

(No Model.)

2 Sheets—Sheet 1.

R. BUCKER.
ELECTRIC ARC LAMP.

No. 285,107.

Patented Sept. 18, 1883.

Fig. 1.

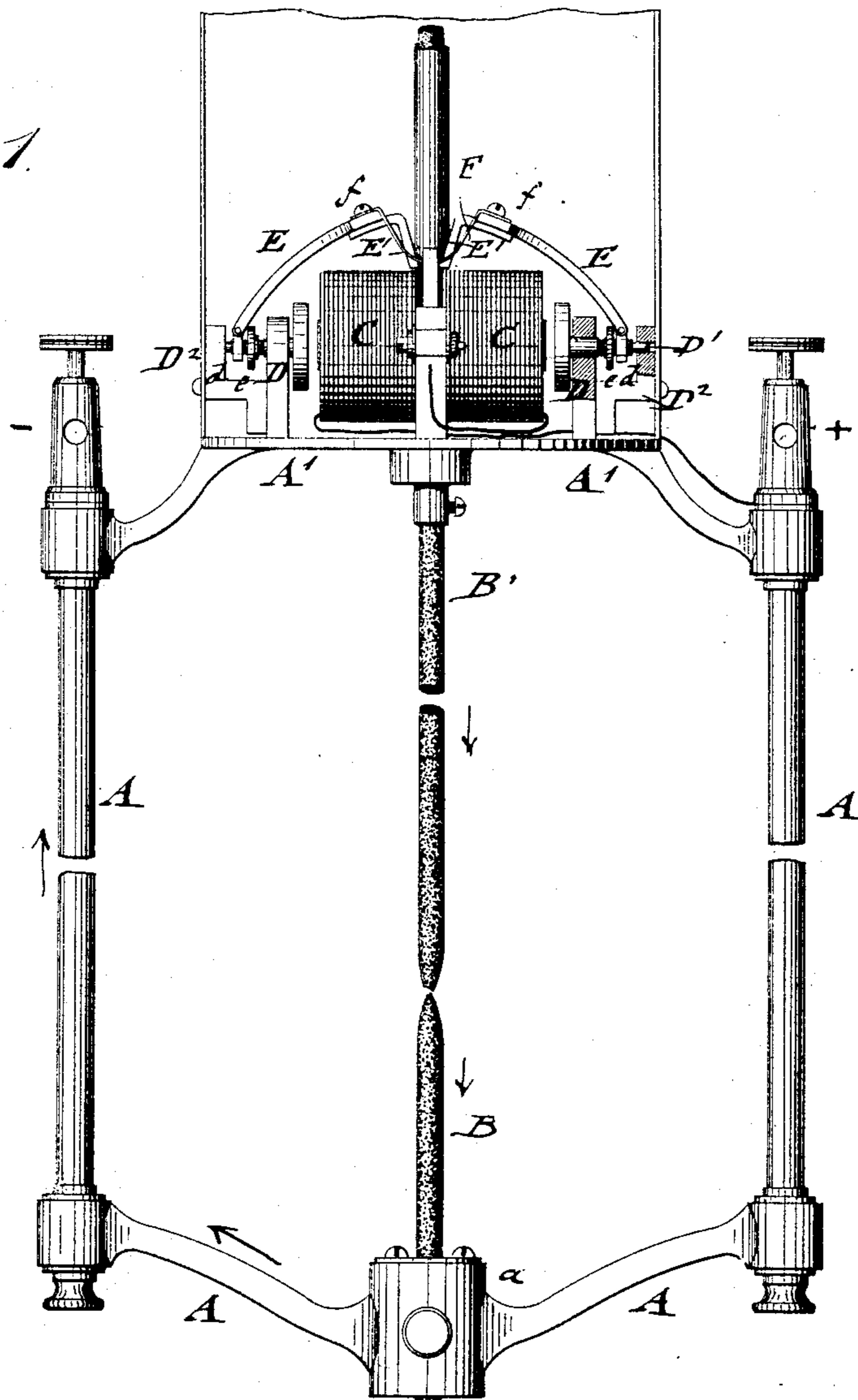
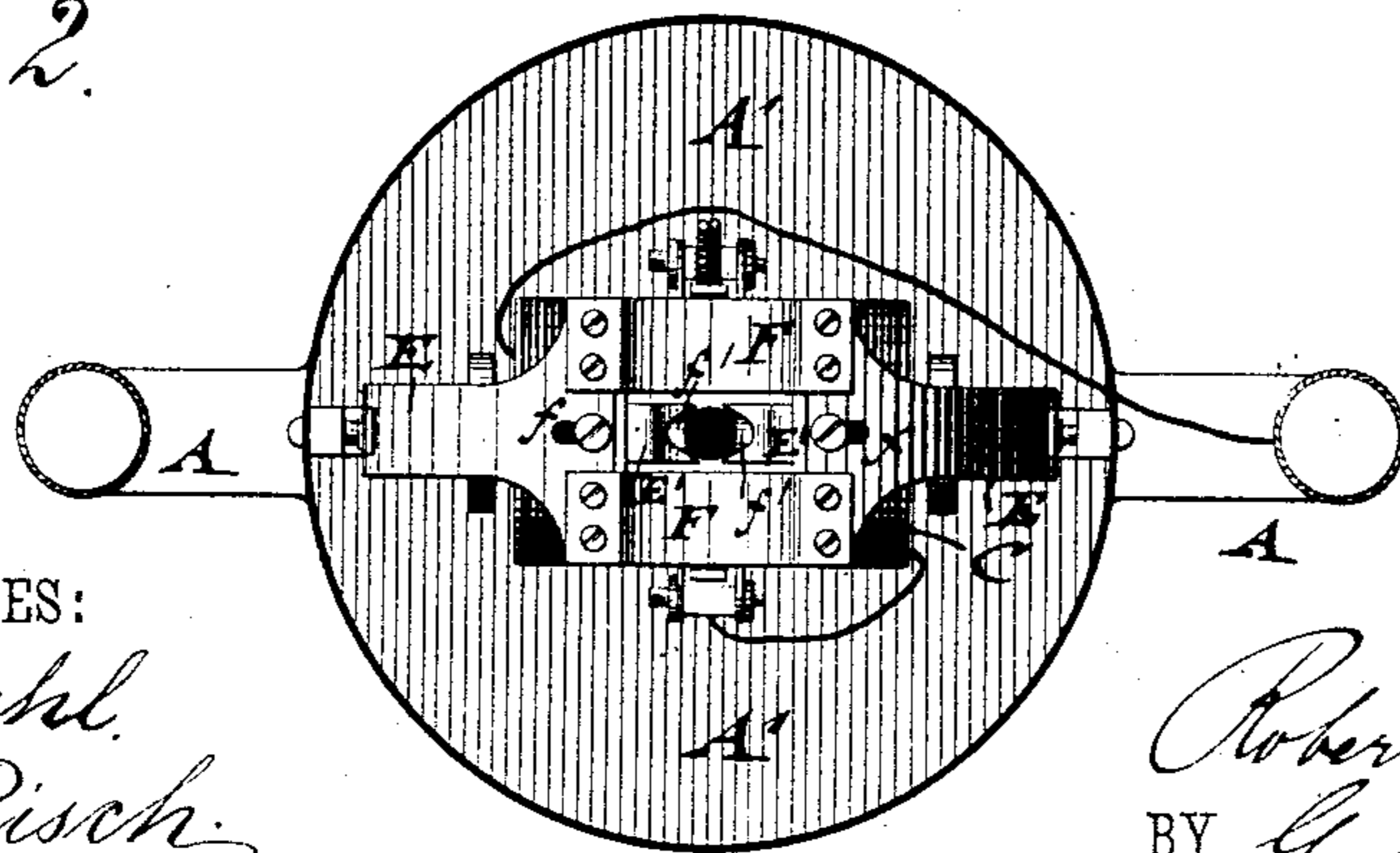


