(No Model.) 2 Sheets—Sheet 1.

E. A. EDWARDS.

ELECTRIC ARC LAMP.

No. 275,174. Patented Apr. 3, 1883.

Fig. 1.

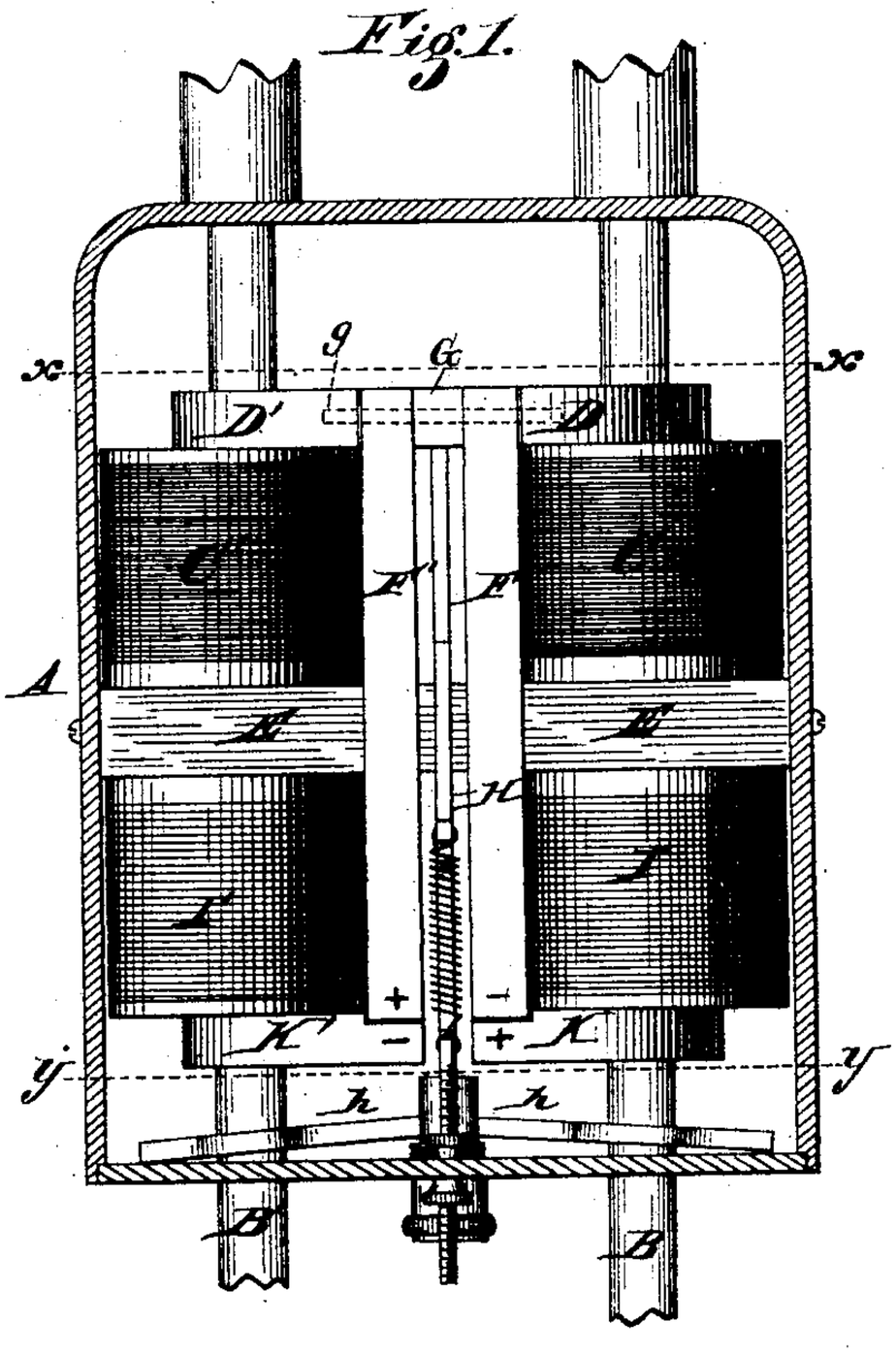


Fig. 2.

