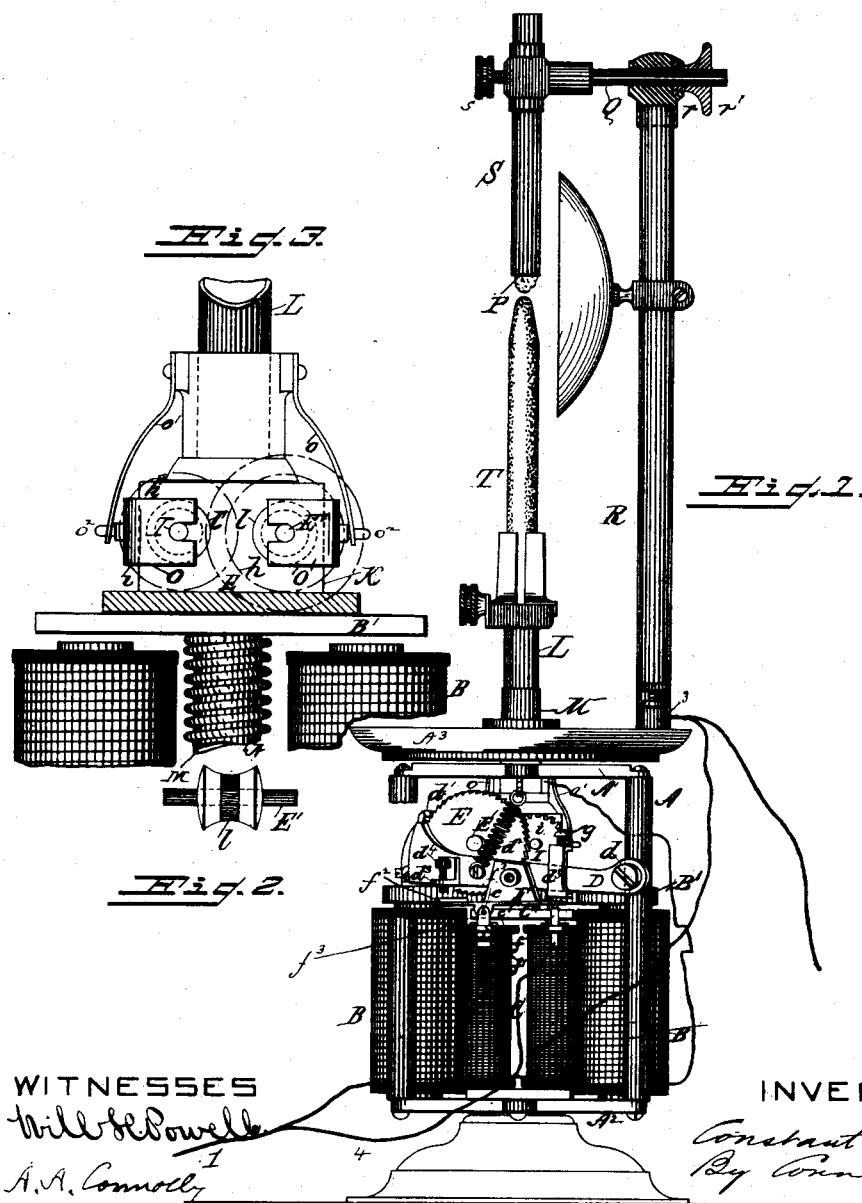


C. DORIOT.
ELECTRIC ARC LAMP.

No. 344,642.

Patented June 29, 1886.



WITNESSES
Will de Powell
A. A. Connolly

INVENTOR
Constant Doriot
By Connolly Bros.,
Attorneys

(No Model.)

