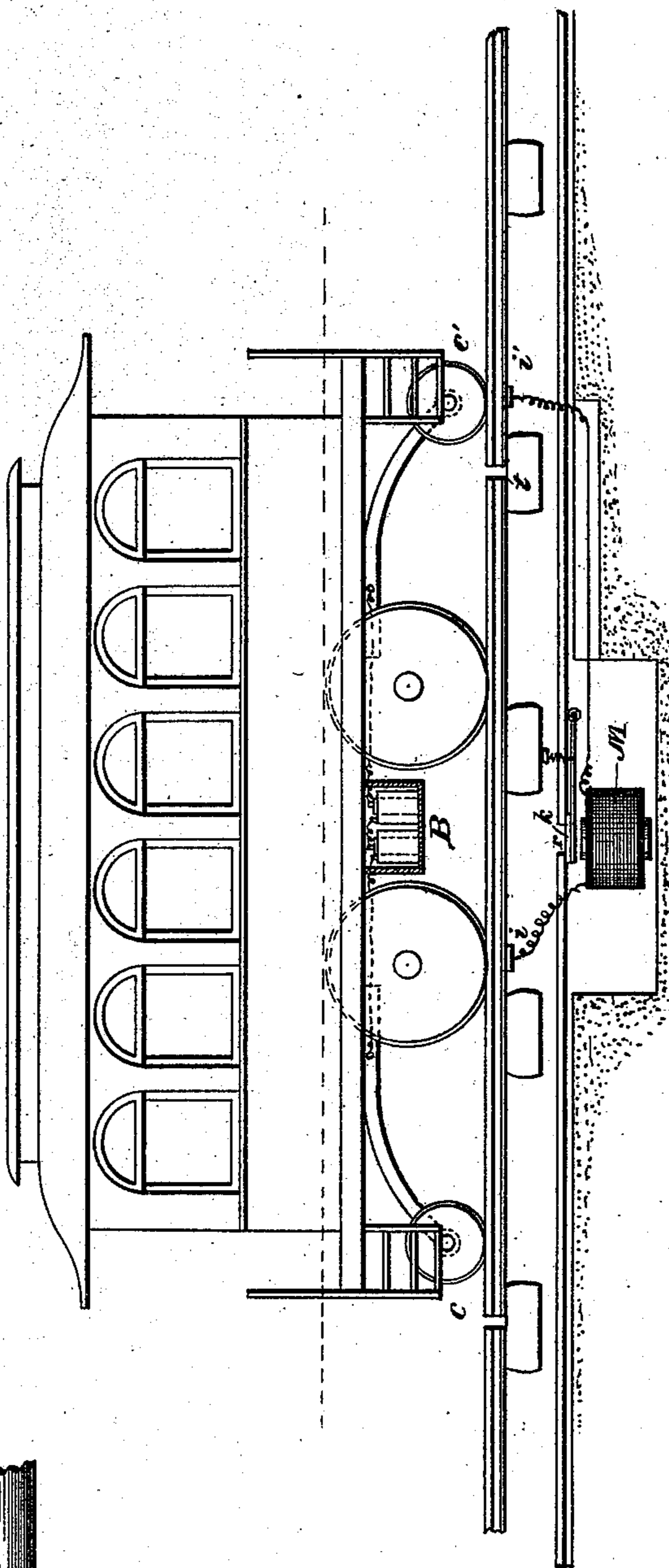
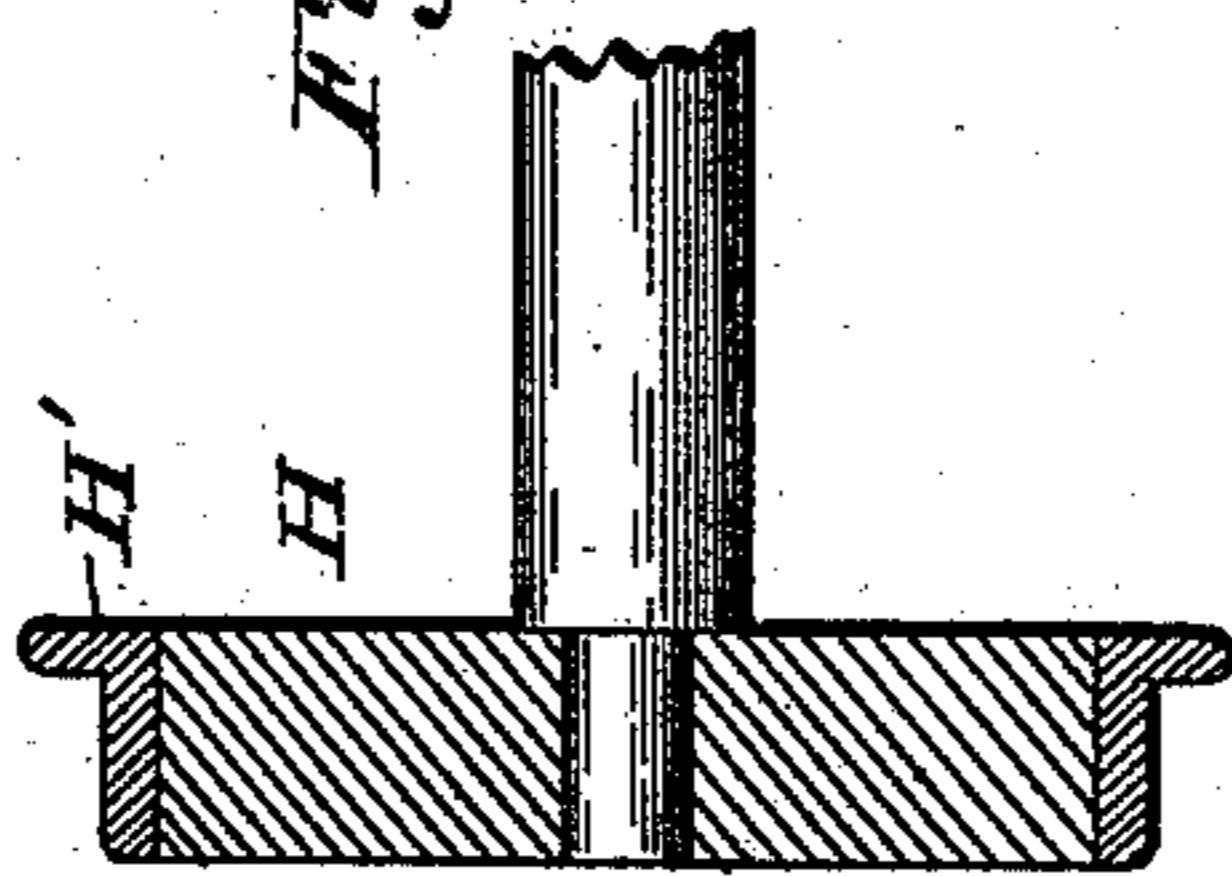


