No. 659,711. Patented Oct. 16, 1900.

G. E. STEVENS.

ELECTRIC ARC LAMP.

(Application filed May 31, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

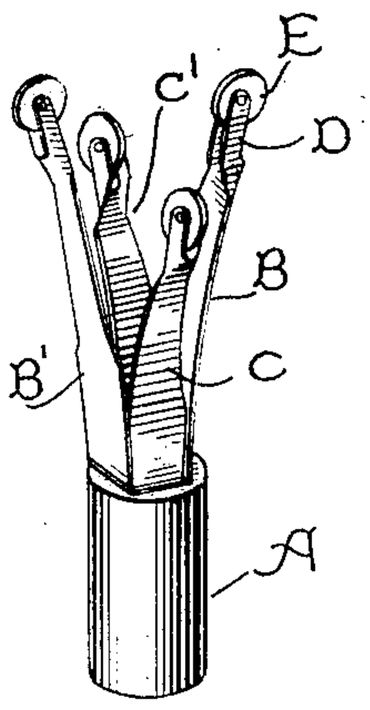


Fig. 2.

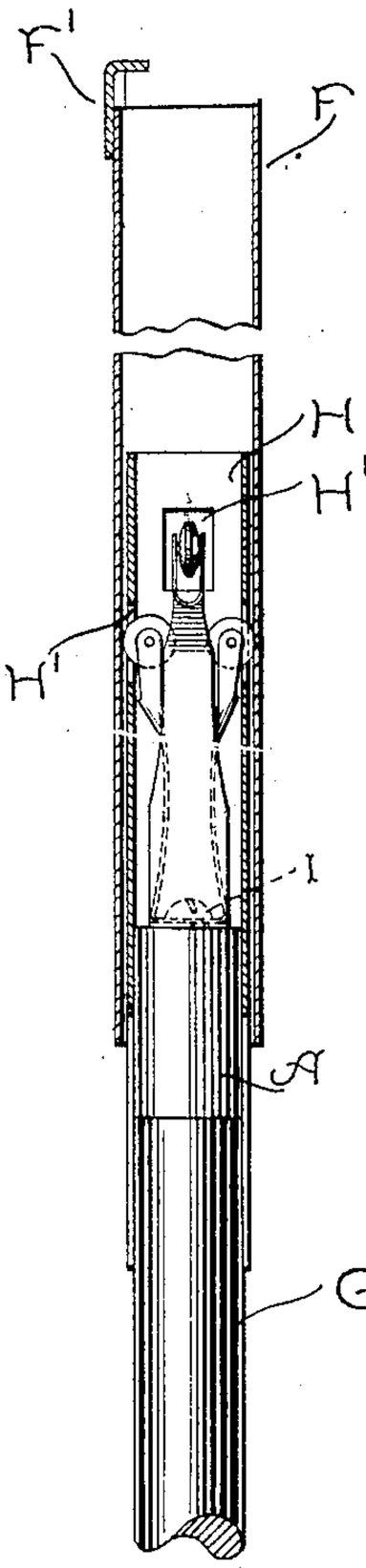


Fig. 3.

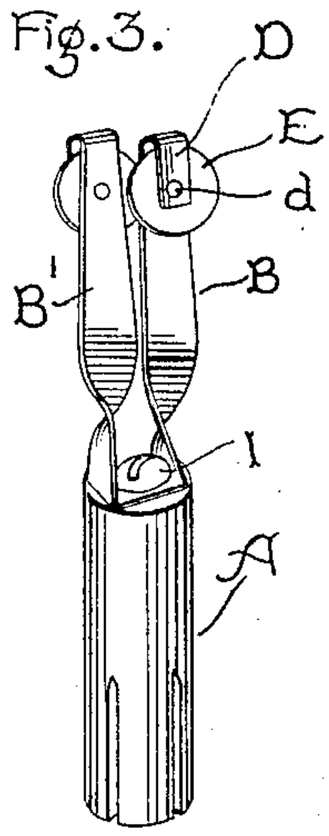
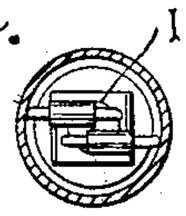


