

(No Model.)

C. F. KELLER.
ELECTRIC ARC LAMP.

No. 429,573.

Patented June 3, 1890.

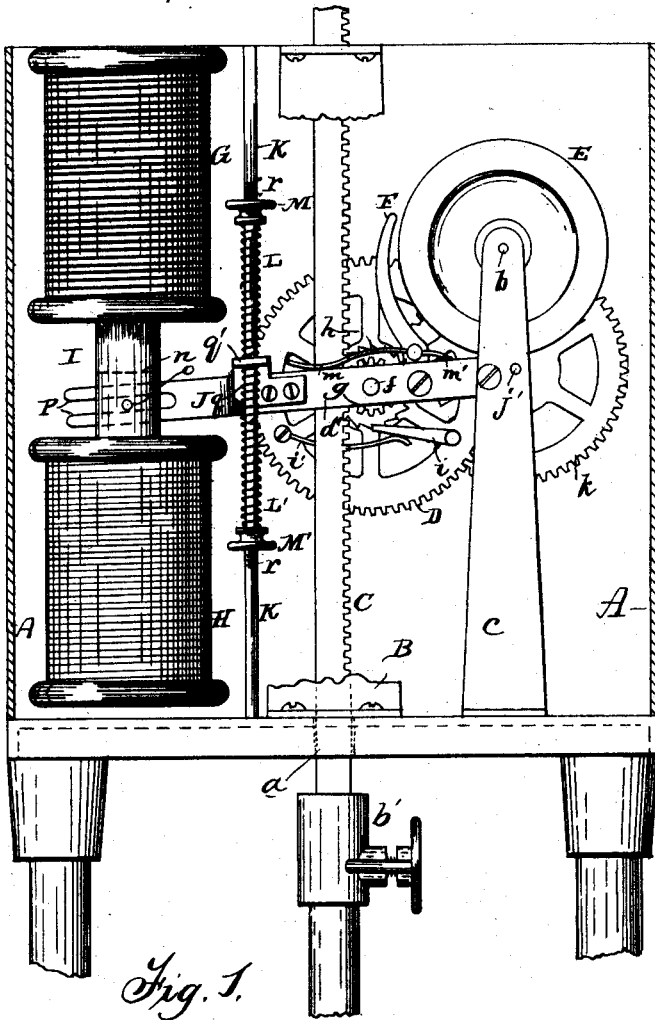


Fig. 1.

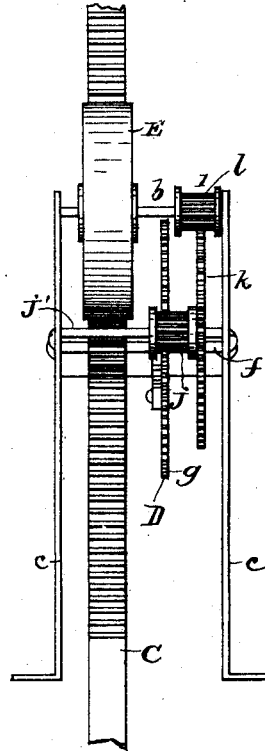


Fig. 2.

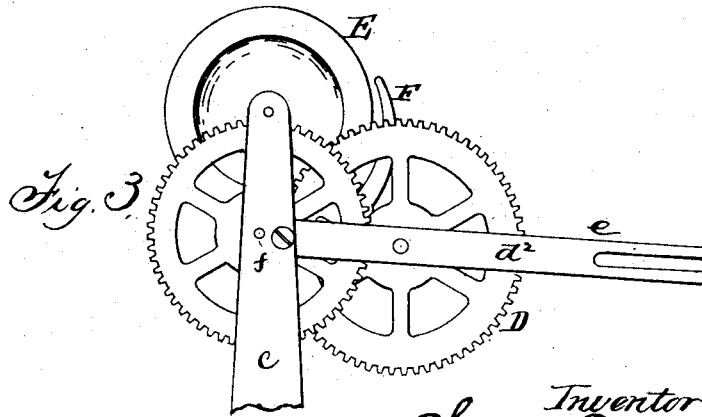


Fig. 3.

