

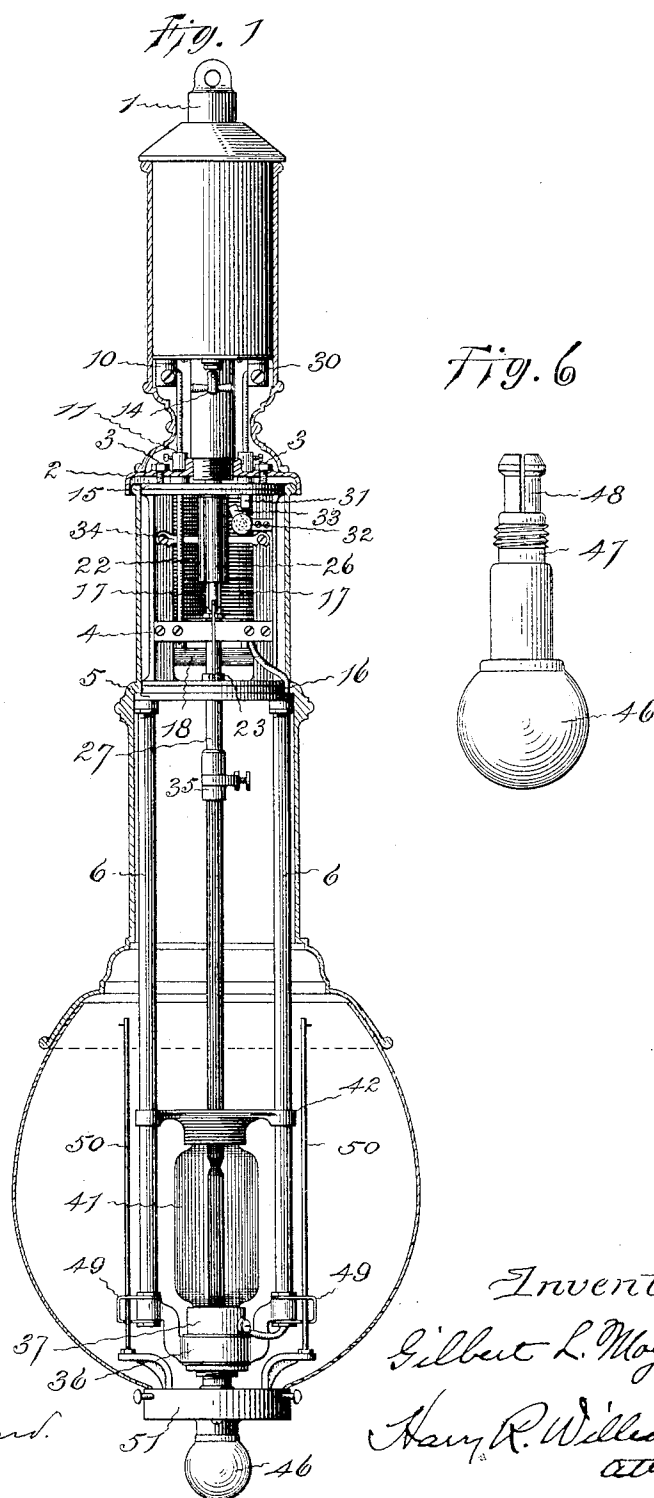
(No Model.)

2 Sheets—Sheet 1.

G. L. MOYER.
ELECTRIC ARC LAMP.

No. 584,184.

Patented June 8, 1897.



Witnesses:

E. J. Hyde.

C. E. Buckland.

Inventor:

