No. 650,057. Patented May 22, 1900.

A. L. WATERS.

CONTROLLER FOR ELECTRIC CIRCUITS.

(Application filed Aug. 2, 1899.)

(No Model.)

Fig. 6

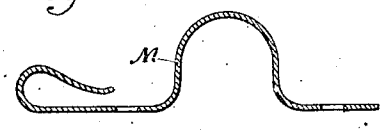


Fig. 1

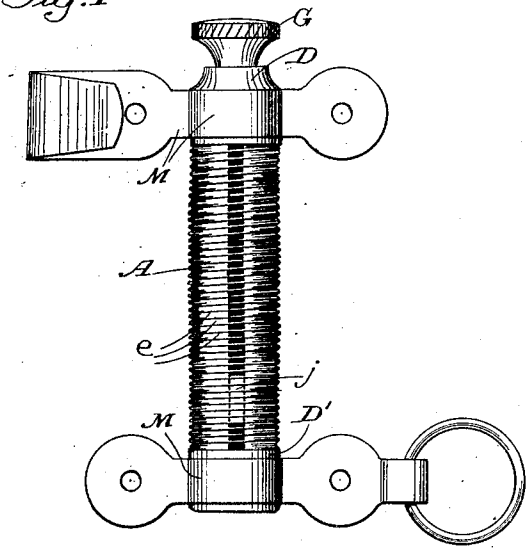


Fig. 2.

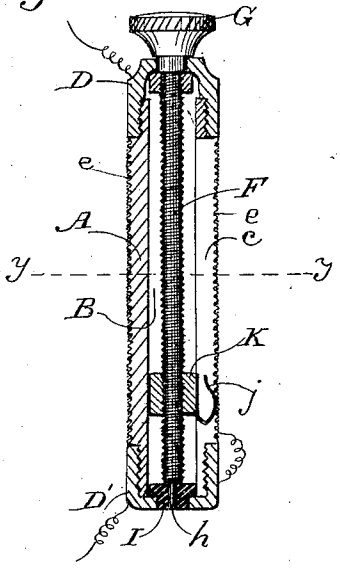


Fig. 5

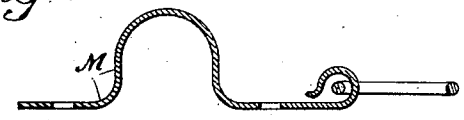


Fig. 3.

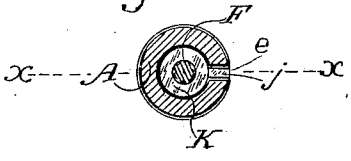
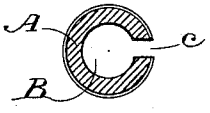


Fig. 4



Witnesses
J. A. Bayless
Chas. J. Armbruster

Inventor
A. Louis Waters
by Jno. L. Boone
his Attorney

UNITED STATES PATENT OFFICE.

ABRAHAM LOUI WATERS, OF SAN FRANCISCO, CALIFORNIA.

CONTROLLER FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 650,057, dated May 22, 1900.

Application filed August 2, 1899. Serial No. 725,919. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM LOUI WATERS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Controllers for Electric Circuits; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention relates to a novel device for controlling and regulating the intensity of an electric current; and it consists of a body of non-conducting substance or material having a hole passing through it and a slot leading from the hole or passage out through one side. The non-conducting body is connected at each end with a metallic fitting, with which the wires of the circuit are connected. A screw which is smaller than the bore or passage through the non-conducting body is mounted in the metallic end, fitting at one end so as to turn freely, and its length passes centrally through or nearly through the hole or passage in the non-conducting body. The exterior of the non-conducting body is wound spirally with fine wire from end to end, so that each wrapping is insulated from the others, and the termids of this wrapping-wire connect with the metallic end pieces. The wrapping-wire at each turn crosses the outer end of the slot that communicates with the main hole or bore. A nut is fitted on the screw which traverses the main hole or bore, and this nut carries a brush that extends out through the slot and contacts with the wrapping-wire as it is raised or lowered by the screw, so as to throw a longer or shorter quantity of the fine wire into the circuit, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 is a view of my electric device in elevation. Fig. 2 is a vertical section on the line *x x* of Fig. 3. Fig. 3 is a horizontal section on the line *y y* of Fig. 2. Fig. 4 is a horizontal section on the cylindrical body, and Figs. 5 and 6 are horizontal sections of the straps.

