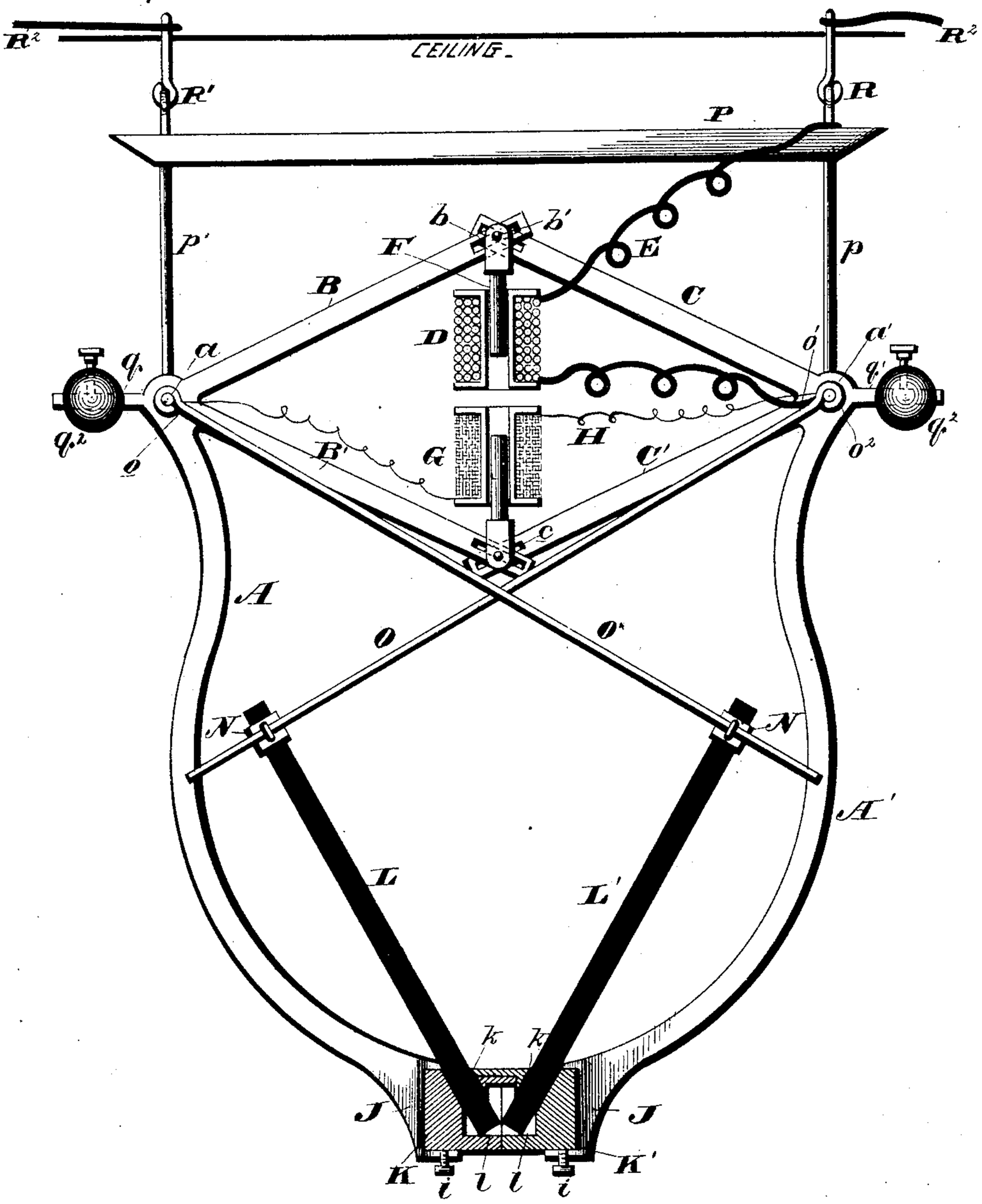
(No Model.)

2 Sheets—Sheet 1.

# H. A. SEYMOUR.

## ELECTRIC LIGHT.

No. 270,491. Patented Jan. 9, 1883.




WITNESSES

E. L. Nottingham

Geo. Cook

INVENTOR

H. A. Seymour

(No Model.) 2 Sheets—Sheet 2.

# H. A. SEYMOUR.

## ELECTRIC LIGHT.

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Fig. 2.

