(No Model.)

# J. R. FINNEY.

## ELECTRIC ARC LAMP.

No. 275,182. Patented Apr. 3, 1883.

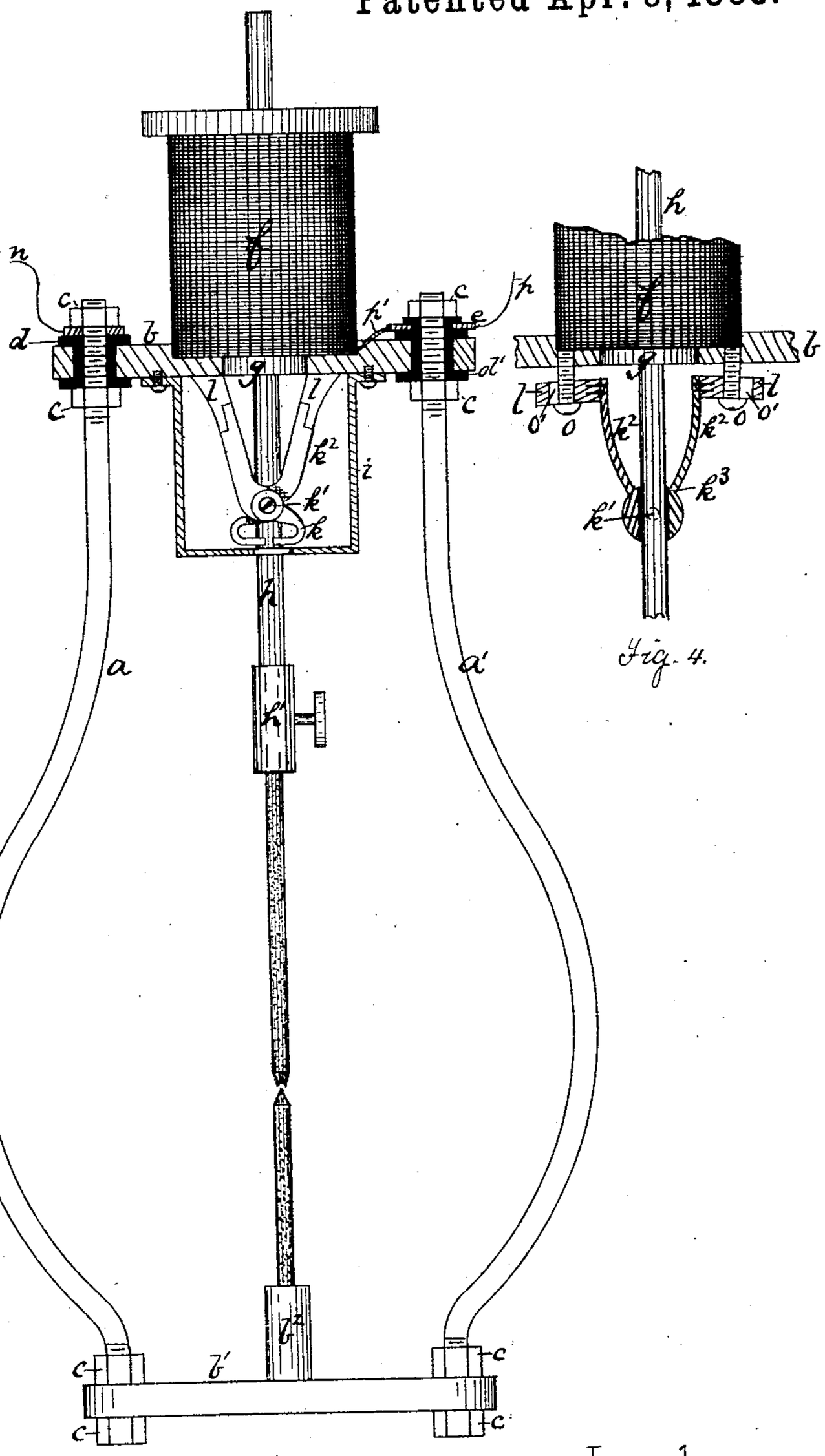

Fig. 1.

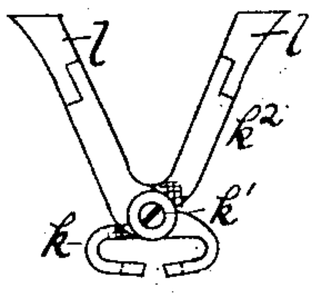

Fig. 2.

