

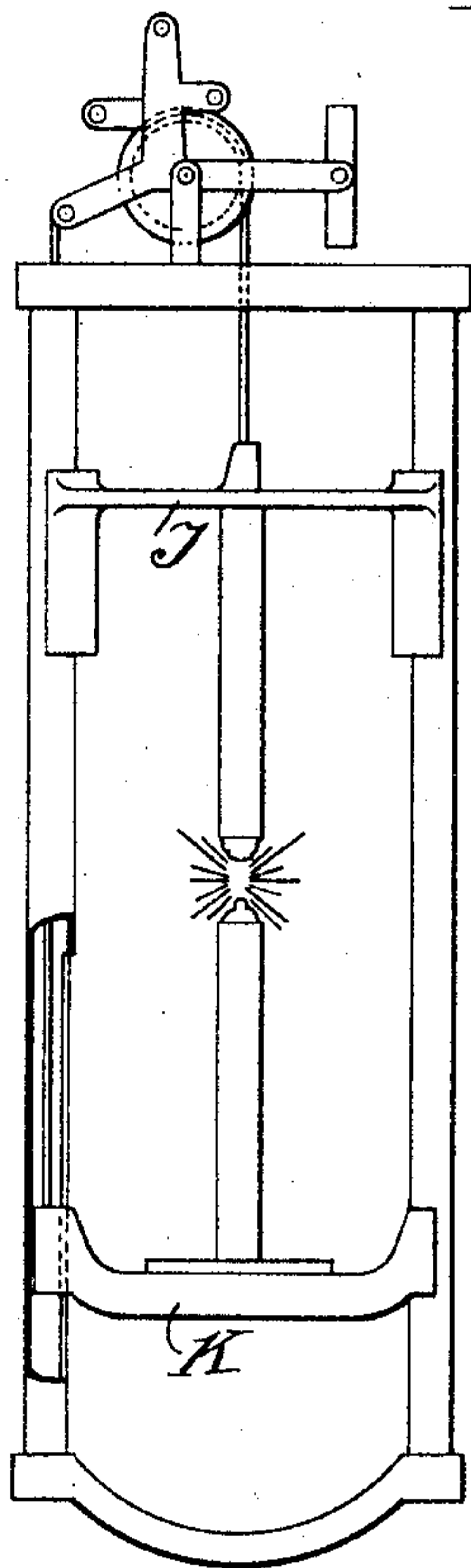
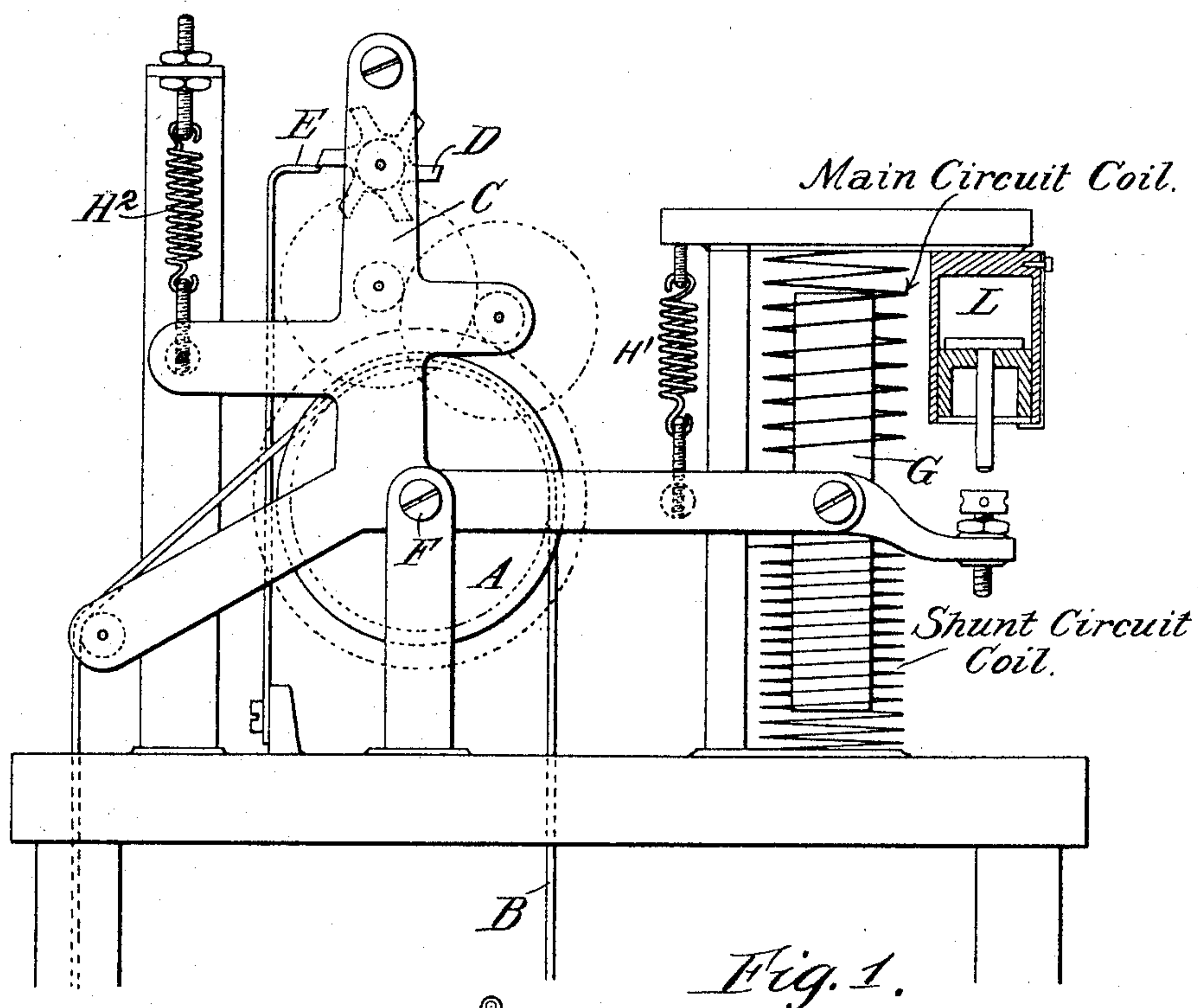
No. 629,603.

