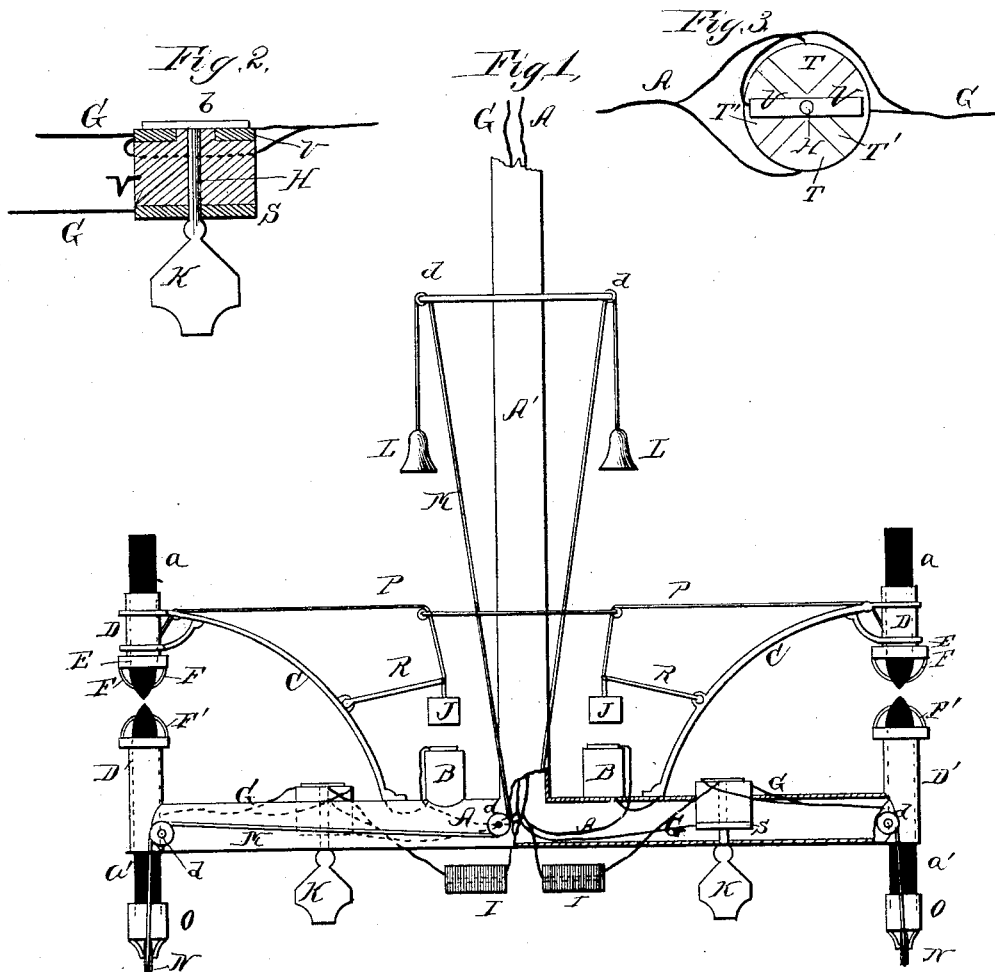


D. PENDLETON.  
Electric Lamp.

No. 220,728.

Patented Oct. 21, 1879.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

DOUGLAS PENDLETON, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN ELECTRIC LAMPS.

Specification forming part of Letters Patent No. **220,728**, dated October 21, 1879; application filed March 18, 1879.

*To all whom it may concern:*

Be it known that I, DOUGLAS PENDLETON, of San Francisco, in the State of California, have invented certain new and useful Improvements in Electric Lamps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to electric lights; and it consists in the construction and arrangement of parts, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of my invention. Figs. 2 and 3 are detailed views of parts thereof.

