

(No Model.)

F. H. WILMARTH.

ELECTRO MAGNETIC CUT-OUT.

No. 355,739.

Patented Jan. 11, 1887.

fig. 1.

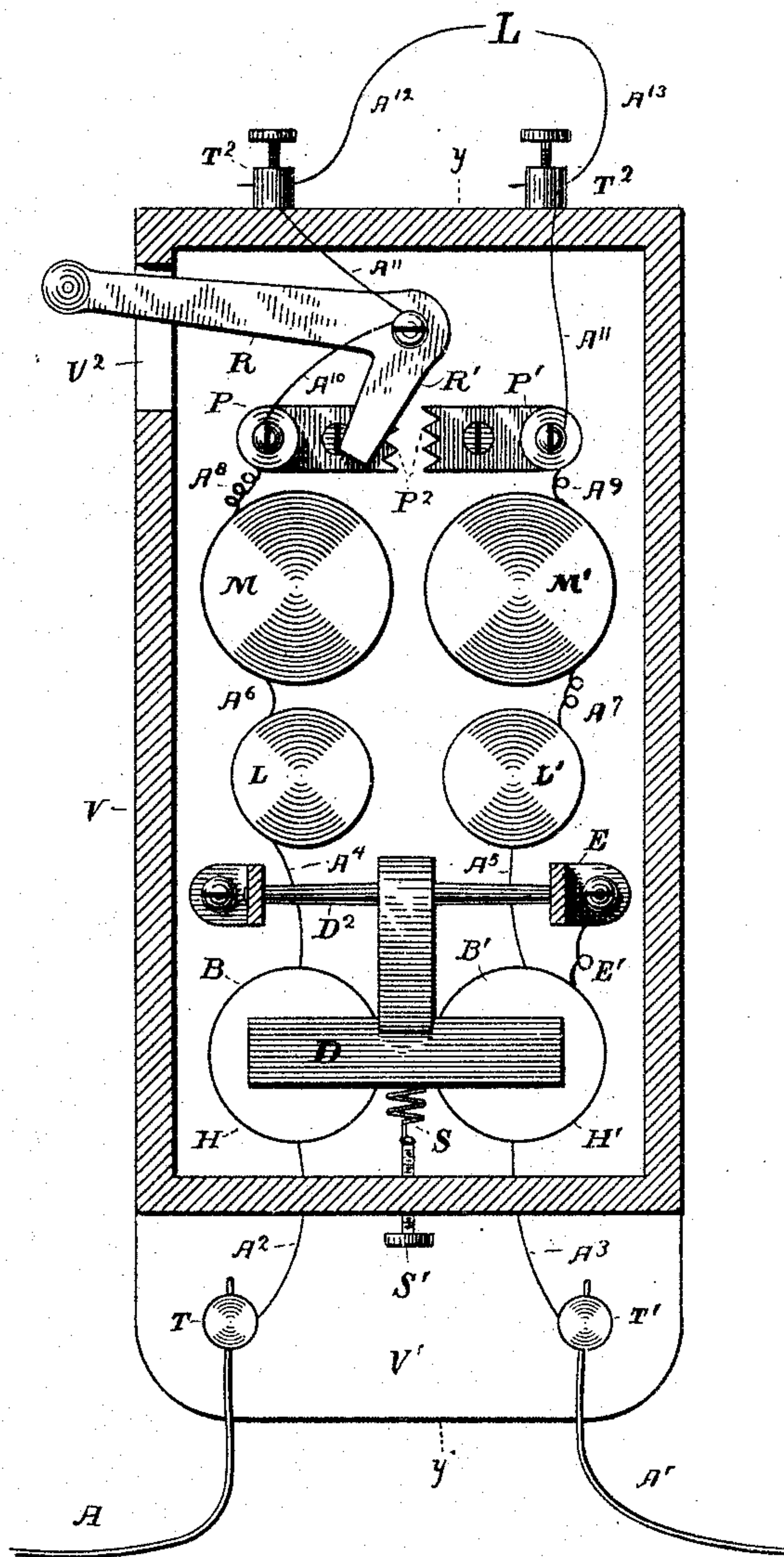
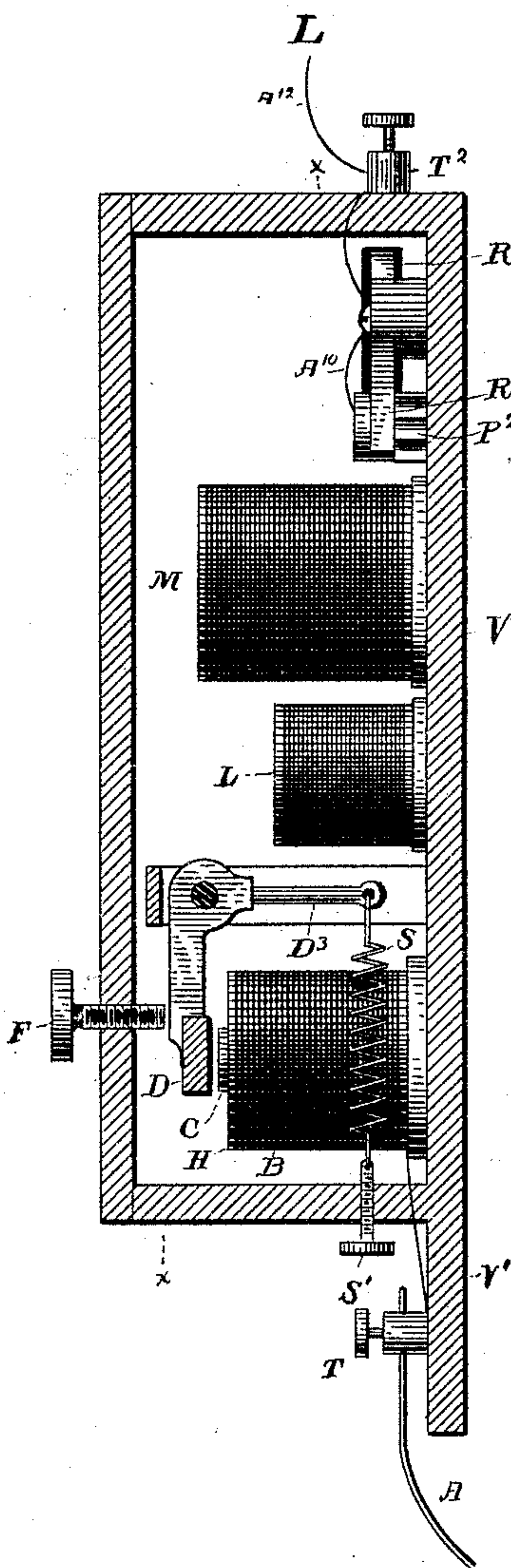