Fig. 2.



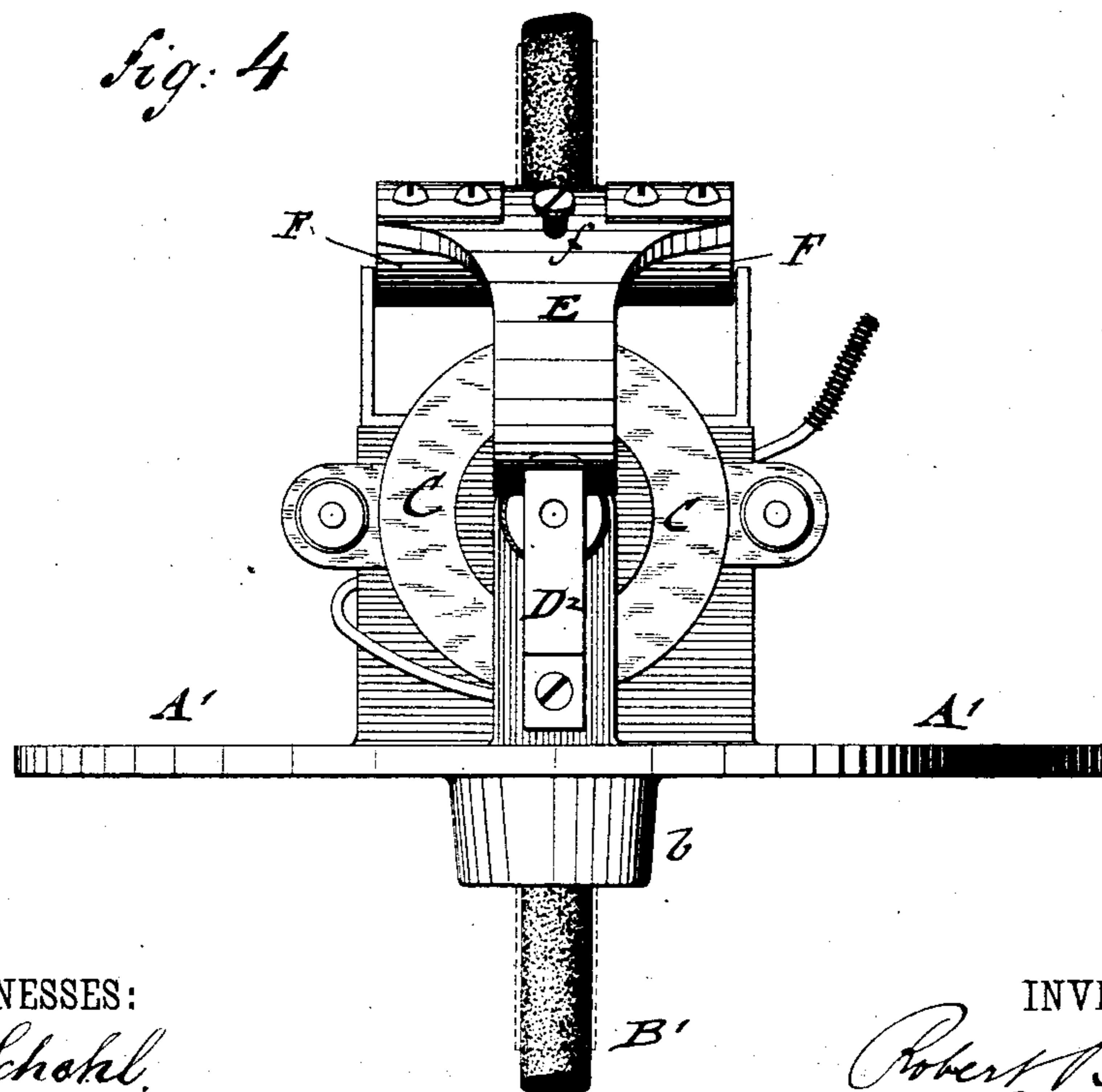
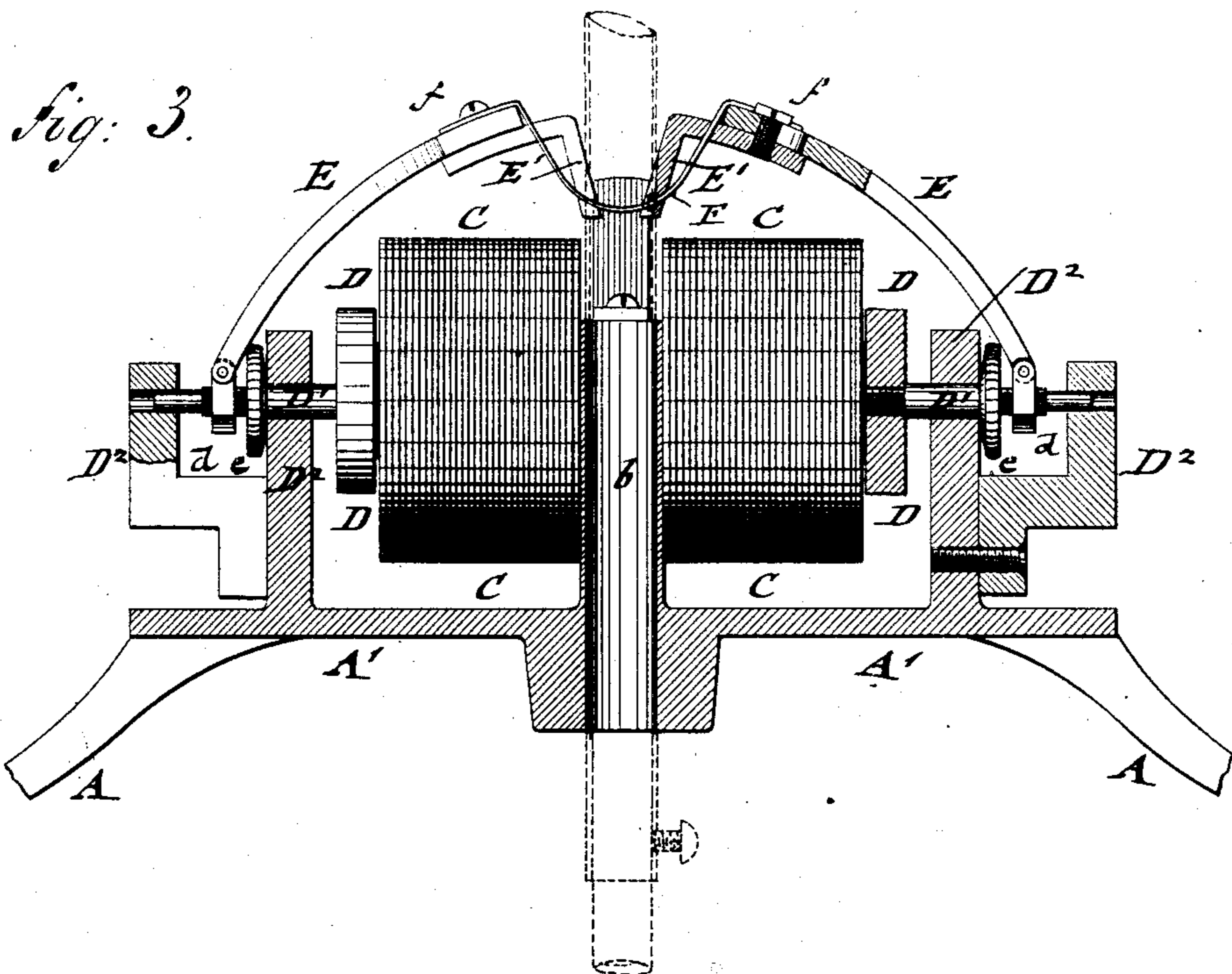
WITNESSES:
A. Schehl.
Otto Risch.