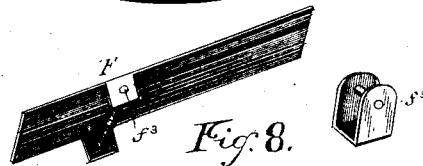
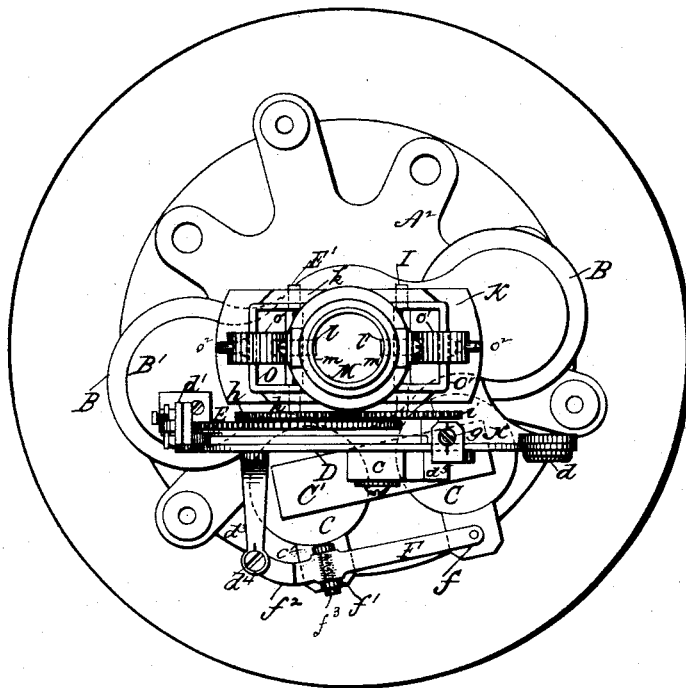
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Fig. 4.



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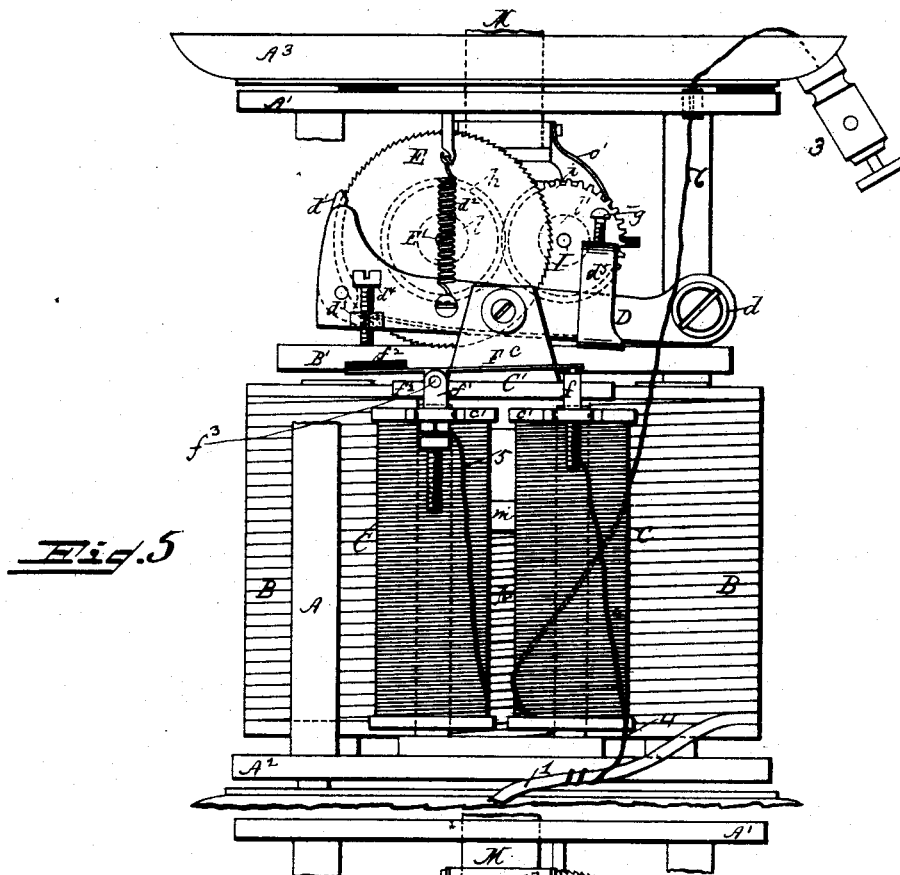
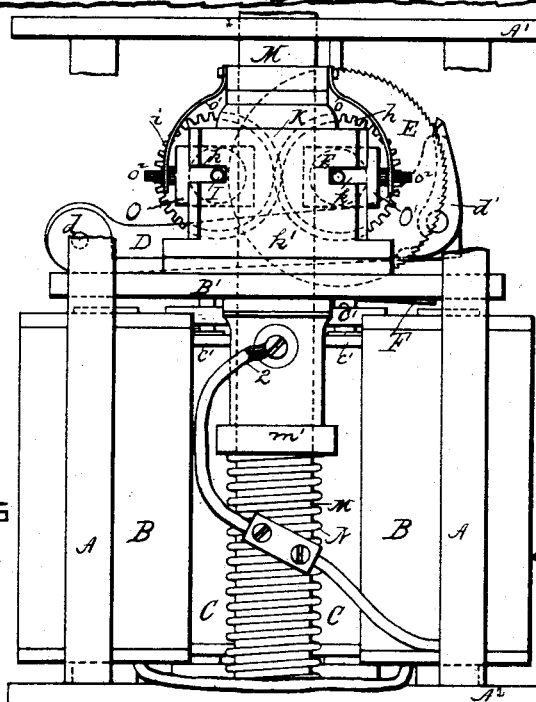