fig. 2.



Witnesses;

H. W. Wells

M. E. Upham

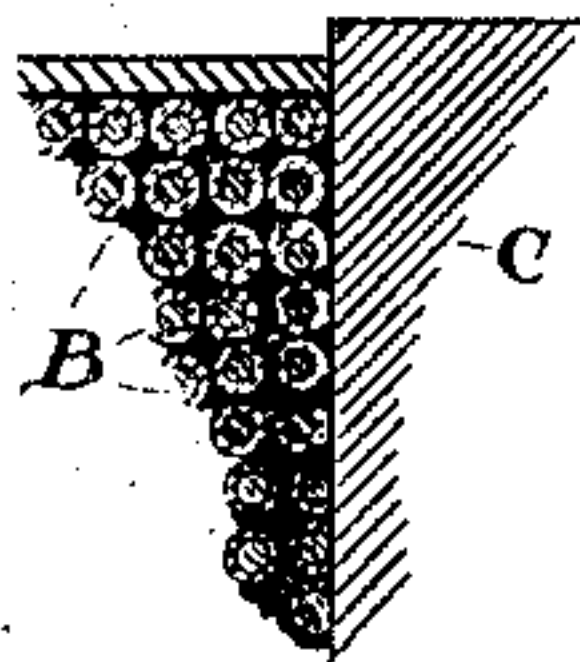


fig. 3.

