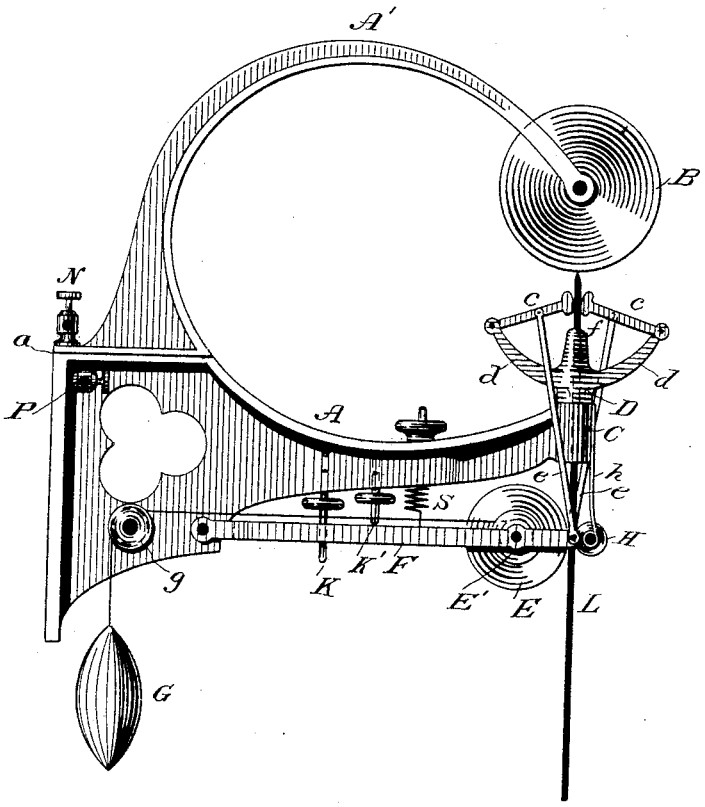
(No Model.)

J. OLMSTED.

ELECTRIC ARC LAMP.

No. 264,958. Patented Sept. 26, 1882.



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JOSEPH OLMSTED, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 264,958, dated September 26, 1882.

Application filed September 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH OLMSTED, residing in 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, reference being had to the drawing accompanying and forming a part of the same.

My invention relates to electric lamps in which the light emitted is produced at the point of imperfect contact between two electrodes of unequal sectional area, as has been illustrated in various patents of recent date; and it consists in devices for maintaining the said electrodes in their proper relative positions for the production of a constant and steady light, irrespective of the rate at which the smaller or positive electrode is consumed by the action of the current.

In carrying out my invention I employ a negative electrode of carbon, of metal, or both combined, giving to it the shape of a circular disk, such being the form I have found the most convenient, and this I mount in a manner hereinafter explained, so as to be capable of a movement about a central axis only. The smaller or positive electrode is formed, in the usual manner, as a slender rod or pencil, and is caused to make contact with the larger electrode by preference on the periphery of the same, and is fed toward it by devices which are arranged to retain it in a vertical, oblique, or horizontal position, as may be deemed the most convenient.

In the accompanying drawing a lamp constructed according to my invention is illustrated in side elevation.

A A′ represent a light frame of metal, made by preference in the form of the letter G, and composed of two independent sections, A and A′, between which, at the point of union, is interposed a layer or washer of insulating material, (represented by *a*.) The upper or negative electrode, B, is a circular disk of carbon or metal, and is carried by a short shaft journaled in the end of part A′. The lower section, A, of the frame is furnished at the end with an eye, C, into which is fitted a device, D, consisting of a tubular stem, *f*, and branching arms *d d*. Through the stem *f* passes the carbon pencil L, and the diameter of the bore of said stem is just sufficient to allow the carbon to slide freely therein.

c c are short levers, of platinum, with rounded ends, pivoted to the branches *d d*, and arranged to bear on opposite sides of the carbon near the end, the point of contact being so placed for the reason that the current passing from the frame to the carbon should traverse as little as possible of the latter.

F is a light frame or bi-branched lever, pivoted to the main frame A, and connected to the levers *c c* by pivoted links *e e*. E is a circular disk of metal, journaled in frame F near its free end.