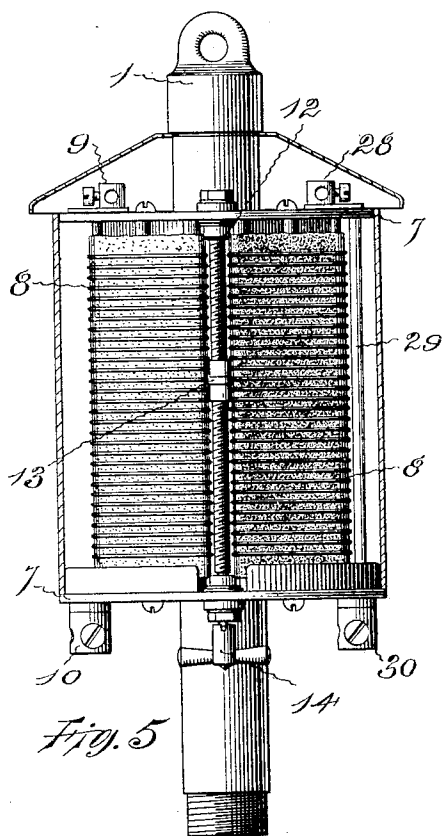
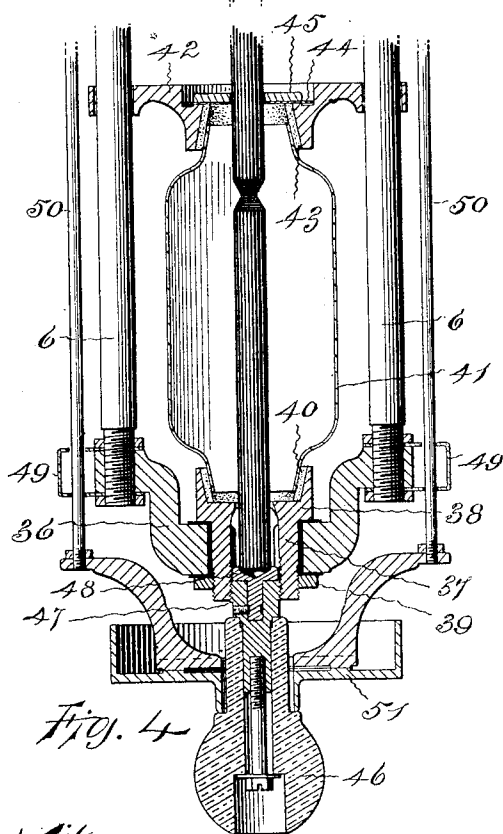
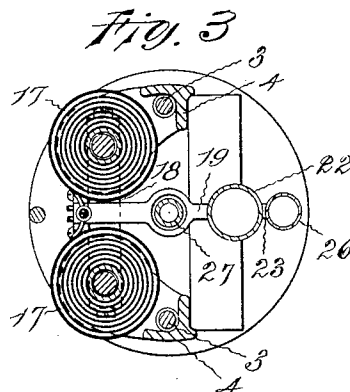
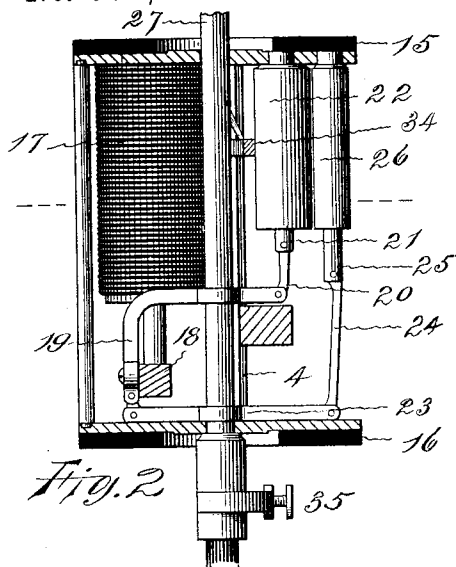
Gilbert L. Moyer

by
Harry R. Williams
att'y.

G. L. MOYER.
ELECTRIC ARC LAMP.

No. 584,184.

Patented June 8, 1897.



Witnesses:

E. J. Hyde.

C. E. Buckland.

Inventor:

Gilbert L. Moyer by
Harry R. Williams
att.

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. 584,184, dated June 8, 1897.

Application filed October 22, 1896. Serial No. 609,699. (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 those electric-arc lamps which are designed and intended to be connected in multiple with incandescent and power circuits, thereby permitting the use of the lamps singly, as is often desirable.

The object of the invention is to provide an efficient and well-insulated lamp of this class which can be quickly trimmed and easily regulated to the voltage of the circuit, so the carbons will have long life and will yield a steady light.

The invention resides in details of the construction of the lamp whereby these objects are attained in a comparatively simple and inexpensive manner, as more particularly hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, which illustrate an arc-lamp embodying the invention, Figure 1 is a side view of a lamp with the shell and outer globe cut in section, so as to expose the mechanisms. Fig. 2 is an enlarged side elevation of the arc-striking mechanisms with a portion cut away to more clearly illustrate the construction. Fig. 3 is a transverse section of these mechanisms taken on plane denoted by the broken line of Fig. 2. Fig. 4 is an enlarged vertical section of the lower part of the lamp. Fig. 5 is a side view of the resistance parts with the shell cut in section, and Fig. 6 is a detail view of the lower-carbon holder.

In the views, 1 indicates the post by means of which the lamp is intended to be suspended. This post is hollow, and connected to its lower end is a cap 2. Bolts 3 pass from this cap through the frame 4, that contains the arc-striking mechanisms, to a plate 5, that holds the rods 6, which support the lower carbon and globe fixtures, Fig. 1.

