No. 802,369. PATENTED OCT. 24, 1905.

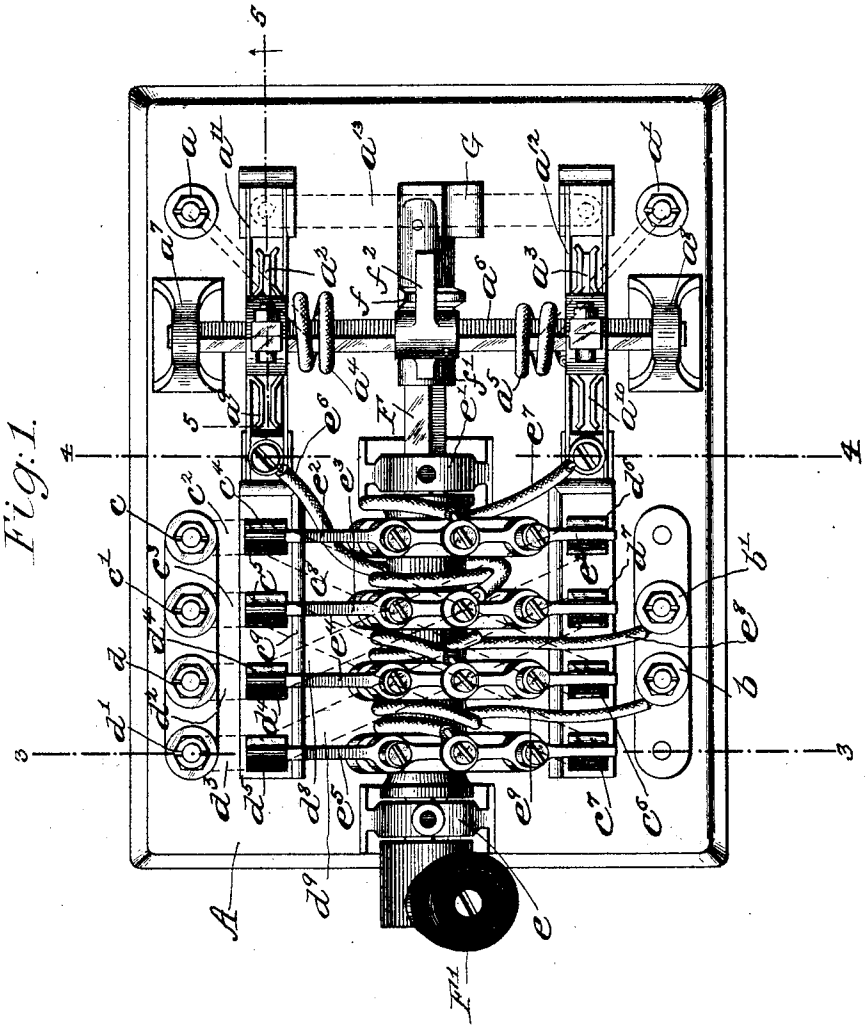
J. P. COLEMAN.

CIRCUIT CONTROLLER OR ELECTRIC SWITCH.

APPLICATION FILED APR. 1, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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CIRCUIT CONTROLLER OR ELECTRIC SWITCH.

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2 SHEETS—SHEET 2.

Fig. 5.

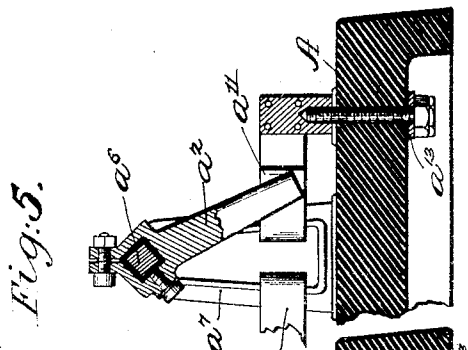


Fig. 2.

