



# UNITED STATES PATENT OFFICE.

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## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 647,691, dated April 17, 1900.

Application filed February 6, 1900. Serial No. 4,217. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN TOM BESWICK, a citizen of the United States, residing at New York city, borough of Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to certain new and useful features of construction of electric-arc lamps, which will be described in the specification and specifically set forth in the claims.

The object of my invention is to improve and reduce the cost of construction of electric-arc lamps and also to decrease the consumption of the carbons in such lamps.

In the accompanying drawings, which illustrate my invention, similar numerals indicate like parts.

Figure 1 is a vertical section of the lower part of the lamp, showing the inclosing globe in the position which it will occupy when the lamp is in operation and when lowered for replacing new carbons or trimming the lamp.

Fig. 2 is a plan view of the top of the clutch and also shows the upper carbon and its containing-tube in transverse section. Fig. 3 is a transverse section and plan taken on the line XX of Fig. 1. Fig. 4 is a diagrammatic transverse section of a modified form of gas-cap.

In the drawings, 5 indicates the upper frame of the lamp, which supports the usual solenoid, (not shown;) 6, the tube for containing the upper carbon, the upper part of which (not shown) forms the armature of the solenoid and the lower part of which is cut away, as at 6<sup>a</sup> 6<sup>b</sup>.

7 is a clutch. The clutch is attached to or may be formed integrally with the tube 6. The clutch consists, essentially, of a body portion 8, having the cylindrical opening 9, in which is located the upper carbon 10. The body of the clutch 8 is provided with an extension 11, in which is formed a cylindrical inclined opening 12, the inclination of this opening being from above downward and inward. The upper face 13 of the projection 11 is inclined downwardly. Located in the opening 12 is a pin 14, provided with a dish-shaped head 15. The periphery of the head

may have a milled edge 16. This may be omitted and a sharp or roughened edge provided.

The diameter of the dish-shaped head 15 of the pin 14 is such that when the parts are in the position shown in Fig. 1 the inner edge of the head will not be in contact with the carbon 10, but will be in contact with the carbon 10 when the clutch 7 has been lifted to the position shown in the dotted lines, Fig. 1.

Located on the opposite side of the clutch-body from the extension 11 is an inclined trough 17, in which is located the ball 18. This inclined trough and ball may be omitted, as they form no part of the clutch mechanism, their object being to insure electrical contact between the tube 6 and the carbon 10 through the instrumentality of the ball 18.

Connected to the frame 5, but insulated therefrom, is the oblong plate 19, perforated at 20 and 21. Connected to the oblong plate 19 is a frame 22, which supports the lower carbon 23. This frame is shown formed of two arms; but a single arm may be employed.

24 is a screw for securing the lower carbon 23, which is inserted through an opening 25, formed in the bottom of the frame 22.

26 is a ring for supporting the globe 27. Connected to the ring 26 is a rod 28, which passes through the opening 20 in the oblong plate 19 and is provided with an enlarged head 28<sup>a</sup>. Located on the opposite side of the ring 26 is a pin 29, adapted to enter the opening 21 in the oblong plate 19. The upper and inner side of this pin is slightly cut away to form the concave opening 30.

Mounted in the oblong plate 19 is a lock 31, which consists of the pin 32 and the exterior handle 33. The pin 32 has one face flattened, as at 34.

The globe 27 I preferably form as shown in the drawings—that is, with the lower portion 27<sup>a</sup> plain and its upper portion having a series of circumferentially-arranged angular faces 27<sup>b</sup>. I prefer to use this form of globe, although a plain globe may be used, for the reason that a globe so formed will direct the major portion of the rays downward and not produce a round luminous spot upon the ceiling of a room, as is usual where an ordinary plain

globe is employed. The upper portion of the globe 27 is provided with a flange 35, which takes over the ring 26.

36 is a gas-cap. In Fig. 1 this is shown as a plate of metal having the depending portion 37, which is slightly smaller in diameter than the interior of the globe 27. In place of using this gas-cap I prefer to use such a one as is shown in Fig. 4. In this figure the body of the cap is formed of spun metal. The depending portion 37 is made much deeper than that shown in Fig. 1 and is hollow to form a gas-chamber 38.

Connected to the gas-chamber 38 and at the top of the gas-cap are the valves 39 and 40. The object of the valve 39 is to permit the escape of gas from within the lamp when the pressure is excessive. The object of valve 40 is to permit the entrance of atmospheric air into the gas-chamber 38 after the gas in the body of the lamp has contracted owing to cooling after the lamp has been extinguished. By the use of this gas-cap the lifetime of the carbons in the lamp will be materially increased owing to the fact that it prevents in a large measure the dilution of the gas on the interior of the globe by atmospheric air.

The operation of the clutch will be readily understood. When the actuating-magnet lifts the tube 6, the clutch 7 will be lifted and the pin 14, owing to the inclination of the opening 12, will fall. This will bring the top of the pin 15 in contact with the upper carbon 10, thereby pushing the carbon against the body of the tube and holding it from descending. When the tube 6 moves down, the end of the pin 14 strikes the body of the casing 5, thereby lifting the head of the pin 15

from contact with the carbon 10, thus allowing the carbon 10 to feed.

The operation of the various other parts will be understood without further description.

Having thus described my invention, I claim—

1. In an electric-arc lamp, in combination with the upper carbon, of a clutch mechanism comprising a body having an opening through which the carbon passes; a second opening arranged at an angle to said first opening, and a gravitally-acting pin provided with an enlarged head, which when the clutch-body is lifted will impinge upon said carbon.

2. In an electric-arc lamp, in combination with the upper carbon, of a clutch-and-contact mechanism comprising a body having an opening through which the carbon passes, a second opening arranged at an angle to said first opening, a gravitally-acting pin provided with an enlarged head located in said second opening, an inclined trough, and a gravitally-acting ball located in said trough.

3. In an electric-arc lamp, the combination with an inclosing globe, of a gas-cap provided with a gas-chamber and two valves, one of which opens outwardly from said chamber, and the other opens inwardly to said chamber.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN TOM BESWICK.

Witnesses:

J. E. PEARSON,

W. H. PUMPHREY.