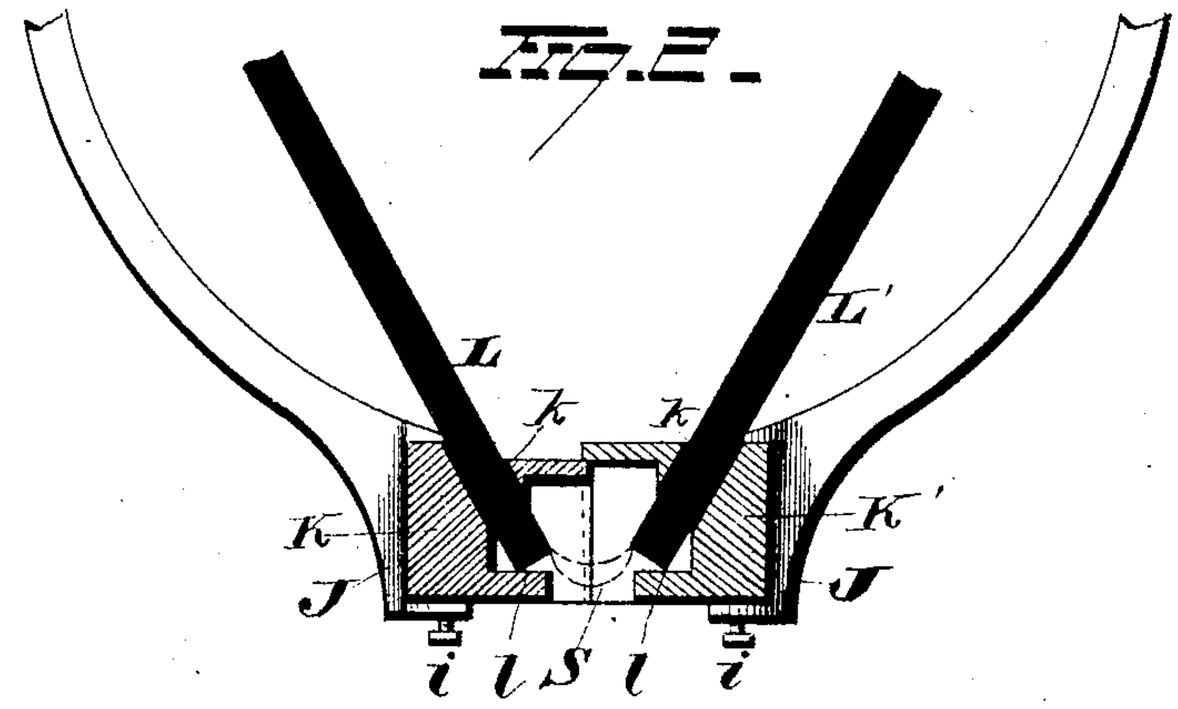



Fig. 3.

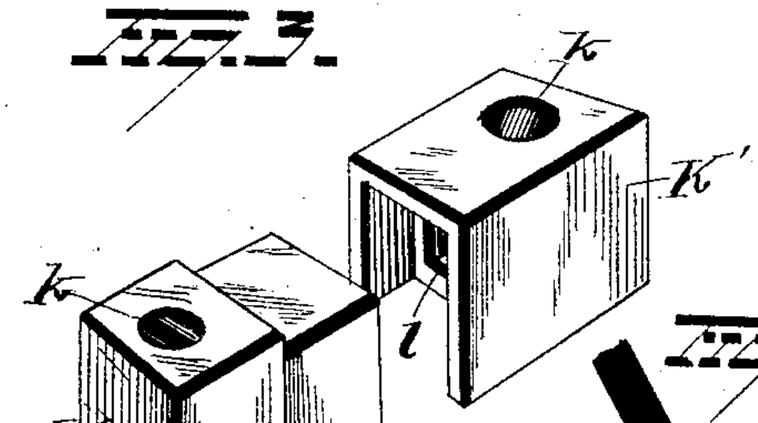



Fig. 4.

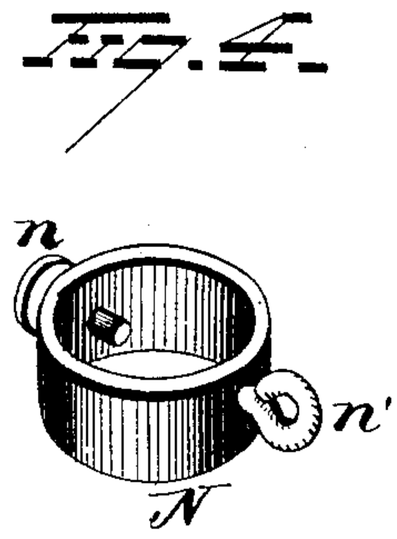



Fig. 5.

