(No Model.)

J. DU SHANE.

ELECTRIC LAMP.

No. 260,288. Patented June 27, 1882.

Fig. 1.

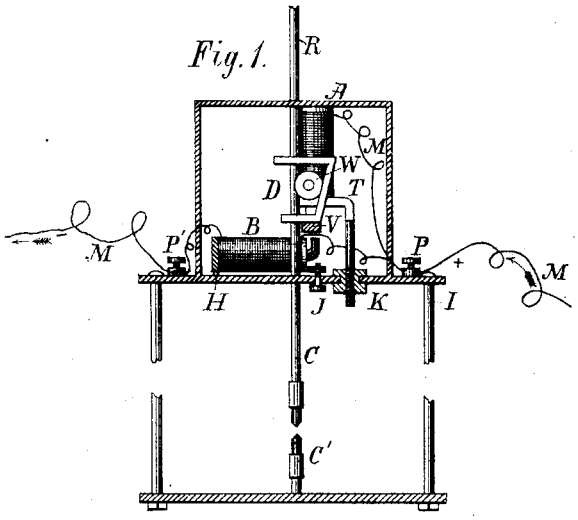


Fig. 2.

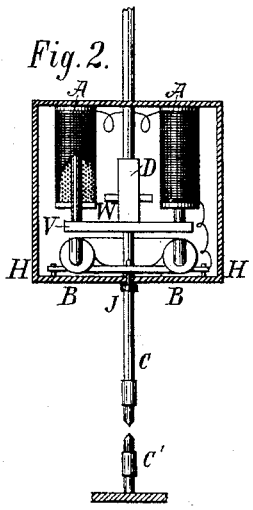
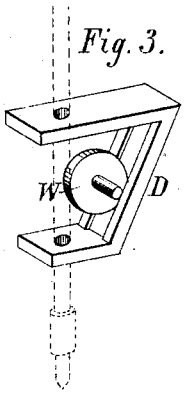


Fig. 3.



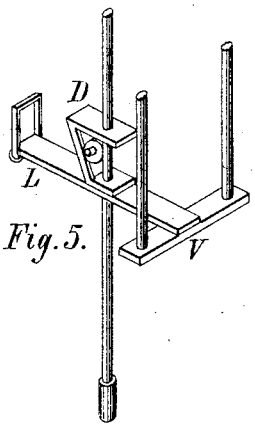


Fig. 5.

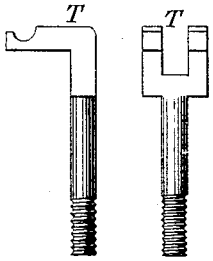


Fig. 4

Witnesses
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UNITED STATES PATENT OFFICE.

JAMES DU SHANE, OF SOUTH BEND, INDIANA.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 260,288, dated June 27, 1882.

Application filed October 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES DU SHANE, a citizen of the United States, residing at South Bend, in the county of St. Joseph, State of Indiana, have invented a new and useful Improvement in Electric Lamps, of which the following is a specification.

My invention relates to an improvement in electric lamps, whereby after the arc is formed it is regulated so as to insure its steadiness and overcome the flickering which is so disagreeable a feature of most arc-lamps now in use.

The following is such a full and exact description thereof as will enable those skilled in the art to make and use the same.

Figure 1 is a sectional front view of the lamp and its mechanism. Fig. 2 is a side view of the same, also partly in section. Fig. 3 is an isometrical view of the inclined plane and wheel by which the upper carbon rod is held. Fig. 4 is a front and side view of the trip which releases the wheel and allows the rod to feed by action of gravity. Fig. 5 shows how the clutch may be operated by a lever.

I will now give a more detailed description of these various parts.

The upper carbon rod, R, Fig. 1, passes through holes in the upper and lower parts of a yoke, one side of which is slanted so as to form an inclined plane. This plane is grooved, and within this groove is one edge of a wheel, whose other edge impinges on the rod R, clamping and holding it. The wheel may be grooved to fit the rod. This yoke and wheel form the clutch D, which rests upon the lower part of the U-shaped core V of the double helices A A. These helices are wound with coarse wire, and through them the electric current passes on its way to the electrodes C C′. The core V fits loosely in the helices A A, and is worked vertically by the magnetism therein induced. Beneath the cross-piece of core V are placed the poles of a horseshoe-magnet, B B, which is wound with fine wire and connected in short circuit across the lamp. This horseshoe-magnet B B is hinged at H, (the bend of the core,) and the polar end is adjusted by a set-screw, J. The upper part of the trip T straddles the clutch D, and its arms extend beneath the shaft of the wheel W. This pinion is prolonged, so that it may strike upon and rest in the notches formed at the end of the arms. These notches have their inner face inclined, so that the pinion will roll slightly before striking the bottom. This trip is also adjusted by means of a screw-nut, K, which is provided with an annular peripheral groove, and is secured in a suitable opening in the frame in such manner that it may be freely rotated without moving otherwise, so as to cause the trip T to move up or down to properly adjust it.

The action of the parts is as follows: The electric current passes by binding-post P into the helices A A. The axial magnetism thus induced raises core V, and with it the yoke D. Wheel W impinges against rod R and holds it fast, thus causing it to rise and separate the electrodes C C′, and the arc is thus formed. The current then passes through the carbons into the bottom part of the frame of the lamp and out of binding-post P′ to the battery. Binding-post P′ is in electrical connection with only the bottom part of the lamp, which in turn is insulated from the top. As the resistance through the arc becomes too great part of it passes through the shunt-circuit, thus rendering the core of magnet B magnetic. The poles of magnet B attract the cross-piece of core V and draw it down until the carbon points approach sufficiently near, when all of the current passes through them as before. Thus the core V plays as a balance between the axial magnetism of the working helices A A and the polar force of the shunt-magnet. Trip T is so adjusted as to rotate wheel W, and thus allow rod R to feed through when the shunt-magnet pulls the core V a certain distance. By means of the two adjustments of the shunt-magnet at J and the trip at K the arc is maintained with a great degree of steadiness. I find this advantage in this combination. The magnetism of core V increases as it rises into the helices. The polar force of the shunt-magnet is also increased, owing to the increased resistance to the current caused by the increased distance between the electrodes. As the core descends its magnetism diminishes, as is also the case with the shunt-magnet. Thus by greater attraction when farther apart, and a gradually-diminishing force as they approach, the motion of core V, and through it of rod R, is made steady and uniform.

It is evident that clutch D may be attached to core V in many ways—*e. g.*, as shown in Fig. 5, by a lever.

Having thus described my invention and its action, what I deem new, and desire to secure by Letters Patent, is as follows:

1. The combination, in an electric lamp, of the hollow helices and longitudinally-moving core, the clutch with an inclined bearing, the wheel and its shaft, and the trip adapted to rotate the wheel to permit the rod carrying the upper electrode to be operated by gravity and the shunt-magnet, substantially as specified.

2. In an electric lamp, the combination of the rod R, helices A A, core V, wheel W, clutch D, and trip T, constructed and arranged for joint operation as described.

3. In an electric lamp, the shunt-magnet B, hinged at one end, and the adjusting-screw J, in combination with rod R, core V, and helices A A, operating together substantially as described.

In witness whereof I have hereto set my hand this 23d day of September, A. D. 1881.

JAMES DU SHANE.

Witnesses:

E. B. KORNS,

ANDREW ANDERSON.