

(No Model.)

E. WESTON & L. E. CURTIS.

ELECTRIC LAMP.

No. 255,225.

Patented Mar. 21, 1882.

Fig. 1.

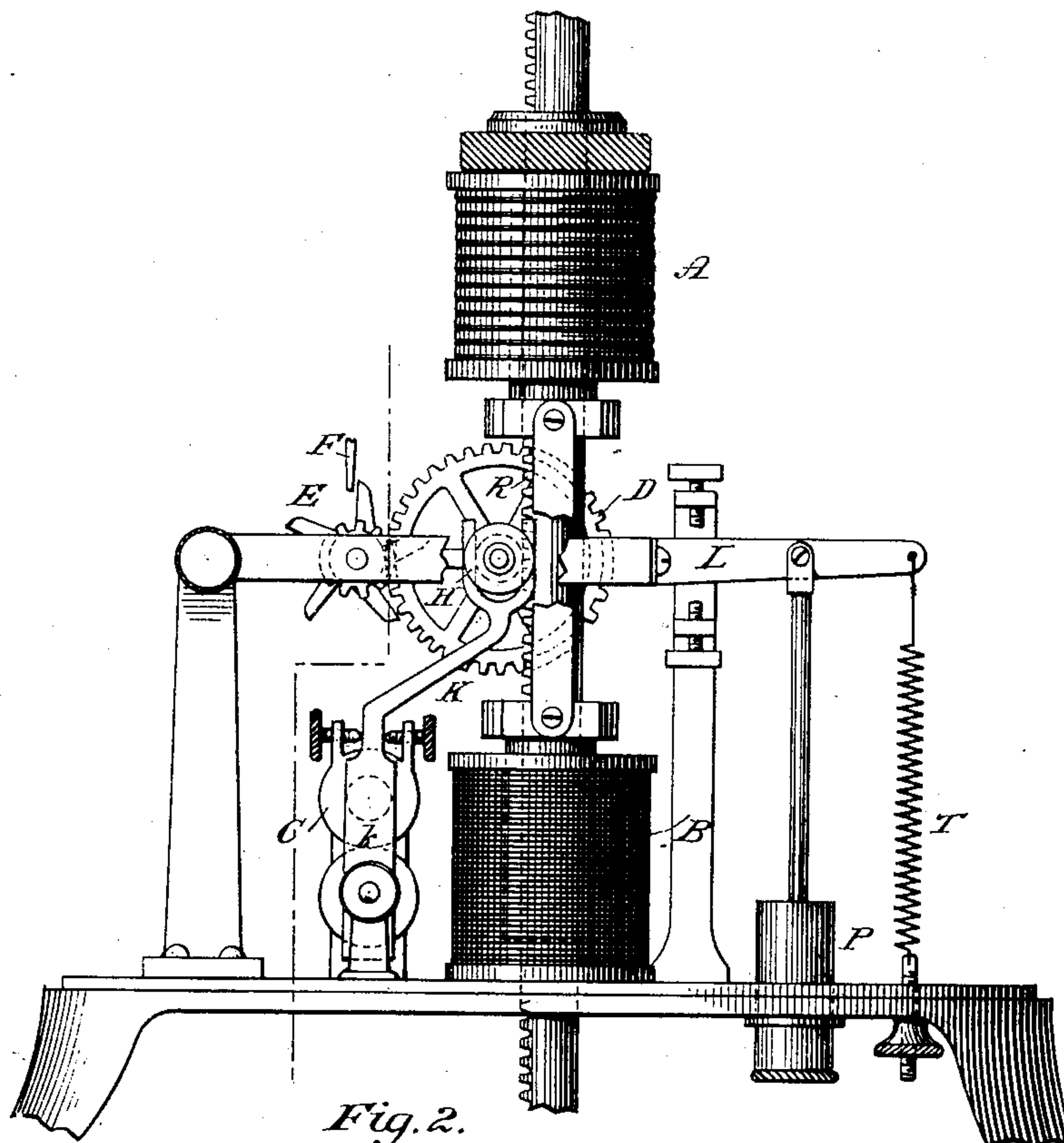
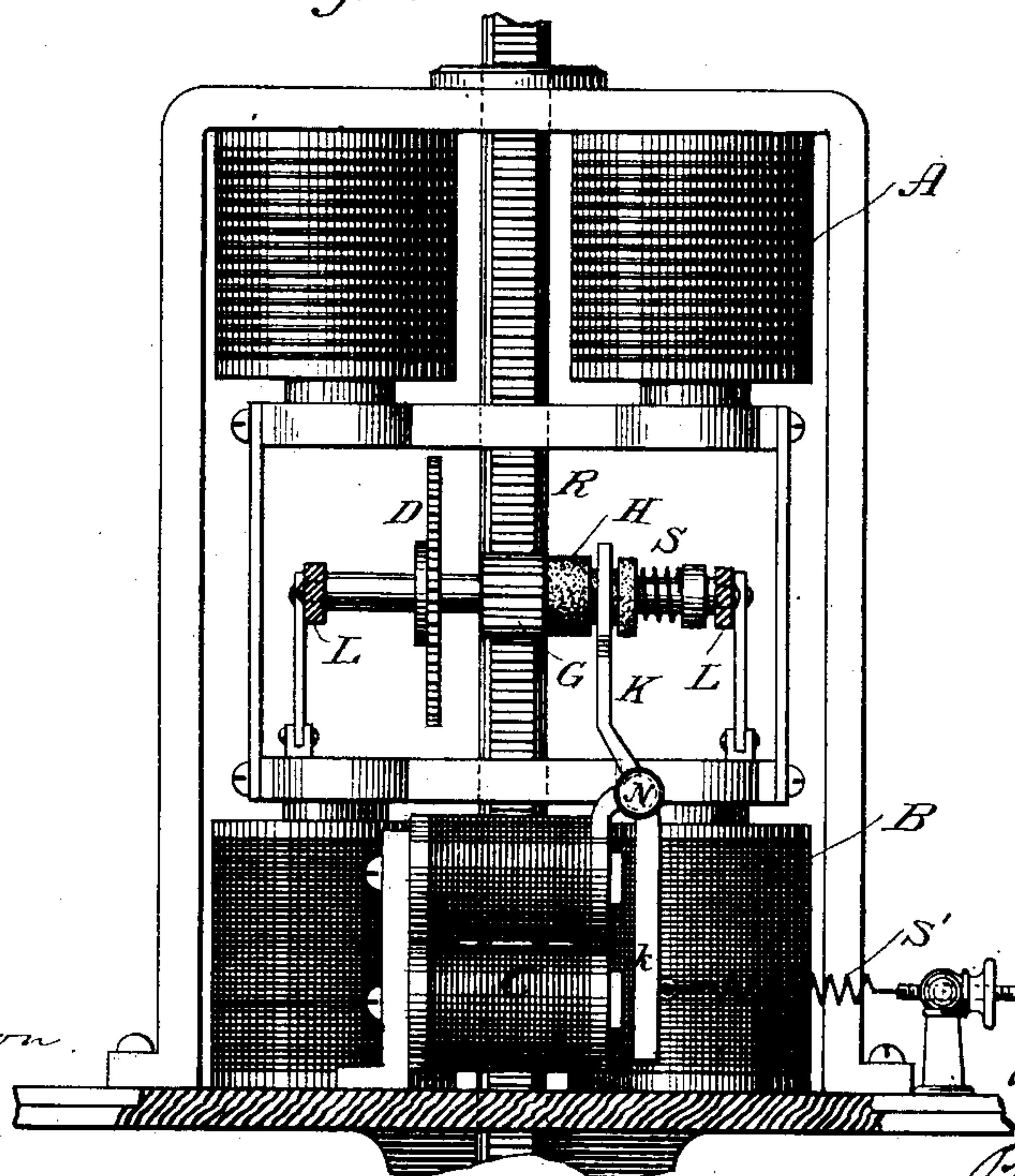


