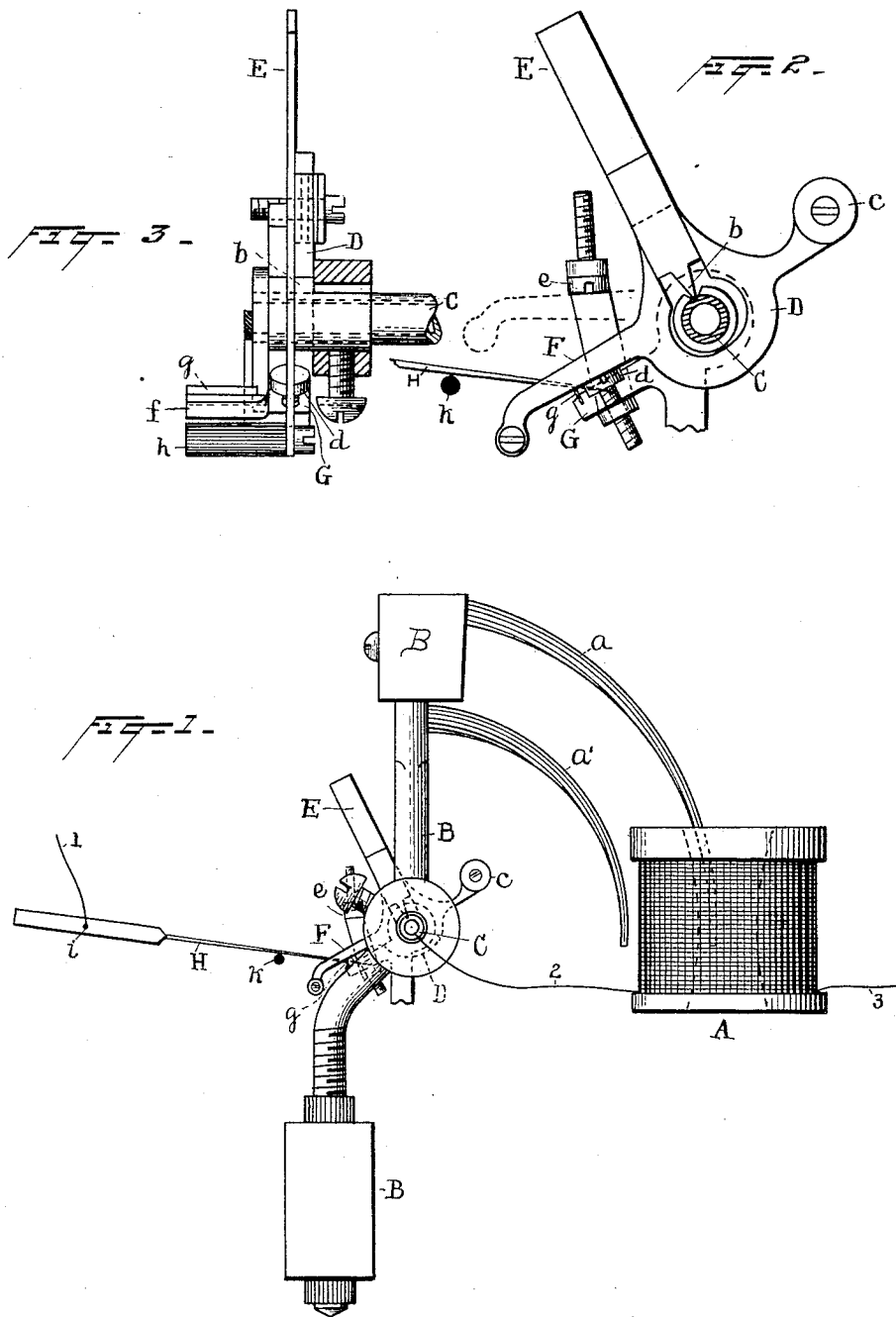


(No Model.)

G. R. GREEN.
ELECTRIC MOTOR.

No. 571,043.

Patented Nov. 10, 1896.



WITNESSES:

Norris A. Clark.

