(No Model.)

F. K. FITCH.

ELECTRIC ARC LAMP.

No. 264,267. Patented Sept. 12, 1882.

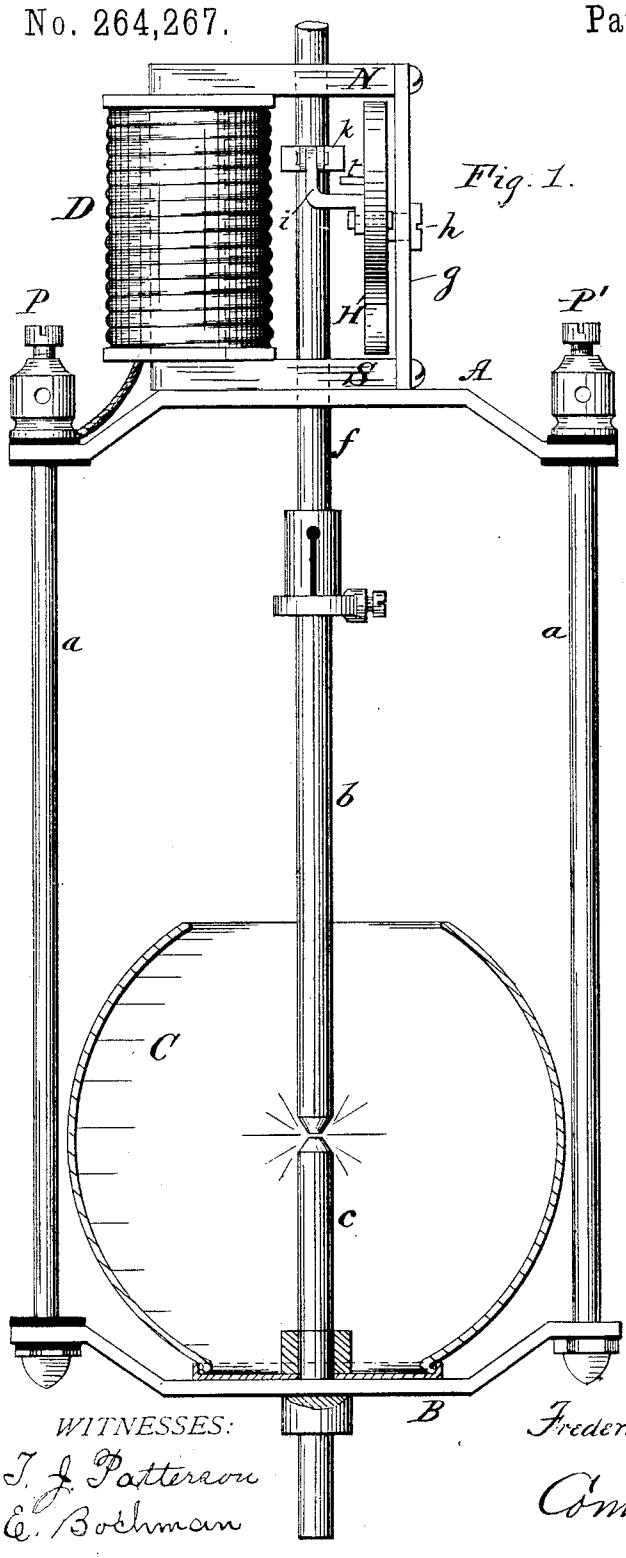
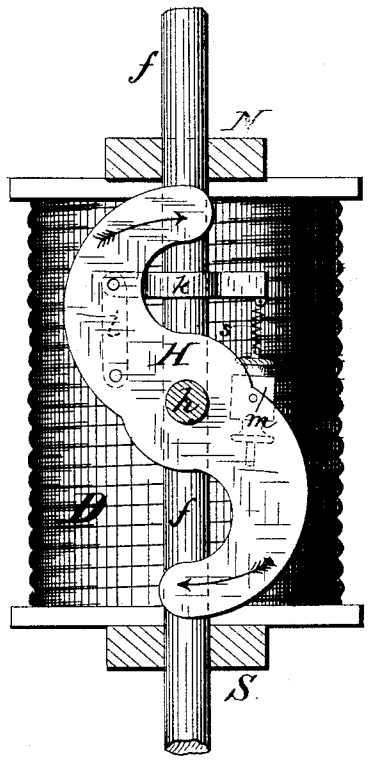


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

FREDERICK K. FITCH, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 264,267, dated September 12, 1882.

Application filed May 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK K. FITCH, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a front view of my improved lamp, the globe being in section. Fig. 2 is a side view, partly sectional, of my regulating and feeding devices.

