

(No Model.)

W. W. KING.  
ELECTRIC ARC LAMP.

No. 316,791.

Patented Apr. 28, 1885.

FIG. I.

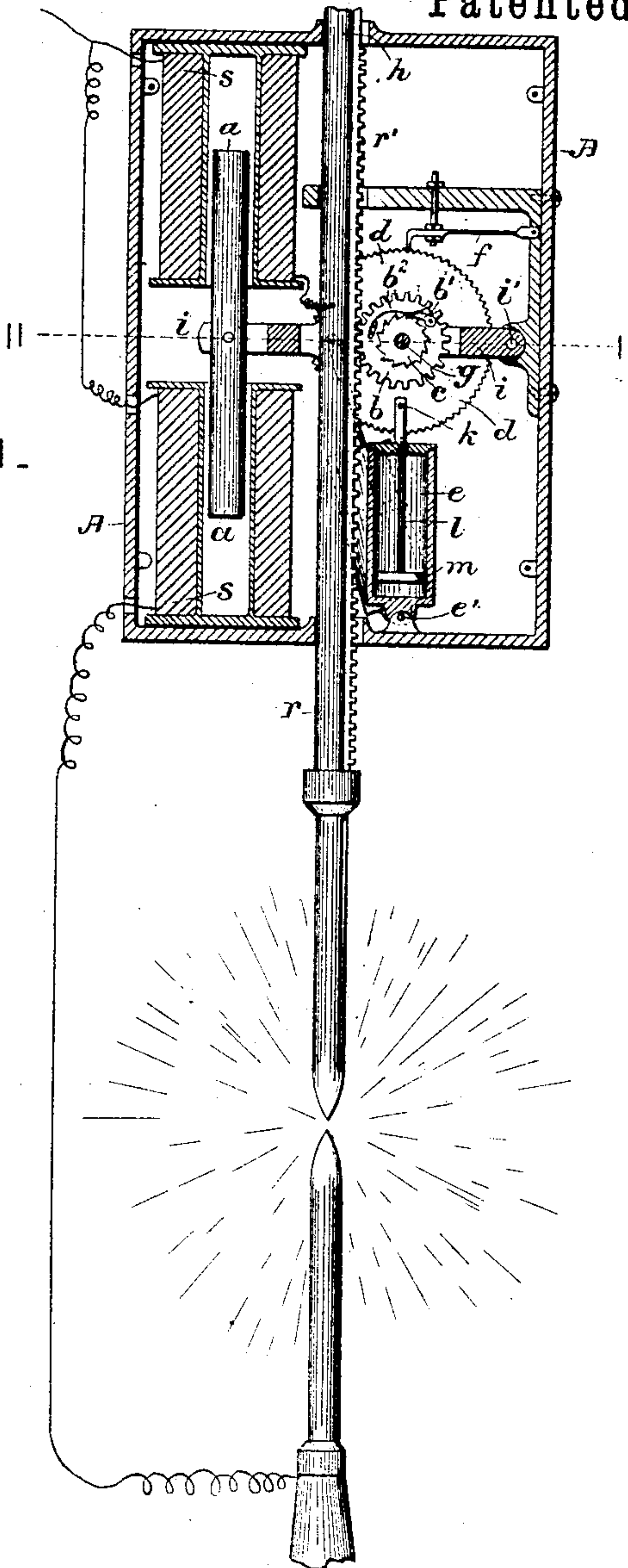
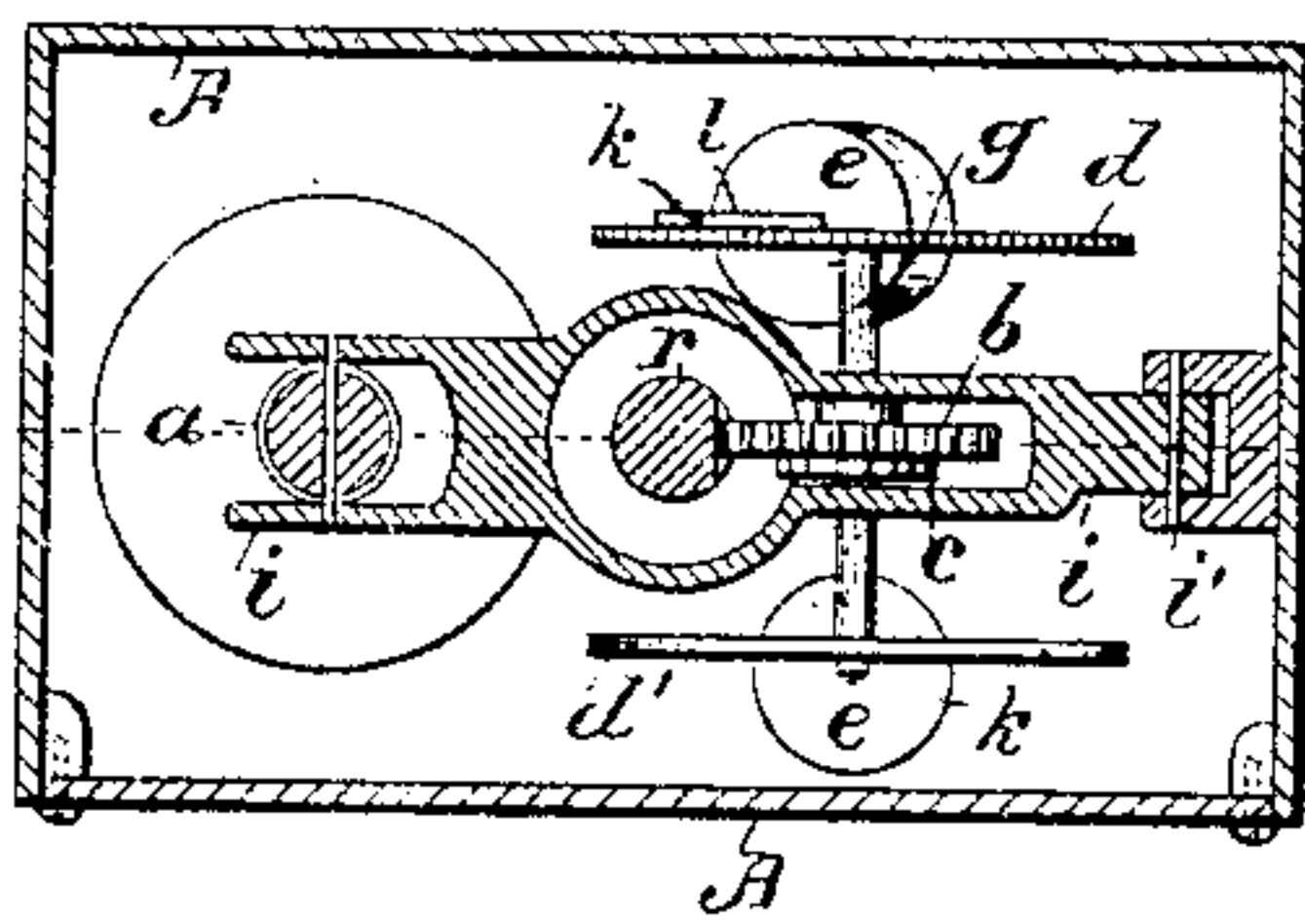