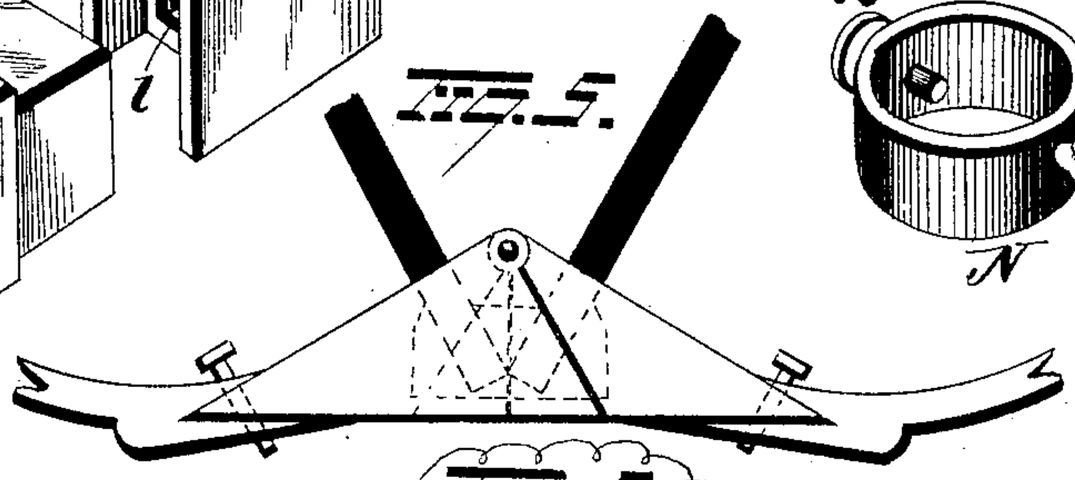
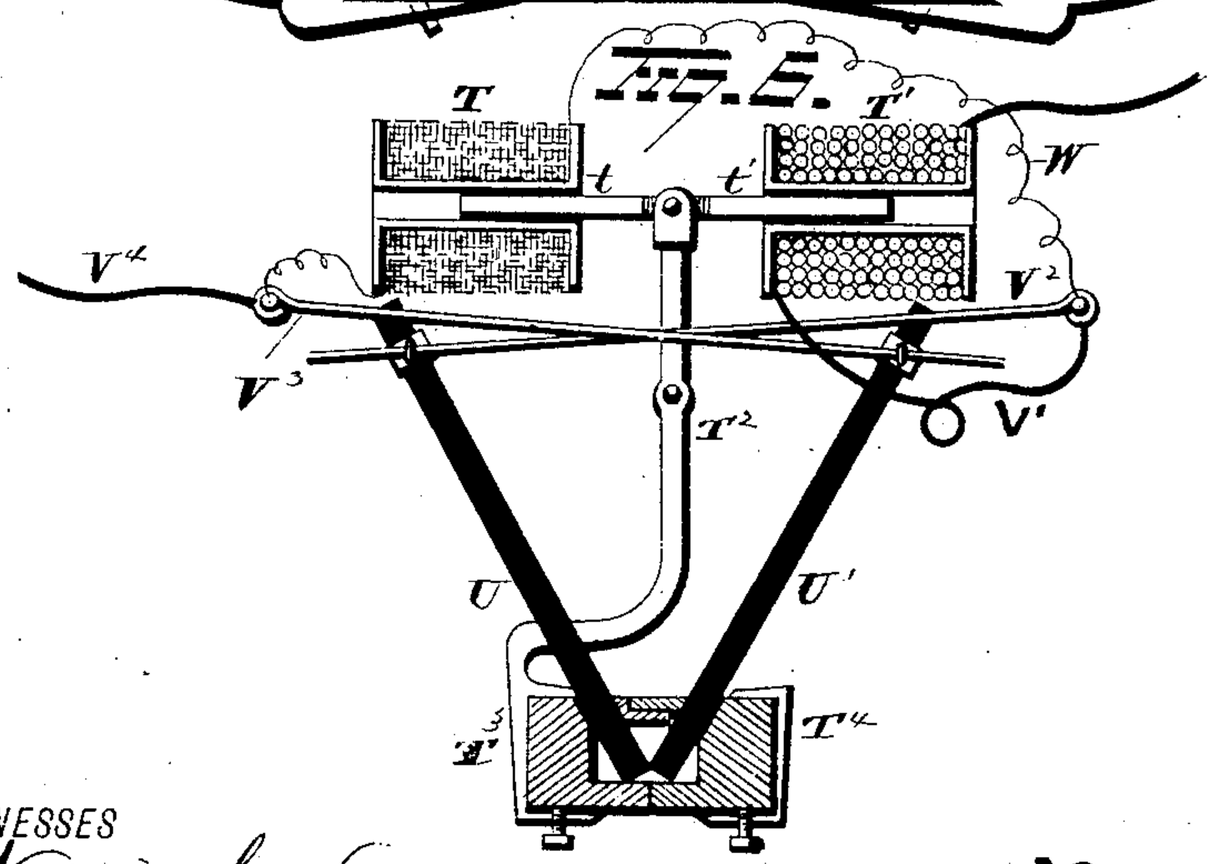


Fig. 6.