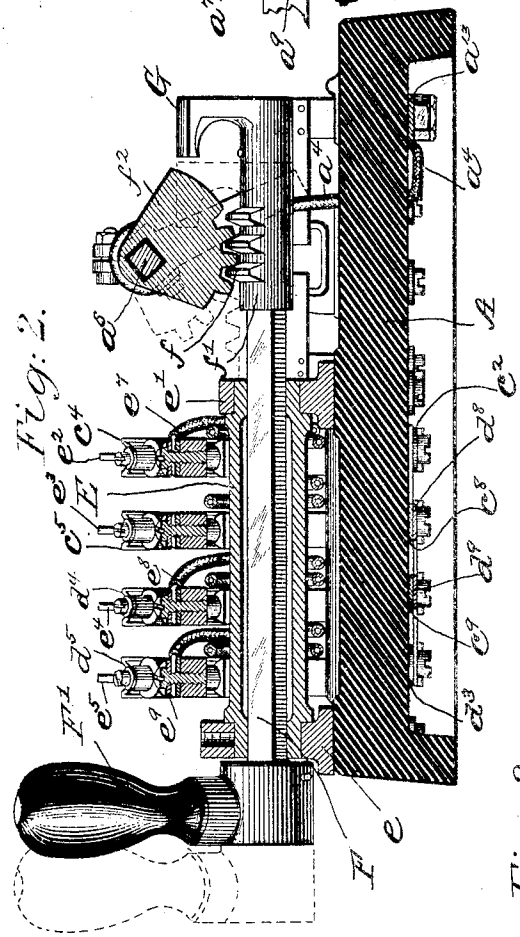


Fig. 4.

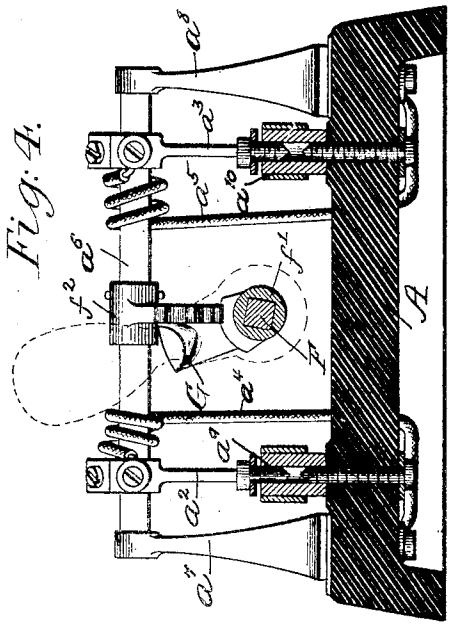
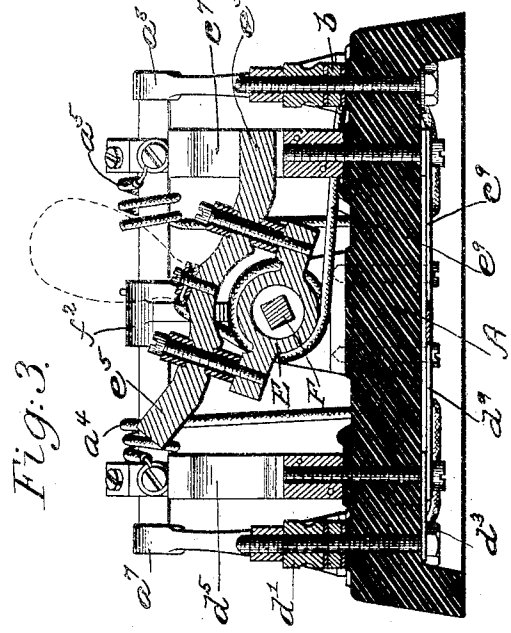


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN PRESSLEY COLEMAN, OF EDGEWOOD, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CIRCUIT-CONTROLLER OR ELECTRIC SWITCH.

No. 802,369. Specification of Letters Patent. Patented Oct. 24, 1905.

Application filed April 1, 1904. Serial No. 201,046

To all whom it may concern:

Be it known that I, JOHN PRESSLEY COLEMAN, a citizen of the United States, residing at Edgewood, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Circuit-Controllers or Electric Switches, of which the following is a specification.

My invention relates to circuit-controllers or electric switches.

I will describe a circuit-controller embodying my invention and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a top plan view of a circuit-controller or electric switch embodying my invention. Fig. 2 is a vertical and longitudinal sectional view of the circuit-controller shown in Fig. 1. Fig. 3 is a vertical and transverse sectional view taken on the line 3 3 of Fig. 1. Fig. 4 is a vertical and transverse sectional view taken on the line 4 4 of Fig. 1. Fig. 5 is a detail vertical sectional view taken on the line 5 5 of Fig. 1.

Similar letters of reference designate corresponding parts in all of the figures.

A circuit-controller embodying my invention comprises means for making and breaking a plurality of circuits, devices for operating each of the circuit making and breaking means, and mechanism for preventing an operation of one device before the operation of another device. In the drawings I have illustrated means for making and breaking four circuits and a common device which by movements in different directions operates the said means for making and breaking the four circuits. Any apparatus may be included in the four circuits, and their order of making and breaking may be any desired, this being taken care of by the mechanism which prevents the operation of one means for making and breaking a circuit before the operation of another means for making and breaking a circuit. The mechanism which prevents the operation of one means before another I shall for convenience herein designate "interlocking" mechanism.

