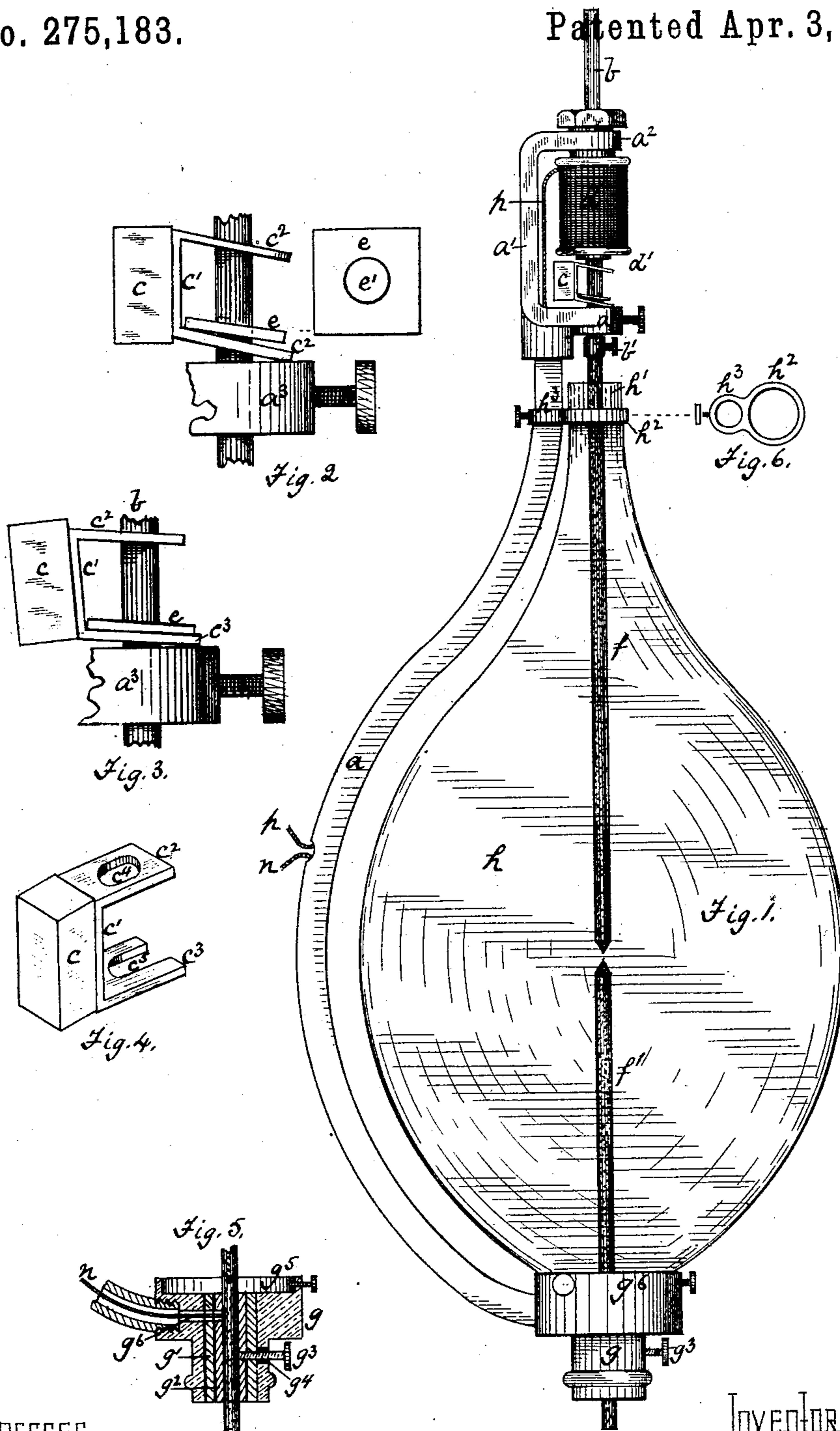


(No Model.)

J. R. FINNEY.  
ELECTRIC ARC LAMP.

No. 275,183.

Patented Apr. 3, 1883.



Witnesses.

Geo. K. Smith  
Robt. J. Sample.

Inventor.

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by his attys  
Bakewell & Kern

# UNITED STATES PATENT OFFICE.

JOSEPH R. FINNEY, OF PITTSBURG, PA., ASSIGNOR TO THE FINNEY ELECTRIC LIGHT AND TELEGRAPH COMPANY, (LIMITED,) OF SAME PLACE.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 275,183, dated April 2, 1883.

Application filed January 15, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH R. FINNEY, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric-Arc Lamps; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of my improved electric-arc lamp. Figs. 2, 3, 4, 5, and 6 are detail views.

Like letters of reference indicate like parts in each.

The drawings show my invention as applied to a bracket-lamp.

