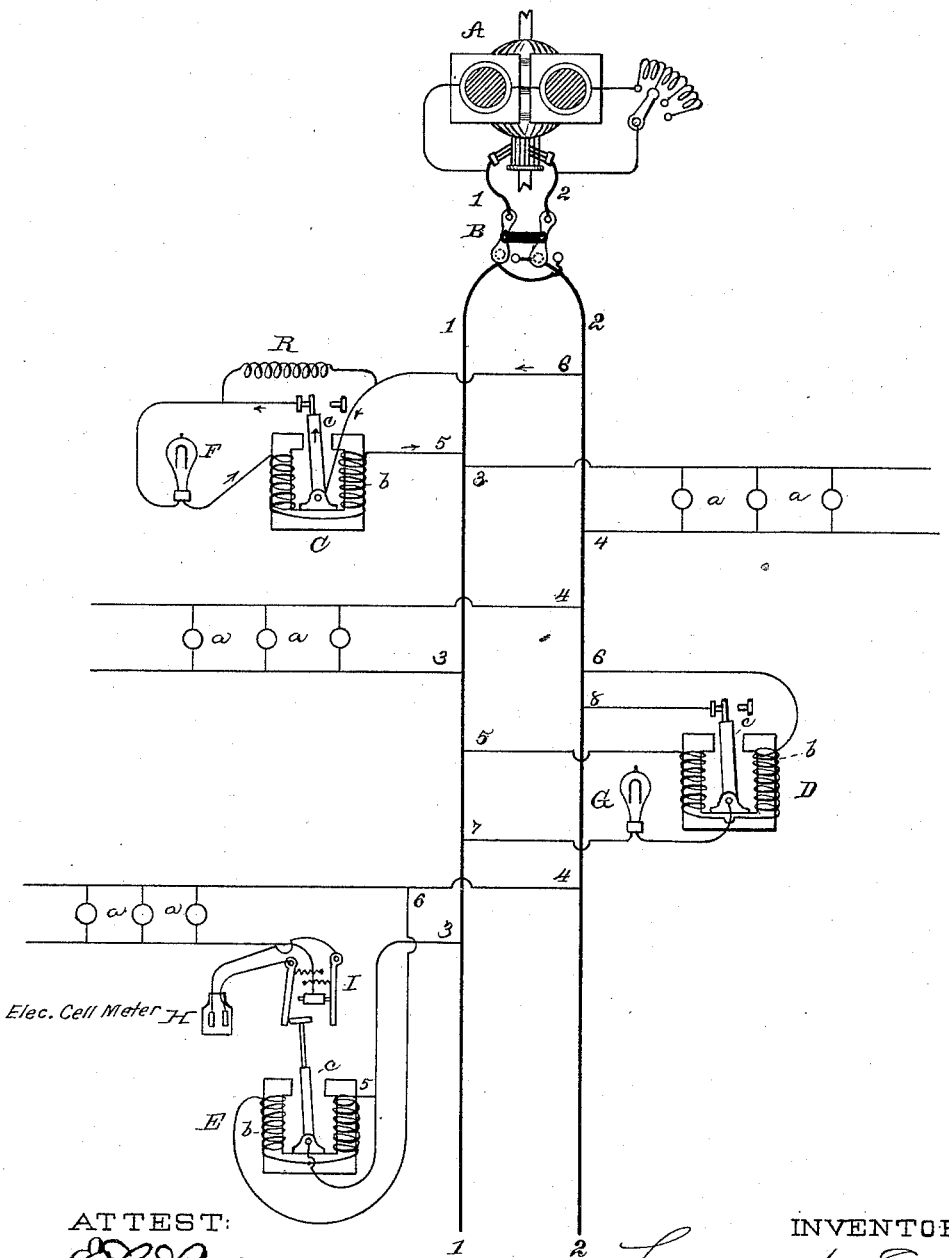
(No Model.)

T. A. EDISON.

ELECTRIC LIGHTING SYSTEM.

No. 430,934. Patented June 24, 1890.



ATTEST:

INVENTOR:
Thomas A. Edison,
By Richd. N. Dyer,
Atty.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 430,934, dated June 24, 1890.

Application filed June 29, 1883. Serial No. 99,555. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Electric-Lighting Systems, (Case No. 579,) of which the following is a specification.

The object I have in view is to provide means for operating electrical apparatus located at different points in an electric-light circuit from the source of supply without the employment for that purpose of a circuit separate from the light-circuit, and more especially to provide means of this character for turning on and off from the source of current-supply certain lamps—as, for instance, street-lamps, whether of the incandescent or arc type—thus avoiding the expense and inconvenience of operating them separately by hand. This I accomplish by the use of polarized apparatus located in connection with the lamp or lamps or other devices to be operated, which polarized apparatus is actuated by a reversal in the polarity of the current at the source of supply, a suitable switch being provided at or near the generator or generators for this purpose. This method of producing motion on an electric-light circuit is preferably employed in a system wherein the regular lamps or other translating devices are not affected by changes in the polarity of the current, such as a system employing my simple incandescing electric lamps, which are preferably arranged in multiple arc or multiple series; but translating devices may be employed which are affected by changes in the polarity of the current—such as my electrolytic-cell meter or arc lamps—and the current in such translating devices will be maintained of one polarity by similar polarized apparatus.

In the accompanying drawing, forming a part hereof, the figure is a view, partly diagrammatic, of an electric-lighting system embodying my present improvement.