Let A represent a cylindrical or other form of body composed of vulcanized rubber or other non-conducting substance or material. This body has a large central hole or bore B, passing longitudinally through it, and a slot *c* on one side leading outward from the bore to the periphery or outer edge. A metallic end piece D D′ is fitted on each end of this non-conducting body by means of screw-threads or otherwise. The exterior of the body A is wrapped spirally with a fine wire *e* from end to end, and the ends of this fine wire are connected with the metallic end pieces D′, but not with the end piece D. I prefer to make the non-conducting body A cylindrical in form and to make a spiral groove similar to screw-threads on its exterior from end to end, and I can then wrap the fine wire in the spiral groove, and thereby insulate or separate each wrapping of the wire from the adjoining wrappings. The wrapping-wire at each turn will then pass over the slot *c*, which connects with the central hole or bore B.

F is a long screw having a milled head G at one end and a step or bearing *h* at its opposite end. This screw is much smaller in diameter than the diameter of the bore or hole B in the cylinder or body A, through which it passes. The head of the screw is fitted to turn freely in a bearing in the metallic end piece D, while the step or bearing *h*, at its opposite end, is mounted and fitted to turn in an insulating-bushing I of the opposite end piece D′.

K is a metallic nut which is tapped with screw-threads, which fit the screw F. This nut is also smaller in diameter than the diameter of the bore B, so that it can travel up or down along the screw in the bore when the screw is turned. On one side of this nut is a metallic arm or brush *j*, which extends outward into the slot *c*, and it is so bent that its outer end comes in contact with the wrapping-wires which surround the cylinder A as it is moved up or down against them. I prefer to bend this arm or brush into a U shape, so that it will form a spring, and to bend the outer branch of the U, as represented at Fig. 2, so as to present a rounding contact with the wires, which will prevent its catching upon the wires when it is moved.

The circuit-wires are connected with the

metallic end pieces D and D', so that the current, in order to pass through this regulator, must pass from the end piece D down through the screw F, thence out through the brush *j* to the wrapping-wire *e*, through which it will pass to the opposite end piece D' and the circuit-wire connected with it. It will now be apparent that I can regulate both the intensity and the quantity of the electric current by shifting the nut and its contacting brush toward or from the metallic end piece D', so as to throw into the circuit a greater or less length of the wrapping-wire *e*. This latter wire, being of small size, interposes a greater or less resistance into the circuit, according to the greater or less length of wire interposed into it, and this is done by shifting the brush toward or from the end piece D' by simply turning the screw F.

I do not confine myself to any particular shape or form of the cylinder A, nor to the spiral thread surrounding it for containing and insulating the small wire, as these may be variously applied, as is well understood in the art.

This regulator or controller may be used in connection with any system of circuit wires, but I have shown it in the drawings as it would be adapted for use in connection with an electric bolt in which case the straps or casings M M are used to cover the end pieces, but it can be applied in any circuit.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

A regulator or controller for electrical currents, consisting of a non-conducting body having a central bore and a slot on one side leading from the bore to the periphery of the body; metallic end pieces to said body, electrically connected with the circuit-wire; a wire wrapped spirally around the exterior of the non-conducting body and connected with one of the metallic end pieces, each wrapping being insulated from the wrapping on each side; a screw passing axially through the bore and electrically connected with the circuit-wire at one end; a nut adapted to be moved in the bore by the screw; a brush carried by the nut and having a brush extending into the slot so as to contact with the wrapping-wire, substantially as described.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses this 6th day of April, A. D. 1899.

A. LOUI WATERS.

Witnesses:
CHAS. J. ARMBRUSTER,
J. A. BAYLESS