Patented July 25, 1899.

P. F. H. QUEISSER.
ELECTRIC ARC LAMP.

(Application filed Sept. 19, 1898.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

PAUL FRANZ HERMANN QUEISSER, OF CHARLOTTENBURG, GERMANY,
ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF
AMERICA, OF CHICAGO, ILLINOIS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 629,603, dated July 25, 1899.

Application filed September 19, 1898. Serial No. 691,359. (No model.)

To all whom it may concern:

Be it known that I, PAUL FRANZ HERMANN QUEISSER, a subject of the Emperor of Germany, residing at Charlottenburg, Germany, have invented a certain new and useful Improvement in Fixed-Focus Arc-Lamps, (Case No. 164,) of which the following is a full, clear, concise, and exact description.

My invention relates to fixed-focus arc-lamps.

In arc-lamps having fixed foci the clock-train usually employed in such lamps generally has to operate both carbon-holders with their carbons, the result being that rotary efforts are exerted upon the frame of the clock mechanism in opposite directions, whereby the operation of the lamp is rendered faulty.

My invention has for its object to improve the construction of lamps having fixed foci; and it consists in the novel apparatus hereinafter described, and particularly pointed out in the claims.

I will explain my invention by reference to the accompanying drawings.

Figure 1 is an elevation of the permissive feeding mechanism of the lamp structure, the parts being diagrammatically indicated. Fig. 2 is a diagrammatic view of a lamp made in accordance with my invention.

Like letters refer to like parts in both views.

A pulley A is preferably provided with a groove to receive a cord or band B, the right-hand portion of which carries the carbon-holder J, while the left-hand portion carries carbon-holder K. The said pulley is mounted upon a frame C, carrying the wheel-train, the wheel D of the train being normally prevented from rotating by means of the detent E. The frame is mounted to turn about the pivot F, the frame carrying an armature G of an electromagnet, which may be included in circuit in any manner well understood to those skilled in the art, as in the main circuit and a shunt thereof. Upon an elongation of the arc the armature of the electromagnet falls away, the wheel-train consequently being bodily turned in a clockwise direction, the wheel D being disengaged from the de-

tent E when the frame reaches a certain position, whereupon the frame C is permitted to rotate and the carbon-holders, with their carbons, are permitted to approach.

