(No Model.)

O. C. WHITE.

ELECTRIC ARC LAMP.

No. 445,724. Patented Feb. 3, 1891.

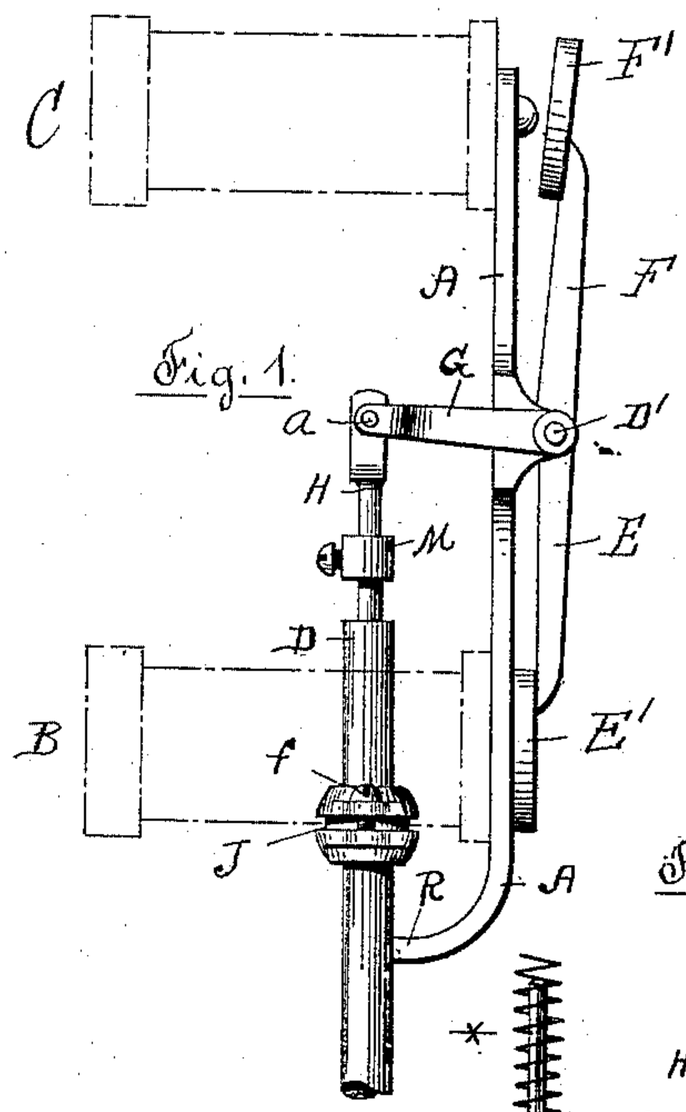

Fig. 1.

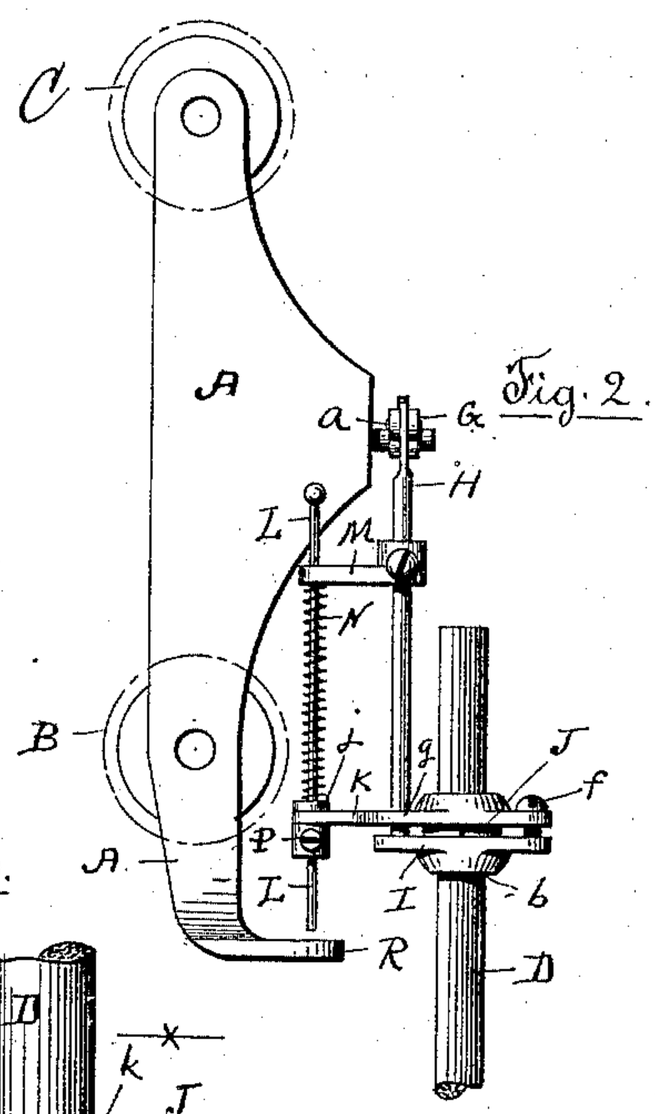

Fig. 2.

