

(No Model.)

2 Sheets—Sheet 1.

E. C. PARHAM.

CONTACT FINGER FOR ELECTRIC CONTROLLERS.

No. 578,464.

Patented Mar. 9, 1897.

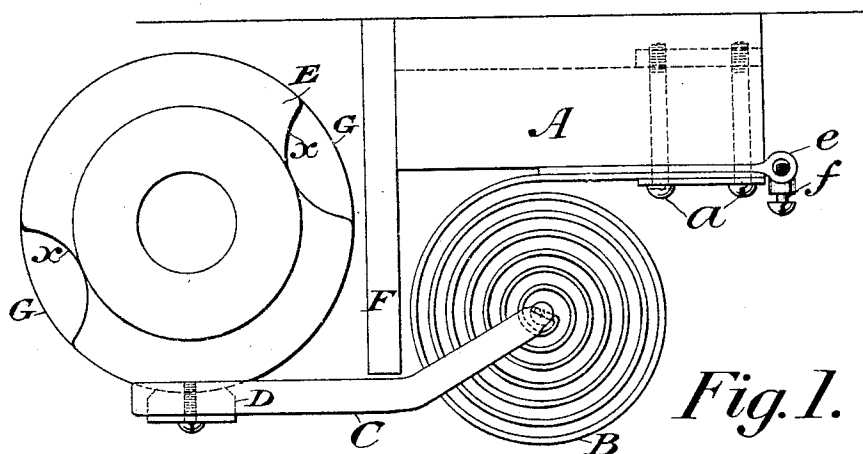


Fig. 1.

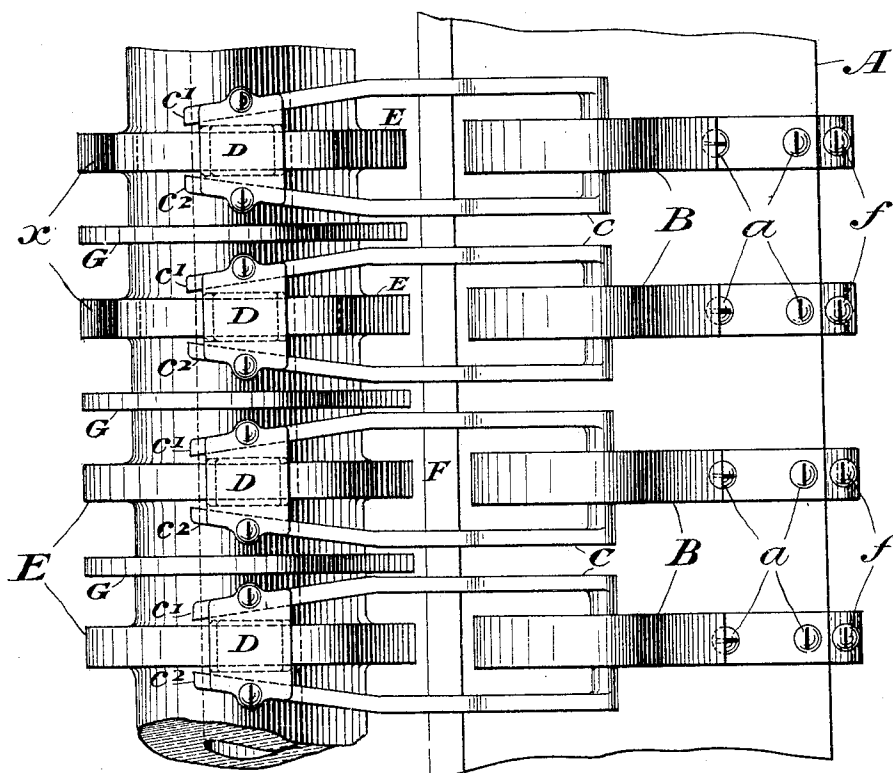


Fig. 2.

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2 Sheets—Sheet 2.

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Fig. 3.