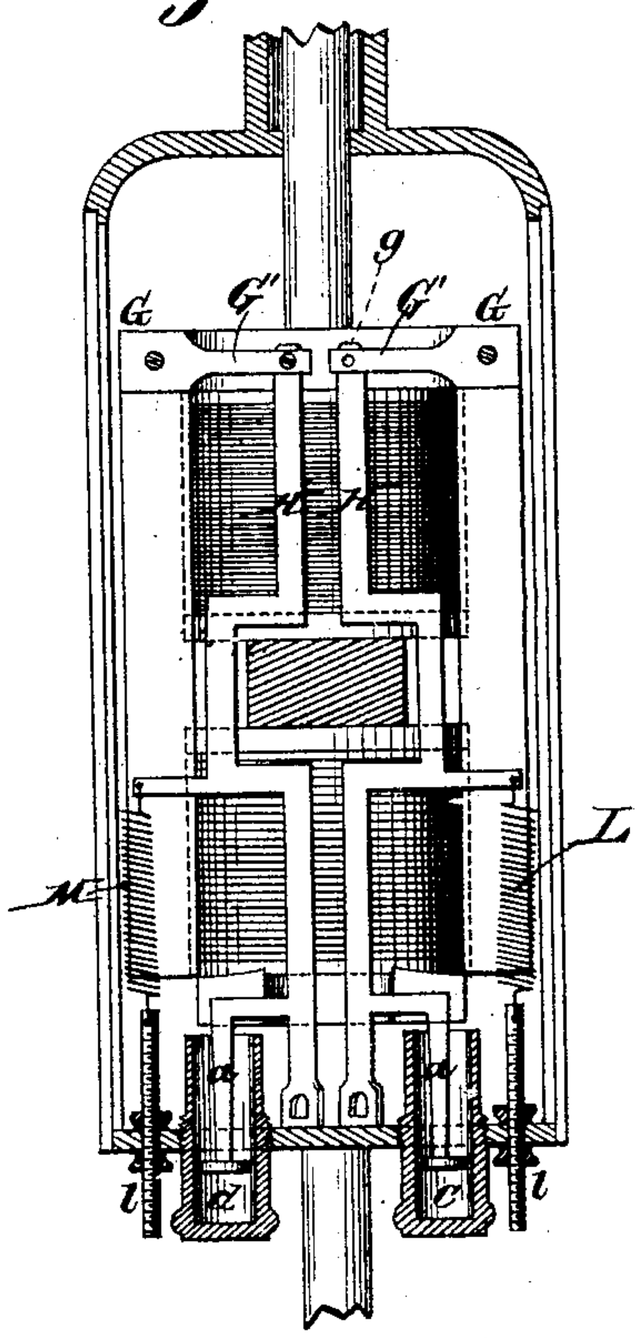


Fig. 3.