WITNESSES

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INVENTOR

H. A. Seymour.

# UNITED STATES PATENT OFFICE.

HENRY A. SEYMOUR, OF WASHINGTON, DISTRICT OF COLUMBIA.

## ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 270,491, dated January 9, 1883.

Application filed June 1, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. SEYMOUR, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Electric Lights; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an improvement in electric lights.

The ordinary type of arc-lights are objectionable, owing to the harshness and the flickering of the light. An attempt has been made to obviate these evils by what is termed the "sun-lamp," which consists essentially of a block of refractory material serving as a support for the carbons, arranged to converge at their lower ends and be fed by gravity. These lamps have proved a great success in so far as the character of the light is concerned, it being soft and agreeable and perfectly steady; but one obstacle has prevented the introduction of this style of lamp—viz., the fact that they were not automatic in lighting. As the lower ends of the carbons were supported in a single block of refractory material, it became necessary, in lighting the lamps, to establish the arc by means of a piece of plumbago or other suitable material placed in contact with the two lower ends of the carbons.

The object of my invention is to obviate the objectionable features referred to and produce an electric light which shall be soft and agreeable, of absolute fixity, and automatic in operation.

With these ends in view my invention consists essentially in the combination, with the carbons of an electric light, of blocks of refractory material against which abut or which support adjacent ends of the carbons, and devices for automatically varying the position of the said blocks according to the resistance of the lamp.

My invention further consists in certain details of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, partly in side elevation and partly in section, of one form of lamp embodying my invention. Fig. 2 is a detached view of the supporting-blocks, showing them separated and the arc formed. Fig. 3 is a view in perspective of the refractory blocks. Fig. 4 is a view in perspective of one of the carbon-clamps. Fig. 5 is a view in side elevation of a modified form of refractory blocks. Fig. 6 is a modification.

A A′ represent oscillating arms, pivoted at *a a′*, said arms having the two diverging arms B B′ and C C′, respectively attached thereto or made integral therewith. The arm B is provided with an elongated slot, *b*, through which extends a pin, *b′*, attached to the arm C, thereby connecting their free ends, while the arms B′ and C′ are similarly connected by the pin *c*.

D is a solenoid wound with large wire E. The core F of the solenoid is pivoted to the pin *b′*, or to any suitable device, at the junction of the two arms B C.

A solenoid, G, wound with very fine wire H, has its core pivoted to the pin *c*, or any device connecting the free ends of the arms B′ C′.

Within the jaws J, formed on the lower ends of the arms A A′, are detachably secured, by thumb-screws *i* or other devices, the blocks K K′, which are made of marble, granite, carbon, or any other refractory material. These blocks are each provided with a diagonal opening, *k*, and a flat or notched step or surface, *l*. They are also made to overlap each other, as shown in Figs. 1, 2, and 3.

L L′ are carbon rods, preferably copper coated, their lower ends being inserted in the diagonal openings *k k* and resting on the surfaces *l l*, so that when the blocks are in contact or nearly in contact the ends of the carbon rods will be nearly or quite in contact with each other.

To the upper ends of the carbons are attached the sockets or sleeves N by means of set-screws *n*, said sleeves being provided with the swiveled posts or eyes *n′*, in which are received the free ends of the spring-rod conductors O O′, the latter being secured or connected at *o* and the other at *o′*.

To the pivot-bearing $o^2$ is secured a post, *p*, which is connected with the cross-piece P, but is insulated therefrom, while the post *p′* is con-

nected to the opposite end of the cross-piece, and in electrical connection with the spring-rod O′.

The arms A A′ may be provided with short arms $q$ $q'$ and adjustable weights $q^2$ for counterbalancing the refractory blocks.

