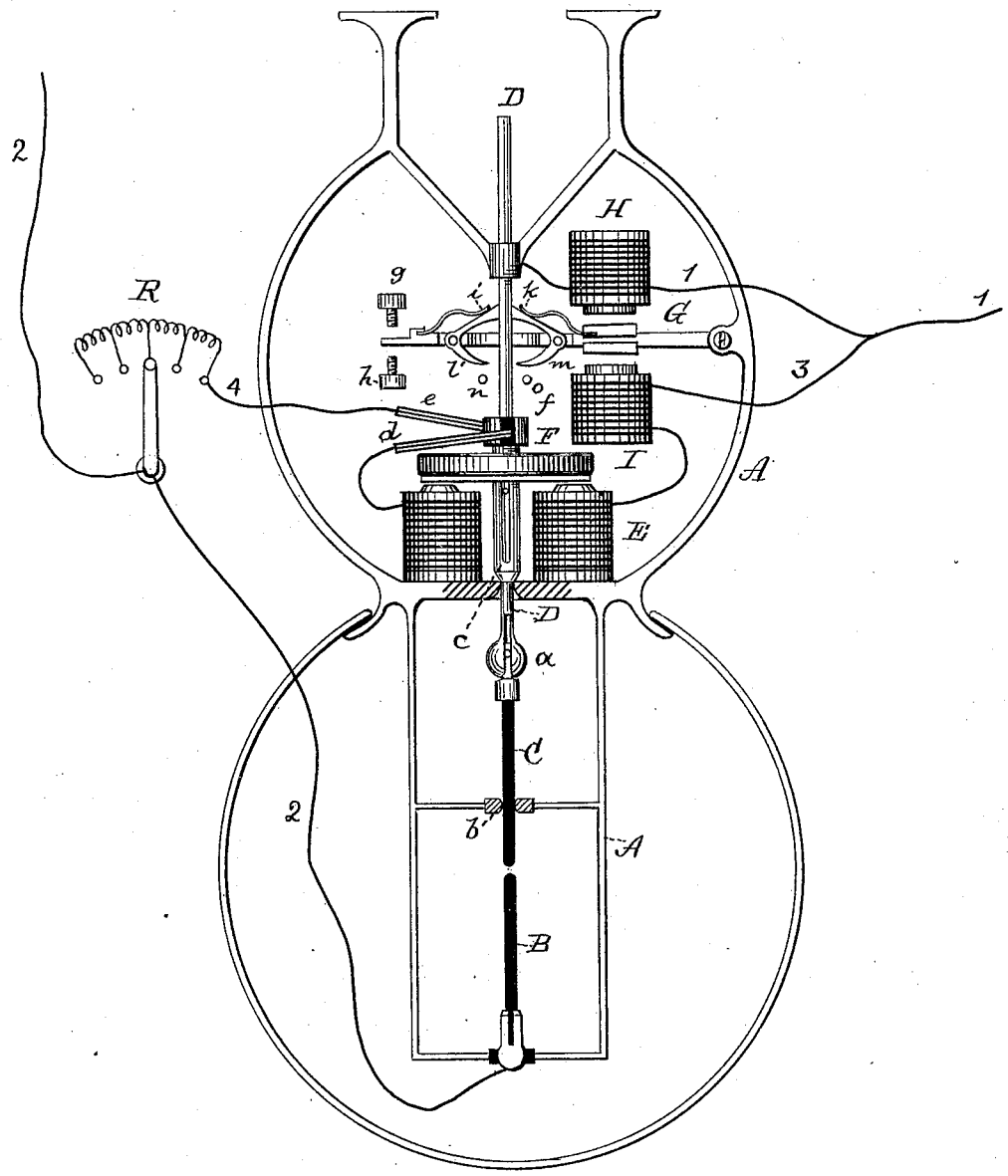
(No Model.)

T. A. EDISON.

ELECTRIC LIGHT.

No. 251,538. Patented Dec. 27, 1881.



Attest:

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UNITED STATES PATENT OFFICE.

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ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 251,538, dated December 27, 1881.

Application filed May 28, 1881. (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-Arc Lights; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention relates to electric-arc lights using carbon pencils or rods, one or both of the carbons being fed forward lengthwise, and in which one (or both) of the carbons is given a rapid continuous rotation upon its longitudinal axis, the rapid rotation tending to cause the arc to remain perfectly steady at all times, (except, perhaps, for an instant occasionally when the feeding of the carbon or carbons takes place,) and the carbons will be consumed evenly.