The frame *a* is a tube of any suitable material, bent to the proper form, and at its upper end is provided with a head, *a'*, having laterally-projecting arms or sleeves *a<sup>2</sup> a<sup>3</sup>*, which are bored for the passage of the feed-rod *b*. Attached to the arm *a<sup>2</sup>* is an electro-magnet, *d*, having a hollow core, *d'*. Between the lower end of the magnet *d* and the arm *a<sup>3</sup>*, and situated at one side of the feed-rod *b* and beyond the vertical plane of the outside of the core *d'*, is an armature, *c*, which is secured to a plate, *c'*, of brass or other diamagnetic metal, having diagonally-projecting ends *c<sup>2</sup> c<sup>3</sup>*. The ends *c<sup>2</sup> c<sup>3</sup>* are provided with oblong slots *c<sup>4</sup>* and *c<sup>5</sup>*, through which, when the device is in place on the lamp, the feed-rod *b* extends. Lying on the lower plate, *c<sup>3</sup>*, is a washer, *e*, having a central hole or opening, *e'*, through which the feed-rod *b* extends. The rod *b* is fitted with a socket, *b'*, for the attachment of the upper carbon or electrode, *f*. On the lower end of the arm *a* is a sleeve, *g*, lined with an insulating-tube, *g'*, which in turn is lined with a brass tube, *g<sup>2</sup>*.

The lower carbon, *f'*, passes up through the tube *g<sup>2</sup>*, and is secured in place by a set-screw, *g<sup>3</sup>*, which is insulated from the sleeve *g* by a suitable insulating-collar, *g<sup>4</sup>*. The sleeve *g* is provided with a shade-holder, *g<sup>5</sup>*, in which the chimney-shape glass shade *h* is secured. This shade is made with a straight tubular neck, *h'*, and at the upper end passes loosely through a collar or ring, *h<sup>2</sup>*, which is secured by a suitable sleeve, *h<sup>3</sup>*, to the frame *a*. When it is desired to take the shade off, it may be done by removing the electrodes and raising the shade

through the collar *h<sup>2</sup>* until its lower end clears the holder *g<sup>5</sup>*. Then by turning the lower end outward it may be drawn down out of the collar *h<sup>2</sup>*. This form of shade has a narrow mouth, and protects the lamp more thoroughly than other forms known to me which have heretofore been in use. The devices by which it is secured in place are simple, cheap, and hold it firmly and without pressure in its proper position. The circuit-wires *p* and *n* are preferably led through the hollow frame, entering at the hole *a<sup>4</sup>*, one passing up to the head *a'*, where, being coiled around the shell or spool *d<sup>2</sup>*, it forms part of the electro-magnet *d*. The other wire, *n*, extends down through the frame to the sleeve *g*, where it passes through a hole, *g<sup>6</sup>*, and is secured in contact with the tube *g<sup>2</sup>*. The wires *p* and *n* are suitably covered with an insulating substance or fabric.

Thus constructed, my improved lamp operates as follows: The circuit is from the machine or other generator of electricity by wire *p*, electro-magnet *d*, core *d'*, rod *b*, electrodes *f f'*, and wire *n*, back to the machine. When there is no current through the lamp the armature *c* stands in the position shown in Fig. 3, with the washer *e* lying flat upon it; but when the circuit is closed the core *d'*, being magnetized to the passage of the current through the magnet-coils, draws the armature into the position shown in Fig. 2. As the upper end of the armature swings in toward the rod *b* the lower end swings out and the plate *c<sup>3</sup>* slips outward on the upper face of the arm *a<sup>4</sup>* and assumes a more angling position with relation thereto. The washer *e*, which, when in the position shown in Fig. 3, permits the rod *b* to slide freely through it, now being tipped slightly, first catches on the rod, and then as the plate *a<sup>4</sup>* becomes more angling is raised thereby and carries the rod *b* up with it. Ordinarily this movement will separate the carbons sufficiently to form the required arc. There is a space, *i'*, between the upper end of the armature and the lower end of the magnet-core, which, if a longer arc than can be economically given by the radial movement of the armature, can be obtained by an axial movement imparted to the armature by the upward attraction of the magnet. The rod *b*, being held by the washer *e*, will then be carried up by the armature, and

thus the distance between the points of the electrodes will be increased and a longer arc obtained. When the points burn off to such an extent as to weaken the magnetism of the core the armature falls sufficiently to permit the rod to slip through the washer and again restore the full strength of the current.

The plate  $c^2$  is for the purpose of preventing the armature  $c$  from falling too far from the magnet, so that it shall always be within the range of the power of the magnet. The slot  $c^4$  is of sufficient length to permit the proper radial movement of the armature. The arm  $a^3$  of the head  $a'$  supports the lower end,  $c^3$ , of the armature-frame. The head  $a'$  is a casting, and is screwed onto the frame  $a$ . It is a light and cheap fitting, and affords the means of supporting the magnet  $d$  and armature  $c$  and of guiding the feed-rod  $b$ . It may also be used for sustaining a cap or case to cover the upper works of the lamp. The slot  $c^5$  is long enough to permit the plate  $c^2$  to slide outward when the upper end of armature  $c$  is drawn inward by the magnet.

The feeding device I have just described is extremely delicate and sensitive in its oper-

tion, and produces a steady and continuous feed, so that the lamp is remarkably free from those pulsations or variations of light which are so commonly found in arc-lamps.

My improved lamp is free from complicated devices, and is consequently cheap in manufacture, and requires but comparatively little attention in use.

What I claim is—

In an electric-arc lamp, the combination of a hollow electro-magnet through which the feed-rod passes, and a pivoted armature arranged at the side of the feed-rod beyond the vertical plane of the core of the magnet, and supported on the frame by slotted laterally-projecting plates encircling the feed-rod, with the feed-rod, and a clamping-washer resting on one of the lateral plates of the armature and actuated thereby, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 10th day of January, A. D. 1883.

JOSEPH R. FINNEY.

Witnesses:

W. B. CORWIN,  
T. B. KERR.