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 255,225, dated March 21, 1882.

Application filed November 11, 1881. (No model.)

To all whom it may concern:

Be it known that we, EDWARD WESTON, of Newark, county of Essex, and State of New Jersey, and LEONARD E. CURTIS, of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

Our invention is designed for use with electric-arc lamps or regulators, its purpose being mainly to effect through the instrumentality of suitably constructed devices, in combination with the regulating mechanism, an instantaneous re-establishment of the arc when, owing to a momentary cessation in the flow of current, or to the breaking of one of the carbons, or to other unforeseen circumstances, the same has been interrupted.

Another important object of the said invention is to release the upper carbon and allow the same to fall when, by reason of the failure of the feed mechanism to perform its allotted functions, the arc has been increased beyond its normal length.

The devices for effecting the above-described results, while differing in construction, according to the class of lamp with which they are or may be employed, are similar in principle in all cases, and consist, in the main, of an electro-magnet included in a shunt or derived circuit about the lamp, and a movable armature, which is connected with the devices for retaining or locking the carbon-carrier in such manner as to effect the release of the said carrier when the attraction of said magnet reaches a predetermined point.

The subject of the present application pertains more especially to the class of electric lamps or regulators known as the "rack-and-pinion" lamps, the devices hereinafter described being particularly adapted for use with lamps of this character. In such lamps, as is well known, the descent of the carbon-carrier is controlled by a train of gear-wheels which engage either directly or indirectly with the car-

rier. By the length of the train, or by the combination therewith of a suitable retarding mechanism, the movement of the carrier is restricted so far that an appreciable time is required for its descent through even a very short space, so that should the arc be suddenly interrupted the only path remaining for the current—that is to say, through the coils of fine wire composing the helix of the usual shunt-circuit magnet—would be exposed to danger from overheating while the carbons are approaching one another, unless some provision is instantly made for diverting the current through a better path than that offered by the said coils. This is accomplished, as stated above, by releasing the upper carbon through the instrumentality mainly of a magnet in a shunt about the lamp from the train and allowing it to drop upon the lower carbon, thus re-establishing the arc and protecting the coils of the shunt-magnet from burning. By the same means the upper carbon is freed from engagement with the train when the latter catches or the feed-magnets fail to act, so that an abnormally long arc, or one that might injure the lamp, is not permitted to form.