Fig. 6

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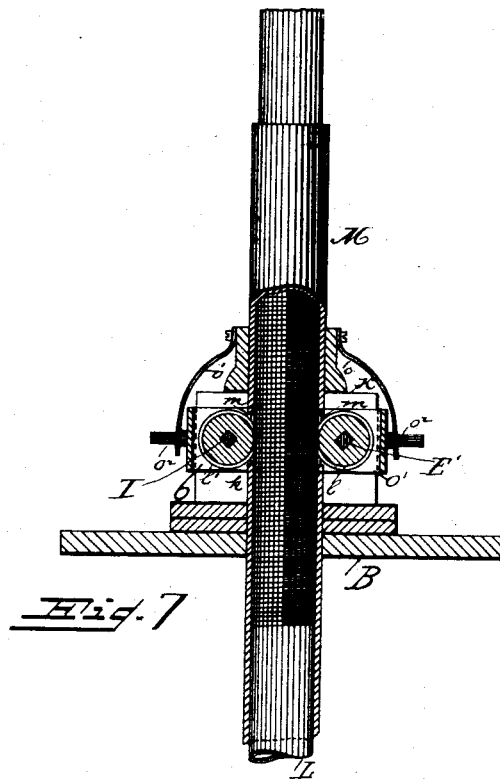
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WITNESSES

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A. E. Grant

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UNITED STATES PATENT OFFICE.

CONSTANT DORiot, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 344,642, dated June 29, 1886.

Application filed September 29, 1885. Serial No. 178,524. (No model.)

To all whom it may concern:

Be it known that I, CONSTANT DORiot, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Arc Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation of lamp. Fig. 2 is an elevation of feed-roller and shaft enlarged; and Fig. 3 is a detail, enlarged, of feed-rollers and supports. Fig. 4 is a plan of lamp below the top frame-plate. Fig. 5 is a side view of the lower-carbon-feeding devices. Fig. 6 is an elevation of the opposite side of the same. Fig. 7 is a sectional view of a detail. Fig. 8 is a perspective view of detail.

My invention has for its primary object to provide a positive feed for electric-arc lamps.

My invention consists in the peculiar construction and combinations of parts, hereinafter fully described, having reference particularly to the following points: first, to the combination, with the feed-magnet of an arc lamp, of two grooved rollers, intermeshing gear-wheels on the shafts of both rollers, and a pawl and ratchet, said rollers being adapted and designed to clamp a carbon pencil or its holder and to feed the same, as hereinafter set forth; second, to the combination, with the feed-magnet of an arc-lamp and its armatures, of a lever carrying a pawl and having a retracting-spring, a ratchet with which said pawl engages, two grooved and serrated or milled rollers, intermeshing gears on the shafts of said rollers, brackets or blocks in which said shafts have their bearings, and springs whereby said rollers are forced toward each other, so as to tightly clamp a carbon pencil or holder between them and to feed the same, substantially as hereinafter fully set forth; third, to the combination, in an arc lamp, of a feeding-magnet in a short circuit, and a switch for cutting out said magnet as soon as it effects the attraction of its armature or produces a step of the feed motion, substantially as hereinafter fully set forth; fourth, to certain details of construction and combination, hereinafter fully set forth.