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

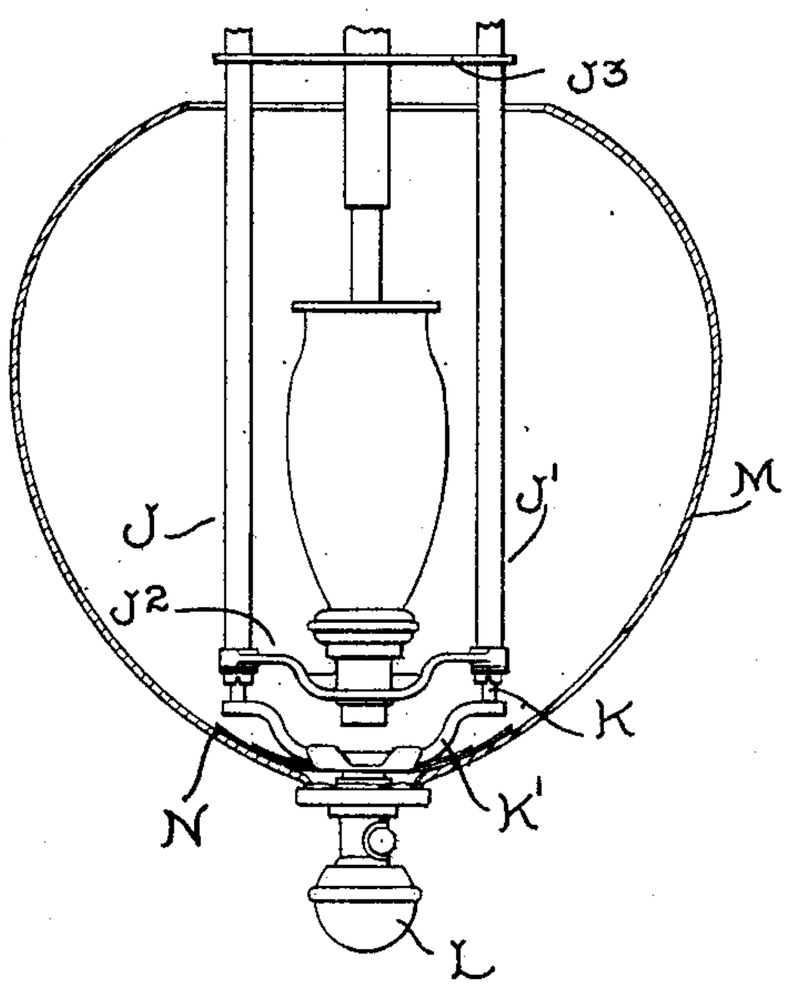
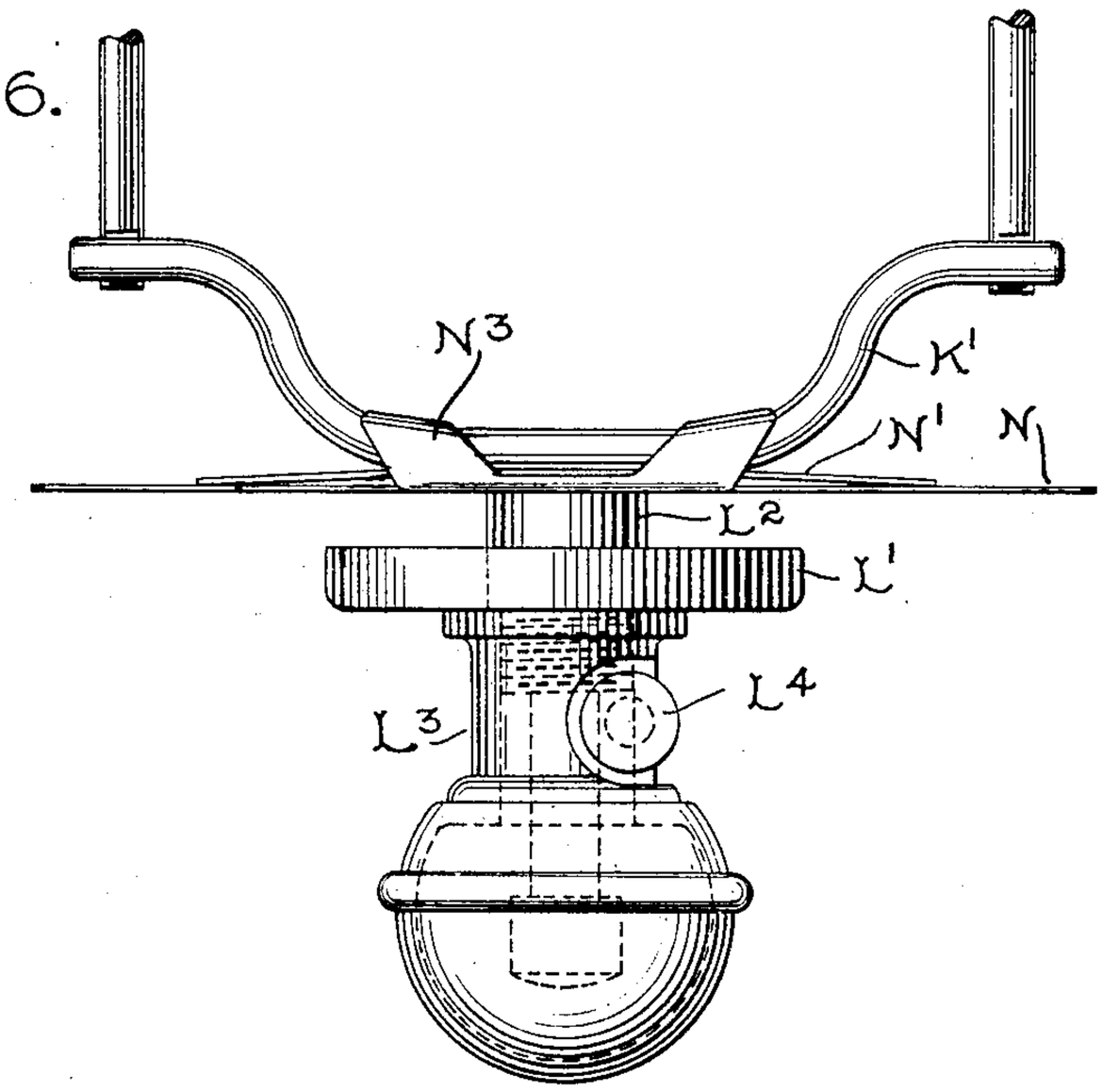


