

W. A. PRICE.
ELECTRIC CONTROLLER.
APPLICATION FILED FEB. 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. I.

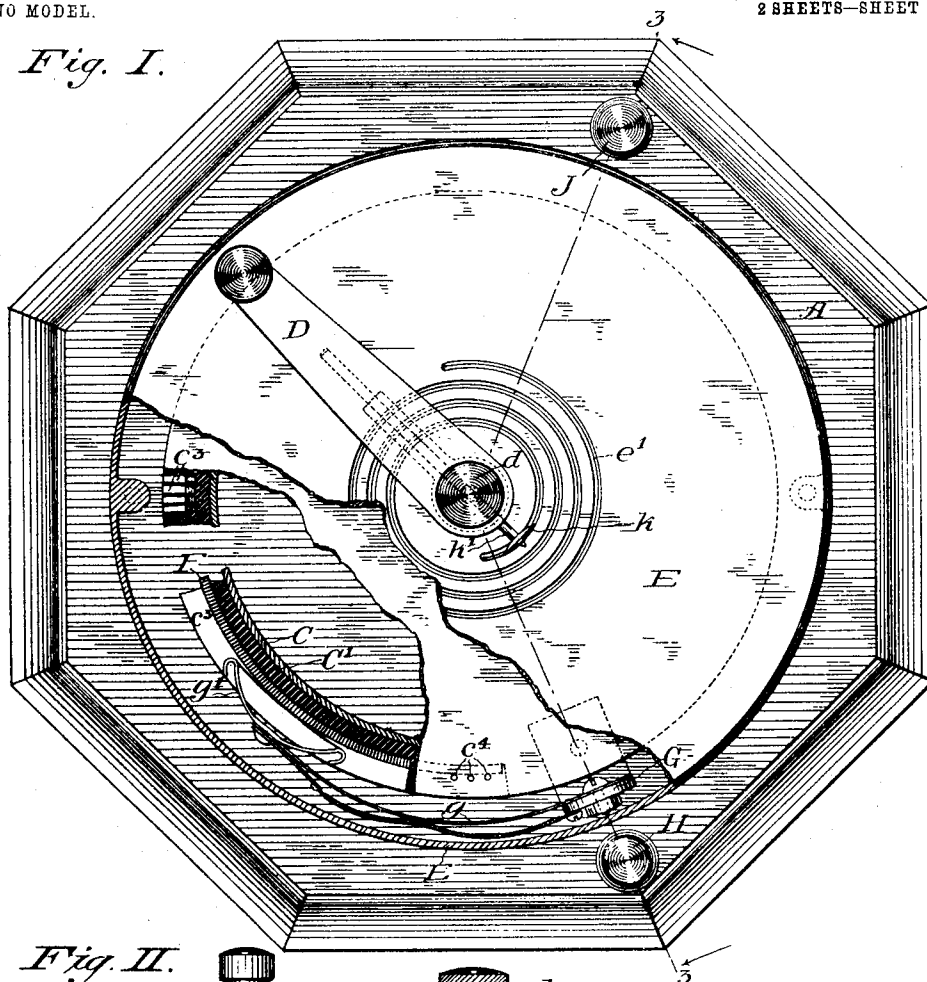
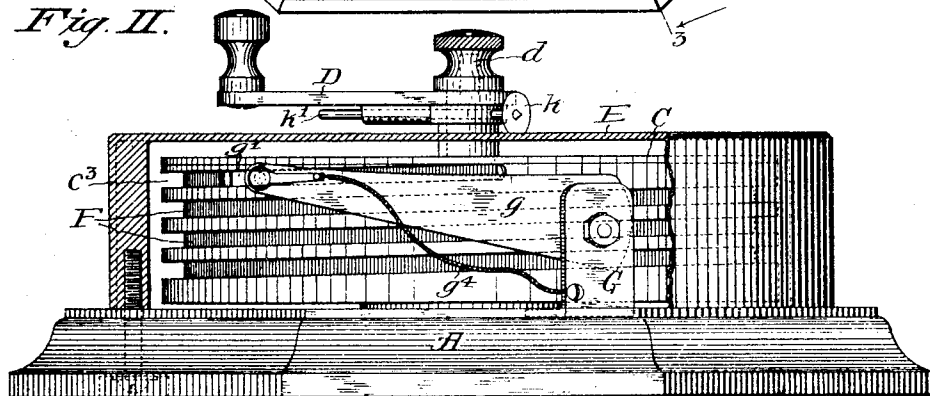


Fig. II.