In the drawings hereto annexed the devices which we have selected as the most convenient for the purpose of illustrating the invention are represented embodied in an ordinary rack-and-pinion lamp, Figure 1 being a side elevation of the operative portions of the feed mechanism, partly in section; and Fig. 2, a view in elevation at right angles thereto.

A and B are helices included in the main circuit of the lamp, and in a shunt or derived circuit about the same, respectively. In conjunction with said helices are arranged movable cores connected with and acting to control the position of a pivoted frame, L, which carries a suitable number of gear-wheels meshing one with another, the train terminating in a scape-wheel, E. A stationary detent, F, is placed in proper relation with one of the members of the train, preferably the scape-wheel, so that when the attraction of the helices A preponderates over that of helices B and the

frame L drawn upward the detent will engage with the wheel E.

R is a rack-bar, to the lower end of which the upper carbon is attached. It is connected
5 with the train of gears above described by means of a pinion, G.

P is a dash-pot for precluding too rapid movement of the frame L, and T an adjustable spring for assisting the helices B in drawing
10 down the cores contained therein.

The parts thus far described compose one form of electric lamp to which our present invention is applicable. We would here state, however, that the specific construction and the
15 relative arrangement of the several component parts may be greatly varied, nor do we claim the same herein, except in combination with others hereinafter set forth.

The pinion G is arranged loosely on its shaft,
20 a collar or shoulder being employed for limiting its movement in one direction. On the opposite side of the pinion is a friction-clutch, consisting of a sleeve, H, of metal, wood, or any desired material, that is caused to revolve
25 with the shaft by a feather connection, and is grooved or reduced in diameter along a portion of its length. It is arranged to be normally forced by a spring, S, against the pinion G, causing the same to revolve with the
30 shaft.

C is a small magnet in the same circuit with the helix B, or in an independent shunt about the lamp. Before its poles is an armature, k, pivoted at N and ending in a forked arm, K,
35 adapted to engage the sleeve H. A spring, S', serves to retract the armature k and hold it in a position where the forked arm K is out of contact with either side of the groove cut in sleeve H. Under ordinary conditions, and
40 when the lamp is burning with the proper length of arc, the amount of current flowing through the coils of magnet C is not sufficient to attract the armature k against the force of spring S', the relative resistances of the main
45 and shunt circuits being easily regulated to bring this about. Should the arc become suddenly interrupted or too much elongated, a diversion of a sufficient amount of current at once takes place to energize magnet C, draw
50 up the armature k, and relieve the pressure between the pinion G and clutch H. The rack-bar R, which before had been controlled in its descent by the train of wheels, is thus set free and instantly falls. The current by this means
55 is re-established through the carbons before any injury can result to the lamp.

It is evident that the mechanical construction of the devices for releasing the rack-bar may be indefinitely varied without affecting
60 the spirit of this our present invention. Some of the most suggestive modifications in construction are to arrange the armature k in

proximity to one or both of the poles of the shunt-magnet belonging to the feed-regulating mechanism proper; secondly, to employ a mag- 65 net in the main circuit in lieu of the spring S', or, in place of the magnets and armature, an expansible wire of platinum, through which the shunt-current is caused to pass, might be employed to impart the requisite movement to 70 the friction-clutch.

In case the connection between the train of wheels and the carbon-carrier is made by a cord, as is commonly done, the releasing mechanism is applied to the pulley, which in this 75 case is the substantial equivalent of the pinion; and so for other forms of lamp the construction of the releasing mechanism is varied to suit the requirements of the particular case, the same being equally applicable to those 80 lamps employing a clutch. This, however, forms the subject of another application of even date hereunto.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is— 85

1. In an electric lamp, the combination, with the feed-regulating mechanism and carbon-carrier controlled thereby, of a shunt circuit of high resistance, and an electro-magnet included 90 therein, and a releasing device adapted to be actuated by said magnet, and thereby release the carrier from the regulating mechanism, as set forth.

2. The combination, in an electric lamp of 95 the kind described, of a train of wheels constituting the feed mechanism, a carbon-carrier engaging therewith by means of suitable connecting-gear, a closed shunt of high resistance, and an electro-magnet included therein, and 100 mechanism independent of the feed mechanism adapted to be actuated by said magnet, and thereby release the said connecting-gear from the train, substantially as and for the purpose set forth. 105

3. The combination, in an electric lamp, with the pinion G, and a friction-clutch arranged to be held against said pinion by a spring, of a closed shunt of high resistance, an electro-magnet included therein, and an armature-lever 110 adapted to be actuated by said magnet, and thereby withdraw the clutch from said pinion, substantially in the manner described.

In testimony whereof we have hereunto set our hands.

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