John R. Taylor.

INVENTOR

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BY

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his ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE ROSS GREEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE AMERICAN ELECTRIC METER COMPANY, OF SAME PLACE.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 571,043, dated November 10, 1896.

Application filed March 7, 1896. Serial No. 582,293. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ROSS GREEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Electric Motors, of which the following is a specification.

The object I have in view is to produce an oscillating electric motor especially designed for employment in electric meters and of the general character described by the patent granted to Charles Wirt January 29, 1895, No. 533,108, in which the circuit making and breaking device for controlling the circuit to the operating-solenoid of the motor will be more simple in construction and more certain in operation than the dash-pot and connected floating contact of the Wirt motor.

In carrying out my invention I provide a circuit-controller whose operative element is a weight carried by the oscillating shaft of the motor and is supported below its center of gravity, such weight being moved by the oscillation of the motor-shaft back and forth past the vertical line, so that it will have a movement first in one direction and then in the other independent of the motor-shaft and in advance of its movement. This device I employ to break the circuit to the solenoid when the pendulum has been swung in one direction by the attraction of the armatures or cores, thus withdrawing the current from the solenoid and releasing the armatures and permitting the pendulum to swing back in the other direction when the weight falls on the other side of the vertical line and places the parts in position for the renewal of the contact upon the next forward movement of the pendulum.

In the accompanying drawings, forming part hereof, Figure 1 is a side elevation of the motor with the circuit connections indicated. Fig. 2 is a side elevation, on an enlarged scale, of the circuit-controlling devices; and Fig. 3 is an end view and partial vertical section of such devices.

A is the motor-solenoid acting upon the armatures or cores $a a'$, which are carried by

the pendulum B, mounted upon the shaft C. Upon this shaft is hung a yoke D by means of a knife-edge b , resting in an angular groove on the upper side of the shaft, as shown, and supporting the weight E below its center of gravity. One end of the yoke D may carry a counterbalance-weight c . The other end of the yoke carries an arm F, which plays between two adjustable limiting-stops d and e , carried by an arm G, secured to and projecting from the shaft C. The arm G has a laterally-projecting finger f , carrying a strip of platinum g , forming a contact-surface. The arm F, projecting from the yoke D, carries on its end a laterally-projecting bar of insulation h .

II is a lever pivoted at i and projecting at its forward end over the contact g , upon which it bears in the position of rest of the motor illustrated by Fig. 1, the tendency of the lever being to fall onto the contact. A pin k supports the lever H and prevents it from following the contact g when the pendulum is swung backwardly beyond the position of rest. The circuit 1 2 3 passes through the lever II to the contact g , thence to the shaft C, and thence to the solenoid A.

In the position of rest of the motor the circuit is completed, as illustrated in Figs. 1 and 2. The solenoid attracting the armatures $a a'$ swings the pendulum forward, the contact g rising and carrying with it the lever II until the weight E passes the vertical line, when that weight topples over to the right, lifting the arm F against the upper limiting-stop e and raising the insulating-bar h , the latter striking the lever H and lifting it off of the contact g , thus breaking the circuit. The circuit through the solenoid being now broken, the pendulum is free to swing in the other direction, the lever II being supported by the bar h out of contact with the contact g . The stop e is so adjusted that on the backward or unattracted swing of the pendulum the weight E will topple over to the position indicated in the drawings when the pendulum reaches its normal or idle position, which is that indicated in the drawings. This movement of the weight E car-

ries the arm F toward the stop *d* and permits the contact-lever II to fall toward the contact *g*, but since the arm G swings with the pendulum the contact *g* will have moved so far on the backward swing of the motor that the contact-lever II cannot make contact therewith, but will strike the pin *k*. Thus the pendulum continues on its backward swing with the circuit to the solenoid still open, and as the pendulum starts on its forward swing, through the force of gravity, the contact *g* will meet the lever II when it reaches its normal or idle position, closing the circuit and again energizing the solenoid A, whereupon the armatures *a* are again attracted and the pendulum continues on its forward swing, the circuit remaining closed until the weight E again topples over and opens the motor-circuit. The limiting-stop *d* is so adjusted that the motor-circuit will remain closed on the forward swing of the pendulum a distance sufficient to carry the weight E past a vertical line. The stop *e* is so adjusted that the weight E will fall over to the normal or idle position when the pendulum reaches its normal or idle position, thus insuring a contact between the plate D and lever II when the motor is at rest. By this adjustment the arm F of the circuit-controller will always rest upon the stop *d* when the motor is at rest.