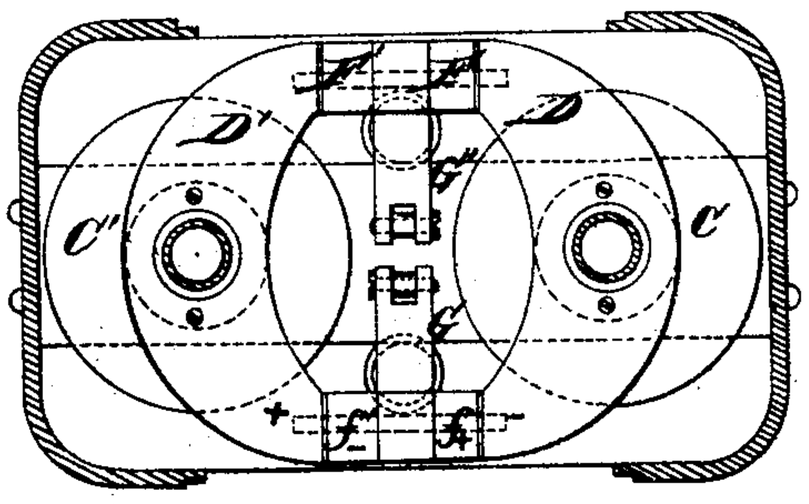
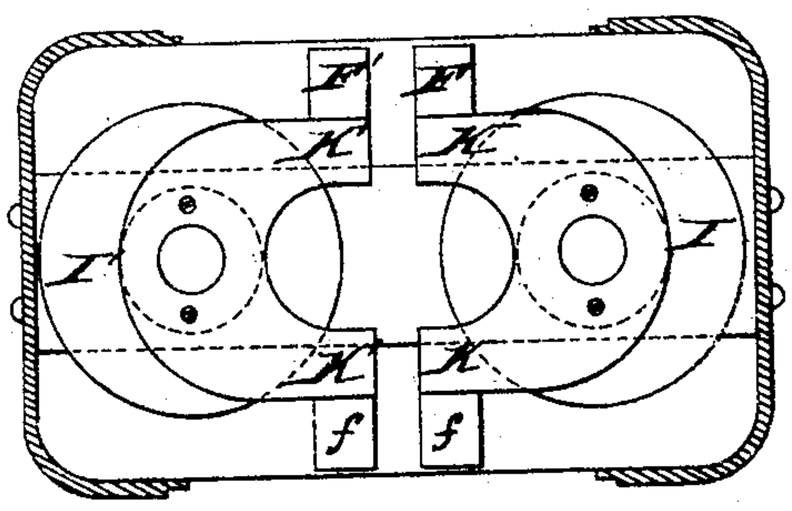


Fig. 4.



Attest,
Jno. E. Wiles.
A. Gluchowsky.

Inventor,
Edgar A. Edwards
by Wood & Boyd
his Attorneys &c.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