H is a small metal roller, carried by a spring-arm attached to main frame A, and arranged to bear on the carbon L and press it against the disk E. On the same shaft with disk E is a pulley or drum, E′, about which a light cord is wound, and then carried over a pulley, *g*, on the frame A.

G is a weight attached to the cord.

K is an adjustable stop, arranged to limit the downward movement of lever F; K′, a similar stop for limiting its upward movement.

S is a coiled spring with means for adjusting its tension, and is employed to raise the lever F.

P and N are binding-posts, connected respectively to the lower and upper portions of the frame and forming the positive and negative terminals of the lamp.

From the above-described construction it is evident that a current introduced at post P traverses the lower part of the frame A, and passes thence, by way of the carbon, (good electrical contact between these two being maintained by rollers H and levers *c c*,) to the negative electrode B, whence it leaves the lamp by part A′ and post N.

The operation of the lamp is as follows: The drum E′ is turned to wind up the cord and the weight G, the direction of winding being such as to impart to the drum and the disk E a tendency to travel downward along the carbon L when the same is inserted in the lamp. A carbon of proper character is then passed up through the tubular stem *f* until it touches the disk B. The disk E, turned by the cord and

drum, as described, travels down along the carbon, carrying with it the lever F, and bringing together the enlarged ends of levers *c c*, which, as soon as they come in contact with the carbon, check the further movement of the lever F and the rotation of disk E, as the weight G is not sufficient to turn the drum E′ against the friction between the disk E and the carbon. If, now, a current be directed through the lamp, the light is formed at the point of contact of the two electrodes, which transfers or eats away the end of carbon L. Spring S is adjusted so as to raise the lever F as soon as a separation of the two electrodes occurs; but the raising of the lever F opens the levers *c c* and allows the disk E to again run down the carbon until it is checked by the binding of levers *c c* against the carbon. In this way the carbon is fed up as fast as consumed, the spring S operating to keep it in contact with the disk B, while the drum and cord and disk E, in conjunction with levers *c* and links *e* and roller H, operate to maintain the lever in proper position to be drawn up by the spring to effect the feed. It is to be observed that the tension of the spring S and the face of the weight G must be so adjusted relatively to each other that the disk E, when left free to rotate in contact with the carbon, will cause the lever F to descend against the face of the spring, while the power of the spring itself must be sufficient to raise the lever F as soon as a separation of the electrodes occurs.

It is obvious from the above that two faces will always operate on the carbon pencil L—one that of the spring S, which tends to raise the lever F and with it the carbon, so that the latter will touch the upper electrode, B; the other the locking or binding of the carbon L and the lateral pressure of the levers *c c*—from which it follows that the upward movement of the carbon L, instead of being uniform, as would be the result if it were acted upon by springs or weights alone, is varied in proportion to the variations in the rate of combustion. It is also to be observed that the movements of the lever F, levers *c*, and other parts connected therewith will be very slight—so slight, in fact, as to amount practically to imperceptible vibrations—so that the light is maintained perfectly steady, owing to the practically uniform character of the contact of the two electrodes.

Although little or no injury is done to the larger electrode in the above-described lamp by the action of the current, it is desirable to keep the surface of the negative electrode smooth and clean at the point of contact with the lower carbon. For this purpose the said negative electrode is made circular and arranged to turn as above set forth.

Having thus described my invention as embodied in the most convenient and practicable form of which I am at present aware, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric lamp having a fixed and movable electrode, substantially as described, the combination, with the said movable electrode and mechanism for feeding the same, of a mechanical locking device connected with the feeding mechanism and adapted to check the movement of the electrode substantially in the manner herein set forth.

2. In an electric lamp having a fixed and movable electrode, substantially as described, the combination, with the said movable electrode, of a swinging lever or frame sustained by a spring or its equivalent, a grooved wheel or disk mounted in said frame, a cord and weight for imparting a rotary movement thereto, whereby the said electrode is raised, and mechanism connected with and operated by the movement of the swinging lever to lock or release the movable electrode in substantially the manner herein set forth.

In testimony whereof I have hereunto set my hand this 18th day of August, 1881.

JOSEPH OLMSTED.

Witnesses:

PARKER W. PAGE,

W. FRISBY.