

E. R. CARICHOFF.
CONTROLLER FOR ELECTRIC MOTORS.

(Application filed Aug. 1, 1901.)

(No Model.)

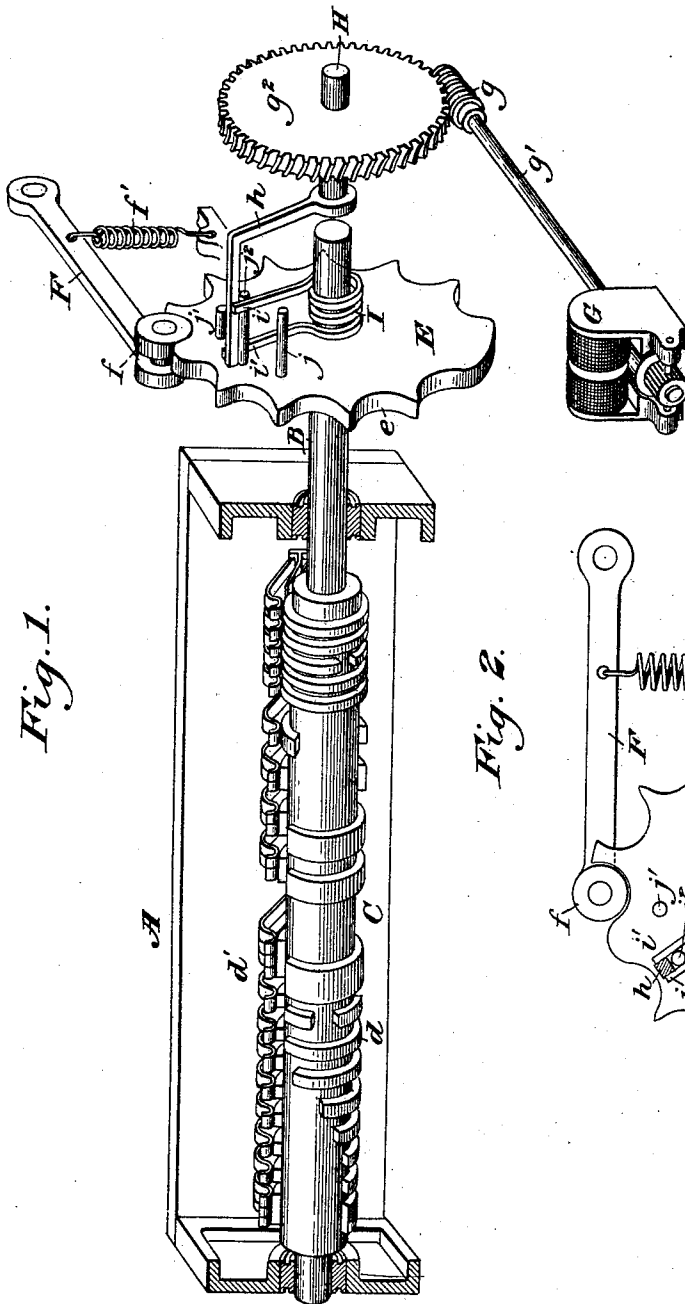
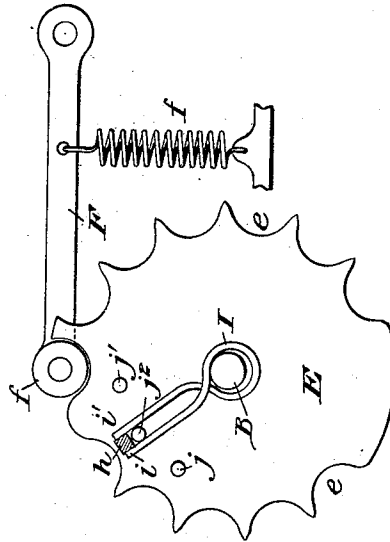


Fig. 1.

Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

EUGENE R. CARICHOFF, OF EAST ORANGE, NEW JERSEY.

CONTROLLER FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 715,975, dated December 16, 1902.

Application filed August 1, 1901. Serial No. 70,517. (No model.)

To all whom it may concern:

Be it known that I, EUGENE R. CARICHOFF, a citizen of the United States of America, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Controllers for Electric Motors, of which the following is a specification.

The present invention relates to controllers for electric motors, and more especially to the means for intermittently driving the controller-cylinder.

It is very desirable in making contact with fixed brushes by means of a controller-cylinder to approach and make contact with both certainty and rapidity.

It is the object of this invention to secure such advantage.

The fixed drive of a cylinder to secure the desired result requires a rate of speed which is impracticable, whereas any method which permits contact to be made or broken slowly proves unsatisfactory on account of burning due to poor contact and arcing due to slow break.

For the purpose of securing the desired results my invention consists of certain features of construction and combination of parts to be hereinafter described and then claimed.

In the accompanying drawings, Figure 1 is a perspective view of a controller for electric motors, parts being broken away and omitted and showing my invention applied thereto; and Fig. 2 is a detail view of the notched wheel and pawl and correlated parts.