I have found it necessary, in order to make an absolutely steady arc and secure an even and smooth consumption of the carbon points, to rotate one of the carbons at a high speed—as, for instance, from two to three thousand revolutions per minute; but a higher rate of speed could be used, and a lower speed might be found, under favorable conditions, to answer the purpose. It is evident that if both carbon pencils are rotated in opposite directions only half the speed for each would be required. For rotating one carbon I use an electro-motor of the Pacinotti or other suitable construction, arranged in the lamp-circuit or in a shunt or derived circuit therefrom, or otherwise suitably connected with the source of energy. If both carbons are rotated, connections may be made with one motor or driving mechanism; or a separate motor or driving mechanism can be used for rotating each carbon. If a feeding-carbon is rotated, the metal rod that carries it will be connected with a revolving part of the motor by a feather or other device, so that the metal rod can slide freely through the part of the motor that rotates it.

The revolving carbon pencil is preferably secured to its rod by a universal joint, (a ball-and-socket joint with locking-pin and slot answering well for this purpose,) and is guided near its point, so that any vibrating or wabbling movement of the metal rod will not change sensibly the position of the carbon point.

For feeding one or both carbons any mechanism can be used, so far as the main features of my invention are concerned. I prefer, however, to regulate the feed of the upper or positive carbon by means of an armature, through an opening in which the metal holding-rod passes. This armature carries two pawls that clamp the rod to hold it up, the armature being supported by an electro-magnet in the lamp-circuit. When, however, the resistance of the lamp-circuit is increased to a certain point by the lengthening of the arc, or when the arc is ruptured, a magnet in a shunt or multiple-arc circuit overcomes the first magnet and draws the armature downwardly. The clamping-pawls have arms, which strike stops when the armature reaches its lowest position and throw the pawls away from the holding-rod, allowing the carbon to drop. The magnet in the lamp-circuit again becomes the more powerful, and stops the further descent of the carbon or raises the armature and carbon to re-establish the arc when ruptured.

The preferred manner of carrying out this invention is shown in the accompanying drawing, in which the figure represents a side elevation and partial section of the lamp and regulating mechanism.

A is the frame, B the lower or negative carbon, and C the upper or positive carbon, connected with metal holding-rod D by ball-and-socket joint *a*, and guided near its point by guide *b*.

1 2 are the main conductors. E is the electro-magnet of the motor, the coils of which are in derived circuit 3 4, and are located on the frame A on opposite sides of the holding-rod D. The revolving armature F of the motor is supported by sleeve *c* from top of frame A, through which sleeve slides the rod D, the rod and sleeve being connected, so as to rotate together, by a feather or other suitable device. The commutator-springs of the motor are represented by *d e*, while *f* is the revolving circuit-breaker. An adjustable resistance, R, is placed in the motor-circuit 3 4, by means of which the speed of the motor can be regulated.

G is a horizontal armature-lever, pivoted on

the frame above the motor and playing in the fields of two electro-magnets, H I, the movement of the armature being limited by stops *g h*. The magnet H is in the lamp-circuit 1 2, while I is in motor-circuit 3 4. The rod D passes through an opening in lever G, such lever being provided with spring-pawls *i k*, that clamp downwardly on such rod. The pawls have arms *l m*, and stops *n o* are located at such points on the frame that the pawls are thrown upwardly away from rod D when the armature-lever reaches a certain point in its downward movement.

While the mechanism for independently and continuously rotating a carbon rod or pencil has been shown as connected to the carbon intended to be fed forward, it is evident that such mechanism may be applied to either or to both carbon rods or pencils.

What I claim is—

1. In an electric-arc light, the combination, with the carbon pencils or rods, of an electro-motor acting independently of the feeding mechanism and rotating continuously a carbon rod or pencil, substantially as set forth.

2. In an electric-arc light, the combination of an electro-motor acting independently of the feeding mechanism and rotating continuously a carbon rod or pencil, a carbon-holding rod sliding freely through a part revolved by the motor, but connected so as to turn with such part, and mechanism for controlling the longitudinal movement of such rod, substantially as set forth.

3. In an electric-arc light, the combination of the carbon-holding rod, two magnets, an armature-lever playing between the magnets, and two pawls provided with lever-arms, pivoted upon the lever, one on either side of the carbon-holding rod, and holding or releasing the carbon-holding rod as the armature is attracted by one or the other of the two magnets for governing the feed of the carbon, substantially as set forth.

4. In an electric-arc light, the combination, with the rod D, of the armature-lever G, controlled by magnets H I, and carrying pawls *i k*, having arms *l' m*, and the strips *n o*, substantially as set forth.

This specification signed and witnessed this 27th day of May, 1881.

THOS. A. EDISON.

Witnesses:
WM. H. MEADOWCROFT,
H. W. SEELY.