

(No Model.)

R. M. HUNTER.  
ELECTRICALLY PROPELLED VEHICLE.

No. 434,148.

Patented Aug. 12, 1890.

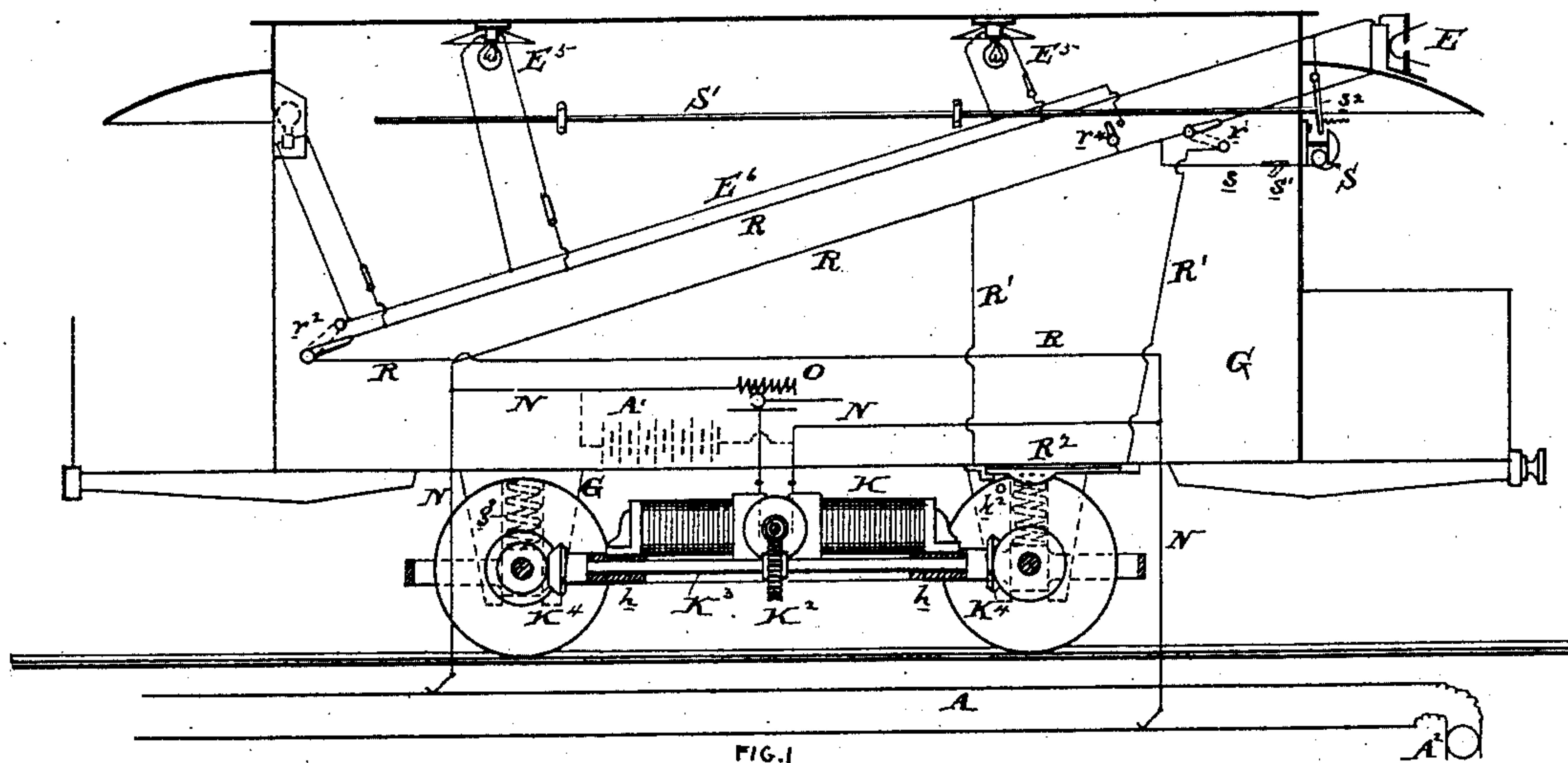


FIG. 1

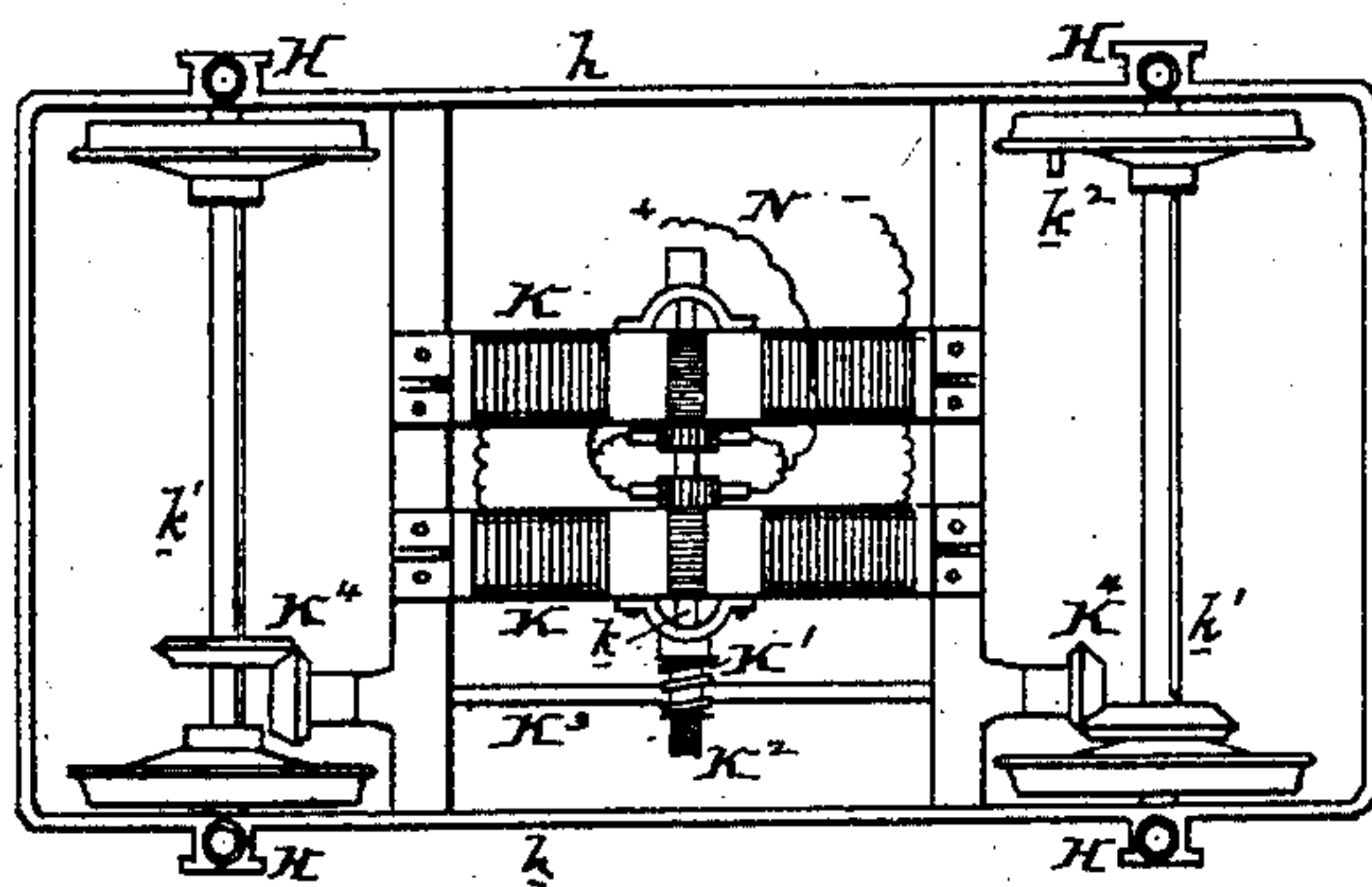


FIG. 2

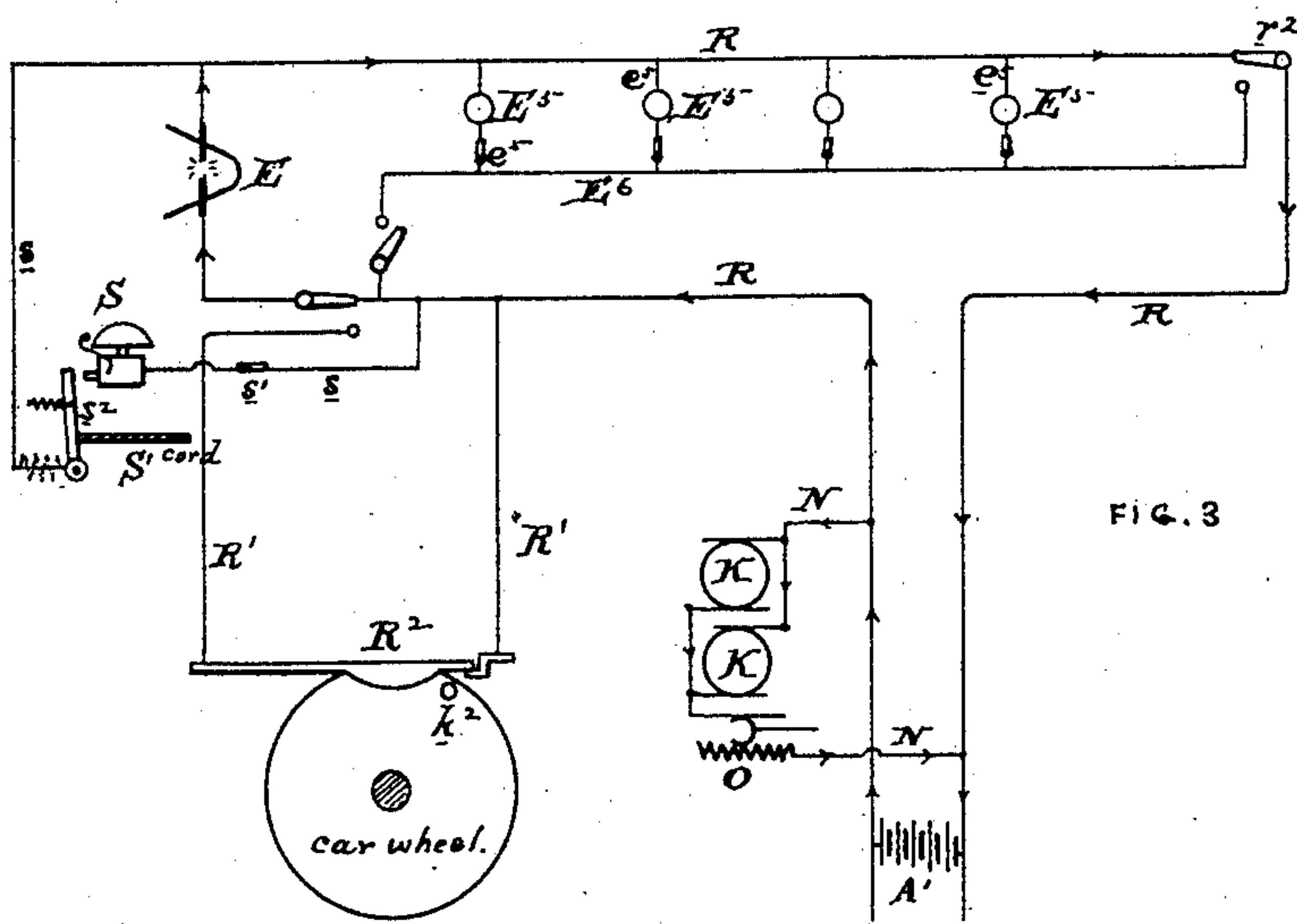


FIG. 3

Attest  
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# UNITED STATES PATENT OFFICE.

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## ELECTRICALLY-PROPELLED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 434,148, dated August 12, 1890.

Original application filed April 28, 1886, Serial No. 200,400. Divided and application filed May 22, 1889, Serial No. 311,659.  
Again divided and this application filed July 16, 1890. Serial No. 358,884. (No model.)

*To all whom it may concern:*

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Electrically-Propelled Vehicles, of which the following is a specification.

My invention has reference to electrically-propelled vehicles; and it consists of certain improvements, all of which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