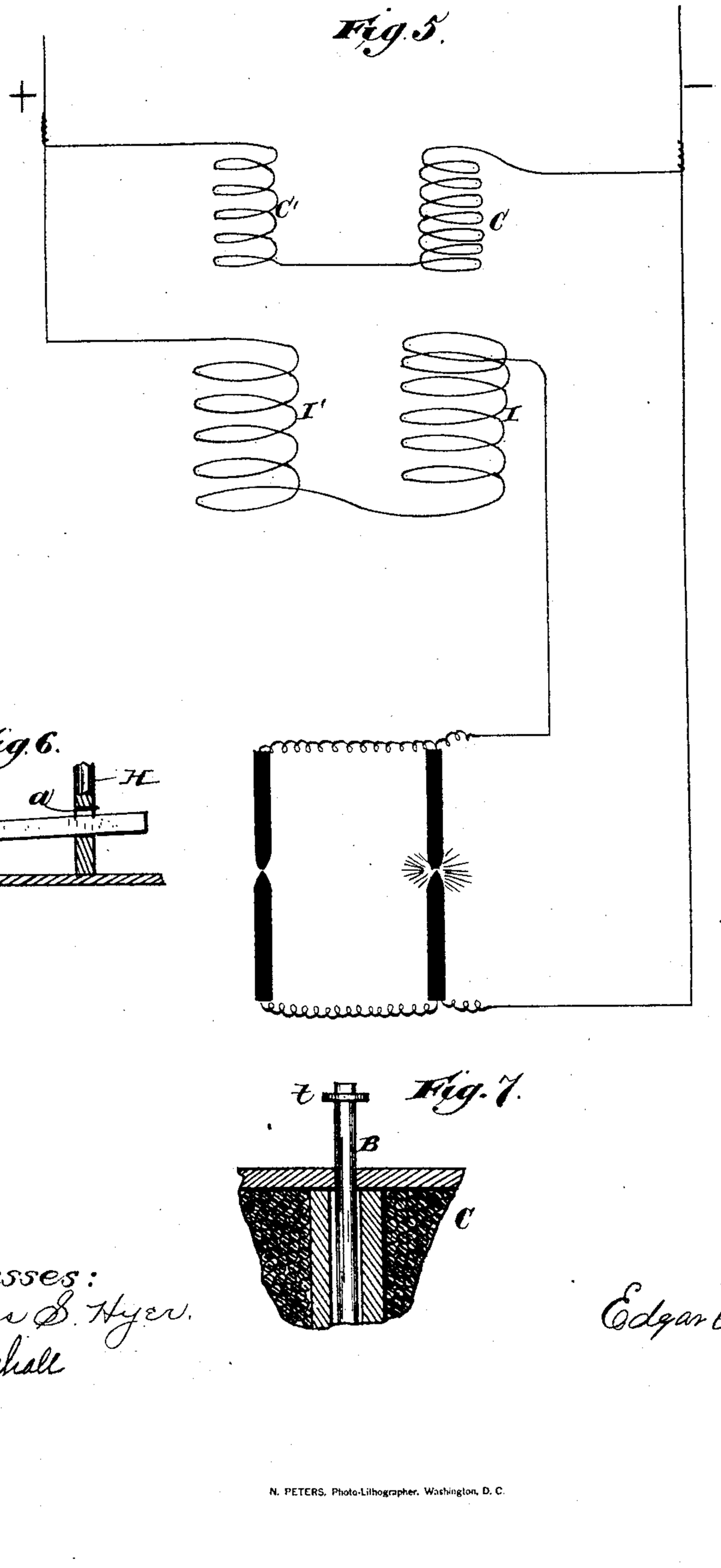

Fig. 6.

Fig. 7.

Witnesses:
Charles S. Hyer.
Wm Gottschall

Inventor.
Edgar A. Edwards

UNITED STATES PATENT OFFICE.

EDGAR A. EDWARDS, OF CINCINNATI, ASSIGNOR TO OSCAR M. GOTTSCHALL, TRUSTEE, OF DAYTON, OHIO.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 275,174, dated April 3, 1883.

Application filed March 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDGAR A. EDWARDS, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Electric Lights, of which the following is a specification.

My invention relates to an improvement in electric lamps of the arc type.

The object of my invention is to produce a more sensitive adjusting carbon mechanism, which is accomplished by pivoting one or more duplex armatures to the poles of the shunt-magnet, with the free end of said armature placed adjacent to the poles of the principal magnet, and in such relation as to be attracted toward said principal poles by the developing of magnetism in the principal coils, and to be moved in the opposite direction by the neutralization of magnetism in the said duplex armature, caused by shunting a portion of the current through the shunt-coils. The same mechanical result will be produced by reversing the position of the coils and pivoting the armature to the poles of the principal instead of the shunt.

Figure 1 represents a front elevation of my improvement as employed in a double lamp. Fig. 2 represents a transverse elevation. Fig. 3 is a section on line *x x*, Fig. 1. Fig. 4 is a section on line *y y*, Fig. 1. Fig. 5 is a diagram of the lamp-connection, showing the sets of carbons in multiple-arc circuit. Fig. 6 is a broken central section of one of the magnets, showing the stop on the carbon-rod. Fig. 7 is a sectional elevation of the clutch-lever, showing its loose connection with the lifting-rod.

A represents the ordinary case; B B′, upper-carbon rods; C C′, coils of shunt-magnet; D D′, polar extensions, which are preferably made of arcs of a circle, and are magnetically connected to the cores of magnet C C′.

E represents a soft-iron yoke connecting the limbs C C′ of the magnet.

F F represent an armature, made of two pieces of soft iron diamagnetically insulated from each other, but connected rigidly together and pivoted to poles D D′, as shown in Fig. 1, G representing the said diamagnetic material. It is preferably employed as a lifting-arm, G′, *g* representing its pivotal connection with the lifting clutch-rod H. It is rigidly connected to the pieces F F′, forming with them a compound armature. *g* represents this axial connection to polar projection D D′.

f f′ represent limbs of a similar duplex armature on the opposite side for controlling the other carbon-holder. This armature *f f′* is connected to the polar projection D D′ in a similar manner as the armature F F′, as shown in Fig. 3, but to the opposite ends of said polar projections. G′ is the lifting-arm attached to said armature; H′, the connecting clutch-rod pivoted to arm G′.