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE E. STEVENS, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 659,711, dated October 16, 1900.

Application filed May 31, 1899. Serial No. 718,797. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. STEVENS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric-Arc Lamps, (Case No. 1,157,) of which the following is a specification.

The present invention relates to electric-arc lamps, and has for its object the improvment of their construction.

Referring to the accompanying drawings, which show an embodiment of my invention, Figure 1 is a perspective view of a carbon-holder; Fig. 2, a view showing the carbon-holder mounted in position within a carbon-tube, the tube being shown in section; Fig. 3, a perspective view of a slight modification of the carbon-holder; Fig. 4, a plan view of a modified holder mounted within a carbon-tube. Fig. 5 shows the lower portion of an arc-lamp with the globes mounted in position, and Fig. 6 is an enlarged detail view of the means for holding the outer globe in position.

Referring to Figs. 1 and 2, A represents the main body of the holder, which in most instances is given considerable weight, so that it will assist in the feeding of the lamp. Mounted on the top of the holder and secured in place by a screw I are four spring-arms B B′ and C C′. The arms B B′ are made from a single piece of spring metal—such as phosphor-bronze, for example. The arms C C′ are also made from a single piece of similar metal and are somewhat shorter than the arms B B′, so that the contact-wheels carried in the ends of the arms will not interfere with each other when the holder is mounted in position within the carbon-tube. Each pair of spring-arms is shown as being made from a single piece of metal on account of cheapness; but, if desired, the arms may be made of separate pieces of metal and secured to the main body by screws or similar means. The outer end of each arm is formed into a fork D, and mounted for radial movement in the fork is a small wheel E. These wheels constitute, in effect, trolley-wheels and are designed to engage with the inside of the carbon-tube F and convey current between the tube and the carbon electrode G.

As shown in Fig. 2, a sleeve H is provided which surrounds the spring-arms and contact-wheels and is secured to and projects downward below the main body A to form a support for the electrode G. The upper end of the tube is provided with openings, one for each of the trolley-wheels E. The parts are so arranged that when the sleeve H is mounted in position within the carbon-tube F of an electric-arc lamp the trolley-wheels will project through the openings H′ sufficiently to engage with the inside of the tube and convey current between the tube F and electrode G. The spring-arms, while pressing the trolley-wheels against the tube F with considerable pressure, do not affect the free moving of the carbon-holder within the tube at the time the carbons feed or when the holder and tube move with respect to each other without feeding. By this arrangement no difficulty is met with in conveying current between the moving parts and the inside of the tube does not become scarred or pitted to any extent, as is often the case with other types of holders in which the outward pressure of the contact devices is comparatively small. The tube H limits the outward movement of the trolley-wheels E and at the same time protects the parts from injury and permits the ready insertion of the holder in the carbon-tube.

It sometimes happens that the trimmer after inserting a new carbon in the upper holder will push the holder up into the lamps so far that the wheels E will engage with the top of the tube F and prevent the carbons from feeding when current is admitted to the lamp. To guard against this, a stop F′ is provided on the tube F, which limits the upward movement of the holder. The stop is so positioned that a carbon of the proper length may be inserted, yet the wheels E can never be moved to a position where they will engage with the top of the tube.

Referring to Figs. 3 and 4, I have shown a modification of my carbon-holder in which only two trolley-wheels are employed. The wheels are mounted on spring-arms B and B′, which arms are formed from a single piece of stock, as before, and are secured to the holder A by a screw I. The trolley-wheels E

are mounted in holders formed by bending the ends of the arms B and B′ downward at D, metal pins *d* being employed to hold the wheels in place. The arms B and B′ are each given a quarter-turn, so that the wheels instead of being in the same plane as in Figs. 1 and 2 lie in different, but parallel, planes. This is best shown in Fig. 4. By this arrangement I am enabled to use wheels that are considerably larger in diameter than would be possible with the construction shown in Figs. 1 and 2, and consequently the friction between the moving parts is decreased. With this construction great flexibility between the wheels and support is secured to compensate for irregularity in the tube and at the same time pressure enough is exerted between the wheels and the carbon-tube F to insure good conductivity.

In arc-lamps having globe-holders which are capable of being moved up and down to permit recarboning it often happens that the upper edge of the globe will be clipped dne to its striking some portion of the lamp-frame as the globe is raised or lowered. I overcome this objection in the manner shown in Figs. 5 and 6.

J and J′ represent the side tubes of an arc-lamp, which tubes are connected at the lower end by a yoke J^2 and at the top by a frame-piece J^3. Mounted within the tubes and capable of vertical movement are rods K. The rods are connected by a downwardly-curved yoke K′ at the lower end, and the upper end is provided with means whereby they may be secured to the lamp-frame. The particular means employed for holding the rods in the raised position is immaterial, and consequently has not been illustrated. Secured to the under side of the yoke K′ is a holder L for the outer globe M. The particular construction of the holder is unimportant, the one shown consisting of a cup-shaped support L′, in which the lower flange of the outer globe is seated. The support is provided with a central opening, and extending through the opening is a screw-threaded stud L^2. Mounted on the stud is a nut L^3, which sustains the support L′ and is capable of vertical adjustment. On the side of the stud is a cut-away portion, and the screw L^4 in the nut prevents the latter from being accidentally removed, although permitting the necessary adjustment.