This application (Case 154) is a division of my application (Case 98) filed May 22, 1889, and No. 311,659, which in turn is a division of my application No. 200,400, filed April 28, 1886.

In carrying out my invention I have had the following objects in view, viz: Providing the car with a lighting-circuit in parallel with the motor which rotates the axle of the car and furnishing it with electric lamps; combining therewith a regulator on the car for controlling the current passing to the motor independently of the current passing to the lighting-circuit, and also providing means for controlling the current passing through the lamps independently of the motor; providing the motor or car with an electric bell or gong receiving current from the motor-circuit, and preferably arranged in a shunt around the motor, and combined with a circuit-closer and signal cord, wire, or bar passing through the car, whereby a passenger may signal the conductor or driver to stop the car; providing the vehicle or car with a shaft geared to the axles, and two sets of motor-armature coils and commutators carried by the shaft, and means to magnetize the said sets of armature-coils simultaneously; also, providing such motor devices with a regulator common to both sets of armature-coils.

The foregoing is a brief enumeration of some of the most important features involved in carrying out my invention, and I will now refer to the accompanying drawings, in which—

Figure 1 is a sectional elevation through a carembodying my invention. Fig. 2 is a plan view of same with the car-body removed, and

Fig. 3 is a diagram showing the arrangement of the electric circuits on the car or vehicle for lighting, signaling, and propelling.

G is the car-body, and is supported upon springs *g*, which rest upon the axle-boxes H, or a frame *h* secured to said axle-boxes.

K K are two motors having a common armature-shaft and carried by the frame *h*. The armature-shaft is provided with a worm K', which gears into a worm-wheel K<sup>2</sup>, secured upon the shaft K<sup>3</sup>, also carried by the frame *h*, and this shaft K<sup>3</sup> is geared to the axles K' by bevel-gears K<sup>4</sup>.