In the particular construction herein set forth the wheel-train or carbon-actuating mechanism of the lamp has to support the weight of both carbons, together with their holders. Aside from the attraction upon the armature and the overbalancing effect of the motor mechanism the upper-carbon holder only exercises a rotary effort upon the frame of the motor mechanism. A weak spring H' is sufficient to keep the frame itself in balance. In view of the fact, however, that the pivot or axle of the frame has to support in addition to the weight of the frame that of both carbon-holders and carbons the spring H' is insufficient to preserve the frame of the motor mechanism in its mean position. I therefore provide a second spring, preferably a spiral spring H², which exerts a rotary effort upon the frame toward the right, while the spring H' exerts a rotary effort toward the left, the pull of both springs being preferably in a vertical direction. Thus by properly proportioning the strength of the springs the friction at the pivot or axle of the frame may be greatly minimized and almost entirely removed. By this construction the lamp is made very sensitive to changes in circuit conditions, the design being to minimize the work of the electromagnet when the motor mechanism is unaffected by any retarding device. With such a sensitive structure, however, a retarding device should be employed, since otherwise the relative movements of the carbons will be too rapid, the extinguishment of the arc being liable to result. This is especially the case in the initial operation of the lamp, when the carbons are cold, a greater voltage then being required to sustain the arc.

In order to separate the carbons very gradually and to afford the necessary retardation in the movement of the motor mechanism, I provide a braking appliance, as a dash-pot L. This dash-pot is preferably adapted to retard the frame in its range of movement in an upward direction. With the frame of the wheel-

train in the position it occupies during the normal operation of the lamp the dash-pot permits the frame to have a small range of movement, whereby the lamp may be perfectly regulated, the frame in this limited movement being unimpeded by the dash-pot.

The feeding mechanism I have shown mounted upon the swinging frame constitutes a permissive feeding means for the carbons, the controlling-magnet upon an undue elongation of the arc serving to release the mechanism from the locking-detent E, whereby the carbons are permitted to feed until the arc has been restored to its normal condition, whereupon the locking engagement of the permissive feeding mechanism with the detent E is reestablished to prevent further self-feeding of the carbons.

It is obvious that changes may be readily made in the construction herein shown and particularly described, and I do not, therefore, desire to be limited to the precise construction shown; but,

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

1. In an electric-arc lamp, the combination with a suitably-supported carbon, of feeding mechanism therefor, a dash-pot and an adjustable device interposed between the dash-pot and feeding mechanism having separable engagement with the dash-pot whereby the feeding mechanism is relieved of the braking influence of the dash-pot, when the arc is in its normal condition, substantially as described.

2. In an electric-arc lamp, the combination with a suitably-supported carbon; of feeding mechanism therefor, and a retarding device to prevent too-sudden response of the feeding mechanism to changes in circuit conditions, said feeding mechanism having separable engagement with the retarding device, substantially as described.

3. In an electric-arc lamp, the combination with a suitably-supported carbon; of feeding mechanism therefor, and retarding means to prevent too-sudden actuation of the feeding mechanism upon changes in the condition of the circuit composed of a plunger or piston and its cylinder as elements, the said feeding mechanism having separable engagement with one of the elements of the retarding device, substantially as described.

4. In an arc-lamp, the combination with a wheel-train, and a swinging frame in which the same is mounted; of a detent normally engaging a wheel of the train, a cord or band upon a wheel or pulley of the train, opposed carbon-holders connected with the cord, means for maintaining the said frame practically in equilibrium, an electromagnet included in the circuit of the lamp for rotating the frame to release the engagement between said detent and the wheel engaging the same to permit the feeding of the carbons, and a retarding device to prevent too-sudden response of the feeding mechanism to changes in circuit

conditions, said feeding mechanism having separable engagement with the retarding device, substantially as described.