Fig. 3.



WITNESSES:

Percy C. Bowen.  
James S. Smith.

INVENTOR

Malone Wheless

# UNITED STATES PATENT OFFICE.

MALONE WHELESS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
OF ONE-HALF TO SAMUEL E. WHEATLEY, OF SAME PLACE.

## ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 413,637, dated October 22, 1889.

Application filed July 22, 1889. Serial No. 318,281. (No model.)

*To all whom it may concern:*

Be it known that I, MALONE WHELESS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in an Electric-Railway Conduit System; 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.

The object of my invention is a system of propelling cars by electricity, which consists, substantially, in causing electro-magnets placed in a conduit to open the line in the conduit, and thereby circuit the dynamo-current through the motor on the car.

The manner in which this is accomplished is as follows:

Figure 1 is a side elevation of a car and section view of a magnet and connections in the conduit. Underneath the car is shown a battery of several cells inclosed in the box B, attached to the bottom of the car, the two ends of the battery being carried to the small wheels C C', which rest always on separate rails, (so that the battery on the car cannot short-circuit itself, the separation or insulation of the rail at t preventing this.) Fig. 2 is a plan view of the car, conduit-line, and magnet-connections. Fig. 3 is a section view of the supporting-wheel used in this device, which is provided with a papier-maché or other suitable non-conducting center.

The operation of the car is effected in the following manner: EE', Fig. 2, is the conduit-line carrying the current from the dynamo-station, which we will suppose to be at E, the current flowing in the direction of E'. This line is laid in a suitable conduit, and after being laid is covered over and leaves no opening between the rails. Extending from the conduit-line, at f f', are wires which are attached to separate rails on one side of the track. By the use of these wires the current can be circuited through the motor on the car and then be led back to the conduit-line. This is accomplished in the following manner: The armature K, Fig. 2, of the magnet M, serves to keep the conduit-line closed at r, by resting against the two ends of the line, when the magnet M is "dead;" but when the

magnet M is vitalized the conduit-line is opened by the withdrawal of the armature K, and the current seeks the rail W through the wire f. It then flows in the direction of the arrow, into the small wheel n, (which is supported on a metal arm o,) and is from there carried to the motor D, thence along the line p to the metal arm o', and passes down this arm, through the small wheel n', to the rail W'. When the current reaches the rail W', it must pass back to the conduit-line through the wire f', as the opening or insulation at z gives it no other route. In other words, it is noticed that the current is simply circuited through the motor on the car by the fact of opening the conduit-line at r, (same figure.)