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J. D. Fay

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2 SHEETS—SHEET 2.

Fig. III.

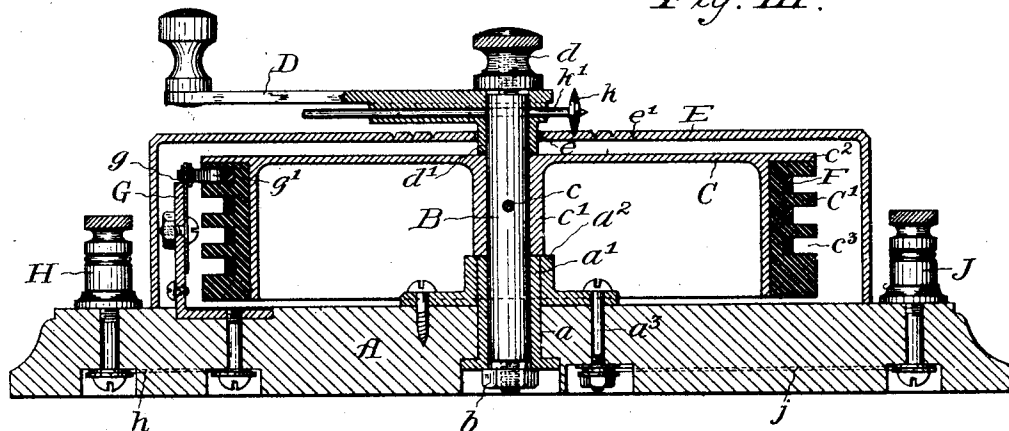


Fig. IV.



Fig. V.

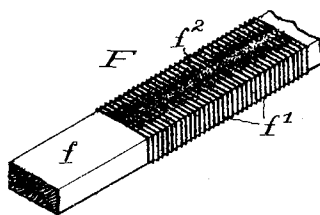


Fig. Va.



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UNITED STATES PATENT OFFICE.

WESTON A. PRICE, OF CLEVELAND, OHIO, ASSIGNOR TO THE ELECTRIC AND DENTAL SPECIALTY COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

ELECTRIC CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 777,536, dated December 13, 1904.

Application filed February 24, 1903. Serial No. 144,610. (No model.)

To all whom it may concern:

Be it known that I, WESTON A. PRICE, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Electric Controllers, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to means for controlling the flow of electric currents, its object being to provide an instrument of said character whereby a large number of variable fractions of a current may be expressed at one terminal of such instrument.

Said invention consists of means hereinafter fully described, and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a plan view of a controller embodying my invention, showing part of the cover broken away to disclose the interior mechanism and a portion of a rotatable drum forming part of the latter broken away and in horizontal section. Fig. II represents a side elevation of such instrument, showing part of the cover in section and broken away. Fig. III represents a vertical section taken upon the plane indicated by lines 3 3, Fig. I, portions of the instrument cut by said plane being shown in elevation. Fig. IV represents a detail view in elevation of a spring-arm and contact-piece forming an element of said instrument. Fig. V represents a perspective view, on an enlarged scale, of an element of my invention; and Fig. V^a represents a detail view of a portion of such element.

