

No. 870,353.

PATENTED NOV. 5, 1907.

T. M. FOOTE.
CIRCUIT CLOSER.
APPLICATION FILED NOV. 3, 1906.

Fig. 1,

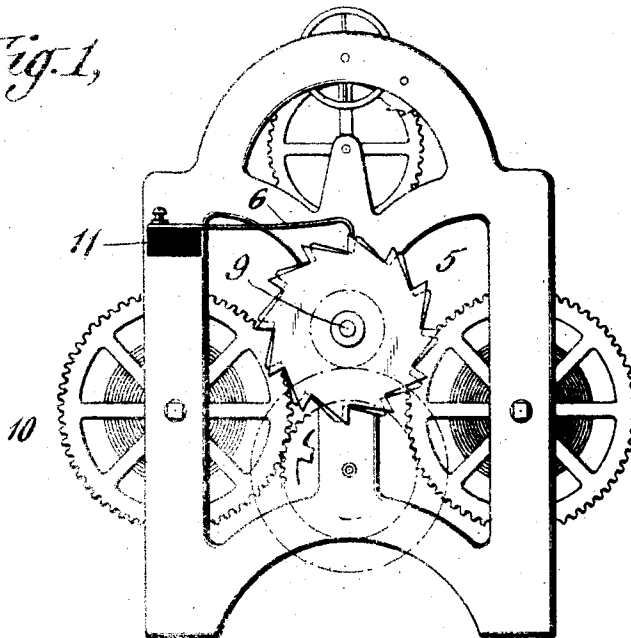


Fig. 2,

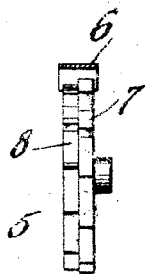
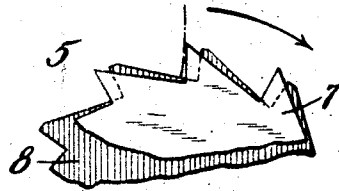


Fig. 3,



WITNESSES:

H. L. ...
Harry ...

INVENTOR

Theodore M. Foote

BY

Chapman & Raymond
ATTORNEYS

UNITED STATES PATENT OFFICE.

THEODORE M. FOOTE, OF ALLSTON, MASSACHUSETTS.

CIRCUIT-CLOSER.

No. 870,353.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed November 3, 1906. Serial No. 341,889.

To all whom it may concern:

Be it known that I, THEODORE M. FOOTE, a citizen of the United States of America, and a resident of Allston, county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Circuit-Closers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in circuit closers of the type in which circuit is made and broken intermittently in the operation of constantly moving mechanism, and the objects of my invention are, first, to simplify mechanism of this description and reduce the number and cost of the working parts, second, to insure positive operation and accurate timing of the circuit making and breaking, and, third, to so construct and arrange the parts that a rubbing contact between the electrodes is secured, whereby the contact surfaces will be constantly kept clean and free from dirt and corrosion.

In order that my invention may be fully understood, I will describe in detail an embodiment thereof, having reference to the accompanying drawings illustrating same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a face view of circuit closing means embodying my invention, showing the same connected with, and driven from, an ordinary spring motor and clock train. Fig. 2 is an edge view of the circuit closing members. Fig. 3 is a fragmentary face view of portions of one of the circuit closing members, showing the same on a very much larger scale than that employed for Fig. 1.

The circuit closer herein illustrated comprises two members, a rotary member 5 and a relatively stationary member 6. The rotary member comprises two substantially similar toothed wheels 7 and 8, secured together, one slightly in advance angularly of the other. These wheels are mounted upon an arbor 9, and are rotated by means of an ordinary spring and clock train 10 through any convenient gearing. The wheel 7 is composed of electrically conductive material, such as brass, while the wheel 8 is composed of electrically non-conductive material, such as rubber, fiber, or the like, or otherwise insulated from the wheel 7. These wheels are quite similar, except that the teeth of the wheel 7 extend radially slightly further than the teeth of the wheel 8. In practice, the teeth of both said wheels are first formed exactly alike, and then the tips of the teeth of the wheel 8 are cut off. This will be clearly and readily understood by reference to Fig. 3 of the drawings. The wheel 8 is arranged slightly in advance of the wheel 7, the direction of rotation of the said wheels being in the direction of the arrow, Fig. 3.