5. In an arc-lamp, the combination with a wheel-train, and a swinging frame in which the same is mounted; of a detent normally engaging a wheel of the train, a cord or band upon a wheel or pulley of the train, opposed carbon-holders connected with the cord, means for maintaining the said frame practically in equilibrium, an electromagnet included in the circuit of the lamp for rotating the frame to release the engagement between said detent and the wheel engaging the same to permit the feeding of the carbons, and retarding means to prevent too-sudden actuation of the feeding mechanism upon changes in condition of the circuit composed of a plunger or piston and its cylinder as elements, said feeding mechanism having separable engagement with one of the elements of the retarding device, substantially as described.

6. In an arc-lamp, the combination with a wheel-train mounted in a rotatable or swinging frame, of a detent normally engaging a wheel of the train, a cord or band upon a wheel or pulley of the train, opposed carbon-holders connected with the cord, two springs acting upon said frame and serving to exert rotary efforts thereupon in opposite directions, the springs serving to maintain the frame and the weights supported thereby practically in equilibrium, an electromagnet in the circuit of the lamp for rotating the said frame, and a retarding device to prevent too-sudden response of the feeding mechanism to changes in circuit conditions, said feeding mechanism having separable engagement with the retarding device, substantially as described.

7. In an arc-lamp, the combination with a wheel-train, mounted in a rotatable or swinging frame, of a detent normally engaging a wheel of the train, a cord or band upon a wheel or pulley of the train, opposed carbon-holders connected with the cord, two springs acting upon said frame and serving to exert rotary efforts thereupon in opposite directions, the springs serving to maintain the frame and the weight supported thereby practically in equilibrium, an electromagnet in a circuit of the lamp for rotating the said frame, and retarding means to prevent too-sudden actuation of the feeding mechanism upon changes in the condition of the circuit composed of a plunger or piston and its cylinder as elements, the said feeding mechanism having separable engagement with one of the elements of the retarding device, substantially as described.

8. In an arc-lamp, the combination with a rotating frame, of permissive feeding mechanism carried thereby, means for locking the permissive feeding mechanism with the frame in one position, said locking means being adapted to permit the operation of the feeding mechanism with the frame rotated to an alternative position, suitably-mounted car-

bons adapted to feed independently of said permissive mechanism, said permissive mechanism being adapted to check the relative movements of the carbons, a magnet adapted for inclusion in the lamp-circuit for rotating the frame, a spring bearing on each side of the pivotal mounting of the frame, and a retarding device to prevent too-sudden response of the feeding mechanism to changes in circuit conditions, said feeding mechanism having separable engagement with the retarding device, substantially as described.

9. In an arc-lamp, the combination with a rotating frame, of permissive feeding mechanism carried thereby, means for locking the permissive feeding mechanism with the frame in one position, said locking means being adapted to permit the operation of the feeding mechanism with the frame rotated to an alternative position, suitably-mounted carbons adapted to feed independently of said permissive mechanism, said permissive mechanism being adapted to check the relative movement of the carbons, a magnet adapted for inclusion in the lamp-circuit for rotating the frame, a spring bearing on each side of the pivotal mounting of the frame, and retarding means to prevent too-sudden actua-

tion of the feeding mechanism upon changes in the condition of the circuit composed of a plunger or piston and its cylinder as elements, the said feeding mechanism having separable engagement with one of the elements of the retarding device, substantially as described.

10. In an arc-lamp, the combination with a rotating frame, of feeding mechanism carried thereby, means for locking the feeding mechanism with the frame in one position, said locking means being adapted to permit the operation of the feeding mechanism with the frame rotated to an alternative position, a magnet adapted for inclusion in the lamp-circuit for rotating the frame, means for maintaining the frame practically in equilibrium, and a retarding device to prevent too-sudden response of the feeding mechanism to changes in circuit conditions, said feeding mechanism having separable engagement with the retarding device, substantially as described.

In witness whereof I hereunto subscribe my name this 29th day of August, A. D. 1898.

PAUL FRANZ HERMANN QUEISSER.

Witnesses:

PAUL ROEDIGER,
CARL ALBRECHT.