FIG. II.



Attest:  
Geo. P. Mallwood.  
Walter Allen

Inventor:  
William W. King.  
By Knights Bros.  
Attest.



# UNITED STATES PATENT OFFICE.

WILLIAM W. KING, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO  
WILLIAM SOMERVILLE, OF SAME PLACE.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 316,791, dated April 28, 1885.

Application filed April 1, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. KING, of the city of St. Louis and State of Missouri, have invented a certain new and useful Improvement in Electric-Arc Lights, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention consists in the manner of connecting the dash-pots with the mechanism by which the rack-rod of the upper carbon is supported, so as to check the downward motion of the carbon; also, in the described construction of the rack-rod, which allows the upper carbon to drop into contact with the lower carbon when it has descended a certain distance, as set forth.

Figure I is a vertical section of my device on line I I, Fig. II, the front cylinder being shown in section and its piston and rod in elevation in position for attachment to its disk. Fig. II is a horizontal section on the line II II, Fig. I.

A is a frame or case in which the supporting mechanism of the upper carbon is contained.

*r* is the rack-rod, to whose lower end the upper carbon is connected, as usual. The rack *r'* of this rod engages with a spur-wheel, *b*, by which the rod is supported. At the side of the spur-wheel is a ratchet-wheel, *c*, that is fast upon the shaft *g*, upon which the spur-wheel is loose.

*b'* is a dog upon the side of the spur-wheel, that engages with the ratchet-wheel *c*, the arrangement being such as to prevent the spur-wheel turning on the shaft in a direction to allow the descent of the rack-rod, while the spur-wheel is capable of turning in the opposite direction on the shaft, so that the rack-rod may be pushed upward at any time without rotating the shaft *g*. The dog is held to the ratchet-wheel by a spring, *b<sup>2</sup>*. The shaft *g* has bearing on an arm, *i*, hinged to the case or frame A at one end, *i'*, and at the other end hinged to the core *a* of the solenoids *s s*. The upper solenoid is in the main line or circuit and the lower solenoid in the shunt line or circuit, as shown.

Upon the shaft *g* are two disks, *d d'*, the former having a notched periphery that is engaged by an adjustable dog, *f*, that prevents

the turning of the shaft *g* when in its normal position. When, however, the distance between the carbons becomes so great that the resistance through the upper solenoid and carbons and consequent increased current through the lower helix causes the core *a* to descend, the disk *d* is drawn out of engagement with the dog *f*, and the rack-rod *r* descends, turning the shaft *g*. As the point of the upper carbon approaches the lower carbon the resistance through the upper helix decreases and the electric current increases, raising the core *a* and engaging the disk or wheel *d* with the dog *f*, thus preventing the further descent of the rack-rod and carbon.

I claim no novelty in the above-described mechanism.

*k k* are wrist-pins upon the outer sides of the disks *d* and *d'*.

*l l* are the rods of pistons *m* of oscillating cylinders *e*, forming dash-pots. The purpose is to check the rotation of the shaft *g* when the disk *d* is freed from engagement with the dog *f*.

To give a uniform and easy movement to the shaft *g* and rod *r* in the descent of the latter, I set the pins *k* at an angle of ninety degrees to each other, so that one piston shall be at half-stroke when the other is at a dead-center. The dash-pot cylinders are hinged to the frame or case A at *e'*, so as to accommodate themselves to the positions of the pistons. The cylinders may contain glycerine or other liquid to clog the movement of the pistons. The upper end, *h*, of the rack-rod *r* is devoid of teeth, so that when the rod has descended to a certain position it shall descend without hinderance, bringing the two carbons into contact, and thus allowing the electric current to pass and avoiding the breaking of the circuit and consequent putting out of other lights that may be in the same circuit.

I have found that unless the dash-pots are at right angles it is impossible to get an even downward motion of the dash-pots. If the dash-pots are connected to the shaft at any other angle than ninety degrees, the downward motion of the rod will not be uniform. In an arc lamp the steadiness of the light cannot be maintained except by the nice adjustment of the distance of the carbon points from each

other, and consequently the checking influence of the dash-pots should be continuously uniform. My manner of connecting the dash-pots has this advantage of the even retarding of the feeding of the carbon.

5 The toothed portion of my rack-bar above the axial line of the supporting-pinion being of slightly less length than the unconsumed carbon beneath its ferrule, the rack-bar will  
10 be certain to drop down out of engagement with the pinion before the upper carbon is quite consumed.

I am aware that it is old to employ two or more dash-pots, which are connected to the  
15 same pin to retard the mechanism controlling the downward movement of the carrier-rod.

I am also aware that it is old to reduce the diameter of the carrier-rod to permit it to drop and slip past its support before the upper carbon is quite consumed. Such devices for re-

tarding and dropping the carrier-rod I do not therefore claim, broadly.

I claim as my invention—

1. The combination, with a carbon-carrier, of a shaft geared thereto so as to be rotated by  
25 the movement of the said carrier, and two oscillating dash-pots with reciprocating pistons pivoted to two crank-arms on the said shaft, respectively, the two arms being substantially at an angle of ninety degrees to each other. 30

2. In an arc lamp, the combination, with the operating-pinion, of an upper rack-bar having the toothed portion above the axial line of the supporting-pinion of slightly less length than the unconsumed carbon extends  
35 beyond the ferrule.

WILLIAM W. KING.

Witnesses:

SAML. KNIGHT,  
GEO. H. KNIGHT.