A base A is provided with a central aperture *a*, in which is secured a bushing *a'*, which projects upwardly beyond the upper surface

of said base, as shown in Fig. III. A centering-piece *a''* surrounds the upper end of said bushing and is screwed to said upper base-surface. In this bushing is journaled the lower end of an arbor B, secured against removal in an upward direction by means of a nut *b*. To the middle portion of this arbor is secured, by means of pin *c*, a central boss *c'* of a metal drum C, preferably aluminium, the lower end of such boss resting and bearing upon the upper surfaces of the bushing *a'* and the piece *a''*, such surfaces being made to fall in the same horizontal plane. Upon the upper end of said arbor is secured, by means of a thumb-nut *d*, a crank D, formed with a hub *d'*, whose lower end rests upon and is jammed against the upper contiguous surface of said drum C. A cylindrical cover E, provided with a central aperture *e* in its upper shell portion, incases the drum and co-operating mechanism hereinafter described, said upper shell portion falling intermediately of the crank D and upper drum-surface, as shown, such crank being thus placed upon the outside of the cover. Said drum is formed with an upper horizontal flange *e'*, beneath which is secured a ring C', of vulcanite, hard rubber, or other suitable insulating material. This ring is preferably of a thickness equal to the width of the flange *e'* and of a height equal to the height of the drum beneath the flange and has its outer cylindrical surface intersected by a winding groove *e''*, preferably of a helical form, as shown in Fig. II. The upper end of the groove for about one inch intersects the upper surface of the ring and is hence bounded for about one inch at its upper end by the metal of the flange *e'*. The lower end of said groove terminates at a suitable point intermediate of the top and bottom edges of the ring and near the lower edge. In the groove is laid and secured a continuous conductor F, consisting, Fig. V, of a thin strip of flexible insulating material *f* and a series of parallel juxtaposed separate copper wires *f'*, secured transversely to its surface. The wires all terminate upon the back of the conductor—that is, the surface adjacent to

the bottom of the groove—and these ends are all embedded in a mass of carbonaceous material f^2 , having adhesive properties and applied to such back surface. The remainder of each wire is secured in any suitable manner, such as will insulate such remaining portions from each other, as by means of shellac applied between them and to the core. It will thus be seen that current can be conducted by this conductor only through the medium of the carbonaceous material of high resistance. The said wires are placed upon the core, preferably, to the number of about sixty to the linear inch. Such construction I have found is best obtained by winding a continuous wire helically about the core, securing it by means of glue or shellac upon the front of the core, then cutting all the wires by means of a saw-cut on the center of the back and longitudinally of the core, and applying the adhesive carbonaceous material to the side of the conductor where the wires are so cut. The upper end of this conductor is electrically connected with the metal of the drum C by suitable means—such as pins c^4 , Fig. I—and more carbonaceous material suitably applied to such side and pins.

A standard G, Figs. I, II, and III, is secured to the wooden base A and supports an arm g , which is pivotally secured thereto, so as to be capable of movement upwardly and downwardly. This arm carries upon its end a spring brass bow and strings g' , the strings consisting of separate parallel German-silver wires g^2 . This bow is electrically connected to the standard by means of a flexible cord g^4 and is adapted to slide in the groove c^3 , and good electrical contact is maintained between it and the copper wires of the conductor F by the arm g , which is made of spring-steel and is arranged to exert the necessary pressure for this purpose. The standard G is electrically connected, by means of a wire h , with an exterior terminal binding-post H, Fig. III, and the drum, through the medium of a centering-piece a^2 , a screw-bolt a^3 , and wire j , is connected with another exterior terminal post, J. The top of the cover is formed with a centrally-located spiral groove e' , in which travels a circular disk k , secured to the end of a rod k' , which slides freely through aligned bores formed in the hub d' of the crank and the arbor B, as shown in Fig. III. This groove is made of a length such that the disk will occupy a position at its ends when the bow contact-piece g' contacts the extremities of the conductor F. This disk indicates by its location relatively to the ends of this spiral groove the location of the bow contact-piece relatively to the ends of the conductor F.

