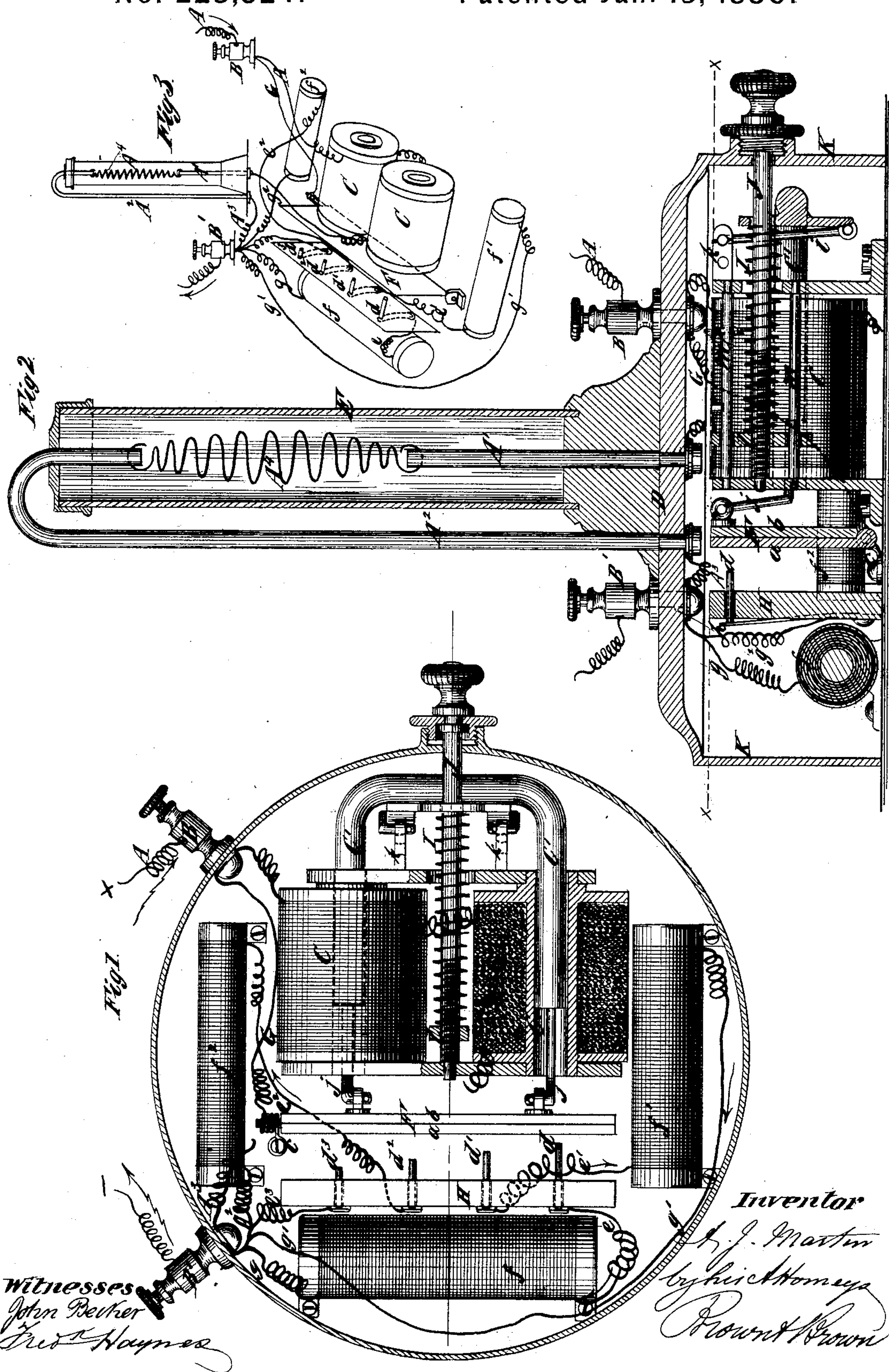


A. J. MARTIN.
Electric-Lighting Apparatus.

No. 223,524.

Patented Jan. 13, 1880.



Witnesses
John Becker
Fred Haynes

Inventor
A. J. Martin
by Richard Homers
Robert Brown

UNITED STATES PATENT OFFICE.

ABRAM J. MARTIN, OF CATSKILL, NEW YORK.

ELECTRIC-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 223,524, dated January 13, 1880.

Application filed February 24, 1879.

To all whom it may concern:

Be it known that I, ABRAM J. MARTIN, of Catskill, in the county of Greene and State of New York, have invented certain new and useful Improvements in Electric-Lighting Apparatus, of which the following is a specification.

My invention is applicable to electric-lighting apparatus of various kinds, but is particularly intended for use in connection with apparatus in which the candle or illuminating device consists of a portion of a closed electric circuit having less conductivity than the remainder of the circuit, and which will become heated to a point of incandescence by the resistance offered to the passage of the current. In apparatus of this kind the candle or illuminating device has been liable to injury, and often destroyed by overheating.

The object of this invention is to provide for automatically regulating the intensity of the current of electricity, so as to prevent the candle or illuminating device from being overheated, and to produce a steady light of uniform brightness.

To this end the invention consists in the combination, with the main circuit of an electric lamp or lamps, one or more branch circuits, and circuit-closing devices consisting of pins having points of different projection connected with resistance-coils, of an electro-magnet, a movable core therefor, and a plate connected with said movable core, whereby the said circuit-closing devices are operated.

