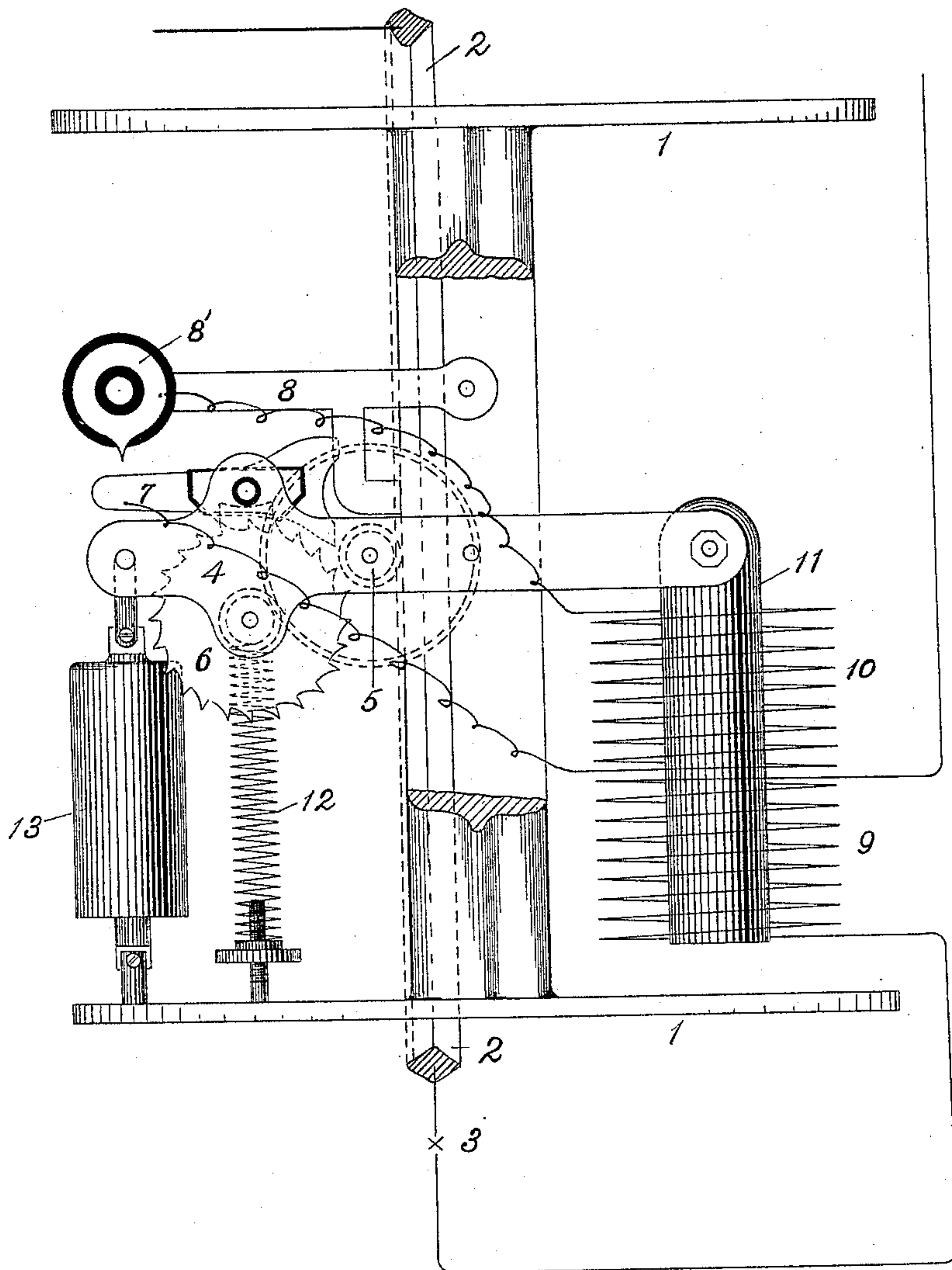


(No Model.)

H. P. DAVIS.
ELECTRIC ARC LAMP.

No. 569,817.

Patented Oct. 20, 1896.



WITNESSES:

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HARRY P. DAVIS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 569,817, dated October 20, 1896.

Application filed January 14, 1895. Serial No. 534,829. (No model.)

To all whom it may concern:

Be it known that I, HARRY P. DAVIS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Carbon-Controlling Means for Alternating-Current Arc-Lamps, (Case No. 610,) of which the following is a specification.

My invention relates to carbon-feeding mechanism for arc-lamps, and more particularly to means employed for regulating the feed of the carbons in lamps operated by alternating currents.

The object of my invention is to provide a simple and efficient controlling means which will insure such a steady uniform feed of the movable carbon as to exactly compensate for the consumption of the carbons by the arc, and thus secure a light that shall be uniform in brilliancy and free from fluctuations.