Witnesses
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By his Atty.
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UNITED STATES PATENT OFFICE.

CHAUNCY F. KELLER, OF LIMA, OHIO, ASSIGNOR OF ONE-HALF TO FRANK BUCHANAN, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 429,573, dated June 3, 1890.

Application filed January 11, 1890. Serial No. 336,655. (No model.)

To all whom it may concern:

Be it known that I, CHAUNCY F. KELLER, a citizen of Lima, in the county of Allen and State of Ohio, 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, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in electric-arc lamps, and more particularly to mechanism for regulating the feed of the upper carbon.

The object of the invention is to provide regulating mechanism for electric-arc lamps, which shall be simple in construction, sure and accurate in operation, and cheap to manufacture.

A further object is to so construct a regulator for electric-arc lamps that when the lamp is subjected to oscillation or secured to an unsteady object the parts will not be accidentally released, and thus cause the carbon to be improperly fed.

A further object is to provide an electric-arc lamp with mechanism by means of which the gradual feeding of the carbon will be insured.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of my improvement, showing the casing in section and a portion of the supporting-bracket broken away. Fig. 2 is an end view of the gearing. Fig. 3 is a view illustrating a portion of the gearing.

A represents any suitable casing for inclosing the regulating mechanism of an electric-arc lamp.

A bracket B is secured within the head or case A and provided at its top with a perforation, which latter is made to align with a perforation *a* in the base of the casing, and passing loosely through these perforations is a rack-bar C, carrying at its lower end a carbon holder or socket *b'*.

Located within the head or casing A, to one

side of the vertical center thereof, are two upwardly-projecting parallel standards or uprights *cc*, having perforations at or near their upper ends for the reception of the journals of a shaft *h*, the purpose of which shaft will hereinafter be explained.

Pivoted to the standards *cc*, at points between their ends, are the arms *d' d''* of a frame *e*, said frame extending horizontally from the standards *cc* beyond the center of the casing. The arms *d' d''* of the frame *e* are provided with perforations for the reception of the journals of a shaft *f*, on which a pinion *g* is loosely mounted, said pinion being adapted to mesh with the rack-bar C, and secured to or made integral with this pinion is a ratchet-wheel *h*. Keyed or otherwise secured to the shaft or arbor *f*, in close proximity to the ratchet-wheel *h*, is a gear-wheel D, and to one face of this wheel a dog *i* is pivoted and adapted to engage the ratchet-wheel *h*, a spring *i'* being secured to the wheel D and adapted to maintain the dog in contact with the ratchet-wheel. The gear-wheel D is adapted to mesh with a lantern-wheel *j*, secured to a shaft *j'*, which latter is journaled in the uprights *c*. Also secured upon the shaft *j'* is a gear-wheel *k*, which is adapted to mesh with a lantern-wheel *l*, secured upon the shaft *b*.

Secured or keyed to the shaft *b* is a heavy balance-wheel E, which also serves as a brake-wheel, as presently explained. Pivotaly connected to the arm *d'* of the frame *e*, at a point in proximity to the balance or brake wheel E, is a shoe F, adapted to make contact with said wheel and retard or prevent its rotation. A flat spring *m* is secured to a shoulder or projection on the shoe F, and bears at one end on a pin *m'* on the arm *d'* of frame *e*, the other and longer portion of the spring bearing on said arm *d'* at or near its opposite end.

Located on the base-plate of the case or head A, at the opposite side thereof from the uprights *c*, are two electro-magnets or solenoids G H, the solenoid G being wound with coarse wire and included in the main circuit and the solenoid or helix H being wound with fine wire and included in a shunt-circuit around the arc. These solenoids G H are provided with a common movable core I, having a

vertical elongated slot *n*, and extending across this slot at or near its center is a pin *o*. An arm *J*, having an elongated slot *p* at its forward end, is secured to the free end of the horizontal frame *e* and extends through the slot *n* in the core *I*, the pin *o* passing into the elongated slot *p* in the arm *J*.

Secured to the arm *d'* of the frame *e* is a bracket *q*, having a perforation *q'*. A post *K*, having screw-threaded portions *r* at its opposite ends, is secured to the base of the case or head *A* and projects upwardly through the perforation *q'* in the bracket *q*.