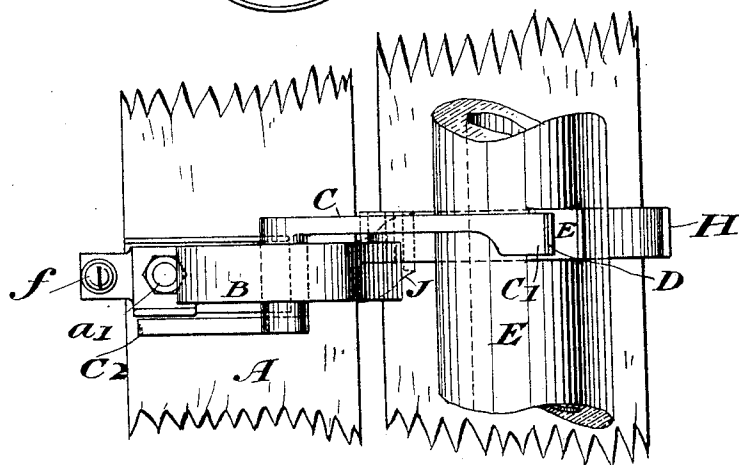
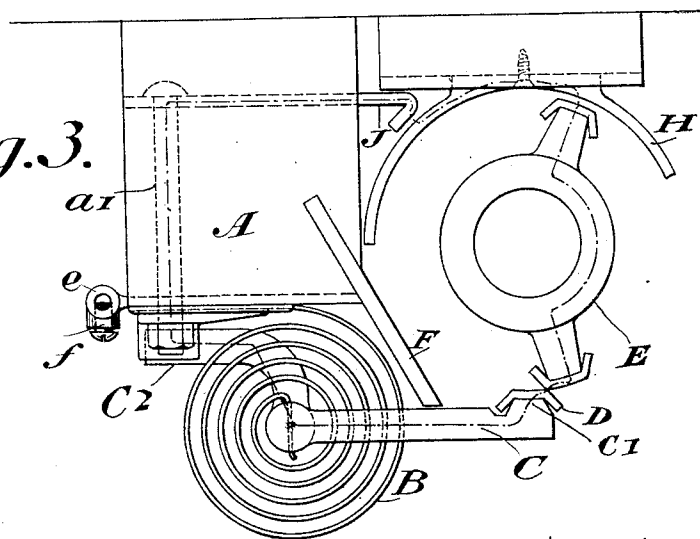


Fig. 4.

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UNITED STATES PATENT OFFICE.

EUGENE CHILTON PARHAM, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR
TO THE STEEL MOTOR COMPANY, OF SAME PLACE.

CONTACT-FINGER FOR ELECTRIC CONTROLLERS.

SPECIFICATION forming part of Letters Patent No. 578,464, dated March 9, 1897.

Application filed November 18, 1896. Serial No. 612,567. (No model.)

To all whom it may concern:

Be it known that I, EUGENE CHILTON PARHAM, a citizen of the United States, residing at Johnstown, in the county of Cambria, State of Pennsylvania, have invented certain new and useful Improvements in Contact-Fingers for Electric Controllers, of which the following is a specification.

My invention relates to electric controllers of the type used on electric railways, and has for an object the provision of an improved form of spring-pressed finger therefor, the contact portions of which, when delivering current to the drum of the controller, are in a strong magnetic field, so that any arc formed by the breaking of the circuit may be surely and quickly broken.

My invention comprises, broadly, the use of a separate electromagnetic arc-interrupter for each contact-finger; and it consists in the novel and simple construction, combination, and arrangement of parts, as will be pointed out hereinafter.

Referring to the drawings, Figure 1 is a top view of portions of a controller, showing the features of my invention and having certain of the upper parts of the controller removed to better show the contact-rings, &c. Fig. 2 is a side view of the inside of a controller with the upper and lower portions broken away. Figs. 3 and 4 are views similar, respectively, to Figs. 1 and 2, but show a modified form of my invention.

A is the finger-board and is made of wood or other suitable material.

E E and G G are respectively contact-rings and insulating-disks of any approved form and adapted to be secured about the shaft of the drum (not here shown) by any preferred method.

B B are helical springs secured near their outer ends to A, as by screws *a a*, and having at said ends means, as the eyes *e e* and binding-posts *f f*, for connecting the springs with any desired part of the electric circuit. The inner ends of each spring are connected to a member C, which is composed of magnetizable material and carries a contact D, adapted to engage the contacts upon E. If D is in contact with the drum, whatever current may be passing takes its course through

B to C, to D, to E, &c., or vice versa. The spring B, surrounding, as it does, a portion of the member C, becomes the field-coil of an electromagnet, C becoming the core thereof, and *c'* and *c''* becoming the poles of the magnet.

In Figs. 1 and 2, C is shown with its poles *c'* and *c''* carrying the contact D between them. In this case D should be made of substantially non-magnetic material if it is desired to effectively blow out the arc which tends to form as the drum rotates.

In Figs. 3 and 4, C is shown with only one pole near the contact portions of the finger, magnetic conducting members, as *a'*, J, H, and E, being used to provide a path for the magnetic lines of force, as shown by the dotted line. The provision of this path is not essential, but is preferable as conserving energy. It is evident that this arrangement is magnetically the equivalent of that shown in Figs. 1 and 2. By the provision of the conducting-path for the magnetic lines of force I place the contact portion of the finger between the poles of the electromagnet, for this conducting-path is equivalent to making that portion of the drum opposite the finger one pole of the electromagnet.