INVENTOR
Robert Bucker
BY *G. & P. Regener*
ATTORNEYS

R. BUCKER.
ELECTRIC ARC LAMP.

No. 285,107.

Patented Sept. 18, 1883.



WITNESSES:
A. Schohl.
Otto Risch.

INVENTOR
Robert Bucker
BY *Loepke & Raegen*
ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT BUCKER, OF ELIZABETH, NEW JERSEY.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 285,107, dated September 18, 1883.

Application filed June 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BUCKER, of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

This invention has reference to improvements in the construction of electric-arc lamps, by which the regular and uniform feeding of the upper carbon is secured by means of a reliable, simple, and cheap construction.

The invention consists of two electro-magnets, the cores of which have equal polarities, in combination with horizontally-sliding armatures, the shanks of which are guided in line with the axis of the electro-magnets. The shanks of the armatures carry laterally-adjustable screw-nuts, to which are hinged curved arms having jaws at their upper ends that engage the upper-carbon holder at opposite sides. The hinged arms are further connected at both sides of the carbon-holder by springs, that serve to return the hinged arms and assist the armatures to recede from the poles of the electro-magnets.

In the accompanying drawings, Figure 1 represents a side elevation of my improved electric-arc lamp. Fig. 2 is a plan of the same. Fig. 3 is a side elevation, partly in section, of the working mechanism, drawn on a larger scale; and Fig. 4 is an end view of the working mechanism.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-frame of my improved electric-arc lamp. The frame A supports, by means of a central socket, *a*, at its lower part, the fixed lower carbon, B. The upper carbon, B', is attached in the customary manner to the upper-carbon holder B², which is guided in a central tube, *b*, of the disk-shaped top plate, A', of frame A. At both sides of the guide-tube *b* are supported electro-magnets C, which are so wound that the outer ends of their cores have the same polarity, so as to attract or repulse simultaneously the disk-shaped armatures D D of the electro-magnets. The armatures D D face the ends of the poles of the electro-magnets C C, their shanks D' being in line with the longitudinal axis of the electro-