A is a dynamo or magneto electric machine, one or more of which may be employed. From this machine extend the main conductors 1 2. A field-circuit of the machine is shown as a multiple-arc circuit from 1 2, and as provided with an adjustable resistance for regulating the machine. House-circuits 3 4 are taken from the main conductors 1 2, and in multiple arc in these house-circuits are located incandescing electric lamps *a*.

At or near the machine A a current-reversing switch B is inserted in the line of the main conductors 1 2, so that the polarity of the current in the lamp-circuit outside of said switch can be changed at will.

C, D, and E represent polarized apparatus, any number of which may be employed, located at any desirable points in the electric-light circuit. This apparatus may be of any suitable construction. It is shown as composed of a U-shaped electro-magnet *b*, between the poles of which is located the free end of a pivoted polarized armature *c*. This arm constitutes a circuit-terminal for the branch circuit with which it is connected, and when moved does not affect the main circuit, and the magnet, with its armature, is termed a "mechanically-moving electrical apparatus." The coils of the electro-magnet are located in any suitable circuit from the electric-light circuit. A multiple-arc circuit 5 6 from 1 2 or from a house-circuit 3 4 or from any branch circuit of the system may be employed. Now, it will be seen that when the current is flowing in one direction the pivoted polarized armature *c* will be moved one way by the magnet *b*, and a reversal of the current will cause the movement of the armature in the other direction. The movement produced in this manner can be utilized to work various devices.

In the drawings the movement is shown as used to open and close the circuits of electric lamps F G and to change the connections of an electrolytic-cell meter H. Two arrangements of circuits are shown for opening and closing the lamp-circuits, either of which may be employed. The lamp F is placed directly in circuit with the coils of the magnet *b*, which coils are of low resistance. The lever *c* and one of its contacts is also in this same circuit, and around the contacts of the lever is a shunt containing a high resistance R. This resistance allows enough current to pass to work the polarized armature, but not sufficient current to light the lamp. The lamp G is placed in a separate multiple-arc circuit 7 8, passing through the lever *c* and one of its contacts. The magnet-coils in the circuit

5 6 of the apparatus D are of high resistance, or an extra resistance is employed in series therewith. Since the heavy lighting-current will always pass in one direction through the lamps F G, those lamps may be regulator-lamps of any description or simple incandescing lamps. It is evident, also, that the circuit of a number of lamps could be opened and closed by a single polarized apparatus, and that an electrolytic-cell meter could be used in connection with the lamps. If, however, it is desired to use an electrolytic-cell meter in connection with the regular lamps, or any other device affected by changes in the polarity of the current, this may be done by utilizing the polarized apparatus to change the connections of the meter or other translating device or devices thus affected. The polarized apparatus E is arranged in connection with a meter H for this purpose. The meter is connected in circuit through a current-reverser I, of which the polarized lever *c* forms a part. A change in the polarity of the current works the reverser and changes connections of meter, keeping the direction of the current therethrough constant.

A conventional form of reverser is shown, the operation of which will be readily understood. One side of circuit passes through lamps to the stationary central block of reverser. The other side of circuit goes to polarized lever *c*. The meter is connected with the two spring-arms of reverser. In its opposite positions the lever *c* makes contact with the opposite spring-arms and throws them off of the central block of reverser, allowing the other arm to rest on such block, and hence the connections of the meter with the circuit are reversed.

I do not claim in this case any matter shown or described but not claimed herein which is shown or described in my applications, Serial Nos. 65,233 and 91,954.

What I claim is—

1. The combination, with an electrical circuit, of the electric lamps operative with either polarity of current connected in the circuit, means for reversing the polarity of the current in the circuit, and polarized electrical apparatus connected in a branch of the same circuit outside of the reversing device and operative without changing the main lamp-circuit, whereby the polarized apparatus may be controlled without affecting the lamps, substantially as described.

2. The combination, with an electrical circuit, of electric lamps operative with either polarity of current connected in the circuit, means for reversing the polarity of the current in the circuit, another lamp connected in a branch of the same circuit outside of the reversing device, and an electrically-operated circuit-controller for said branch controlling said other lamp, whereby both sets of lamps may be burned simultaneously, or the first set may be burned alone, substantially as described.

3. The combination, with an electrical circuit, of one or more translating devices affected by changes in the polarity of the current and polarized mechanically-moving electrical apparatus for maintaining constant the direction of the current through such device or devices independent of changes in the polarity of the current in the circuit, substantially as set forth.

4. The combination, with an electrical circuit, of polarized mechanically-moving electrical apparatus for operating mechanism by changes in the polarity of the current, translating devices not injuriously affected by changes in the polarity of the current, and other polarized mechanically-moving electrical apparatus for maintaining constant the direction of the current through said translating devices, substantially as set forth.

5. The combination, with an electrical circuit, of polarized mechanically-moving electrical apparatus for operating mechanism, translating devices not injuriously affected by changes in polarity of current, translating devices affected by changes in polarity of current, and other polarized mechanically-moving electrical apparatus for maintaining constant the direction of the current through the latter translating devices, substantially as set forth.

6. The combination, with an electric-light circuit and a current-reversing switch for such circuit, of electric lamps, an electrolytic meter, and polarized mechanically-moving electrical apparatus for maintaining constant the direction of the current through such meter, substantially as set forth.

This specification signed and witnessed this 25th day of June, 1883.

THOS. A. EDISON.

Witnesses:
H. W. SEELY,
EDWARD H. PYATT.