N is the motor-circuit receiving current from the line-conductors A, having a generator A<sup>2</sup>, or from a battery A' carried by or moving with the car. Any source of electric energy may be employed.

O is a variable resistance, which may be located in the motor-circuit. This resistance-changing device or regulator controls the current flowing through the motor. By it the current flowing through both sets of armature-coils may be controlled.

The car is provided with electric lights E<sup>5</sup>, either small arc or incandescent, the latter being preferred, and these are connected in multiple arc by wires *e*<sup>5</sup> and conductors R, connected with the motor-circuit and preferably shunted around the motor. These circuits *e*<sup>5</sup> may have switches to cut out each lamp. The circuit R may include the head-light E<sup>4</sup>, which may be either of the arc, large incandescent type, or a group of small incandescent lamps. If the switch *r* is closed, the head-light circuit will be closed and the light continuous. Referring to Fig. 3, it will be observed that when the circuits are coupled as shown the head-light E alone will burn and its light will be continuous. If, now, switch *r* be turned to break circuit R and include the circuit R' and its interrupter-switch R<sup>2</sup>, the head-light will be a flash-light. If the switch *r* be closed as before and the switch *r*<sup>2</sup> turned to include circuit E<sup>6</sup>, then the incandescent lamps E<sup>5</sup> will be arranged in multiple arc with each other and in series with the arc or head-light E. If it is desired to burn the lamps E<sup>5</sup> alone, the switch *r* is opened and switch *r*<sup>4</sup> closed in the circuit *r*<sup>3</sup>, connecting



the conductor  $E^6$  with circuit  $R$ , leading from the motor-circuit. If, now, the switch  $r$  be closed to circuit, the head-light will be in multiple-arc connection with the incandescent lamps, and if the switch is turned to circuit  $R'$ , then the head-light will flash and the incandescent lamps burn continuously.

To accomplish the flashing of the head-light, I provide the circuit  $R'$  with a circuit-breaker  $R^2$ , which preferably closes by a spring action and is opened by a pin  $k^2$  on the car wheel or axle or other moving part of the vehicle. As said pin moves around, it opens the circuit  $R'$ , extinguishing the lamp, and as said pin passes the switch closes and re-establishes the circuit. I do not limit myself to any arrangement of the lamps on the car or to their particular circuits, and in place of taking the current from the motor-circuit they may receive current from separate conductors, the essential feature of the invention being the lighting of an electric motor or car by electric lamps receiving electricity from a common source with the motor.

$S$  is a signal bell or gong to enable the passenger or conductor to notify the driver or operator to stop the car, and receives its current from a shunt-circuit  $s$  around the motor or from the motor-circuit. A switch  $s'$  may be used to cut the signal out of circuit. Normally, the bell is out of circuit, but by pulling upon a bell-rope  $S'$ , running through the car, the switch  $s^2$  may be closed to signal the operator to stop the car. The novelty in this arrangement consists in that the current to operate the bell is received from the motor-circuit.

Broadly considered with reference to the lighting, signaling, and motor circuits, it is immaterial to my invention what the source of electric energy may be, as it may be carried by or with the car or received from line-conductors, as desired.

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

1. In an electrically-propelled vehicle, the combination of a shaft geared to the axles,

two sets of armature-coils and their commutators carried by said shaft, and means to magnetize both of said sets of armature-coils simultaneously.

2. In an electrically-propelled vehicle, the combination of a shaft geared to the axles, two sets of armature-coils and their commutators carried by said shaft, means to magnetize both of said sets of armature-coils simultaneously, and current-controlling devices carried by the vehicle and common to both sets of armature-coils.

3. The combination of an electrically-propelled vehicle, a source of electrical energy, electric circuits between the source of energy and the electric motor on the vehicle, and a current-regulating device carried by the vehicle for controlling the current passing to the motor.

4. The combination of an electrically-propelled vehicle, an electric motor coupled with the axle thereof, a source of electrical energy, a lighting-circuit in parallel with said motor and receiving current from the same source of electrical energy, a regulator for controlling the current passing to the motor independently of the current passing to the lighting-circuit, a series of electric lamps arranged in the lighting-circuit, and independent means for controlling the current passing through said lamps.

5. In an electric railway, the combination of the motor-circuit including the motor, a shunt-circuit around the motor and including an electric belt, a circuit-closer adapted to make and break said shunt-circuit, a switch to break said shunt-circuit and render it inoperative, and a signal cord passing into or through the car to actuate said circuit-closer for the purpose of signaling the operator to stop the car.

In testimony of which invention I have hereunto set my hand.

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,  
LOUIS M. PORTER.