The contact member 6 comprises a thin resilient

strip comprising a brush or contact piece, said strip secured to a block 11 insulated from the rest of the device. The end of the strip 6 is so located, and is of such a width, as to engage the teeth of either or both of the said wheels 7 and 8. Normally the end of the said strip will rest upon the teeth of the wheel 8, because the said teeth are slightly in advance of the teeth of the wheel 7, and, as the said teeth are of electrically non-conductive material, no current will flow from the contact member 6 to the contact member 5 during this time. In the rotation of the member 5, however, the end of the strip 6 will finally slip off the end of a tooth of the wheel 8, and will then rest for a short time upon the outer extremity of one of the teeth of the wheel 7. The wheel 7, being of electrically conductive material, circuit will be closed between the members 6 and 5 for so long a time as this engagement is permitted to take place. The engagement, however, is of short duration, because, in its advance, the tooth of the wheel 7 which extends but a short distance from the tooth of the wheel 8, will quickly release the said spring strip 6, and the said strip will then spring over the outer edge of the tooth of the wheel 7 to be received by the next successive tooth of the wheel 8.

By this means it will be seen that, while the strip 6 is insulated for the major portion of the time from the member 5, it will be caused to intermittently close contact toward the end of each successive tooth, whereby, upon a complete revolution of the member 5, there will have been a succession of contacts made and broken equal to the number of teeth on either of the wheels which go to make up the said member 5.

By the foregoing it will be seen that I have provided an exceedingly simple mechanism for successively making and breaking electrical contact, and that both make and break are positive in every sense of the word. The rubbing contact between the end of the strip 6 and the portion of the metallic teeth of the wheel 7, is such as to insure electrical connection every time contact is made, and such rubbing contact has, as will be well understood, the effect of keeping the points of contact clean and preventing corrosion etc. It will also be understood that both make and break occur quickly and not gradually, the make occurring at the moment the end of the spring piece 6 drops from an insulating tooth to a metal tooth, and the break occurring as the end of the said contact strip snaps off the edge of a metal tooth. The advantage of this will be well understood to those skilled in this art.

What I claim is:

1. A circuit closer comprising two substantially similar toothed wheels secured together, one slightly in advance angularly of the other, the teeth of one of said wheels being composed of electrically non-conductive material, and of the other of said wheels of electrically conductive material, and a single contact piece arranged to successively engage the said teeth of both said wheels.

2. A circuit closer comprising two substantially similar toothed wheels secured together, one slightly in advance of the other, the teeth of one of said wheels being composed of electrically non-conductive material, and the teeth of the other of said wheels composed of electrically conductive material and arranged to extend radially slightly further than the other said teeth, and a contact piece arranged to successively engage the said teeth.
- 5 3. A circuit closer comprising two substantially similar wheels having ratchet teeth, one of said wheels composed of metal, and the other of vegetable material, one of said wheels set slightly in advance of the other, and a single contact piece common to both said wheels arranged to successively engage the teeth of both said wheels.
- 10 4. A circuit closer comprising a brass toothed wheel 7, and a rubber toothed wheel 8, secured together, the latter slightly in advance of the former, means for rotating the two contact wheels together, and a relatively stationary contact piece 6, arranged opposite the teeth of both said
- 15 20 wheels, and arranged to engage the successive teeth of the said wheels in alternation.
5. A circuit closer comprising two substantially similar toothed wheels insulated from each other and secured together, one slightly in advance angularly of the other, and a single contact piece arranged to successively engage 25 the said teeth of both said wheels.
3. A circuit closer comprising two substantially similar toothed wheels insulated from each other and secured together one slightly in advance angularly of the other, whereby portions of the teeth of one wheel will project 30 above portions of the teeth of the other wheel, but other portions of the teeth of the latter said wheel will project beyond similar portions of the teeth of the former said wheel, and a contact piece arranged to bear upon the teeth of said wheels, said contact piece being kept away 35 from the teeth of one wheel by the teeth of the other said wheel in alternation.

THEODORE M. FOOTE.

Witnesses:

D. HOWARD HAYWOOD,
C. F. CARRINGTON.