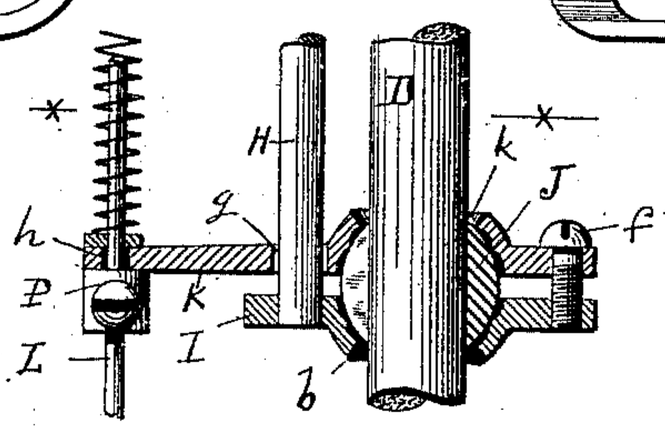

Fig. 3.

Fig. 4.

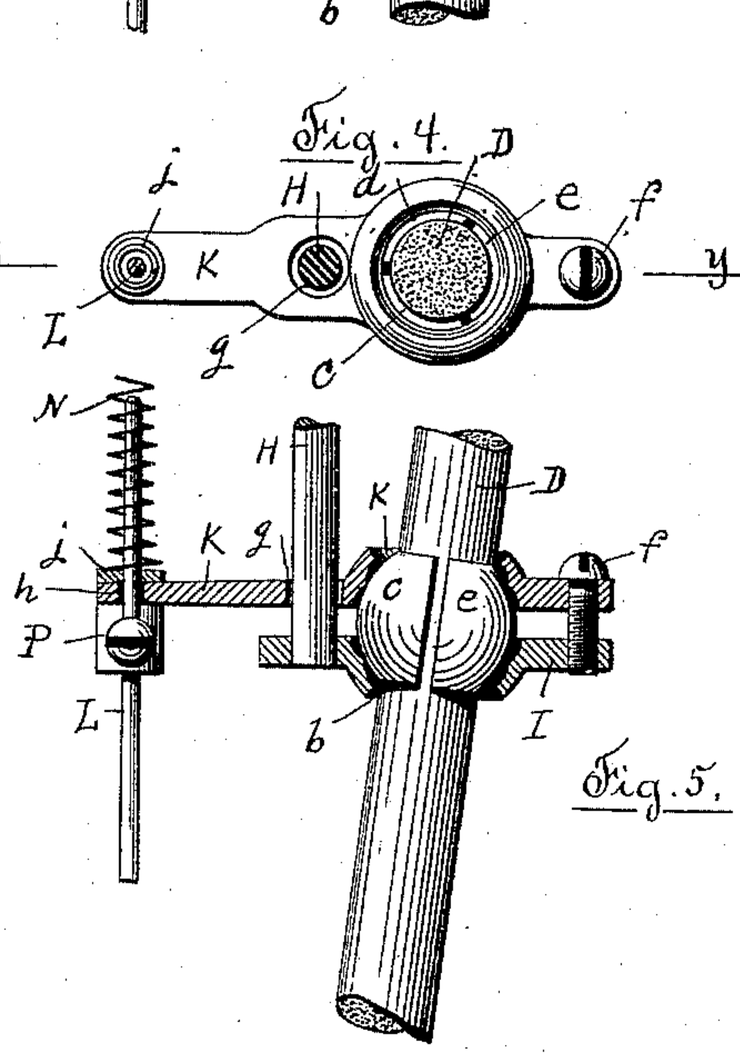

Fig. 5.

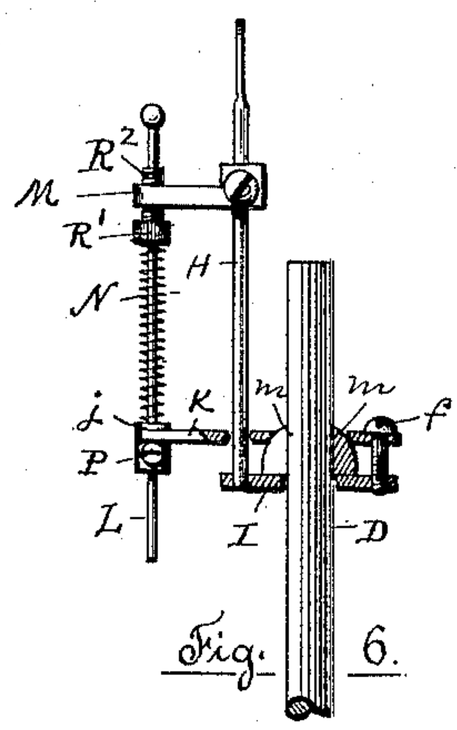

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

OTIS CONVERSE WHITE, OF WORCESTER, MASSACHUSETTS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 445,724, dated February 3, 1891.