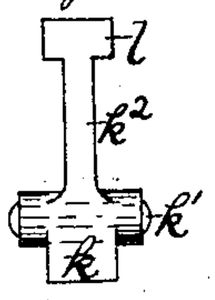

Fig. 3.



Fig. 4.

Witnesses
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by his attys.
Bakewell & Kerr

# 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. 275,182, dated April 3, 1883.

Application filed October 24, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH R. FINNEY, of Pittsburg, 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 an elevation of my improved electric-arc lamp, partly in section. Fig. 2 is a detached view of the carbon-feed-rod holder. Fig. 3 is an edge view. Fig. 4 is a view of a modified form.

Like letters of reference indicate like parts in each.

The lamp-frame is composed of two side bars, *a a'*, and two cross-heads, *b b'*. The side bars are secured to the cross-heads by means of nuts *c*. The cross-head *b* is insulated from the arm *a* by means of a collar, *d*, of insulating material, which is provided with flanges which extend between the nuts and the head. The side bar *a'* is insulated from the cross-head *b* by the insulating-collar *d'*. Placed around the collar *d'* is a ring, *e*, of insulating material, to which one of the circuit-wires, *p*, is attached. Sustained on the cross-head *b* is an electro-magnet, *f*, having a core, *g*, which is bored longitudinally for the passage of the carbon-feed rod *h*, the bore being of sufficient size to permit the rod to slide freely through the core. Secured on the under side of the cross-head *b* is a frame or stirrup, *i*, which is also bored for the passage of the feed-rod *h*. Supported on the frame *i* is a feed-rod holder, *k*, which consists of two jaws pivoted together at *k'*, and recessed at their lower ends for the passage of the rod. The jaws have arms $k^2$, which extend upward, and at their upper ends are fastened to iron armatures *l*, which project out beyond the lower edges of the core *g*. The arms $k^2$ have a slight radial movement, which is limited by the stirrup *i*, and is sufficient to enable them to swing outwardly far enough to release the feed-rod when the core *g* is demagnetized, but not far enough to go beyond the attractive power of the magnet. The lower carbon is secured in a suitable socket, $b^2$. The upper carbon is secured in a socket, *h'*, on the lower end of the feed-rod *h*. The head *b* is formed of a diamagnetic metal. The magnet *f* is formed by wrapping the core with the wire *p'*, which extends from the ring *e*. The end of the wire *p'* terminates at the core. The wire *n* is connected to the rod *a*. The current passes by the wire *p*, ring *e*, wire *p'*, and rod *h* to the upper carbon. The connection between the wire *n* and the lower carbon is through the rod *a*, lower cross-head, *b'*, and carbon-holder $b^2$. When the circuit is closed the armatures *l* on the ends of the arms $k^2$ are first drawn inward until the jaws *k* bite on the feed-rod *h*, and then the armatures are drawn upward to the core *g*, raising the rod with the upper carbon and establishing the arc. When by the burning off of the points the resistance increases the magnetism of the core *g* decreases until the core loses its hold on the armatures, which fall downward and outward and permit the sliding rod to fall until the carbon points come together again. This establishes the circuit, increases the magnetism of the core, draws up the armatures, and by that means raises the rod and again establishes the arc.

In Fig. 4 I show a modification in which the lower jaws, *k*, are done away with, and the holder is caused to bite on the rod at the points $k^3$. In this case the stirrup *i* is done away with, and the holder *k* is sustained by means of the screws *o*, which extend down from the cross-head *a* through slots *o'* in the armatures. These slots permit the radial movement of the armatures, so as to admit of the jaws $k^3$ biting on the rod, as described.

My improved lamp is simple and cheap in its construction, requires but little attention to keep it in order, and feeds with great smoothness.

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

1. The combination, in an electric-arc lamp, of an electro-magnet, a cross-jaw, detached gripping device, the outer ends of the jaws being provided with armatures capable of a radial and axial movement, and a bracket for sustaining and limiting the motion of the gripper, substantially as and for the purpose specified.

2. The combination, in an electric-arc lamp, of a vertically-arranged annular electro-magnet and a pair of gripping-jaws pivoted together and arranged in a vertical plane bisecting the magnet, each jaw having a separate armature fastened to its outer end, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 23d day of October, A. D. 1882.

JOSEPH R. FINNEY.

Witnesses:
W. B. CORWIN,
T. B. KERR.