Two springs *L L'* are made to surround the post *K* at opposite sides of the bracket *q*, each being adapted to bear at one end against the bracket *q*. The opposite ends of the springs *L L'* bear on thumb-nuts *M M'*, screwed upon opposite ends of the post *K*, by means of which thumb-nuts the tension of the springs may be regulated.

Now it will be seen that when the main current is passing through the helix *G* the upper portion of the core *I* will be drawn within said helix and the brake-shoe *F* made to bear against the wheel *E* and prevent said wheel from rotating, thus holding the rack-bar and carbon carried thereby in a fixed position. When the arc becomes abnormally long, a portion of the current will be shunted through the helix *II*, and the lower portion of the core *I* will be drawn within said helix, thereby lowering the free end of the frame *e* and relaxing the pressure of the shoe *F* against the wheel *E*. This wheel being heavy, will start to rotate slowly and evenly, and through the intermediate gearing above described the upper carbon will be lowered very gradually and the arc allowed to again assume a normal position.

It is of course to be understood that the rotation of the balance-wheel and intermediate gearing is caused by the weight of the rack-bar and carbon carried thereby.

The springs *L L'* will assist the helices in moving the core in case it should stick or be prevented from moving promptly from any cause.

As above mentioned, the wheel *E* is made quite heavy as compared with similar wheels in prior constructions, and that it serves as a balance-wheel to cause the feed of the upper carbon to be gradual and steady, whereas in prior constructions, where the brake-wheel is made thin and light, the upper carbon is liable to drop suddenly when the wheel is released, instead of moving down gradually.

I have described the invention as applied to a single-carbon lamp, but it is evident that it is equally applicable to a double-carbon lamp, it simply being necessary to provide one more gear-wheel.

The regulating mechanism above described is very simple in construction and its operation is sure and steady.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination, with electro-magnets, movable core, and a pivoted frame having loose connection with the core, of a spring bearing on each side of the pivoted frame, and thumb-nuts or equivalent devices for regulating the tension of the springs, substantially as set forth.

2. In an electric-arc lamp, the combination, with a carbon-carrier, of uprights carrying a brake-wheel, electro-magnets, a movable core common to both magnets, a frame pivoted at one end to said uprights and at the other end to the core of the electro-magnets, a rod extending loosely through the frame, springs mounted on the rod on each side of the frame, a brake-shoe to engage the brake-wheel, and gearing connecting the brake-wheel and carbon-carrier, substantially as set forth.

3. In an electric lamp, the combination, with a carbon-carrier, of uprights carrying a brake-wheel, electro-magnets, a movable core common to both magnets, a frame pivoted at one end to said uprights and at the other end to the core of the electro-magnets, a rod extending loosely through the frame, springs mounted on the rod on each side of the frame, means for regulating the tension of the springs, a brake-shoe to engage the brake-wheel, and gearing connecting the brake-wheel and carbon-carrier, substantially as set forth.

4. In an electric-arc lamp, the combination, with a carbon-carrier, of uprights carrying a brake-wheel, electro-magnets, a movable core common to both magnets, a frame pivoted at one end to said uprights and at the other end to the core of the electro-magnets, a post screw-threaded at or near its opposite ends, a bracket on the pivoted frame, through which said post passes, springs on the post at opposite sides of said bracket, and thumb-nuts on the post, by means of which to adjust the springs, a brake-shoe to engage the brake-wheel, and gearing connecting the brake-wheel and carbon-carrier, substantially as set forth.

5. In an electric lamp, the combination, with a carbon-carrier, of uprights carrying a brake-wheel, electro-magnets, a movable core common to both magnets, a frame pivoted at one end to said uprights and at the other end to the core of the electro-magnet, a brake-shoe pivoted to said frame and adapted to engage the brake-wheel, a spring connected to said brake-shoe and bearing on the frame, and gearing connecting the brake-wheel and carbon-carrier, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHAUNCY F. KELLER.

Witnesses:

ALF. B. CRULL,
W. L. PARMENTER.