Between the plates 7, that are held by the hanger-post 1, are a number of cores wound with resistance-wire. The coils of resistance-

wire 8 are joined in series, and one end of the resistance-wire is connected with a binding-post 9, to which the negative circuit-wire is adapted to be connected, while the other end of the resistance-wire is connected with a binding-post 10, that is adapted to be connected with a binding-post 11 on the cap 2.

Loosely held by the plates 7 is a screw-threaded rod 12, and upon this is a threaded sleeve 13, that has a projecting portion adapted to make contact with the resistance-wires of two adjacent coils. Below the lower plate 7 and outside of the case that protects the resistance-coils this rod is provided with a handle 14, by means of which it may be rotated. According to the direction of rotation of the handle and rod the sleeve is raised or lowered so as to cut in or out coils of the resistance-wire and thus regulate the resistance of the lamp-circuit. It is preferred to have the coils wound in such manner and the rod threaded in such proportion that one complete rotation of the handle on the end of the rod will cause the sleeve to move sufficiently to either add or remove one ohm of resistance, Fig. 5.

On top of the frame that bears the arc-striking mechanisms is a disk 15, of insulating material, and beneath the frame is a disk 16, of insulating material. These two disks completely insulate the frame from the cap 2 above and the plate 5, that holds the rods 6 below, and also the bolts 3, that hold these parts together.

Supported by the frame 4 are a pair of solenoidal magnets 17. The coils of these magnets in the lamp shown are connected in series with the negative-wire of the lamp-circuit by a wire that passes downward from the binding-post 10, Fig. 1. The cores are connected to an armature-bar 18. Secured to this armature-bar is a bent arm 19, which is joined by means of a link 20 with a piston-rod 21. The piston connected with this rod is adapted to move in the cylinder 22, so as to resist any sudden and violent movement of the armature-bar and solenoid-cores when the lamp-current is turned on and the magnets are energized, Fig. 2.

The clutch-bar 23 is joined at one end with the armature-bar, and at the other end the

clutch-bar is joined by a link 24 with a piston-rod 25. The piston connected with this rod is adapted to move in a cylinder 26, so as to aid in resisting any sudden and violent movement of the armature-bar, and also to prevent the clutch-bar from jumping up too far by virtue of its own momentum when the magnets are energized and the arc is struck. This latter function of this piston and cylinder are the more essential, for by their employment a long arc can be quickly struck and retained. The arm 19 encircles the upper-carbon rod 27 without making contact therewith, while of course the clutch-bar engages with and lifts the rod 27 when the cores are drawn up by the magnets, Figs. 2 and 3.

When an arc is struck the upper-carbon rod is raised suddenly by the clutch, and previously the momentum of the parts when the clutch moved up would frequently be sufficient to cause the clutch to jump slightly when the lifting-armature reached the end of its movement, and this jumping so threw the clutch as to slightly release the carbon-rod and allow it to feed downward and shorten the arc, thus lessening the resistance to the current. By the use of these combined resistance devices, one connected with the armature-bar directly and the other connected with the end of the clutch-bar, the arc is struck steadily and evenly without any such upward jerk of the parts that the clutch would release and let the carbon down, so as to shorten the arc.

The positive circuit-wire is attached to the binding-post 28 on the top of the upper of the plates 7. This binding-post is connected by a rod 29 with a binding-post 30, which is connected by a wire with the contact 31, held by the upper part of the frame 4, Figs. 1 and 5.

Adapted to be turned by a handle 32, so as to engage the contact 31, is a plate 33, pivotally connected with the frame 4, and supported by the frame is a metallic bar 34, that bears brushes which make contact with the upper-carbon rod, which bears any common form of chuck 35 for retaining the carbon, Figs. 1 and 2. When the handle is turned so the plate 33 engages the contact 31, current passes through these parts to the upper-carbon rod and carbon.

Secured to the lower ends of the rods 6 is a piece 36, and supported by this is a sleeve 37. This sleeve is insulated by suitable material from the cross-piece, and it is held by its enlarged head 38 at one end and a nut 39 at the other end. Placed in a socket in the enlarged head of this sleeve is a tapering bushing 40, of soft asbestos or similar heat and electrical non-conducting material, that will pack and make a tight joint with the tapering lower end of the inner globe 41 without causing the globe to be cracked when expanded by the heat of the arc, Fig. 4.

Held so as to slide upon the rods and adapted to retain the upper end of the inner globe is

a piece 42. In a socket in this piece is placed a tapering bushing 43, of soft asbestos or of similar non-conducting material, that will pack the upper tapering end of the globe. In order to close the opening at the top of the globe and form a comparatively tight joint about the upper movable carbon and allow the ready outflow of gas from the inner globe, a washer 44, of sheet-mica or similar material, is located in a recess in this piece 42, and upon this is placed a washer 45, of metal, that is made to fit the carbon comparatively closely and hold the insulating-washer down to place, Fig. 4.