The object of this invention is to simplify as much as possible the construction of arc-lamps in so far as relates to the mechanism by which the arc is established, the carbon fed in proportion to consumption, and the circuit closed upon momentary failure of the current to surmount the distance between the electrodes.

To these ends my invention consists in the construction and combination of parts substantially as hereinafter fully described and claimed.

In the drawings, A *a a* B represent respectively the top plate, side rods, and base-plate of the lamp, between which is suitably secured the glass globe C, in which the arc is to be established and maintained between the electrodes *b c*. The lower carbon is suitably clamped in a holder, *d*, of any desired form, attached to the base-plate B.

A coarse helix, D, is secured on top of the top plate, A, at one side of the center, and is provided with a fixed core of soft iron. (Represented by dotted lines.) To each end of this core are firmly attached the polar extensions N and S, which project across the axis of movement desired for the carbon-holder *f*, and are perforated to receive and guide the latter. By this means the rod *f* may be very accurately centered and guided, as no play is needed at these extensions N and S. The outer ends of extensions N and S or poles are firmly held by the non-magnetic bar or support *g*, to whose center is swiveled or pivoted an S-shaped armature, H, normally hanging in such position that it does not close the magnetic field between the poles N and S. When current energizes the poles N and S they attract the respective ends of the armature H, which thus oscillates on its center pin, *h*, and moves in a vertical plane. An arm or link, *i*, pivoted to the armature H, projects upwardly, and is pivoted to one end of a clamp, *k*, which is adapted to grip the carbon-holding rod *f* when tilted or raised at that end, the rod *f* passing through it. To the other end of the clamp *k*, I attach a spring, *s*, which is adjustably attached to a swivel, *m*, pivoted on the armature H, as shown. The link *i* is on one side of the carbon-holding rod *f*, and the swivel *m* and spring *s* are on the other side. The current enters at the insulated post P, whence it goes to and through helix D, thence to rod *f via* plate A, thence to carbon *b*, to carbon *c*, to plate B, to post P′, and to line. Rod *a* is insulated from plates A and B. When the helix D is energized by the current the poles N S attract the respective ends of the S-shaped armature H, which, oscillating on its center, raises the arm *i* and tilts the clamp *k*. The spring *s* on the opposite side being drawn down by the oscillation of the armature H, the rod *f* is clamped firmly and at the same time raised upwardly through the guide-holes in poles N and S. Carbon *b* is raised with it and the arc established. When in the course of time the arc would tend to become too long by consumption of the carbons the increase in resistance of the arc would have a tendency to weaken the current, thus reducing the attractive power of the poles N and S. In that event the armature H, by gravity or by the force of a suitable retracting-spring, oscillates backwardly and allows rod *f* to be lowered by the clamp *k*. This action takes place at once and the arc is diminished to a degree suitable to the strength of the current. When there is no current traversing the lamp-helix and electrodes the clamp is inoperative to sustain or lift the rod *f*, and consequently the latter drops into position where the carbons *b c* are in contact, thus automatically re-establishing the circuit at that point. The amount of movement required for this purpose will be the length of the maximum arc. To prevent any damage from sudden fall of the rod *f* and carbon *b* through this distance, the clamp *k* is so adjusted as to not assume a horizontal position till the rod *f* has descended about this disatnce, and until the clamp is horizontal, or at right angles to rod *f*, its grip on the rod remains effective.

At this point I place a projecting pin, *t*, on the bar *g*, adjustable, if desired, which will stop the downward oscillation of the clamp *k* at a point just before contact of the two carbons takes place, or thereabout, so that when about horizontal the clamp *k* lets go of the rod *f*, the latter slides down, the resistance diminishes, the magnetism of N and S increases, and the clamp is again oscillated and the arc adjusted. These changes take place in a minute degree and are hardly appreciable.

I claim as my invention—

1. In an arc-lamp, the combination, with the carbon-holding rod *f*, of an electro-magnet, D, whose axis is at one side of and parallel to rod *f*, and provided with polar extensions N and S, perforated for the passage of the rod *f*, and an S-shaped armature, H, suitably swiveled, and provided with a clamp, *k*, substantially as described.

2. The combination of magnet D, extensions N and S, bar *g*, S-shaped armature H, pivoted thereto, link *i*, clamp *k*, spring *s*, and swivel *m*, substantially as described.

3. In an electric-arc lamp, in combination with the carbon-holding rod *f*, a clamp extending on both sides thereof, and attached on one side to an oscillating armature directly and on the other side attached to said armature by an interposed spring, substantially as described, whereby the one side of the clamp is tilted upwardly by the armature directly and the other side depressed by the spring and the lift of the rod effected by the preponderance of power in the direct upward tilting.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

FREDERICK K. FITCH.

Witnesses:

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JAS. H. MATTHAW.