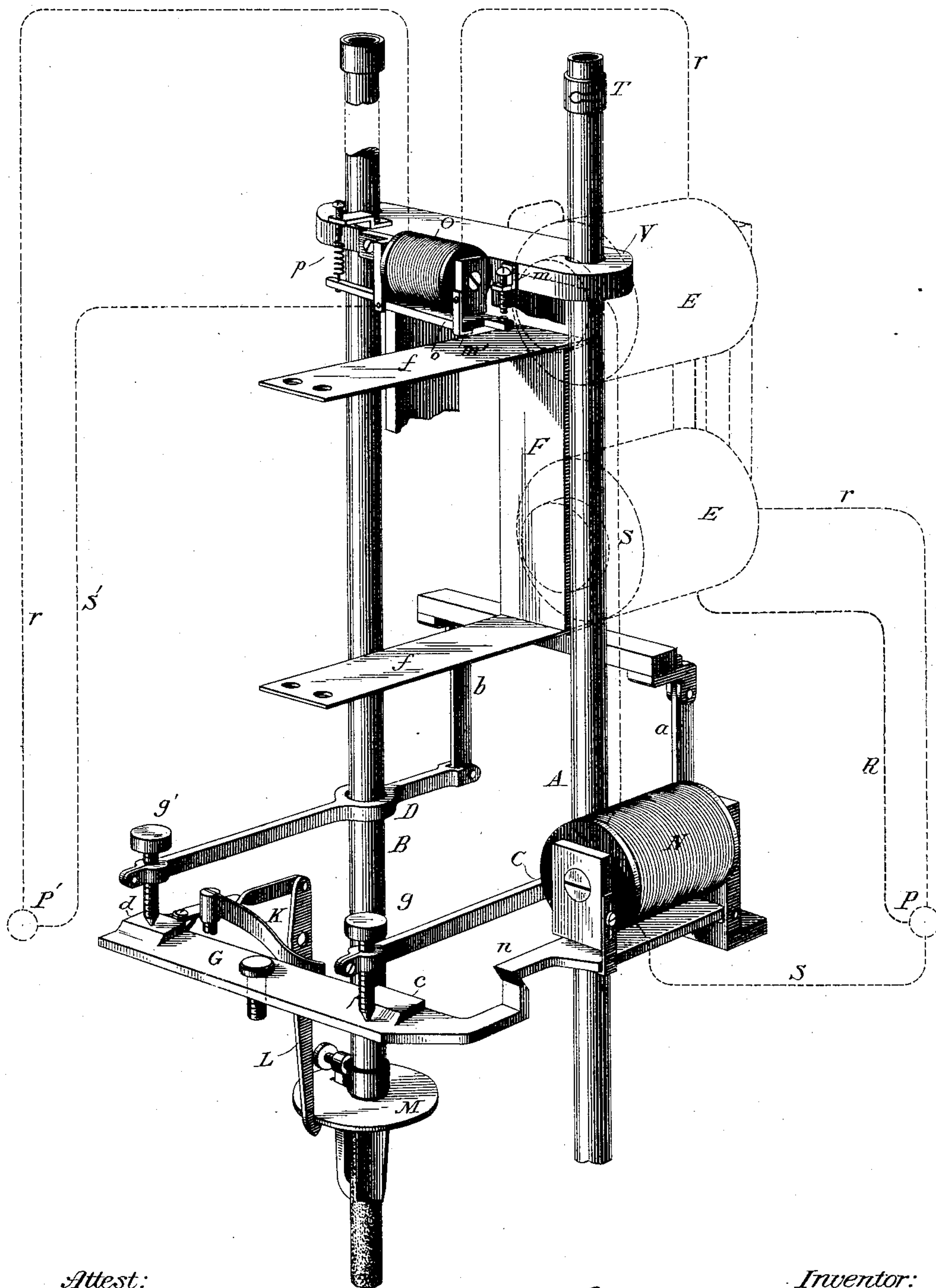


(No Model.)

E. WESTON.  
ELECTRIC LAMP.

No. 330,450.

Patented Nov. 17, 1885.



Attest:

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Inventor:

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att'y.



# UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

## ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 330,450, dated November 17, 1885.

Application filed February 12, 1885. Serial No. 155,666. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification, reference being had to the drawing accompanying and forming a part of the same.

In a patent granted to me November 14, 1882, No. 267,474, I have shown and described an electric-arc lamp in which two sets of carbons are operated and controlled by a single set of feed-magnets, the current being shifted from the first set of carbons to the second, through the instrumentality of an electro-magnet, in a derived circuit normally open, but closed by the contact of a stop carried by the gravitating carbon rod of the first set of carbons with a fixed contact-point.

To this form of lamp my present invention relates; and it consists in an apparatus operating upon a different plan for accomplishing the same result, and which, from the nature of its mode of operation, is capable of a much wider application to lamps of other forms.

According to my present invention I employ substantially the same mechanical construction of feeding and shifting devices as in the patent referred to. In lieu of the means for closing the circuit through the magnet controlling the shifting devices, however, which I previously employed, I use the stop on the carbon rod of the set of carbons first to be consumed simply as a means of arresting the descent of said rod at a predetermined point in its path, and for sustaining its weight, the shifting-magnet being operated, whether directly or indirectly, by the diversion of current above a certain normal limit through a closed shunt or derived circuit around the lamp, which is occasioned by the arrest of the carbon rod by its stop and the elongation of the arc by the consumption of the carbons consequent thereon. To do this I have a closed derived or shunt circuit of high resistance around the lamp, and in this the shifting-magnet may be included. I prefer, however, on account of the greater certainty of action obtained thereby, to employ a relay-magnet in this circuit, which shall

close the circuit from whatever source it may be derived through the shifting-magnet, and this form I have illustrated in the accompanying drawing, in which I have shown those parts of a lamp that enter directly into the invention, the lamp-frame supports and the like being omitted, inasmuch as they differ in no essential particular from those described in my said former patent.