Mounted on the under side of the yoke K′ is a spring N, which engages with the inner walls of the outer globe M and holds the globe in its proper position while being moved up and down. The spring N is composed of two flat plates N′ and N^2, both of which are provided with a central opening to receive the stud L^2. The lower plate is provided with projections N^3, which are bent over the yoke K′ and serve to hold it in place. The projections also serve to hold the plate N′ in place. When the outer globe is removed, the springs occupy the position shown in Fig. 6; but when the globe is mounted in position in the holder and the latter is adjusted to its proper place the springs assume the position shown in Fig. 5. With the parts arranged as described the globe is always held in its proper position with respect to the holder, thereby preventing all chipping of the upper edge of the outer globe or breaking as it is raised or lowered for the purpose of trimming. Another advantage lies in the fact that the globe being held by a spring-clamp is not so liable to be broken as would be the case if it were held by a rigid clamp.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an arc-lamp, a fixed guide for the movable electrode, a carbon-holder having an extension thereon, and a contact device carried thereby, provided with elastic arms shod with contact-rollers engaging the guide, the said extension being arranged to surround the arms and limit their outward movement.

2. In an arc-lamp, the combination of a fixed tubular guide for the movable electrode, a carbon-holder, elastic arms each carrying an outwardly-pressing contact, and a device for limiting the spread of the arms and contacts to permit insertion of the follower in the guide.

3. In an electric-arc lamp, the combination of a support, a spring-arm secured thereto, a tubular conductor, a rolling contact device carried by the end of the spring-arm and pressing outwardly against the inner wall of the tubular conductor to convey current therefrom to the support, and a tubular extension on the support for limiting the outward movement of the rolling contacts.

4. In an electric-arc lamp, the combination of a support, a number of spring-arms secured thereto, a rolling contact device mounted in each arm, a tubular sleeve for limiting the outward movement of the spring-arms and a tubular conductor which surrounds the contact devices the rolling contacts being pressed outwardly against the inner wall of the conductor.

5. In a contact device, the combination of a support, a number of spring-arms secured thereto, each arm provided with a contact, and a sleeve surrounding the arms and provided with openings through which the contacts project.

6. In a contact device, the combination of a support, a number of spring-arms arranged in such manner that they do not interfere as they move toward and away from each other, a roller-contact mounted on each spring-arm and a sleeve surrounding the contacts having openings therein through which the roller-contacts project.

7. In a contact device, the combination of a support, a pair of spring-arms secured thereto, each arm having a partial turn there-

in so that the contacts carried thereby occupy different planes, and contacts carried by the arms.

8. In a contact device, the combination of a support, a tube surrounding the support, the two uniting to form a carbon-holder, spring-arms secured to one end of the support by a single holding device, each arm having a partial turn or twist therein, and a holder formed integral therewith, and a rolling contact mounted in each arm, the contacts being arranged to occupy substantially-parallel planes.

9. In an electric-arc lamp, the combination of a side rod capable of vertical movement, guides for the rod, a yoke secured to the rod, a globe-holder mounted on the yoke, means for adjusting the holder, and a spring mounted on the yoke and arranged to press against the inner wall of the globe and hold the same in position.

10. In an electric-arc lamp, the combination of a yoke, a pair of side rods which are connected by the yoke, a spring-plate mounted on the under side of the yoke and provided with extensions which are bent over the yoke for holding it in position.

11. In an electric-arc lamp, the combination of a holder for a moving carbon, a spring-pressed contact-wheel mounted on the holder and arranged to make contact with the inside of a carbon-tube, a carbon-tube, and a stop for preventing the holder from being moved upward to a point where the wheel will engage with the top of the carbon-tube.

In testimony whereof I have hereunto set my hand this 27th day of May, 1899.

GEORGE E. STEVENS.

Witnesses:
DUGALD MCKILLOP,
EDWARD WILLIAMS, Jr.