(No Model.)

G. L. MOYER.

ELECTRIC ARC LAMP.

No. 584,186. Patented June 8, 1897.

Fig. 1

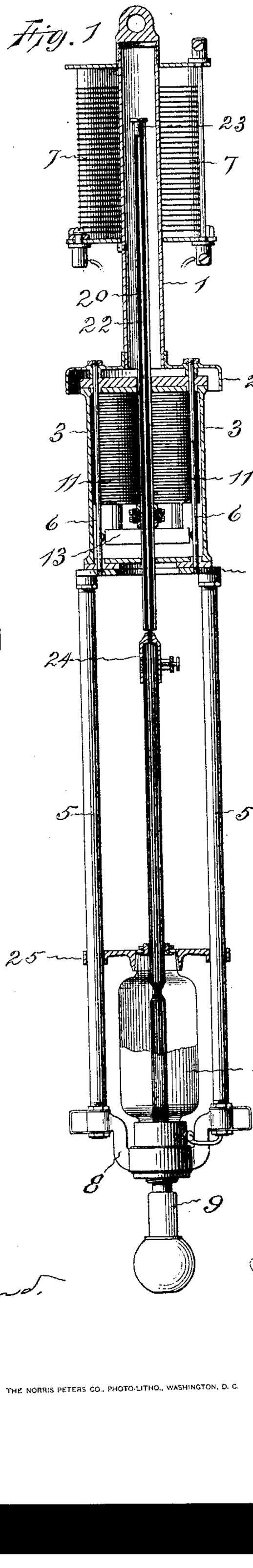


Fig. 2

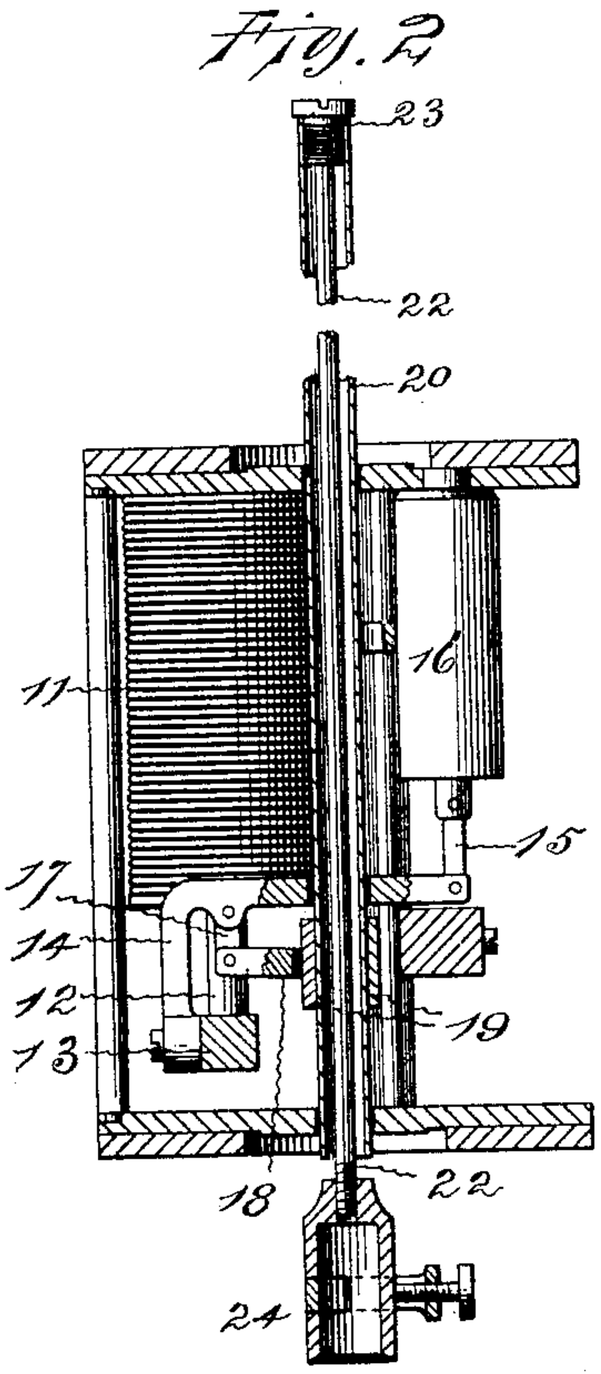


Fig. 3

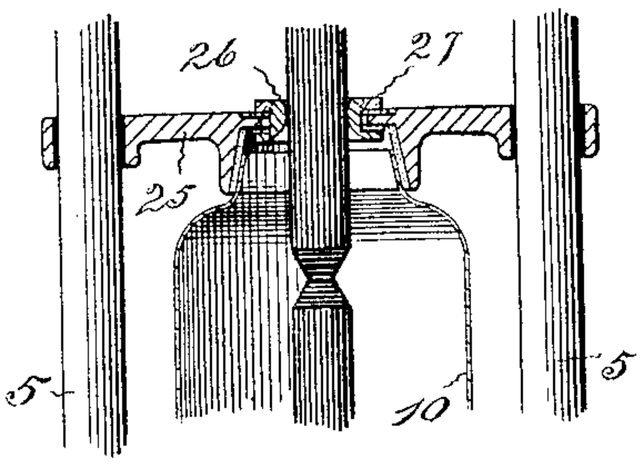


Fig. 4

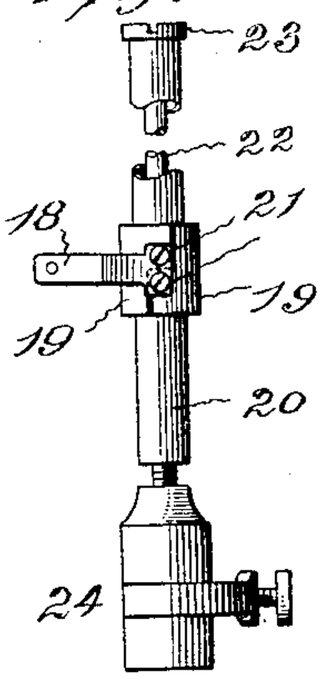
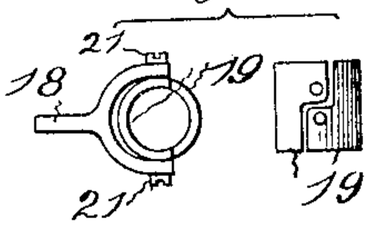


Fig. 5



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UNITED STATES PATENT OFFICE.

GILBERT L. MOYER, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE PERKINS ELECTRIC SWITCH MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 584,186, dated June 8, 1897.

Application filed January 20, 1897. Serial No. 619,900. (No model.)

To all whom it may concern:

Be it known that I, GILBERT L. MOYER, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a specification.

The invention relates more particularly to the so-called "inclosed-arc" lamps—that is, those lamps in which the arc is formed in a chamber or inner globe that is exhausted or partially exhausted of atmosphere or occupied by other gas than atmosphere, and also those lamps in which it is necessary that the arc remain stationary, as in focusing-lamps.

The object of the invention is to so hold and guide the carbons of these lamps that the carbons will assume such positions with respect to each other and so aline their points that a good arc will always be insured, even if the carbons are crooked or bent, and also to provide a clutch for the movable-carbon feed, which will act quickly with a strong firm grasp and which will permit an even and steady feed of the movable carbon.

Referring to the accompanying drawings, Figure 1 is a central sectional view of an arc-lamp provided with an embodiment of the invention. Fig. 2 is a sectional view, on larger scale, of the frame that supports the arc-striking, clutch, and upper-carbon-holder feed mechanisms. Fig. 3 is a sectional view of the guide for the point end of the upper carbon. Fig. 4 shows in side elevation the clutch and the upper-carbon-holder parts, and Fig. 5 shows details of the clutch.