magnets C C, and guided in bearings of brackets D², which are either cast in one piece with the top plate, A', or attached in suitable manner thereto. The shanks D' of armatures D are not of the same diameter throughout their entire length, but are made at their middle portion of a smaller diameter than at those portions immediately adjoining the armatures, and of a still smaller diameter at their outermost ends. The middle portions of the shanks D' are screw-threaded and carry two pairs of screw-nuts, *d d* and *e e*. The screw-nuts *d d* serve to support curved upwardly-extending arms E, which are hinged to the upper part of the screw-nuts *d d*. The screw-nuts *e e* serve as stops for the shanks D' D' in one direction, and the shoulders formed by the middle portions of the shanks or stops in the opposite direction, so as to accurately define the extent of lateral motion of the armatures toward and away from the magnets. When it is desired to adjust the curved arms E on the shanks D', the armatures are simply turned in one or the opposite direction round their axes, whereby the position of the screw-nuts *e e* is correspondingly changed. To the slotted upper ends of the curved arms E are applied, by clamp-screws *f*, adjustable jaws E', which are bent in downward direction and provided at their lower ends with concave recesses having sharp edges, (shown in Fig. 3,) by means of which the jaws "bite" the upper-carbon holder at opposite sides whenever the armatures D D are attracted by the electro-magnets C C. The wider upper parts of the curved arms E are connected by U-shaped springs F, that extend at both sides of the upper-carbon holder, as shown clearly in Fig. 2, said springs serving to force the curved arms in downward direction, so as to assist in the receding motion of the armatures D whenever the current is weakened or entirely interrupted. When the armatures are attracted by the electro-magnets, the jaws are applied to the carbon-holder and a certain degree of tension imparted to the springs by the lifting motion of the arms, which alternates with the lowering action before described, so as to secure thereby, in connection with the gravity of the carbon-holder, the regular feeding of the carbon.

The operation of my improved arc-lamp is

as follows: The current enters at the positive binding-post of the frame A, passes from the same to and around the coils of the electro-magnets, then to the top of the frame and through the upper carbon to the lower carbon, then along the frame to the second binding-post, and back to the source of electricity, as indicated by arrows in Fig. 1. At the moment when the current passes through the electro-magnets the armatures will be attracted and a lifting action exerted upon the upper-carbon holder to such an extent that the arc can be formed between the carbon points. When the carbon points are gradually burned off, the resistance to the current is increased, the attraction of the electro-magnets is decreased, and the upper carbon for a moment released from the jaws, so that it slides in downward direction by its own gravity, whereby an immediate effect is exerted upon the electro-magnets and the armatures attracted again. The jaws lift thereby the upper-carbon holder, and so on alternately, so that an arc of uniform size is maintained between the carbon points by the alternating play of the laterally-moving armatures, in connection with the hinged and spring-actuated arms and jaws. Whenever, for some reason or other, the distance between the carbon points has become so large that no arc should be formed, then the armatures recede to their full extent and cause the jaws to liberate the carbon-holder entirely, so as to cause the instant dropping of the same into contact with the lower carbon, so that the current can pass from one to the other, so as to re-establish the arc by the lifting of the upper-carbon holder. The lamp is adjusted for the strength of the current by turning the armatures, whereby the distance of the same from the poles of the electro-magnets is regulated in connection with the adjustment of the screw-nuts *e*.

The working parts of my lamp are inclosed in a suitable casing of sheet metal, which is applied to the disk-shaped top plate, A', by which the working parts, when once properly adjusted, are protected against injury.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric-arc lamp, the combination of electro-magnets placed in line with each other, horizontally-guided armatures, the shanks of which are supported in line with the longitudinal axis of the electro-magnets, curved arms hinged adjustably at their lower ends to the shanks of the armatures, band-springs that connect the upper ends of said arms, and adjustable jaws that engage the upper-carbon holder at diametrically-opposite points, substantially as and for the purpose set forth.

2. The combination of the supporting-frame A, having a top plate, A', and guide-brackets D², electro-magnets C C, armatures D D, the shanks D' of which are guided in bearings of the brackets in line with the longitudinal axis of the magnets, a central guide-tube, *b*, intermediately between the magnets, curved arms E, hinged at their lower ends to screw-nuts on the shanks, band-springs F, connecting the upper ends of said arms, and adjustable jaws E' at the upper ends of the arms E, said jaws having concave faces at their lower ends to engage the upper-carbon holder B at opposite sides, substantially as described.

3. In an electric-arc lamp, the combination of the electro-magnets C C, having the same polarities at their opposite poles, armatures D D, shanks D', the middle portion of which is threaded and provided with screw-nuts *d* and *e*, brackets D², for guiding the shanks, curved arms E, hinged at their lower ends to the screw-nuts *d d*, connecting-springs F F, and jaws E', applied to the upper ends of the arms E, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ROBERT BUCKER.

Witnesses:

CARL KARP,
SIDNEY MANN.