Application filed November 7, 1889. Serial No. 329,543. (No model.)

To all whom it may concern:

Be it known that I, OTIS CONVERSE WHITE, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Clamping Mechanisms for Electric Lamps, of which the following is a specification, accompanied by drawings, which represent a clamping device for sustaining the carbon-supporting rod of an electric lamp embodying my invention, and in which—

Figure 1 represents a front view of my improved clamping device. Fig. 2 is a side view of the same. Fig. 3 represents a sectional view of that part of the clamping mechanism embodying my invention and shown in sectional view on line Y Y, Fig. 4. Fig. 4 is a top view of the portion of the clamping device embodying my invention, and represented in sectional view on line X X, Fig. 3. Fig. 5 represents the same view as shown in Fig. 3, but with the carbon-supporting rod inclined from a true vertical position; and Fig. 6 shows a modified form of the clamping-jaws, the clamping device being represented in sectional view on line Y Y, Fig. 3, and also further illustrating the adjusting mechanism by which the tension of the tightening-spring is varied.

Similar letters refer to similar parts in the different figures.

The object of my present invention is to provide means whereby the carbon-supporting rod of an electric lamp may be sustained in its proper position, and as the carbon points become separated by combustion the carbon-supporting rod may be released and allowed to fall with an even and uniform motion the proper distance to preserve a uniform arc, and, further, to provide means whereby the pressure of the clamping-jaws upon the carbon-supporting rod may be varied, and I accomplish these objects by means of the mechanism shown in the several figures of the accompanying drawings, and hereinafter described.

In the drawings I have shown in detail the clamping device by which the carbon-supporting rod is grasped, and indicated the arrangement of so much of the co-operating parts of the mechanism of an electric lamp as will serve to illustrate the construction and operation of those parts which more especially embody my present invention.

A denotes a portion of the frame-work of an electric lamp, supporting a main magnet, whose position is indicated by the broken lines B, and a shunt-magnet indicated by the broken lines C, and also a three-armed lever, pivoted at D′ and provided with the arms E and F, carrying armatures E′ and F′, which are alternately attracted by the magnets B and C as the distance between the carbon points varies in the usual and well-known manner in electric lamps of this class. The third arm G of the lever supports a rod H, to which it is pivoted at *a*. The lower end of the rod H is rigidly attached to the bar I, having a circular opening *b* to receive a ball J, comprising the three sections *c*, *d*, and *e*.

To the end of the bar I and opposite the rod H, I hinge a clamping-lever K, the connection in the presence instance being made by means of a screw *f*, passing through the end of the lever K and entering the bar I, the lever K being allowed a slight rocking motion upon the screw *f*; but other known methods of attachment permitting a hinged motion may be employed. The lever K has an opening *g*, through which the rod H passes, and a hole *h* at its end, through which the small rod L passes. To the rod H, I attach the arm M, which is provided at its outer end with a hole through which the rod L passes, and between the lever K and fixed arm M, I insert a spiral spring N, with its ends bearing against the arm M and a washer *j*, lying upon the lever K, the tension of the spiral spring serving to separate the arm M and lever K. The lever K is provided with a circular opening *k* corresponding with the similar opening *b* in the bar I and inclosing the ball J, which has an opening extending diametrically through the ball in order to receive the metallic rod D, to the lower end of which the carbon is attached by any of the known methods. The carbon-supporting rod D is firmly and securely clamped between the sections *c*, *d*, and *e* of the ball J by the force of the spring N, which in separating the arm M and lever K serves to bring the opposing sides of the lever K and bar I toward each other, the circular openings *b* and *k* resting upon the sides of the sections *c*, *d*, and *e* and compressing them against the

carbon-supporting rod D. The outer and curved sides of the sections *c*, *d*, and *e* form angles with the axis of the rod D, and the amount of pressure of the sections upon the rod D is partly determined by the zone of contact of the lever K and bar I upon the periphery of the ball J. The less the angle formed by the tangent to the circle at its point of contact with the clamping-surfaces and the axis of the rod the greater the pressure, and vice versa. To the rod L is attached the collar P, resting against the lower side of the lever K, and the projecting arm R of the rigid frame-work A is brought into the path of the end of the rod L as the clamping mechanism suspended upon the arm G is lowered by the rocking of the lever through the attraction of the shunt-magnet C, causing the rod L to be arrested as the clamping mechanism is lowered, compressing the spring N and releasing the rod D by withdrawing the pressure of the spring N upon the lever K, allowing the rod D to slide downward, bringing the carbon points nearer together and restoring the electric to the main magnet B, thereby causing the clamping mechanism, as shown, to be lifted and allow the spring N to again exert its force upon the sections *c*, *d*, and *e*. The ball J can be turned between the bar I and lever K as a ball within its socket, allowing the carbon-supporting rod D and rod H to assume a position other than parallel, as shown in Fig. 5, without impairment of the operation of the clamping mechanism.