D in the modification of my device last described is preferably made of copper or brass because of the electrical functions it is designed to perform, but as far as the magnetic properties of the invention are concerned *c'* may itself be used as the contact. It is therefore understood that where I refer in the claims to the finger members as carrying contacts I do not limit myself to the use of the separate member D, except where the combination requires such limitation to adapt it for operation.

F is a stop made of wood or other suitable material and is designed to prevent too much inward movement of D.

It will be seen that when the circuit between D and E is broken by the rotation of the drum, as at *x*, the magnetic field between *c'* and *c''* will interrupt the arc which tends to form.

A valuable feature of my invention is that the strength of the magnetic field varies substantially in proportion to the volume of the

current passing through the contact-finger, so that the greater the size of the arc to be broken the stronger will be the field with which to break it. On the other hand, if
5 there is no current passing through the contact-finger, none will be wasted in the field-coil to energize a magnet that is not needed.

Another advantage of my invention is that I am not required to use any more parts or
10 more complicated parts to obtain the magnetic field than are necessarily used for other ordinary forms of contact-fingers which have not the advantage of an arc-interrupting attachment.

15 A further advantage of my improvement is obtained by the use of the separate electromagnets for each finger, for if one is damaged in any manner such damage is only local and may readily be repaired.

20 I do not limit myself to the exact form of my invention as herein shown and described nor to its use with any particular form of controller.

Many modifications of my invention will readily suggest themselves to those skilled in the art, such as other methods of providing a path for the magnetic lines of force and different methods of energizing the member C.

What I claim, and desire to protect by Letters Patent, is—

30 1. In a contact-finger for electric controllers, in combination, a magnetizable finger member, means for magnetizing said member, and a contact carried by said member and
35 carried between the poles thereof.

2. In an electric controller, in combination, a rotatable drum carrying suitable contacts, a plurality of fixed fingers contiguous thereto, said fingers each comprising a magnetizable
40 finger member, a contact carried thereby, and an energizing-coil about, and electrically in series with, said finger member.

3. In a contact-finger for electric controllers, a spring constituting the field-coil of an electromagnetic arc-interrupter and adapted
45 to press the contact portions of the finger against the contact portions of the controller-drum.

4. In combination with a contact-finger for electric controllers, a spring electrically connecting a desired part of the outside circuit with the contact-fingers and constituting the field-coil of an electromagnetic arc-interrupter, said spring being also adapted to press
50 the contact portions of the said finger against the contact portions of the controller-drum.

5. A contact-finger for electric controllers comprising, in combination, a magnetizable finger member, a contact carried thereby, and
60 a spring adapted to press said contact toward the controller-drum and to constitute an energizing-coil for said magnetizable member.

6. In an electric controller, in combination, the finger-board of the controller, a plurality
65 of magnetizable finger members, and an energizing-coil for each of said members consti-

tuting means for securing it to the finger-board.

7. In a contact-finger for electric controllers, in combination, a helical spring constituting the energizing-coil of an electromagnet, and a contact-carrying finger constituting the core of the electromagnet. 70

8. In an electric controller, in combination, a rotatable drum and a plurality of fixed contact-fingers contiguous thereto, each of said
75 fingers comprising a magnetizable contact-carrying member and a spring adapted to hold said member in a yielding-contact relation with the drum and adapted to magnetize
80 said member.

9. In a contact-finger for electric controllers, in combination, a member composed of magnetizable material and carrying a contact, a field-coil adapted to magnetize and secure in position said member, said contact
85 being magnetically between the poles of said member.

10. In a contact-finger for electric controllers, a fork made of magnetic conducting material, with two prongs which are adapted to become opposite magnetic poles when energized by a suitable field-coil surrounding a part of said fork, and a contact-piece carried between the prongs and near the free ends
90 thereof. 95

11. In a contact-finger for electric controllers, in combination, a magnetizable fork carrying a contact between its prongs and means for magnetizing said fork. 100

12. In a contact-finger for electric controllers, in combination, a magnetizable member carrying a contact, means adapted to hold said member in a desired position and magnetize it, said contact being magnetically between the poles of said member. 105

13. In a contact-finger for electric controllers, in combination, a fork carrying a contact between its prongs, said prongs constituting the poles of an electromagnet and a suitable field-coil about a part of said fork and in series therewith. 110

14. In a contact-finger for electric controllers, a helical spring secured at its outer end to the finger-board of the controller and connected electrically to a suitable part of the circuit, and having its inner end connected to a magnetizable finger and in circuit with the contact carried thereby. 115

15. In a contact-finger for electric controllers, in combination, a magnetizable fork, a contact between the prongs of said fork, a helical spring adapted to energize said fork and deliver current thereto, said spring being adapted to secure the fork in its proper position. 120 125

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

EUGENE CHILTON PARIHAM.

Witnesses:

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W. S. SHERIDAN.