Referring to the accompanying drawings, A represents the frame of the lamp, which may be of any usual or suitable construction, to enable the lamp to stand on a base or pedestal, or to hang vertically, or with its carbon horizontal, the feed being adapted to operate either up or down or horizontally.

B is a low-resistance magnet in the main circuit, and C a high-resistance magnet in a shunt-circuit.

C' is the armature of magnet C, and it is fastened by an insulated piece, *c*, to a lever, D, the latter being pivotally attached at one end, *d*, to the feed-frame, hereinafter described. Said lever carries at its opposite end a pawl, *d'*, which engages with a ratchet, E, and it has a retracting-spring, *d''*. The circuit to the feed-magnet C is made through two contact-pins, *f f'*, fastened in the insulating-heads *d'* of said magnet. A spring, lever, or switch, F, having an insulated tail-piece, *f''*, makes electric connections between said pins, and when said lever is raised from pin *f*, such connection is broken. A spring on the fulcrum *f''* of said lever normally holds latter in contact with pin *f*.

The lever D has a lateral arm, *d''*, with adjustable screw-stud *d'''*, that meets and presses the tail-piece *f''* when said lever is moved toward the magnet C. The magnet C is thereupon de-energized, releasing armature C' and permitting lever D to be retracted by spring *d''*, causing pawl *d'* to slip back over a tooth or two or more teeth of ratchet E. The extent of retraction (and therefore of length of feed) may be adjusted by means of a set-screw, *g*, fitted in a stationary bracket, arm, or projection, *d''*, extending from a frame, K, and limiting the vibration of lever D.

On the shaft E' of ratchet E is a gear-wheel, *h*, which meshes with a similar gear-wheel, *i*, on a shaft, I, said shafts having bearings in slots in the sides *k' k'* of a frame, K. These shafts E' and I carry grooved rollers *l l'*, whose peripheries are corrugated or milled, so as to enable them to secure a good bite on the carbon pencil or its holder placed between them. L shows a carbon-holder consisting of a tube with a rack-like or threaded surface with which the rollers *l l'* engage. The holder L fits snugly, and may be freely moved lengthwise in another tube, M, which has bearings in the ends

or heads A' A² of frame A, its sides being slot-
 ted at *m m*, to permit contact of rollers *ll'*
 with the holder L, or with a carbon pencil if
 said holder be dispensed with. The frame or
 5 box K is secured to the tube M, as is also the
 armature B' of magnet B. A retracting-
 spring, N, encircling tube M and pressing
 against a collar, *m'*, thereon, as shown in Fig.
 6, or directly against armature B', as shown in
 10 Fig. 3, serves to push back armature B' when
 magnet B is not energized, the frame K, tube
 M, and the feeding mechanism carried there-
 on moving therewith.

The shafts E' I are supported in pillow-blocks
 15 O O', which fit in the frame K, and have stems
 o² o², which fit in openings in springs o o' that
 bear against these blocks, so as to cause the
 rollers *ll'* to be pressed toward each other,
 and give them a clamping action on the holder
 20 L, or on a carbon pencil in place of said
 holder.

The carbon pencil is the positive electrode
 of the lamp, the negative electrode being a
 stationary carbon or iridium point, P, secured
 25 in an arm, Q, which is both horizontally or
 laterally adjustable on a standard or support,
 R, said arm passing through a coupling, *r*, on
 standard R, and being made fast in any ad-
 justed position by means of a set-screw, *r'*.
 30 Carried on the arm Q is a slide, S, to which
 the point P is directly attached, said slide be-
 ing movable transverse to the arm Q in a plane
 parallel with support R, and held in any ad-
 justed position by means of a set-screw, *s*.

35 T represents the positive carbon pencil,
 whose point, before the electric current enters
 the lamp, bears against the iridium point P,
 being held thereto by the action of spring N,
 which holds armature B' away from the face
 40 of its magnet B. The current on entering en-
 ergizes said magnet B, attracting armature B',
 and producing a movement of tube M, which
 draws carbon T away from point P and estab-
 lishes the arc.