The supporting-wheels of the car perform no part in the circuiting of the current through the car, as they are made dead or non-conducting by being provided with papier-maché or other non-conducting centers, and the current flows through the motor from one of the small wheels to the other.

A description of the car-wheel used is shown in section in Fig. 3, the center H being of non-conducting material and surmounted by a metal ring H' properly flanged to hold the car to the rail. The magnet M, Fig. 2, which serves to open the conduit-line by withdrawing the armature K, is vitalized from a storage or other battery placed upon the car, as shown at B, Fig. 1. The two small wheels m m' are supported by metal arms similar to those shown at n n', and occupy a distance on the car greater than the length of the rail. In this manner one wheel is always on one rail and one wheel on the next rail. It will be noticed that the wires from the magnet in the conduit are fastened in like manner—i. e., one wire to one rail and the other wire to the next rail. In this manner the contact of the small wheels m m' with the two rails serves to close the circuit in the conduit-magnet as the car moves. The manner in which this is effected is as follows: B' B'', Fig. 2, are cells of the battery carried on the car. From B'' one wire is led to the metal arm S, and thence to the rail V, through the small wheel m'. Now the rail V is separated or insulated from the rail V' by the opening at y. Therefore the current traverses the

line  $x$  in the direction of the arrow, passes around the magnet  $M$ , thence to the wire  $x'$ . From  $x'$  it travels to the rail  $V'$ , pursuing the direction of the arrow to the small wheel  $m$ , and from there to the metallic arm  $S'$ ; thence along the wire  $t'$  to the other pole of the battery at  $B'$ , and the magnet  $M$  is vitalized. The result of this vitalization, as already shown, is to open the conduit-line and throw the circuit around through the motor on the car and the car is at once put into motion. This operation is repeated as the car passes over every rail and a uniform and rapid speed is acquired. The connections of the magnets to the track are shown in a simple manner at  $i$   $i'$ , Fig. 1, it being seen that  $i$  is fastened to one rail and  $i'$  to the other, the insulation or opening  $t$  keeping the wires from being fastened to a continuous conductor. The motor is geared to the axles in any suitable manner.

Having now described my invention, what I claim as new is—

1. The combination of an electric circuit separated at intervals, magnets placed at the points of separation; the armatures of the magnets normally closing the circuit, a car provided with a source of electricity and a motor, and two lines of conductors consisting of sections insulated from one another, the magnets and the source of electricity on the car being connected with one line, the motor and the main circuit being connected with the other, as set forth.

2. The combination of an electric circuit separated at intervals, track-rails insulated from one another, magnets placed at the points of separation of the circuit and connected with one line of rails, the armatures of the magnets normally closing the circuit, a car carrying a source of electricity connected with the line of rails to which the magnets are connected and a motor connected with the other line of rails, the main circuit being connected with the latter line of rails on each side of each point of separation, as set forth.

3. The combination of a closed conduit with

an electric circuit placed therein and separated at intervals, magnets placed at the points of separation, the armatures of the magnets normally closing the circuit, a car provided with a source of electricity and a motor, and two lines of conductors consisting of sections insulated from one another, the magnets and the source of electricity on the car being connected with one line, the motor and the main circuit being connected with the other, as set forth.

4. The combination of a closed conduit with an electric circuit consisting of an insulated main conductor separated at intervals, magnets placed at the points of separation, the armatures of the magnets normally closing the circuit, a car provided with a source of electricity and a motor, and two lines of conductors consisting of sections insulated from one another, the magnets and the source of electricity on the car being connected with one line, the motor and the main circuit being connected with the other, as set forth.

5. The combination of an electric circuit separated at intervals, magnets placed at the points of separation, the armatures of the magnets normally closing the circuit, a car provided with a source of electricity and a motor, and two lines of conductors consisting of sections insulated from one another, the magnets being connected with the sections of one line of conductors on opposite sides of the points of insulation, and the source of electricity on the car connected with the same line, the motor connected with the other line and the main circuit connected on each side of each point of separation with the sections of the latter line on opposite sides of the points of insulation, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

MALONE WHELESS.

Witnesses:

M. DORIAN,  
FRANK C. ROACH.