In the views, 1 indicates the tubular post, by means of which the lamp shown is intended to be suspended. Connected with the lower end of this post is a cap 2. The frame 3 holds the arc-striking mechanisms, and to the plate 4 are attached the rods 5, which support the lower-carbon holder and globe-fixtures. Bolts 6 pass from the cap 2, through the frame 3, to the plate 4 for securing these parts together. Upon the post may be placed the usual resistance-coils 7 for regulating the flow of current to the lamp, and at the lower end of the rods 5 is the cross-frame 8, which is adapted to receive the lower-carbon holder 9 to hold the inner globe or arc-inclosure 10 and to support the outer globe-fixtures. Supported by the frame 3 are a pair of solenoidal magnets 11, which are connected with the lamp-circuit. The cores 12 of these magnets are attached to an armature-bar 13, bearing an arm 14, that is connected with a piston-rod 15. The piston connected with this rod is adapted to move in the cylinder 16, so as to resist any sudden and violent motion of the solenoid-cores and the armature bar and arm when the arc is being struck or the carbons are being fed. These parts are similar to and are arranged the same as the corresponding parts of the lamp set forth in my application for patent, Serial No. 609,699, filed October 22, 1896.

A link 17 connects the clutch-shank 18 with the arm 14. This clutch-shank is forked, so as to pass around to opposite sides of the clutch-blocks 19. There are two of the clutch-blocks, each being a segment of a cylinder and encircling a portion of the feed-tube 20. The ends of the fork are hinged or pivoted by studs or screws 21 to both of the clutch-blocks. The blocks are shaped so that they will fit together and the pivot-screws be one above the other, enabling one screw on each side to pass into each of the blocks.

