(No Model.)

# C. A. HUSSEY.

## ELECTRIC ARC LAMP.

No. 260,204. Patented June 27, 1882.

Fig. 1.

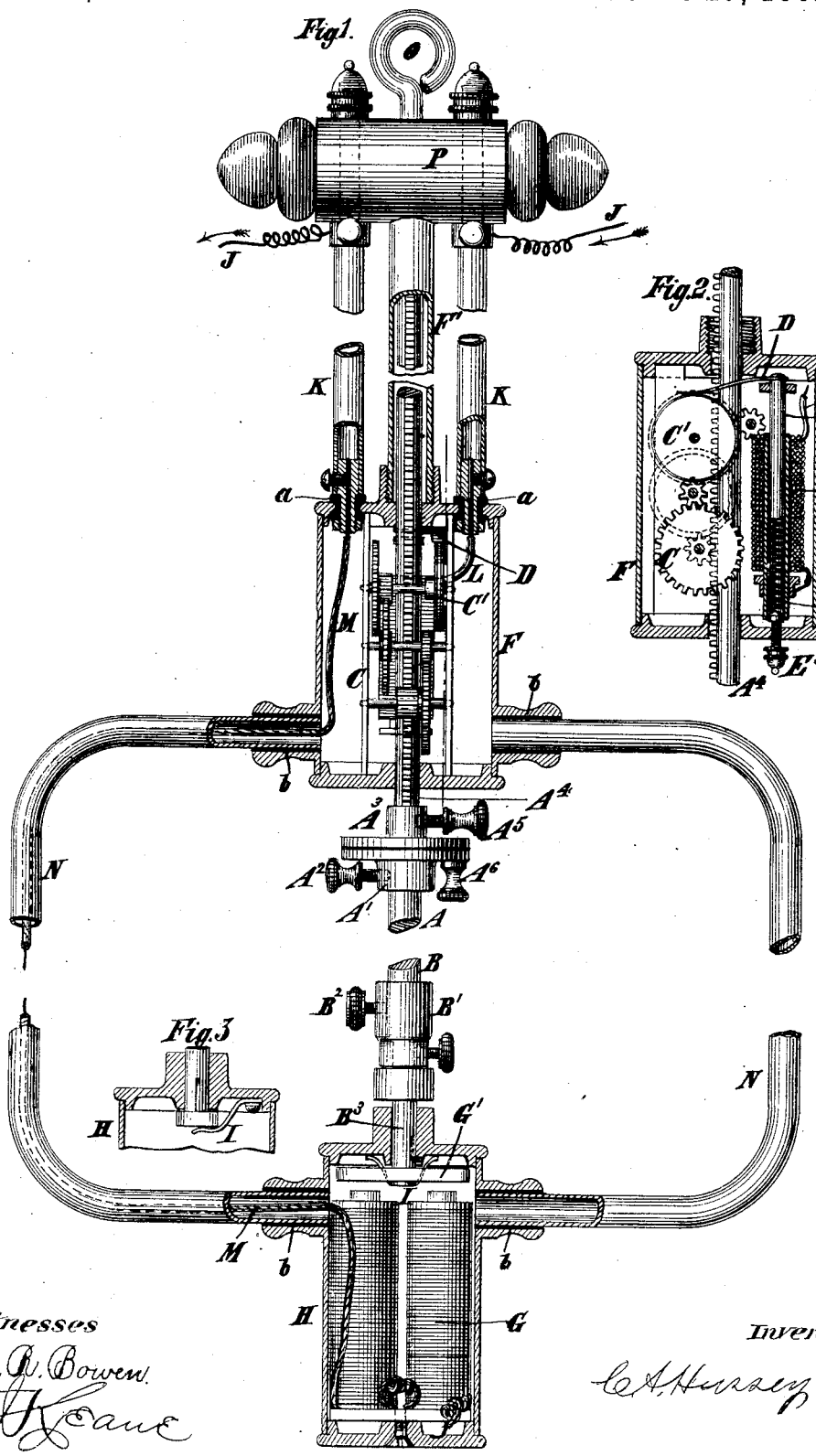


Fig. 2.




Fig. 3.




Witnesses

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CHARLES A. HUSSEY, OF NEW YORK, N. Y., ASSIGNOR TO THE HUSSEY ELECTRIC COMPANY, OF SAME PLACE.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 260,204, dated June 27, 1882.

Application filed August 31, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. HUSSEY, of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My improvements consist in the combination, with the upper and lower carbons of an electric lamp, of an electro-magnet or solenoid and an armature or core for controlling the lower carbon, a train of wheel-work, a brake-wheel, a brake, an electro-magnet or solenoid and an armature or core therefor, for controlling the upper carbon, a spring for retracting said brake, and means for varying the resilience of said spring, all arranged and operating substantially as hereinafter described.

The improvements also consist in certain novel means providing for adjusting one of two carbons comprised in an electric lamp into line with the other when desirable.

In the accompanying drawings, Figure 1 is a sectional elevation of an electric lamp embodying my improvements, parts being broken away to economize space in said figure. Fig. 2 is a central longitudinal section, taken in a plane at right angles to Fig. 1, of a case containing a train of wheels comprised in the lamp; and Fig. 3 is a central section, taken in a plane at right angles to Fig. 1, of the upper part of a case, and appurtenances containing an electro-magnet, whereby the lower carbon is operated.

Similar letters of reference designate corresponding parts in all the figures.