I I′ represent coils of a two-limbed principal magnet, which are wound of coarse wire. They are shown connected to the neutral yoke E. Each magnet may, however, have a separate neutral yoke.

K K′ represent polar projections, suitably connected to the cores of coils I I′. They project inwardly toward each other and their upper surface slightly below the horizontal plane of the lower end of the armature, so as to allow the armatures to swing vertically over them.

The clutch-rods H H′ are shown as bent around the neutral yoke E. The lower ends of said connecting-rods rest upon the bottom of case A and serve as stops to limit the movement of the armatures.

h h′ represent the clutches, the forward arms of which loosely rest in the openings in the lower ends of rods H H′, as shown at *a*, Fig. 7. Any form of clutch may, however, be used.

c d represent dash-pots, and *a a* plunger-rods, connected to rods H H′.

L represents a retractile spring, one end of which is connected to adjusting-screw *l* and the other to an arm on the connecting-rod H.

M is a similar spring attached to rod H′.

The operation of my adjusting device is as follows: The retractile springs are adjusted so as to hold the armatures in a vertical position. The ends of rods H H′ rest upon the bottom of the case, as shown in Fig. 2. The armatures occupy the relation to the polar projections K K′ as shown in Figs. 1 and 4, and when used in a double lamp the retractile springs are adjusted so that one will have a

lesser retractile force than the other. When the current is passed through the lamp the magnetism developed by the coils I I′ attracts the duplex armature or armatures, raising the lifting-arms G′, and with them the connecting-rods H H′, elevating the clutches and upper carbon forming the separation. An increased resistance in the circuit, caused by burning away of the carbon, shunts a corresponding portion of the current through the coils C C′, developing magnetism in the cores thereof, which neutralizes in the duplex armatures a corresponding amount of magnetism, developed by the principal magnet, causing the armature or armatures to move outwardly toward its normal position, lessening the grasp of the clutch, and thus readjusting the carbon-holder.

It will be seen that either one of said compound armatures *f f′* or F F′ and its connecting clutch-regulating mechanism may be removed, and the remaining armature and regulating mechanism would operate one set of carbons.

I do not desire to limit myself to the exact form of polar projections herein described, as various incidental modifications could be made without departing from the claim herein.

What I claim as my invention is—

1. In an electric-arc lamp, the combination of a two-limbed principal and a two-limbed shunt magnet, one or more pendulous armatures, composed of two pieces of soft iron diamagnetically connected together and pivoted at one end to the poles of one of said magnets, and the free end in close proximity to the poles of the other magnet, substantially as described.

2. In an electric-arc lamp, the combination of a two-limbed principal and a two-limbed shunt magnet, one or more pendulous armatures, composed of two pieces of soft iron diamagnetically connected together and pivoted at one end to the poles of one of said magnets, and the free end in close proximity to the poles of the other magnet, the lifting-arm, connecting-rod, and clutch mechanism, substantially as described.

3. In an electric lamp, the combination of a two-limbed principal magnet, having polar projections K K′, attached to the respective limbs of said magnets opposite each other, a shunt-magnet with polar projections D D′, and one or more compound armatures pivoted to the polar projections of the shunt-magnet, its free end in close proximity to the poles of the principal magnet, substantially as described.

4. In an electric lamp, the combination of a two-limbed principal and a two-limbed shunt magnet, each of said magnets having U-shaped polar projections, and one or more compound armatures pivoted to one set of polar projections, and the free ends in close proximity to the polar projections of the other magnet, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDGAR A. EDWARDS.

Witnesses:
JNO. E. JONES,
ADOLPH GLUCHOWSKY.