A and B designate the carbon rods or holders of a double lamp; C and D, the clamps or clutches for controlling the movement of the same; E, the electro-magnet for controlling the feed and adjustment of the carbons; F, the armature supported by springs *ff*, and to which the clamps C and D are connected by the links *ab*. G is a pivoted plate that forms the floor or rest for tripping the clutches. It is provided or formed with two raised parts, *cd*, with a beveled edge, which by the movement of the plate G are brought under the tails of the clutches, or the ends of screws *g g'* passing through the same. A spring, K, bears upon the plate G and exerts a force tending to shift the plate to a position in which the screw *g* rests upon the raised part *c* and the screw *g'* upon the face of the plate. The plate is held in a position opposed by the spring by a pivoted catch, *n*, that forms the armature of a magnet, N. Another pivoted catch, L, connected with the plate G, locks under a flange, M, on the carbon rod B and holds the carbon carried thereby out of contact with its lower carbon until the catch *n* releases the plate G. At some convenient point a magnet, O, is attached to the lamp-frame and provided with an armature, *o*, adjustable by means of a spring, *p*. The armature has front and back stops, *m m'*. The feed magnet or magnets E are here shown in dotted lines, and may be of any kind—as, for example, the ordinary type of compound or differential magnets, the main coils being in circuit R from the binding-post P to the frame of the lamp, or by the usual means to the carbon rods. The derived-circuit coils are in a circuit, *r*, from post P to post P', and as the armature *o* may be operated by any closed shunt of high resistance, I insert the magnet which controls it in this circuit. The magnet N is included in a derived circuit of high resistance formed by a



wire, S, from post P to the front stop, *m*, and by a wire, S', from post P' to the armature *o*.

The operation is as follows: The parts being adjusted as shown in the drawing, the  
5 carbons, of which the rod A carries the positive, are fed and consumed, while the others are not moved, for the reason that the clutch C, with its screw resting on a lower floor than that upon which rests the screw of clutch D,  
10 will grip and release its carbon rod while the clamp D is held out of action. When the carbons are in this way consumed to a certain point, a stop, T, on the carbon rod A comes down into contact with the stationary cross-piece V of the lamp-frame. A further downward feed of the rod A being thus prevented,  
15 the arc gradually elongates as the consumption of carbon continues and increases in resistance. This diverts a greater amount of current through the circuit *r*, which, when it has imparted a magnetism to the magnet that controls the movement of the armature *o* sufficient to overcome the adjusted tension of the spring *p*, draws the armature over against the  
20 stop *m* and closes the circuit through the magnet N. By this means the catch *n* is drawn up, the plate G shifted, and the second set of carbons dropped into contact. This also throws clutch C out of action and brings  
25 clutch D into action, so that the arc will continue between the second set of carbons.

This invention is applicable to lamps of many various kinds of feed mechanism and shifting devices. In illustrating the same by  
35 means of the most practicable devices for carrying out the invention of which I am aware, and applied to a special form of lamp, I do not confine myself either to the specific means shown or to the special form of lamp to which  
40 they are applied.

What I claim is—

1. In an electric lamp, the combination, with a single magnet or set of magnets and two sets of carbons and feed mechanism therefor, of  
45 devices for bringing into operation the two

sets of carbons successively, and an electro-magnet in a constantly-closed derived circuit around the lamp, adapted to operate the said devices upon the attainment of an attractive force caused by a given diversion of current  
30 through the derived circuit, as set forth.

2. In an electric lamp the combination, with a single magnet or set of magnets and two sets of carbons and feed mechanism therefor, of devices for operating the two sets of carbons  
55 successively, a shifting-magnet for operating said devices, and a magnet and armature in a constantly-closed derived circuit around the lamp, for closing the circuit of the shifting-magnet, as set forth. 60

3. In an electric lamp, the combination, with a single magnet or set of magnets and two sets of carbons and feed mechanism therefor, of devices for bringing into operation the two sets of carbons successively, a shifting-magnet  
65 in an open derived circuit, for operating said devices, and a relay-magnet and armature in a constantly-closed derived circuit, for closing the circuit of the shifting-magnet, as set forth.

4. In an electric lamp, the combination, with a single feed-magnet or set of magnets and armature, two sets of carbons, and clamps or  
70 clutches for controlling the feed of the same, and connected with the armature of the feed-magnets, and a pivoted floor of varying height for tripping said clutches, of an electro-magnet in an open derived circuit, for shifting the floor, a magnet in a constantly-closed derived circuit, for closing the circuit through the shifting-magnet upon a given lengthening of  
75 the arc, and a stop for arresting the feed of the carbons first to be consumed, and thereby producing the elongation of the arc at the proper time, as set forth.

In testimony whereof I have hereunto set  
85 my hand this 9th day of February, 1885.

EDWARD WESTON.

Witnesses:

FRANK N. CRANE,  
JAS. L. RIKER.