A' represents a chandelier of any suitable construction, having an electric light at each arm. A is the main-supply wire, which carries the current to the upper positive carbon, through the electro-magnet B, and thence to the metallic arm C, into the metallic tube D, in which the carbon *a* is placed. The arm C is to be insulated from the metal of the chandelier.

The tube D slides through a hole in the arm C, and is raised by the attraction of the armature J, which is attached to an arm, R, hinged or pivoted to the arm C at one end, and the other end of said arm R connected by a cord, P, with the tube D.

The electro-magnet B and armature J, together with the arm R, may be placed in any position or place desired.

Around the lower end of the tube D, and insulated therefrom, is a metallic ring, E, having platinum point F attached to it to prevent the carbon from sliding too far through it. By the points F being insulated from the tube D no current can pass through them, but must pass down the carbon *a*, and will jump from it to the carbon *a'*, which produces the light. After the current has entered the lower carbon, *a'*, it is transmitted to the lower metallic

tube, D', in which said lower carbon moves, and thence through the return-wire G to the two metal plates T T on the key shown in Fig. 3, thence through the arms U to the metal pin H, down said pin to the plate S, and through the return-wire G to the generator.

The lower tube, D', is stationary, and is insulated from the metallic substance of the chandelier. The lower carbon, *a'*, passing through said tube, is set in a socket, O, at the bottom of which is a pulley, N. Under this pulley is passed a cord, M, fastened at one end to the chandelier opposite the pulley N, and the other end of said cord passes around pulleys *d*, and has a weight, L, attached to it. As the carbon is consumed the lower carbon, *a'*, is kept up against its platinum points F' by means of the falling of the weight L.

The above is the course of the current when two or more lights are burning. When one light is extinguished the current comes down A into a coil, I, which gives the same resistance to the current as the current has in jumping from carbon to carbon. After passing through the coil it passes to the key, and thence through the pin H to the plate S, and through the return-wire G to the generator.

The key is composed of a metallic plate, S, at the bottom, on which is placed a block, V, of insulating material, and on the top thereof are inserted four metallic plates, T, to two of which are attached supply-wires A, and to the other two are attached the return-wire G from the lower tube, D'. This portion of the key remains stationary. Through the center of the stationary portion of the key runs the pin H, to the lower end of which is connected a metallic washer, making a better connection on the plate S. Below this is the hand-hold K, which must be either a non-conductor or insulated.

The upper end of the pin H is attached to the metallic arm U, which thus can be turned to connect the circuit either with the plates T from the supply-wire A, or the plates T', connected with the return-wire G from the lower tube, D'. The latter plates, T', must be insulated from each other and smooth, to allow the arms U to pass over them.

When the key is turned to form the proper

connection, the current is thrown to the wire A through the resistance-coil, which coil has resistance graduated to the amount of resistance furnished by the burner, the resistance in the coil being a little less than that of the burner, so by this means all branches of the circuit are kept in operation.

The advantage gained by the key is that one or more lights on the circuit can be extinguished without affecting any of the remaining burners.

The advantage gained by the resistance-coil is that the current of electricity has the same work or resistance to do when one or more burners are extinguished, thereby not brightening or diminishing the brilliance of the remaining lights.

The tube D may be made fast to the arm C, and said arm work on a hinge, and by means of a set-screw the distance between the carbons be better regulated.

The current can be reversed through the entire lamp by changing the poles on the generator, thus making the positive carbon at the bottom, by which arrangement the ashes would

fall to the bottom, and would not have to fall through the light, which would be apt to make it flicker.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric light, the combination of the upper carbon, *a*, sliding tube D, with points F, the cord P, armature J, and electro-magnet B, substantially as and for the purposes herein set forth.

2. In an electric light, a key composed of the plate S, insulating-block V, and plates T T', with the wires A G connected thereto, and the pin H, with insulated knob K and plates U, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

DOUGLAS PENDLETON.

Witnesses:

VIC. GUERRERO,  
H. P. WELSH.