In using the above-described instrument the terminals of the line are connected with the binding-posts H and J and the current flows through the drum, thence into the end of the conductor connected therewith,

thence through the carbonaceous material, thence through the wires f' in contact with the contact-piece g' , through the flexible conductor g^4 , and so through standard G reaches the other terminal of the line connected with post H. The resistance of the carbonaceous material being high determines the amperage of the current after its passage through the instrument. Such resistance is determined by the length of the carbonaceous conductor and by the position of the bow contact-piece upon the conductor F. This position is varied by turning the handle D. The number of wires f' being large and close together, it will be seen that a great number of variations of current strength may be obtained.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In an electric controller, the combination of a conductor formed in convolutions, means for rotating such conductor, a cover for inclosing the latter, a contact member arranged to contact successive portions of such conductor during such rotation, and means upon the exterior of such cover to indicate the rotations of said conductor.
2. In an electric controller, the combination of a conductor formed in convolutions, means for rotating such conductor, a cover for inclosing the latter, a contact member arranged to contact successive portions of such conductor during such rotation, a spiral groove in said cover, and a member traveling in said groove to indicate the rotations of said conductor.
3. In an electric controller, the combination of a rotatable drum provided with a spiral groove upon the periphery thereof, a conductor in said groove comprising a core of insulating material, and a series of conducting elements secured to said core and electrically connected to each other by a conducting medium of comparatively high resistance, and a contact member arranged to slide in said groove and contact said elements successively.
4. In an electric controller, the combination of a cylindrical support, a rotatable drum of conducting material mounted thereon and provided with an upper horizontal flange, an annular ring of insulating material located beneath said flange and formed with a spiral groove, a conductor in said groove and contacting said flange, a contact member arranged to slide in said groove to contact said conductor, and circuit connections with said contact member and said flange.
5. In an electric controller, the combination

of a rotatable member provided with a conductor of current secured thereto in convolutions, a contact member arranged to contact such conductor during the rotation of such rotatable member, a cover for incasing the latter and provided with a spiral groove, and an indicating member mounted so as to revolve coincidently with the rotation of said drum and to travel in said groove.

6. In an electric controller, the combination of a cylindrical support, a rotatable drum of conducting material mounted thereon and provided with a periphery of insulating material, a conductor embedded in said material and comprising a plurality of disconnected conducting elements electrically connected together by means of a conducting medium of comparatively high resistance, a pivoted arm and a contact-piece pivoted at the end of said arm and arranged to contact said elements successively, a cover for said drum provided with a spiral groove, and an indicating member mounted to revolve coincidently with the rotation of said drum and to travel in said groove.

7. In an electric controller, the combination of a conductor comprising a core of insulating material and a series of separate juxtaposed copper wires secured on said core, said wires being electrically connected together by means of a conducting medium of comparatively high resistance; a pivoted arm, and a contact-piece pivoted at the end of said arm and arranged to contact said wires successively; and circuit connections.

8. A conductor of current consisting of a core, and a series of disconnected, juxtaposed, conducting elements secured to the outer surface of said core, said elements being electrically connected by means of a conducting medium of comparatively high resistance.

9. A conductor of current consisting of a core, and a series of disconnected, juxtaposed, conducting elements secured to the outer surface of said core, such elements having a por-

tion thereof embedded in a continuous conductor of comparatively high resistance.

10. A conductor of current consisting of a core, and a series of disconnected, juxtaposed, conducting elements secured to said core, said elements having a portion thereof embedded in a continuous mass of carbonaceous material applied to said core.

11. A conductor of current consisting of a core, and a series of separate, juxtaposed, copper wires secured to such core and electrically connected with each other by means of a conducting medium of comparatively high resistance.

12. A conductor of current consisting of a core of insulating material, and a series of separate juxtaposed copper wires secured to such core, and electrically connected with each other by means of a conducting medium of comparatively high resistance.

13. A conductor of current consisting of a core of insulating material and a series of separate juxtaposed copper wires secured on said core, a portion of each wire being embedded in a continuous conducting medium of comparatively high resistance.

14. A conductor of current consisting of a core of insulating material and a series of separate juxtaposed copper wires secured on said core, a portion of each wire being embedded in a continuous mass of carbonaceous material.

15. A conductor of current consisting of a core of insulating material and a series of transversely-located copper wires each terminating upon the surface of said core, and having its ends embedded in a continuous conducting medium of comparatively high resistance.

Signed by me this 10th day of February, 1903.

WESTON A. PRICE.

Attest:

G. W. SAYWELL,
A. E. MERKEL.