Inventor,

Fred H. Wilmarth;

By *A. B. Upham,*
His Attorney.

UNITED STATES PATENT OFFICE.

FRED. H. WILMARTH, OF PEORIA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
FRANK A. MILLER, OF SAME PLACE.

ELECTRO-MAGNETIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 355,739, dated January 11, 1887.

Application filed August 6, 1886. Serial No. 210,188. (No model.)

To all whom it may concern:

Be it known that I, FRED. H. WILMARTH, of Peoria, in the county of Peoria, State of Illinois, have invented an Improved Electric-
5 Current Governor; and I do hereby declare that the following is a full, clear, and exact description thereof.

The object of this invention is the construction of an improved device for so controlling
10 the electric current feeding an incandescent or carbon light that any sudden variation in the strength of said current shall not be permitted to affect the light.

The invention is fully described and explained below, and illustrated in the drawings
15 connected with this application, in which—

Figure 1 is a sectional view of the invention at X X in Fig. 2. Fig. 2 is a sectional view of the same at Y Y in Fig. 1. Fig. 3 is a sectional view of a portion of the electro-magnet.
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Referring to the first figure of the drawings, A A' represent the several parts of the main line of the electric circuit communicating with an electric light, (indicated by L,) the current
25 being supposed to flow from A to A'. Between the section A and the light L is introduced the electro-magnet H, consisting of the coil of fine insulated wire B and the soft-iron core C. The pendulous armature D, supported by trunnions D², mounted in bearings
30 E, is adapted, by means of the tension-spring S, connected to the arm D³ of the armature, and by the play-limiting set-screw F, to be attracted to the helix H whenever in circuit, but not to actually touch the core C thereof,
35 except when the latter is rendered somewhat more powerful by an increase in the strength of the current. There are many ways in which it is possible to enable this action of the armature to so actuate a switch as to directly connect the wires A A', and thereby permit the excess of current to pass along the main line, instead of being transmitted to the light and causing the same to flicker and flare. I have
40 shown, however, in the drawings but two ways of thus governing the current and steadying the light. One of these consists in making bare a coil or coils of the helix B in contact with the core C, so that a slight current can
45 pass from said coil to said core, and then con-

necting the armature D to the wire A'; hence, when the armature is caused to touch the core C by an excess of electric current the latter flows readily from the coil to the core, and thence to the armature and section A' of the
55 main wire. The second way consists in introducing a second electro-magnet, H', between the wire A' and the light L, said electro-magnet being constructed exactly similar to the electro-magnet H and controlling the armature D jointly therewith. When, therefore,
60 the excess of current attracts the armature to the two cores C, the electricity can pass from core to core and thence to the wire A'.

My preferred construction is that first described, modified, however, by the latter. In
65 this preferred construction I retain the helix H', having its coil in the circuit between the light L and the section A'; but the core and coil thereof are entirely insulated with relation to each other, so that should the armature
70 D touch the core no direct circuit will be made thereby. To further insure the relative direct insulation of the helices B and B', the armature D can have its arm D' cut away or
75 so canted as not to touch the core C' when in contact with the core C.

Instead of connecting the bearings E of the armature directly to the section A', I usually join said bearings by a wire, E', to the coil B'.
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To regulate the tension of the spring S, I usually attach its end to the adjusting-screw S'.

In order to render my governor more complete in its action, I introduce between the electro-magnets H H' and the light L the coils
85 of wire L, L', M, and M', forming part of the circuit. The coils L L' are made of very fine wire, while the coils M M' are of wire intermediate between that of said coils L and the coils B. By means of the resistance of said
90 coils the electricity passing to and from the light L is prevented from being too easily influenced by variations in the current in the main line not entirely shunted back by my previously-described arrangement of helix and
95 armature.