It has long been recognized as essential that the feeding of one or both of the carbons in an arc-lamp should, as nearly as possible, be such that the length of the arc should not vary except as the current might vary, in order that a steady light of uniform brilliancy might be produced. Many devices have been proposed for effecting this result, but where the feed has been controlled electrically such control has usually been effected by means of either a shunt or a series coil alone or by means of both a shunt and a series coil combined. In my present invention I employ one coil in series with the lamp and a second coil in inductive relation thereto, the circuit through which is closed by means of the action of the energized series coil upon suitable movable devices, the feed-regulating mechanism being controlled by the combined action of the two coils.

In the accompanying drawing I have shown a side elevation of one form of feed-regulating mechanism for an arc-lamp with my invention applied thereto, the mechanism shown being merely illustrative, both as regards the general type and the mechanical details of construction.

Referring to the drawing, 1 is a suitable supporting-frame for the carbon-holding rods

and feeding and regulating mechanism, and 2 is the movable carbon-holding rod.

3 is a diagrammatic representation of the arc.

Pivoted in the supporting-frame 1 is a support or frame 4 for the feed-regulating train and escapement.

5 is a pinion which engages with a rack on the carbon-holding rod 2, and which is connected with an escapement-wheel 6, through intervening gears of ordinary construction.

7 is an escapement-lever mounted above the escapement-wheel 6, to coöperate therewith in the usual manner.

8 is a stop-lever pivoted to the frame 1, having a head 8' insulated therefrom, or, if desired, the entire device may be of insulating material except that portion which is in the path of movement of the escapement-lever 7.

9 is the coil in series with the lamp, and 10 a coil arranged in inductive relation to the coil 9 and having one of its terminals in the head 8', its other terminal being the portion of the escapement-lever 7 which engages with the head 8', in order that when these two parts of the apparatus come into contact the circuit through the secondary coil shall be completed.

11 is a core for these coils, which is attached to one end of the frame or support 4 and is free to move therewith.

12 is a spring, and 13 a dash-pot for respectively balancing and retarding the movement of the frame 4.

The operation is as follows: Upon the passage of the current through the carbons and series coil, the former being in contact, the core 11 will be drawn into the coil, thus lowering the end of the frame 4, connected thereto, and raising its other end, thus bringing the escapement-lever 7 into engagement with the head 8' at the end of the stop-lever 8 and locking the escapement-wheel against rotation. When so locked, the train, its escapement, and the supporting-frame form a rigid whole, and the upper carbon will therefore be raised a sufficient distance from the lower to form the necessary arc. At the same time the engagement of the parts 7 and 8' will complete the circuit through the secondary

coil, and by reason of the current induced in this coil a counter electromotive force will be set up in the series coil and the pull upon the core 11 be accordingly decreased. The resulting upward movement of the core 11 will slightly separate the lever 7 and head 8', and thus interrupt the circuit through the secondary coil and permit a slight movement of the escapement. Immediately upon the breaking of this secondary circuit, however, the series coil will again attract its core and the escapement be elevated and locked against movement. It is apparent, therefore, that the feeding of the carbon is thus controlled in such a manner that it may be moved a very slight degree only at a time, and it is also obvious that sufficient feeding of the movable carbon is insured, so that there shall be no undue separation at any time.

While I have illustrated and described my invention as applied to a special form of feed-regulating mechanism, it is obvious that it is equally applicable to many other forms. It is also obvious that the secondary coil may be connected in various ways other than those shown, it being essential only that the circuit in this coil should be interrupted when there is no current in the primary coil or when it is reduced to an appreciable extent below the normal.

What I claim is—

1. In an alternating-current arc-lamp, the combination with a series coil and a coil in inductive relation thereto, of carbon-controlling mechanism comprising means actuated directly and solely by said coils to open and close the secondary circuit, substantially as described.

2. In an alternating-current arc-lamp, the combination with a series coil and a coil in inductive relation thereto, of gravity-actuated carbon-feeding mechanism and releasing means therefor, said releasing means being

actuated directly and solely by the combined action of said coils, substantially as described.

3. In an alternating-current arc-lamp, the combination with a series coil, a coil in inductive relation thereto, and a rocking frame provided with a movable core for said coils, gravity-actuated carbon-feeding mechanism and locking and releasing means therefor, of a contact device in the path of movement of said locking and releasing means, the secondary circuit being completed by the engagement of said parts, substantially as described.

4. In an alternating-current arc-lamp, the combination with the carbon-feeding rack and train and locking and releasing means therefor, of a movable contact device in the path of movement of said locking and releasing means, a coil in series with the lamp and a coil in inductive relation to said series coil, the terminals of which are respectively in said contact device and the adjacent portion of the locking and releasing means, substantially as described.

5. In an alternating-current arc-lamp, the combination with a coil in series with the lamp and a coil in inductive relation to said series coil, of a movable core for said coils, carbon-controlling mechanism comprising a tilting frame connected to said core at one end and carrying one terminal of the secondary coil at its other end, whereby the secondary circuit is opened and closed and the feeding mechanism controlled directly and solely by the action of said coils, substantially as described.

In testimony whereof I have hereunto subscribed my name this 10th day of January, A. D. 1895.

HARRY P. DAVIS.

Witnesses:

WESLEY G. CARR,
HUBERT C. TENER.