From the foregoing it will be seen that the motor-circuit is closed only during the forward swing of the pendulum and for a comparatively short period, and in actual practice the angle through which the pendulum swings on its forward stroke while the motor-circuit is closed is about eighteen degrees.

My circuit-controller, it will be seen, is one of simple mechanical construction and is effective and certain in its operation.

What I claim is—

1. The combination with an electric motor, of a circuit-controller therefor comprising a contact movable therewith, a second contact movable with the first-named contact and capable of movement independently of the motor, and an overbalanced device for periodically separating said contacts and maintaining them separated for definite periods, substantially as set forth.

2. The combination with an oscillating electric motor, of a circuit-controller therefor comprising a contact movable therewith, a second contact movable with the first-named contact and capable of movement independently of the motor, and a weight oscillating with the motor but capable of independent movement for periodically separating said contacts and maintaining them separated for definite periods, substantially as set forth.

3. The combination with an oscillating electric motor, of a circuit-controller therefor comprising a contact movable therewith, a second contact movable with the first-named contact and capable of movement independently of

the motor, and a weight supported below its center of gravity oscillating with the motor but capable of independent movement for periodically separating said contacts and maintaining them separated for definite periods, substantially as set forth.

4. The combination with an electric motor, of an oscillating shaft, and a circuit-controller for said motor, comprising a contact movable with said shaft, a second contact movable with the first-named contact and capable of movement independently of said shaft, and a weight pivoted on said shaft below its center of gravity and oscillating with said shaft but capable of independent movement for controlling the position of one of said contacts by its overbalanced movement, substantially as set forth.

5. The combination with an electric motor, of an oscillating shaft, and a circuit-controller for said motor, comprising a contact movable with said shaft, a contact-lever movable with the first-named contact and capable of movement independently of said shaft, and a weight pivoted on said shaft below its center of gravity and oscillating with said shaft but capable of independent movement for controlling the position of said contact-lever by its overbalanced movement, substantially as set forth.

6. The combination with an oscillating electric motor, of a circuit-controller therefor, comprising an oscillating contact moving with the motor, a second contact engaging with said oscillating contact, and an overbalanced weight for separating said contacts by its overbalanced movement, said weight being adjusted to permit the engagement of said contacts for a short interval during the movement of the motor in one direction, substantially as set forth.

7. The combination with an oscillating electric motor, of a circuit-controller therefor, comprising an oscillating contact moving with the motor, a second contact engaging with the oscillating contact, an overbalanced weight for separating said contacts by its overbalanced movement, and means for adjusting said weight whereby when the motor comes to rest the said contacts will remain in contact, substantially as set forth.

8. The combination with an oscillating electric motor, of a circuit-controller comprising two stops moving with the motor, a contact also moving with said motor, a second contact engaging with said first-named contact and capable of independent movement, and a weight pivoted below its center of gravity and having an arm playing between said stops, said arm engaging the second contact to move the same out of contact with the first-named contact by the overbalanced movement of said weight, substantially as set forth.

9. In an electric motor, the combination with a pendulum and an operating-solenoid,

of a circuit-controller comprising a contact
oscillating with the pendulum, a second con-
tact engaging with said oscillating contact
and capable of independent movement, and
5 a weight supported below its center of grav-
ity, oscillating with said pendulum and hav-
ing an overbalanced movement independent
of the movement of the pendulum for con-

trolling the position of the second contact,
substantially as set forth.

This specification signed and witnessed this
16th day of November, 1895.

GEO. ROSS GREEN.

Witnesses:

ANDREW ZANE,
JOHN FUSS.