As the force of the spring is the power employed to bring the bar I and lever K toward each other, I provide means whereby the tension of the spring can be varied, which is shown in Fig. 6 of the drawings, and consists of a screw-threaded sleeve R^2, held in a screw-threaded opening in the fixed arm M, the lower end of the sleeve being preferably provided with a milled head R′, resting against the upper end of the spring N, the tension of which is varied by the upward or downward movement of the screw-threaded sleeve R^2 in the arm 2.

The ball J, as represented in Figs. 1 to 5, consists of the three sections *c*, *d*, and *e;* but a different number of sections can be employed, three, however, being preferable, as the pressure of each section is in direct opposition to the resultant pressure of the other two sections.

Except for the advantage of being able to vary the inclination of the carbon-supporting rod D, as and for the purpose described, the ball J can be omitted, and in lieu thereof a block employed consisting of sections inclosing the carbon-supporting rod and having their outer surfaces plain instead of spherical, and forming an angle with the axis of the block, whereby the movement of the bar I and lever K toward each other will serve to compress the block upon the rod D. The circular opening in the bar I and in the lever K constitute compressing-rings, which are moved over the outer surfaces of the clamping-blocks.

In Fig. 6 I have shown one modification of clamping device in which the clamping-blocks *m m* are portions of a hemisphere instead of a spherical ball, and are held by the bar I as a platform, the circular opening in the lever K pressing upon the outer and curved surfaces of the blocks to compress them upon the rod D.

If desired, the blocks, as represented in Fig. 6, can be hinged to the supporting-bar I or otherwise retained upon the bar by an annular ring extending upward from the surface of the bar.

I do not confine myself to the specific method as shown of applying the tension of the spring to the purpose of compressing the sections of the clamping-block upon the carbon-supporting rod; neither do I confine myself to any special mechanism whereby the clamping mechanism is raised or lowered, as such is not essential to my invention, which relates wholly to the use of a clamping-ring moved over the outer surfaces of clamping-blocks inclosing the carbon-supporting rod and having their outer surfaces forming an angle with the line of movement of the clamping-ring, and also to the adjustment of the spring whereby the clamping-blocks are compressed.

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

1. In an electric lamp, the combination, with a carbon-supporting rod, of a clamping device, substantially as described, said clamping device comprising clamping-blocks with their inner surfaces bearing against the carbon-supporting rod and with their outer surfaces forming an angle with said rod, a clamping-ring bearing upon the outer surfaces of said clamping-blocks, and a spring with its tension applied to press said ring against the outer surfaces of said clamping-blocks and cause them to seize the carbon-supporting rod, substantially as described.

2. In an electric lamp, the combination, with a carbon-supporting rod, of a bar provided with a circular opening, a hinged lever provided with a similar circular opening corresponding with the opening in said bar, said openings forming sockets to receive a ball, a ball formed in sections inclosing the carbon-supporting rod and held in said sockets, and a spring applied to said lever and said bar to press them together and compress the sections of said ball, substantially as described.

3. In an electric lamp, the combination, with a carbon-supporting rod, of a bar provided with a circular opening, a hinged lever provided with a similar circular opening corresponding with the opening in said bar, said openings forming sockets to receive a ball, a ball formed in sections inclosing the carbon-supporting rod and held in said sockets, a spring applied to said lever and said bar to

press them together and compress the sections of said ball, and a screw-threaded sleeve held in the frame-work of the mechanism, with its end bearing against said spring, whereby its tension is varied, substantially as described.

4. In an electric lamp, the combination, with the carbon-supporting rod, of clamping-blocks arranged to grasp said rod, a supporting-bar I, by which they are held from movement along said rod, a clamping-ring capable of being moved over the outer surfaces of said clamping-blocks, and a spring with its tension applied to press said ring upon said blocks and compress them around and upon the outer surface of said rod, substantially as described.

5. In an electric lamp, the combination, with a carbon-supporting rod, of clamping-blocks forming the sections of a ball or sphere, two opposing rings inclosing said ball and forming sockets within which the ball is capable of turning, and a spring with its tension applied to bring said rings together and compress the sections of said ball and cause them to seize the sides of the carbon-supporting rod, substantially as described.

Dated at Worcester, in the county of Worcester and State of Massachusetts, this 30th day of October, 1889.

OTIS CONVERSE WHITE.

Witnesses:

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H. M. FOWLER.