A and B respectively designate the upper and lower carbons of the lamp. The upper carbon, A, is fitted into a holder, A′, and secured therein by a set-screw, $A^2$. This holder is provided at the upper end with a laterally-extending flange, which fits against a similar flange extending laterally from a socket, $A^3$. The socket $A^3$ fits on a rod, $A^4$, and is retained there by a set-screw, $A^5$. The socket $A^3$ may, by adjusting the set-screw $A^5$, be turned around the rod $A^4$ into and secured in different positions. The flanges of the said holder and socket are secured together by a screw, $A^6$, passing freely through one and screwing into the other near the circumference. Hence by loosening this screw the holder may be so adjusted relatively to the socket as to shift the upper carbon more or less to one side. By these two adjustments the upper carbon may at any time be adjusted into line with the lower carbon.

The rod $A^4$ is provided longitudinally with a toothed rack, and with this rack engages a pinion, which is comprised in a train of wheels, C, including a brake-wheel, C′, preferably much larger diametrically than the said pinion. The periphery of this brake-wheel may be faced with india-rubber or analogous material, if desirable.

D designates a brake consisting preferably of an arm of spring metal, which at one end impinges against the periphery of the brake-wheel C′. It is affixed to the upper end of the core E′ of a solenoid, E, which, with the train of wheels C, is arranged in a metallic case, F, through which the rod $A^4$ works. The rod $A^4$ extends above this case into a tube, F′, which is surmounted by a cross-piece, P, which is made of wood or other insulating material. The solenoid E is in the electric circuit of the lamp, and hence when the carbons burn away, so as to effect an increase of the resistance in the electric circuit, the solenoid E is weakened, and its core E′ is caused by a spring, $E^2$, to rise and lessen the pressure of the brake upon the brake-wheel. Then the gravity of the upper carbon and its apurtenances causes the said carbon to descend and reduce the resistance in the electric circuit. Owing to the train of wheels, the movement of the upper carbon in descending is rendered very slow. As soon as the said carbon descends sufficiently to shorten the voltaic arc between the carbons to its normal length the solenoid draws in its core and applies the brake to the brake-wheel, thereby retaining the upper carbon in position again. Owing to the very slow movement which the upper carbon has in descending, a very delicate feeding of the said carbon is provided for and an extremely steady light is maintained. The means here shown for raising the core of this solenoid when the solenoid becomes weakened consists of a spiral spring, $E^2$, arranged within the solenoid below its core and impinging against a screw, $E^3$, which

works through the bottom of the case F. By manipulating this screw the spring may be compressed or relaxed more or less to adapt the lamp for use with different electric currents.

The lower carbon, B, is fitted into a holder, B′, and secured there by a set-screw, $B^2$. This holder is affixed to and entirely supported by a rod, $B^3$, which is secured to the armature G′ of an electro-magnet, G. This electro-magnet and its armature are arranged in a metallic case, H; but the rod $B^3$ protrudes through the top of the same. A spring, I, of steel or other suitable material, affixed to the top of the case and impinging against the under side of the armature, tends to hold it away from the electro-magnet, and therefore raises it whenever the electro-magnet becomes sufficiently weakened or demagnetized.

The cases F and H are connected by tubes N, which may be made of metal, but must, in that case, be insulated from the said cases—as, for instance, by blocks *b* of insulating material.

J designates wires connected with a source of electricity and leading to metal tubes K, which extend from the cross-piece P to the case F, but are insulated from the latter by blocks *a* of india-rubber or other suitable material.

To the right-hand tube K is secured a wire, L, which leads to the solenoid E. Thence the circuit extends to the case F, thence through rod $A^4$ and carbon-holder A′ to the upper carbon, A. Thence the circuit extends to the lower carbon, thence through the case H to the electro-magnet G, and thence through a wire, M, to the left-hand tube K and wire J.

The lamp may be suspended by means of an eye, O, affixed to the cross-piece P.

When no electricity is passing through the lamp the lower carbon is raised and supported by the spring I, and the upper carbon rests upon it. As soon, however, as the electricity is supplied to the lamp, the solenoid E draws down its core E′, thereby applying the brake D to the brake-wheel C′ and retaining the upper carbon in position. Simultaneously the electro-magnet G draws down its armature G′, and with it the lower carbon, B, thereby forming the voltaic arc between the carbons. Whenever the carbons burn away, so as to materially elongate the arc and increase the resistance in the circuit, the solenoid E allows its core E′ to effect the release of the brake-wheel C′, and the upper carbon thereupon slowly descends until the normal length of arc and of the resistance in the circuit are established, whereupon the upper carbon is again secured in position.

An ordinary electro-magnet and armature may be employed in lieu of the solenoid E and its core E′. The solenoid and its core in reality constitute one form of electro-magnet and armature.

It will be seen that by my improvements I produce a very simple lamp, wherein the proper relative positions of the carbons will be effectually maintained.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination of upper and lower carbons, A B, the magnet G or a solenoid, the armature G′ or a core directly supporting the lower carbon, B, the train of wheels C and brake-wheel C′ for controlling the upper carbon, A, the solenoid E or an electro-magnet, the core E′ or an armature, the brake D, attached to and entirely supported by said core or armature, a spring acting upon said core E′ or armature to retract said brake, and means for varying the resilience of said spring, all arranged and operating substantially as herein described.

2. In an electric lamp, the combination, with one of the carbons and a rod for sustaining it, of a holder, A′, a socket, $A^3$, a set-screw, $A^5$, and a screw, $A^6$, substantially as specified.

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Witnesses:
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