When the solenoids are energized or the current increases and the cores are raised, the clutch-shank 18 is lifted upward by means of the arm connected with the armature-bar, and this movement of the shank tends to carry the inner of the clutch-blocks outward against the feed-tube and to carry the outer of the clutch-blocks inward against the feed-tube, causing the feed-tube to be grasped tightly between the two blocks and then lifted by the further upward movement of the parts. When the solenoids are deënergized or the magnetic strength is lessened, the cores, armature-bar, and arm drop, and this moves the clutch-shank, so as to unlock the clutch-blocks and allow the tube to feed downwardly between them until the magnetism is again sufficiently strong to cause an oscillation of the shank, which will make the clutch-blocks

again grip and prevent further feed of the tube. The oscillation of the clutch-shank so quickly tips the two clutch-blocks that the clutch-blocks act almost instantly to grasp or release the feed-tube, and when they do grasp the feed-tube the leverage is so great that the grip is very strong and firm, so that there is no danger of slip or release due to rebound incident to quick movement of the parts. This quick action and strong grip of the clutch parts enables a long arc to be readily struck and maintained with the mechanism described.

Connected with the upper end of the feed-tube 20 is the carbon-supporting rod. This rod, which is somewhat smaller in diameter than the interior diameter of the feed-tube, is shown as connected at its upper end with a screw 23, which is threaded into the end of the tube. To the lower end of this rod is connected the upper-carbon chuck 24. The chuck shown is threaded and screwed upon the end of the rod, and it has a chamber for the end of the carbon and a loop and screw for binding the carbon. With this arrangement of parts the clutch operates upon a feed-tube of considerable size that is guided in its reciprocation by the end walls of the frame that holds the arc-striking mechanisms, and the carbon firmly and evenly fed with the movement of the tube as allowed by the clutch, and yet the carbon-holder, and of course the upper end of the carbon, may have a movement from side to side, depending upon the flexibility of the rod and the difference in diameter between the rod and the walls of the feed-tube.

The upper carbon near the arc-point is guided centrally by a cross-bar 25, which is shown as extending between the rods 5, upon which it is adapted to be moved vertically to allow the removal of the inner globe. There is a socket in this cross-bar for receiving the upper end of the inner globe, and in an opening through this cross-bar is a bushing 26, which forms the guide for the carbon. This bushing is insulated from the cross-bar by washers of suitable material, and is held in place by a nut 27. The inner diameter of the bushing is preferably of a size to just receive the carbon, and the inner walls are preferably rounded somewhat to allow the carbon a slight oscillation.

If an upper carbon is crooked or bent, it will be held by the bushing of the cross-bar near its arc-point, so that the end will always be central and in line with the arc-point of the lower carbon, the flexible rod that is connected at its extreme upper end to the upper end of the feed-tube permitting of a lateral movement of the upper end of the upper carbon and thus compensating for all crookedness, bends, or like imperfections. When the lower carbon is screwed into position, its engagement with the end of the upper-carbon holder will not rotate and walk the latter off to one side, nor can the upper carbon, if crooked, burn so that it will stand out of alinement, for it is held and guided near its arc-point. The carbons in this lamp will always feed together when the arc is extinguished because the upper carbon is guided so near its point, and as the upper end of the upper carbon is free to move sidewise in any direction there is no danger that the upper carbon will bind in passing through the bushing near the point.

The carbons in a lamp constructed in this manner will always be in alinement and will burn true and evenly, and this, connected with the quick acting and firm clutch, permits a long arc to be easily struck and regularly maintained.

I claim as my invention—

1. In an arc-lamp, in combination with the arc-striking mechanism, a feed-clutch, a feed-tube engaged by the clutch, and a feed-rod connected at one end with the feed-tube and at the opposite end with a carbon-holder, substantially as specified.

2. In an arc-lamp, in combination with the arc-striking mechanism, a feed-clutch, a feed-tube engaged by the clutch, and a feed-rod of smaller diameter than and located within the tube, said rod being connected at one end with the tube and at the opposite end with a carbon-holder, substantially as specified.

3. In an arc-lamp, in combination with the arc-striking mechanism, a feed-clutch, a feed-tube engaged by the clutch, a feed-rod of smaller diameter than and located within the tube, said rod being connected at its upper end to a screw that is screwed to the upper end of the tube, and a carbon-holder connected with the lower end of the rod, substantially as specified.

4. In an arc-lamp, in combination with the arc-striking mechanism, a feed-clutch, a feed-tube engaged by the clutch, a feed-rod connected at one end with the feed-clutch and at the opposite end with a carbon-holder, and a guide adapted to engage a carbon supported by the holder, near its point, substantially as specified.

5. In an arc-lamp, in combination with the arc-striking mechanism, a feed-clutch, a feed-tube engaged by the clutch, a feed-rod connected at one end with the feed-tube and at the other end with a carbon-holder, a bushing adapted to engage and guide a carbon supported by the holder, near its point, and a cross-bar supporting the bushing, substantially as specified.

6. In an arc-lamp, in combination with the arc-striking mechanism, an armature adapted to be moved by the energizing of magnets connected with the circuit, a clutch-shank pivotally connected with the armature, and clutch-blocks that are adapted to engage opposite sides of the carbon-support, both the said clutch-blocks being loosely connected with the clutch-shank by pivot-pins that are all

substantially the same distance from the axis of oscillation of the clutch-shank whereby the oscillation of the clutch-shank in one direction causes the blocks to move directly toward each other and grasp the support and the oscillation of the clutch-shank in the opposite direction causes the blocks to move directly from each other and release the support, substantially as specified.

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