45 When the consumption of the carbon makes
 the resistance of the arc greater than that of
 the shunt-magnet, the current passes by way
 of the latter, energizing it, causing it to attract
 its armature and to produce a motion of the
 50 grooved rollers in the proper direction to feed
 the carbon toward the iridium. As already
 mentioned, as soon as the feed is effected the
 shunt-magnet is automatically cut out by the
 movement of the switch-lever. The resistance
 55 of the shunt-magnet may be so proportioned,
 and the ratchet movement made so fine, that
 the feed will be almost imperceptible.

As the feed is positive and not depending
 upon gravity, the movement of the carbon
 60 will be accomplished, no matter what the po-
 sition of the lamp—i. e., standing, with the mag-
 nets, &c., below the carbon, or inverted, or
 with the carbon horizontal.

The construction described, including the
 stationary iridium point, is mainly intended 65
 for lamps which maintain a stationary focus,
 but the feed specified is applicable to any lamp
 having a progressively-moving carbon pencil.

The vertical adjustability of the negative
 electrode permits the length of the arc to be 70
 regulated by this means, and the lateral ad-
 justability of the same secures the presenta-
 tion to the reflector of whichever side of the
 arc it is desired to present thereto.

The circuit through the lamp is as follows: 75
 Entering at 1 it passes to magnet B, and from
 latter to positive electrode by connection at 2
 with tube M. From positive electrode it
 passes to negative electrode, and from latter
 to lamp-frame out at 3. The shunt to resist- 80
 ance-magnet is from connection 1 by connec-
 tion 4 to pin *f*; thence by switch-lever F to
 pin *f'*, and from latter to magnet C by connec-
 tion 5. From magnet C the circuit is by con-
 nection 6 to 3. The standard R, which is 85
 metallic, rises from a metal ring, A³, supported
 upon and insulated from the upper head, A,
 and the tube M, where it passes through the
 heads A' A², is insulated from said heads by
 means of collars. 90

What I claim as my invention is—

1. In an arc-lamp feed motion, the com-
 bination of two grooved rollers on separate
 shafts, two intermeshing wheels on said shafts,
 a ratchet on one of said shafts, a lever carry- 95
 ing a pawl for said ratchet, and a magnet
 whose armature is connected to said lever,
 whereby when said magnet is energized said
 rollers will be positively turned, substantially
 as shown and described. 100

2. The combination, with feed-magnet C
 and its armature C', of lever D, spring *d*²,
 pawl *d'*, ratchet E, gears *h i*, rollers *ll'*, arm
*d*³, spring switch-lever F, and contact-pins 105
f-f', whereby the energization of said magnet
 causes a rotary motion of said rollers, and im-
 mediately thereafter a cutting out of said
 magnet and a retraction of said lever D, sub-
 stantially as shown and described.

3. The combination, in an arc lamp, of 110
 frame A, main-circuit magnet B, with arma-
 ture B', shunt-magnet C, with armature C',
 lever D, having retracting-spring *d*², pawl *d'*
 and switch-operating arm *d*³, switch-lever F,
 insulated contacts *f f'*, ratchet E, gears *h i*, 115
 grooved rollers *ll'*, box or frame K, and pillow-
 blocks O O', having spring-pressers o o', said
 parts being constructed and combined for op-
 eration, substantially as shown and described.

In testimony that I claim the foregoing I 120
 have hereunto set my hand this 8th day of
 September, 1885.

CONSTANT DORIOT.

Witnesses:

R. DALE SPARHAWK,
 M. D. CONNOLLY.

Correction in Letters Patent No. 344,642.

It is hereby certified that in Letters Patent No. 344,642, granted June 29, 1886, upon the application of Constant Doriot, of Philadelphia, Pennsylvania, for an improvement in "Electric-Arc Lamps," an error appears in the printed specification requiring the following correction, viz: In line 3, page 1, the patentee is described as a citizen of the United States, whereas he is a citizen of France; and that the Letters Patent should be read with this correction therein to make it conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 13th day of July, A. D. 1886.

[SEAL.]

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.

D. L. HAWKINS,
Acting Secretary of the Interior.