The upper end of the perforation through the sleeve 37 is made tapering from the larger diameter of the perforation to about the diameter of the lower carbon, and a portion of the lower end of this perforation is provided with a thread. The end of the lower carbon-holder is provided with a knob 46, of insulating material, and this knob is connected by suitable means with a part 47, provided with a thread that is adapted to be screwed into and out of the threaded lower part of the perforation through the sleeve 37. Connected with this part 47 is a socketed part 48, adapted to receive the end of the lower carbon. This part 48 is preferably connected with the part 47, so that the latter part may be screwed into or out of the sleeve without rotating the former, the end of which is slitted to allow yielding and made tapering. When the latter part is screwed into the sleeve, the slitted tapering end of the part 48 engages with the tapering end of the perforation through the sleeve and is closed so as to grasp the end of the carbon, Figs. 4 and 6.

Guided by brackets 49, supported by the lower ends of the rods 6, are the outer globe-holder wires 50. Connected with the lower ends of these wires is a globe-holder plate 51 of common construction.

The negative wire passes from one of the solenoids down through one of the rods 6 to the sleeve 37, and thence to the lower-carbon holder and carbon.

When the lamp is to be trimmed, the lower-carbon holder is unscrewed and taken out. The removal of this allows the outer globe-holder with its globe to be lowered down. The upper carbon is then readily placed in position and secured to the upper rod. The lower carbon is then placed in the holder, and when the globe is lifted this holder is readily secured in place by a few turns, so that the lower carbon is in position for use and the outer globe retained in place.

A shell of any desired ornamentation is placed outside of the mechanisms above the outer globe for protection.

The removal of the lower-carbon holder frees the lower globe-fixture, so that the interior can be readily reached for trimming. The upper carbon is thrust up through the bottom and secured in place and then the lower-carbon holder is secured in place. The

arrangement shown for holding the inner globe insures a tight inner chamber for the inclosed arc without danger of the inner globes becoming broken when heated. The insulated movable valve at the top of the inner globe allows air to escape from the inner globe when the arc is struck. The combined dash-pot resistance for controlling both the movement of the solenoid-armature and the movement of the clutch insures the establishment of a long arc at once. The location of the insulating-disks in a simple manner thoroughly insulates the frame parts that are in circuit from all other parts of the lamp, and the adjustment provided allows the resistance to be regulated at will for any change of voltage of the circuit without necessitating the removal or exposure of any of the lamp or resistance parts.

Lamps embodying this simple and efficient construction burn, as a result of these features, with a long steady arc and have an extended life.

I claim as my invention—

1. In an arc-lamp, in combination, a magnet connected with the circuit-wires, an armature for the magnet, a piston connected with the armature and movable in a cylinder, a clutch connected with the armature and adapted to engage with and move the upper-carbon rod, and a piston connected with the clutch and movable in a cylinder, substantially as specified.

2. In an arc-lamp, in combination, supporting-rods, a socket-piece supported by the rods for receiving and holding the lower end of the inner globe, a socket-piece supported by the rods for receiving and holding the upper end of the inner globe, and washers of soft non-conducting material with tapering inner openings secured in the socket-pieces for packing the upper and lower ends of the inner globe, substantially as specified.

3. In an arc-lamp, in combination, supporting-rods, a socket-piece supported by the rods for receiving and holding the lower end of the inner globe, a socket-piece supported by the rods for receiving and holding the upper end of the inner globe, an insulating-disk loosely resting in a recess in the upper socket-piece, and a disk of metal loosely lying upon the insulating-disk, said disks being perforated for the passage of the upper carbon, substantially as specified.

4. In an arc-lamp, in combination, supporting-rods, a cross-piece connecting the lower ends of the rods, a part with a threaded socket held by the cross-piece, a lower-carbon holder having an outer end of insulating material and an inner recessed end of conducting material, said carbon-holder being provided with a screw-thread adapted to fit the thread in the socket and having a supporting-shoulder, and a globe-holder plate supported by the shoulder, substantially as specified.

5. In an arc-lamp, in combination, supporting-rods, a cross-piece connecting the lower ends of the rods, a part with a threaded socket held by the cross-piece, said socket having a portion of its wall formed tapering, a lower-carbon holder adapted to be screwed into the threaded socket and bearing a loose conducting-piece that has its inner end provided with a recess capable of being contracted and also having a tapering shoulder adapted to engage with the tapering wall of the socket, said lower-carbon holder being provided with a supporting-shoulder, and a globe-holder plate supported by the shoulder on the lower-carbon holder, substantially as specified.

GILBERT L. MOYER.

Witnesses:

H. R. WILLIAMS,
E. J. HYDE.