Referring now to Figs. 1 to 5 of the drawings, A designates a base of some suitable insulating material—for example, porcelain. Mounted on this base are terminals of a plurality of circuits and the means for making and breaking the plurality of circuits. I also preferably arrange on the base A the device or devices for operating the said means and the interlocking mechanism.

One of the circuits to be controlled includes the binding-posts a a', a second circuit includes the binding-posts b b', a third circuit the binding-posts c c', and a fourth circuit the binding-posts d d'. In the drawings the circuit including the binding-posts a a' is connected at one time with the circuit including the binding-posts c c' and at another time with the circuit including the binding-posts d d'. The circuit including the binding-posts b b' is connected at one time with the circuit including the binding-posts c c', at another time with the circuit including the binding-posts d d', and at still another time with both circuits including the binding-posts c c' d d'. The circuit including the binding-posts b b' is in the arrangement illustrated never connected with the circuit including the binding-posts a a', this being prevented by interlocking mechanism which is embodied in the circuit-controller.

The binding-posts a a' are connected with contact-pieces a^2 a^3 by means of conductors a^4 a^5, here shown as being flexible and as extending partially beneath the base A. The contact-pieces a^2 a^3 are rigidly mounted on and are insulated from a shaft a^6, journaled at its ends in bearings a^7 a^8, which are mounted on the base A. The contact-pieces a^2 a^3 are adapted upon the oscillation or rotation of the shaft a^6 to alternately engage with the pairs of contact-pieces a^9 a^{10}, a^{11} a^{12}. The shaft a^6 may be oscillated or rotated by any desired device. The pairs of contact-pieces a^{11} a^{12} are shown as being connected by a conductor a^{13}, or it may be a resistance, located on the under side of the base A. If desired, the pairs of contacts a^{11} a^{12} and the contact-plate or resistance a^{13} may be omitted.

The binding-posts c c' are connected by plates c^2 c^3 with pairs of contact-pieces c^4 c^5 and with pairs of contact-pieces c^6 c^7 by plates c^8 c^9, which extend from the pairs of contact-pieces c^4 c^5. The plates c^2, c^3, c^8, and c^9 are preferably located on the under side of the base A.

The binding-posts d d' are connected by plates d^2 d^3 with pairs of contacts d^4 d^5 and with pairs of contact-pieces d^6 d^7 by plates

d^8 d^9, which extend from the pairs of contact-pieces d^4 d^5. The plates d^2, d^3, d^8, and d^9 are preferably located on the under side of the base A, and the plates d^8 d^9 are insulated from the plates c^8 c^9 preferably by mica. (Not shown.)

E designates a sleeve, the ends of which are suitably journaled in standards e e', mounted on the base A. This sleeve carries contact-pieces e^2, e^3, e^4, and e^5, which upon an oscillation of the sleeve E alternately engage with the pairs of contact-pieces c^4 c^5, d^4 d^5, d^6 d^7, and c^6 c^7. The contact-pieces e^2 e^3 are connected by conductors e^6 e^7 with the pairs of contacts a^9 a^{10}, and the contact-pieces e^4 e^5 are connected by conductors e^8 e^9 with the binding-posts b b'. It will be seen, therefore, that the circuit including the binding-posts a a' may be when the contact-pieces a^2 a^3 are in engagement with the pairs of contacts a^9 a^{10} connected with the circuits including binding-posts c c' d d', according to whether the contact-pieces e^2 e^3, which are electrically connected with the pairs of contacts a^9 a^{10}, are in engagement with the pairs of contacts c^4 c^5 or d^6 d^7, and that the circuit including the binding-posts b b' may be connected with the circuits including the binding-posts c c' d d', according to whether the contact-pieces e^4 e^5 are in engagement with the pairs of contacts d^4 d^5 or c^6 c^7, and in circuit simultaneously with both the circuits containing the binding-posts c c' d d' if the contact-pieces e^4 e^5 are simultaneously in engagement with the pairs of contacts d^4 d^5 and c^6 c^7.

