(No Model.)

R. J. PRATT.

ELECTRIC ARC LAMP.

No. 258,805. Patented May 30, 1882.

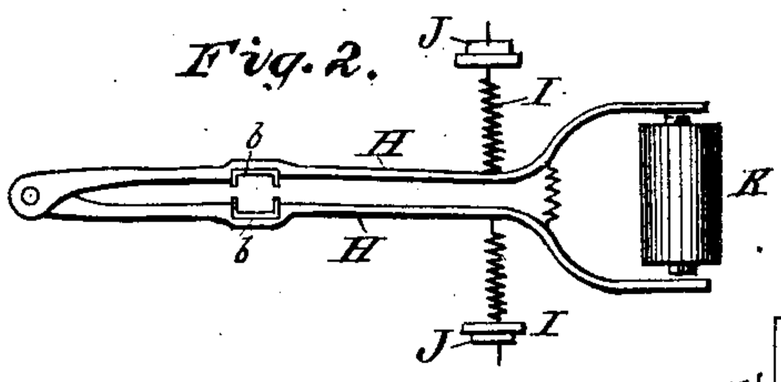

Fig. 2.

Fig. 1.

Fig. 4.

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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 258,805, dated May 30, 1882.

Application filed February 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. PRATT, of Troy, in the county of Rensselaer and State of New York, have invented a new and Improved Electric-Arc Lamp; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of an electric lamp with my devices attached thereto. Fig. 2 is a plan view of the clamping-levers for holding the upper carbon. Fig. 3 is an end view of the same. Fig. 4 is a view similar to that shown in Fig. 2, presenting a modification.

My invention relates to an improved regulator for that class of electric lights known as the "arc-light," in which two carbon pencils are arranged in alignment and maintained a constant distance from each other by automatic feed devices. It belongs to that particular class of such regulators in which an electro-magnet interposed in the circuit of the light-current is made to act upon clamping devices that sustain the top carbon, which magnet, acting upon the clamping devices through an armature, holds the carbon stationary whenever the proximity of the two carbons is such as to establish a sufficient current, and when such current is weakened by increased distance between the carbons due to the burning away of the carbon such weakened current in the electro-magnet allows its armature to respond to the tension of a spring and release the clamps upon the carbon rod, allowing the same to drop to closer proximity and renew the arc and the strength of the current.

My invention consists in the peculiar means for accomplishing this result, as will be hereinafter fully described.

In the drawings, A represents the top and B the bottom frames of an electric lamp, which are preferably made of hard wood, and connected by metal rods C C. In the top frame is arranged the brass guide-tube D for the stem or rod E of the carbon-holder F, which latter is arranged to clamp and hold the upper carbon pencil, G. Hung to the top frame, A, at the point *a*, are two horizontal levers, H H, arranged upon opposite sides of the carbon-holder, and provided with clamps *b b*, that seize and hold the carbon-holder whenever said levers are brought toward each other. These two levers are held apart by springs I I, (see Fig. 2,) connected respectively to the two levers at one end, and at the other to pendent projections J J, extending downwardly from the top frame, A. The ends of these levers H upon the opposite side of the carbon-holder from their pivots are flared or branched away from each other, and upon their ends are mounted armatures, between which is placed an electro-magnet, K, whose coil is arranged in the electric-light circuit, said coil being connected by wire *c* to binding-post *x* on the top frame at one end, (see Fig. 1,) and being connected by flexible wire-conductor *d* to the top carbon-holder at the other end. Instead of making these levers in the form shown in Fig. 2, I may bend and cross them, as shown in Fig. 4, and place the clamps *b* at the ends thereof, and then I may use any one of the three arrangements of springs shown at I′, I², or I³ for holding the branched ends of the levers away from the core of the magnet.

Now, with the invention as so far described it will be seen that whenever too great a distance exists between the points of the carbons, the current being thereby weakened, the attractive energy of the magnet on the armatures of the levers is decreased, and the springs I, then overcoming the influence of the magnet, opens the levers and allows the upper carbon to drop down from its own gravity to closer proximity to the lower carbon, and this it will be seen serves to restore the arc and the energy of the current, and the magnet being then more energetically charged, it brings together the levers and their clamps *b b*, which latter, pressing upon the carbon-holder, prevent further downward movement until the necessity for the same exists by reason of further consumption of and increased distance between the carbons. Now, when the upper carbon drops, it will be seen that it may drop into contact or at least to too close proximity to the lower carbon to be consistent with the proper formation of the arc. Some means for separating the carbons and forming the arc must therefore be employed. For this purpose the lower carbon, L, is guided through a hole in the metal base-frame M, supported on the lower

wooden frame, B, of the lamp, and said carbon is held by a carbon-holder, M′, that is in the nature of a soft-iron armature, and is mounted upon a brass rod, N, which is supported upon a lever, O, jointed at one end to a metal frame, P, beneath the wooden frame B, and at the other end connected by a spring, *f*, to a set-screw, *g*, so that the effect of this spring is to hold the lower carbon up. Around the brass rod N is arranged an electro-magnet, Q, having a hollow core, through which passes the said brass rod in concentric relation. Now, this electro-magnet Q is also arranged in the electric-light circuit, and for this purpose connections are made as follows: from the lower carbon, L, to the metal frame M by a flexible conductor, *h*, thence by screw *q* to lower metal frame, P, thence by wire h^2 to magnet Q, thence by wire *i* to plate *j*, thence by side rod, C, to plate *k*, and thence to the binding-post Y.

From this construction and arrangement of parts it will be seen that the lower carbon is held *in equilibrio*, or balanced between the tension of spring *f*, which pulls it up, and the attractive force of magnet Q on carbon-holder armature M′, which has a tendency to bring it down. Now, if the upper carbon drops down too close to the lower one, the increased strength of current causes magnet Q to act on carbon-holder armature M′ and bring down the lower carbon to the proper distance from the upper carbon. If, on the other hand, the distance between the carbons is too great, the incident weakness of the current in magnet Q allows the spring *f* to overcome the attractive influence of the magnet, and said spring then projects the lower carbon upwardly to closer relation to the upper carbon.

For cutting out the carbons from the light-circuit when the upper carbon is burned away a disk or plate, *m*, is fixed upon the tube E, and when this tube reaches its lowest position from the consumption of the carbon G said disk comes in contact with the wires *l l′*, and thereby short-circuits the light-current. This metal plate is adjusted on the rod E, according to the length of the carbon, by a set-screw or otherwise.

Having thus described my invention, what I claim as new is—

1. In an electric lamp, the combination, with the progressively-fed carbon and its holder, of a pair of levers disposed at right angles thereto upon opposite sides of said holder, and provided with clamping faces, a pair of armatures arranged upon the ends of said levers, an electro-magnet arranged in the light-circuit, and placed between the armatures of the two levers to bring said levers together, and one or more springs for forcing said levers apart, substantially as and for the purpose described.

2. The combination, with the carbon-holder stem E, of the horizontal levers H H, arranged upon opposite sides of the carbon, and provided with clamps *b b*, the springs I I, and the horizontal magnet K, arranged between the ends of said levers, as and for the purpose described.

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Witnesses:

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