Instead of disconnecting the main line from the governor when it is desired to shut off the light, I insert the switch R between the coil M and the light L, by means of which the current
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is diverted from the light L and made to pass from the switch-plate P through the wire A¹⁰ to the switch-lever R, and through the arm R' thereof to the switch-plate P', from whence the current continues on to the main-line wire A'.

When the switch-arm R' is moved into contact with the switch-plate P, the electric current can pass through the same to the wire A¹², and thence through the lamp L around to the main-line section A'.

I usually bring the ends of the switch-plates P P' somewhat near together and provide said ends with the serrations P², by means of which an electric stroke communicated to the main line is prevented from passing to the lamp L and injuring or affecting the same, the lighting being caused to spring from one switch-plate to the other by means of said serrations.

Although I have described this governor as introduced into the circuit between the main line and a single light, it can similarly control two or more lamps. Neither do I restrict myself to the employment of my governor in connection with electric lighting alone, as it is equally applicable to controlling and steadying an electric current for whatever purpose used.

I usually locate my governor in the rectangular case V, having the projecting side V', on which are the attaching-posts T T', for removably connecting the same to the main-line wires A A'. From the said attaching-posts wires A² A³ connect the same to the helices B B'. Said helices are joined to the coils L L' by the wires A⁴ A⁵. Said coils are connected to the coils M M' by wires A⁶ A⁷, and the latter coils to the switch-plates P P' by wires A⁸ A⁹. Instead of running wire directly from the switch-plate P' and the switch-lever R to the lamp L, I mount attaching-posts T² upon the case V and connect thereto said plate and lever by wires A¹¹. By means of wires connected to said attaching-posts one or more lights are put into the circuit therewith.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. The combination, with the two severed parts of an electric line, of a helix of insulated wire in electrical connection with one of said parts, and having a portion of its inner surface laid bare, a soft-iron core within said helix and in electrical contact with the bared inner surface thereof, and an armature suspended in the field of the electro-magnet formed by said helix and core, and in electrical connection with the other of the severed parts of said main line, whereby when said core is magnetized by the passage of a sufficient cur-

rent of electricity through said helix the armature is drawn into contact with the core, and the current passes from one of the parts of said main line through said helix, core, and armature to the other part of said line.

2. The combination, with the two severed parts of an electric line, of a helix of insulated wire in electrical connection with one of said parts, and having a portion of its inner surface laid bare, a soft-iron core within said helix and in electrical contact with the bared portion thereof, an armature pivoted in a suitable support of conducting material and lying in the field of the electro-magnet formed by said helix and core, and an electrical conductor connecting said armature-support with the other of the severed parts of said line.

3. The combination, with the two severed parts of an electric line, of two helices of insulated wire in electrical connection with said parts, respectively, one of said helices having a portion of its inner surface laid bare, soft-iron cores lying within said helices, respectively, and forming therewith electro-magnets, and an armature suspended in the field of the electro-magnet, having the inner surface of its helix laid bare and electrically connected with the helix of the other electro-magnet.

4. The combination, with the two severed parts of an electric line, of two helices of insulated wire in electrical connection with said parts, respectively, each of said helices having a portion of its inner surface laid bare, soft-iron cores lying within said helices, respectively, and in contact with the bared surfaces thereof, and an armature suspended in the field of the electro-magnets formed by said helices and cores, and adapted to be drawn into contact with said cores when the same are magnetized by the passage of a sufficient current of electricity through said helices.

5. The combination, with an electric lamp and the two severed parts of an electric line supplying the current thereto, of a series of wire coils of different degrees of resistance interposed between the lamps and each of the parts of said line, the two parts of the line, the resistance-coils, and the lamp being in electrical connection, and the resistance-coils adapted to take up and equalize variations in the current passing through the circuit.

In testimony that I claim the foregoing invention I have hereunto set my hand and seal this 31st day of July, in the year 1886.

FRED. H. WILMARTH. [L. S.]

Witnesses:

A. B. UPHAM,
A. KEITHLEY.