It also consists in details and combinations of parts hereinafter explained.

In the accompanying drawings, Figure 1 represents a central vertical section of an electric lamp embodying my improvements. Fig. 2 represents a horizontal section thereof on the dotted line $x x$, Fig. 1; and Fig. 3, a perspective view of certain parts thereof.

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

A designates the circuit through which the main current of electricity passes. This circuit extends from the positive pole of a battery (not here represented) to the binding-post B, thence to a magnet, C, which may consist of one or more helices, two being here represented. After leaving the magnet, I have represented the circuit as comprised of an

upwardly-extending portion, A' , and a downwardly-extending portion, A^2 , both of which may consist of rods or bars of metal, which are here represented as secured rigidly in the base-plate D of the lamp. A portion, A^3 , of the circuit passes from the rod A^2 through the binding-post B' to the negative pole of the battery. The candle or illuminating device is represented as consisting of a piece of platinum wire, A^4 , placed in the upwardly-extending portion A' of the main circuit. As the portion A^4 possesses less conductivity than the remainder of the circuit, the resistance offered to the current will cause the portion A^4 to become incandescent and emit light.

To protect the candle or illuminating device from injury, I have represented it as inclosed in a glass cylinder, E, supported by the base-plate D.

As an increase in the intensity of the current of electricity might injure or possibly destroy the candle or illuminating device A^4 , it is very desirable that the intensity of the current passing through the main circuit should be automatically regulated, and I will now proceed to describe the means for effecting the same.

F designates a plate having a conducting-face, a , and an insulated back, b . This plate is preferably hinged to the support of the lamp at c , and is connected with the positive pole of the battery by a connection, G, extending to the binding-post B.

$d d' d^2 d^3$ designate a series of pins of different lengths arranged in a support or plate, H, so as to project more or less beyond the support or plate, and capable of longitudinal adjustment therein. The pin d is represented as longest and the pin d^3 as shortest. These pins are each held in place by means of springs h , which impinge against their ends and prevent them from becoming displaced.

From each of the pins $d d' d^2$ extend connections $e e' e^2$, which are connected with resistance-coils $f f' f^2$, and which are then connected with binding-post B' and the negative pole of the battery by means of connections $g g' g^2$. The pin d^3 is represented as connected with the binding-post B' by means of the connection e^3 .

By swinging the plate F toward the pins

contact is made with them one after another, and a series of branch circuits are thus formed for conveying a greater or less proportion of the main current of electricity, and thereby diminishing the intensity of said main current. When the plate F is swung over sufficiently to touch the pin d^3 the entire current is carried off through the connection e^3 , and the light is extinguished.

In order to effect the automatic swinging of the plate F as the current increases or diminishes, I connect it with the core C' of the magnet C, so that when the said core is drawn inward by the intensity of the main current the plate F is swung over so as to touch one or more of the pins d d' d^2 d^3 , and thereby complete one or more branch circuits, for returning a greater or less proportion of the main current to the battery without passing through the magnet C. The intensity of the main current is thereby diminished, and the candle or illuminating device A⁴ is preserved from injury by overheating.

I prefer to support the core C' of the magnet C so as to be free to move with little friction, and have here represented it as supported by means of suspending-rods i j , the rod i being pivoted to suitable supports k , and the rod j being pivoted to the plate F, and insulated therefrom by means of the lock b .

If desirable, electro-magnets having movable armatures may be substituted for the magnet and movable core here represented.

In order to insure the proper return of the plate F when the intensity of the main circuit is diminished by the action of the branch circuits, I have represented a spring, I, as coiled upon a rod, J, and impinging against the core C' to force it back. In lieu of a spring, any equivalent device—such, for instance, as a weight—may be employed.

In order to properly regulate the resistance offered by the spring I to the forward movements of the core C', I have shown the rod J as provided with a screw-thread and a nut, l , against which one end of the spring I impinges. When the rod J is turned the nut l is prevented from being turned also by guide-

rods m m , and hence is adjusted longitudinally upon the rod, and the resistance offered by the spring I correspondingly increased or diminished.

If it is desired to use the lamp with a weak electric current, it may be preferable to connect the conducting-face a of the plate F with the wire A' of the circuit, in which case the current would pass from the magnet to the plate F, and thence to the candle or illuminating device, instead of directly from the magnet to the candle.

To properly protect parts of the lamp, I provide a case, K, extending downward from the base-plate D, and inclosing such parts.

By my invention the candle or illuminating device is protected from injury by overheating, and the light radiated therefrom is of uniform brightness.

My improvements may with advantage be embodied in apparatus for heating small spaces by electricity, and for any other purpose where it is desired to maintain a current of uniform intensity.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the main circuit of an electric lamp or lamps, one or more branch circuits, and circuit-closing devices consisting of pins having points of different projection connected with resistance-coils, of an electro-magnet, a movable core therefor, and a plate connected with said movable core, whereby the said circuit-closing devices are operated, substantially as specified.

2. The combination of the magnet C, core C', spring I, rod J, suspending-rods i j , and plate F, substantially as specified.

3. The combination of the pins d d' d^2 d^3 , connections e e' e^2 e^3 , resistance-coils f f' f^2 , connections g g' g^2 , swinging plate F, with its connection G, and magnet C, with its movable core C' connected to said swinging plate, substantially as specified.

ABRAM J. MARTIN.

Witnesses:

FREDERICK SALESBURY,
MORRIS ARNSFIELD.