The controller-casing A is provided with bearings for the shaft B of the controller drum or cylinder C, which is provided with the stepped-off contacts *d* on its periphery, that make or break contact with the spring contact fingers or brushes *d'*, fixed to the casing in the usual manner. The shaft B is sufficiently extended so as to carry the notched wheel E, into the notches *e* of which the antifriction-roller *f* on the free end of the pawl F takes. A spring *f'* acts on the pawl, tending to move it into engagement with the notched wheel, the effect being that a variable opposition to the rotation of the drum is produced, the maximum opposition being at the desired points of contact—that is, where the pawl takes in the notches truly—and the minimum

being intermediate between these points, or, in other words, when the pawl is moving over the teeth formed between the notches. Pilot-motor G transmits by a worm *g* on its shaft *g'* and a gear-wheel *g''* rotary motion to a suitably-supported shaft H, the axis of which is in line with that of shaft B. Shaft H carries a crank *h*, the end of which extends parallel with the shafts and by means of a helical torsion-spring I is caused to be "centered," so to speak, as that normally it lies midway between abutments formed by pins *j, j'*, located on that face of the notched wheel which is presented toward the crank. To this end, therefore, the coils of said spring are placed over the projecting end of shaft B, while the ends of the spring are bent out so as to extend approximately parallel with each other in the same direction, one end *i* of said spring being disposed on one side of an abutment or stop formed by fixed pin *j''*, located midway of and preferably in the same plane as the abutments or pins *j, j'*, while the other end *i'* of the spring is disposed on the other side of pin *j''*. The result is that pin *j''* is located between the ends of the spring, which lie in contact with opposite sides of said pin. Spring ends *i, i'* protrude beyond the pin *j''* sufficiently so that the pin of crank *h* may be positioned between them and whereby the crank is normally held centrally between the abutments *j, j'*.

The action is as follows: The rotary force of the pilot-motor is transmitted to the controller-cylinder through the spring I, which moves under torsion between the abutments *j, j'*. Owing to the retarding effect of the pawl F in a notch of wheel E, the spring is coiled or placed under stress as the pilot-motor revolves until an abutment *j* or *j'* is reached, according to whether the spring end *i* or *i'* is advanced by the crank *h*, whereupon a positive movement is given to the controller-cylinder, rotating it until the force of the spring, still under stress, is greater than the retarding action of the pawl, now at its minimum, when the controller-cylinder is thrown by the spring, due to the pressure of the spring end *i* or *i'* on the center stop or abutment *j''*, until stopped by the pawl at the next point of maximum retardation. The cylinder will have thus been caused to advance more rap-

idly than the crank *h* of the pilot-motor, and the spring then becomes neutral. As the pilot-motor continues to advance the described action is repeated once for each notch *e*, securing an intermittent movement of the controller-cylinder, with a uniform motion of the pilot-motor. The pressure of the pawl may be varied, and when properly adjusted to the strength of the driving-spring it is impossible to stop the controller-cylinder at any point giving other than full contact or full open circuit to any brush.

It will be seen that by the described intermittent drive the contacts are made with certainty and quickness.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a controller for electric motors, the combination with the controller-cylinder, and driving means for imparting motion thereto, of a notched wheel and spring-pawl for intermittently and yieldingly retarding the rotation of the cylinder, and a torsion-spring for transmitting in either direction to the cylinder quicker impulses of motion than those given by the driving means, a portion of the driving means lying normally between and adapted to engage either end of the spring to place it under tension; substantially as described.

2. In a controller for electric motors, the combination, with the controller-cylinder, the pilot-motor, and a shaft geared with that of the pilot-motor and provided with a driving-crank, of means for intermittently retarding the rotation of the controller-cylinder, and a torsion-spring coiled around the shaft of the controller-cylinder for imparting quicker impulses of motion to the same than those given by said driving-crank, such spring being set for action by the operation of said crank on one end thereof and, when permitted to exert its force, acting, by its other end to throw the controller-cylinder, substantially as described.

3. In a controller for electric motors, the combination, with the controller-cylinder provided with three abutments on a portion

thereon, and driving means for imparting positive motion to the cylinder, of means for intermittently retarding the rotation of the controller-cylinder, and a spring the ends of which normally rest against the middle abutment and receive between them a portion of the driving means so as to center the same, while said ends may be moved against the other abutments, whereby quicker impulses of motion, in either direction, may be imparted to the controller-cylinder than those given by the positively-acting driving means, substantially as described.

4. In a controller for electric motors, the combination, with the controller-cylinder provided with three abutments on a portion thereof, and driving means for imparting positive motion to the cylinder, of means for intermittently retarding the rotation of the controller-cylinder, and a torsion-spring coiled around the shaft of the controller-cylinder for imparting quicker impulses of motion to the same than those given by said driving means, the ends of said spring normally resting against the middle abutment and receiving between them a portion of the driving means so as to center the same, which said ends may be moved against the other abutments, substantially as described.

5. In a controller for electric motors, the combination, with the controller-cylinder, and driving means for imparting positive motion thereto, of means for intermittently retarding the rotation of the controller-cylinder, and a spring the ends of which both bear against a portion on the controller-cylinder, and thereby neutralize the effect of the spring when the parts are at rest, a portion of such driving means being arranged to act on either end of said spring, and permit it to exert its full force, when the retarding influence is overcome, substantially as described.

Signed by me in New York city the 31st day of July, 1901.

EUGENE R. CARICHOFF.

Witnesses:

GEO. L. WHEELLOCK,
SAMUEL W. BALCH.