The operation of the lamp is as follows: Current flows through the main line $R^2$ and connection R, through the large wire E, and through the helix of the solenoid D, energizing the same, thence to the spring-arm O, and through the same to the carbon rod L, and across the arc through carbon rod L′ and spring conducting-rod O′ upward through the post $p'$ and connection R′ to the other end of the main conductor $R^2$. As the current is thus sent through the lamp it energizes the solenoid D and draws down the arms B C, and thus separates the refractory blocks K K′, as illustrated in Fig. 2, thereby forming the arcs S. If from any cause the lamp should offer too much resistance, a greater proportion of the current would flow through the fine wire H, constituting the shunt-circuit, and energize the solenoid G, thereby raising the core and the arms B′ C′, and thus causing the refractory blocks and carbons to approach each other. Thus the arc will be maintained at a length proportionate to the strength of the current, and the lamp will be automatically lighted without resorting to plumbago or other connecting-strips. This improvement enables any number of such lights to be operated in a single circuit.

In Fig. 6 I have shown a lamp embodying my invention, wherein only one of the supporting-blocks is laterally adjustable. T T′ represent solenoids and $t$ $t'$ their cores, connected by a diamagnetic piece, to which is pivoted the upper end of a lever, $T^2$, the lower end of which supports a refractory block similar to those described, while the block $T^4$ is stationary. The current is conveyed to and from the carbons U U′ in the manner heretofore described. The current enters from the main line through the large conductor, flows through the convolutions of the solenoid T, energizing the same, thence through wire V′ to spring conducting-rod $V^2$, to the carbon U, from thence up through carbon U′ to the spring-rod $V^3$ and to main line $V^4$. This action draws the upper end of the lever $T^2$ toward the solenoid T′, and thereby moves the block $T^3$ away from block $T^4$, establishing the electric arc between the lower ends of the two carbons. If for any reason the lamp offers too great resistance, the current will flow through the small wire W, constituting the shunt, and through the solenoid T, energizing the same and moving the block $T^3$ toward the stationary block $T^4$, the current escaping to the main line.

By confining the lower ends of the carbons in openings formed in the refractory blocks and forming a vault or cut-away portion, which may be at the bottom or side of the blocks, the rays of light are forced to take a prescribed course. The carbon points are not visible, and hence the harshness of the ordinary electric light is obviated. The arc renders the refractory blocks incandescent and destroys the blue and violet beams of light, which are objectionable, and causes the light to be of a beautiful gold color.

Another important result attained by the employment of lamps of the construction described is absolute steadiness of the light, as there is no flickering or winking of the arc, as is found in all lamps where the carbons are fed by clutch mechanism.

I do not restrict myself to any form or shape of refractory supporting-blocks. They should be made detachable, so as to be readily removed when required. Neither do I limit myself to any particular arrangement of devices for automatically adjusting the position of the supporting-blocks, as almost numberless devices might be used for this purpose. The carbons may be fed by gravity, weight, or spring, as desired. The carbons may be arranged vertically, horizontally, or in the manner shown.

I may dispense with the devices for automatically lighting and regulating the length of the arc, and simply provide for lighting the lamp by bringing the carbons in contact and then separating them, the refractory blocks being made separate and independent and adapted to be adjusted toward and from each other.

In Fig. 5 I have represented the refractory supporting-blocks made so as to telescope, as illustrated in section in Fig. 2, the block being formed so as to be closed at its top and sides, and leave an opening on its under side for the escape of the rays of light. In Fig. 5 the blocks are pivoted to each other, the sides of one block being made to overlap the sides of the other.

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

1. The combination, with the carbons of an electric light, of blocks of refractory material, against which the carbons rest, or which serve to support the adjacent ends of the carbons, and devices for automatically separating the blocks by the action of the current, substantially as set forth.

2. The combination, with the carbons of an electric light, of blocks of refractory material, against which the carbons rest, or which serve to support the adjacent ends of the carbons, and devices for automatically moving the blocks toward and from each other by the action of the current, substantially as set forth.

3. The combination, with the carbons of an electric light, of blocks for limiting the lengthwise movement of the carbons, and devices for automatically varying the distance between the adjacent ends of the carbons, substantially as set forth.

4. The combination, with the carbons of an

electric light, of blocks for limiting the feed of the carbons, a solenoid in the main circuit for separating the blocks, and a solenoid in a shunt-circuit for causing the blocks to approach each other, substantially as set forth.

5. The combination, with the carbon, of an electric light and blocks of refractory material for supporting the adjacent ends of the carbons, of arms having said refractory blocks removably secured to the adjacent ends thereof, and electro-magnets for automatically regulating the distance between the ends of the carbons, substantially as set forth.

6. The combination, with the carbons of an electric light, of separate blocks of refractory material for supporting the adjacent ends of the carbons, said blocks being cut away to form an opening on their lower sides, and devices for automatically varying the distance between the ends of the carbons, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY A. SEYMOUR.

Witnesses:

F. O. McCLEARY,

GEO. D. SEYMOUR.