F designates a shaft, and F′ an operating-handle therefor. This shaft in the form of invention illustrated in the drawings constitutes a single device for operating the means for making and breaking the several circuits to be controlled. These means for making and breaking the circuits comprise the contact-pieces a^2, a^3, e^2, e^3, e^4, and e^5 and the pairs of contact-pieces with which they engage. The shaft F operates the sleeve E and the shaft a^6, the one by an oscillation or rotation and the other by a longitudinal movement. The oscillation or rotation of the shaft through its handle F′ may be communicated to the sleeve E by means of square openings provided in the ends of the sleeve. With this arrangement the sleeve serves as a bearing for the shaft. Any other equivalent arrangement for producing rotary movement of the sleeve E by the shaft F and permitting longitudinal movement of the shaft relatively to the sleeve may be employed. The longitudinal movement of the shaft F through its handle F′ may be communicated to the shaft a^6 by means of teeth f, engaging with a toothed segment f^2, carried by the shaft a^6. The teeth f are here shown as being carried by a sleeve f', secured on the shaft F.

G designates a projection carried by the shaft F. This projection G engages with the segment f^2 in certain longitudinal positions of the shaft F and prevents an oscillation or rotation of the shaft F. In this form of the invention the projection G and the segment f^2 constitute interlocking mechanism which prevents the operation of one means for making and breaking a circuit or circuits before the operation of another means for making and breaking a circuit or circuits.

The operation of the circuit-controller as illustrated and hereinbefore described is as follows: So long as the contact-pieces e^2 e^3, &c., or any one of them are entirely in engagement with their pairs or a pair of contact-pieces on one side of the sleeve and disengaged from the pairs or a pair of contact-pieces on the other side of the sleeve the shaft F can be moved longitudinally to make and break the circuit including the binding-posts a a'. If the contact-pieces e^2 e^3, &c., or any one of them be in engagement with the pairs of contact-pieces on both sides of the sleeve, assuming the circuit including the binding-posts a a' to be broken, the shaft will be prevented from having longitudinal movement to make or close a break in the circuit containing the binding-posts a a' by reason of the projection G engaging the edge of the segment f^2. Also when the shaft F is moved longitudinally to the position shown in dotted lines, Fig. 2, it is impossible by reason of the projection G engaging the segment f^2 to oscillate or rotate the shaft F and with it the sleeve E. This is true no matter which side of the segment f^2 the projection G engages.

Other forms of interlocking mechanism may be used and any other order of operating the means for making and breaking the circuits may be had, which is determined by the interlocking mechanism; also, independent devices suitably interlocked may be employed for independently operating the several means for making and breaking the circuits.

Having thus described my invention, what I claim is—

1. In a circuit-controller, the combination of means for making and breaking a plurality of circuits, a shaft adapted to have longitudinal and oscillatory movements, a sleeve adapted to be moved with said shaft in its oscillatory movements, which sleeve operates certain of said circuit making and breaking means, teeth carried by said shaft, a toothed segment engaging the teeth of said shaft, which toothed segment operates other of said circuit making and breaking means upon a longitudinal movement of said shaft, and means for preventing oscillatory movements of said shaft until after a longitudinal movement of said shaft.

2. In a circuit-controller, the combination of means for making and breaking a plurality of circuits, a shaft adapted to have longitudinal and oscillatory movements, a sleeve adapted to be moved with said shaft in its oscilla-

tory movements, which sleeve operates certain of said circuit making and breaking means, teeth carried by said shaft, a toothed segment engaging the teeth of said shaft, which toothed segment operates other of said circuit making and breaking means upon a longitudinal movement of said shaft, and a projection carried by said shaft adapted to engage said toothed segment to prevent oscillatory movement of said shaft.

3. In a circuit-controller, the combination of a shaft adapted to have longitudinal and oscillatory movements; circuit making and breaking means operated therefrom; a second shaft; circuit making and breaking means operated from the second shaft; means between the two shafts which, upon a longitudinal movement of the first shaft causes a movement of the second shaft; and other means between the two shafts for preventing an oscillatory movement of the first shaft until after a longitudinal movement of the first shaft to operate the second shaft.

4. In a circuit-controller, the combination of a shaft adapted to have longitudinal and oscillatory movements; a circuit making and breaking means operated therefrom; a second circuit making and breaking means; means between the shaft and the second circuit making and breaking means which, upon a longitudinal movement of the first shaft causes an operation of the second circuit making and breaking means; and other means between the shaft and second circuit making and breaking means for preventing an oscillatory movement of the shaft until after a longitudinal movement of the first shaft to operate the second circuit making and breaking means.

In testimony whereof I have signed my name to this specification in the presence of two subscribed witnesses.

JOHN PRESSLEY COLEMAN.

Witnesses:
A. HERMAN WEGNER,
GEO. E. CRUSE.