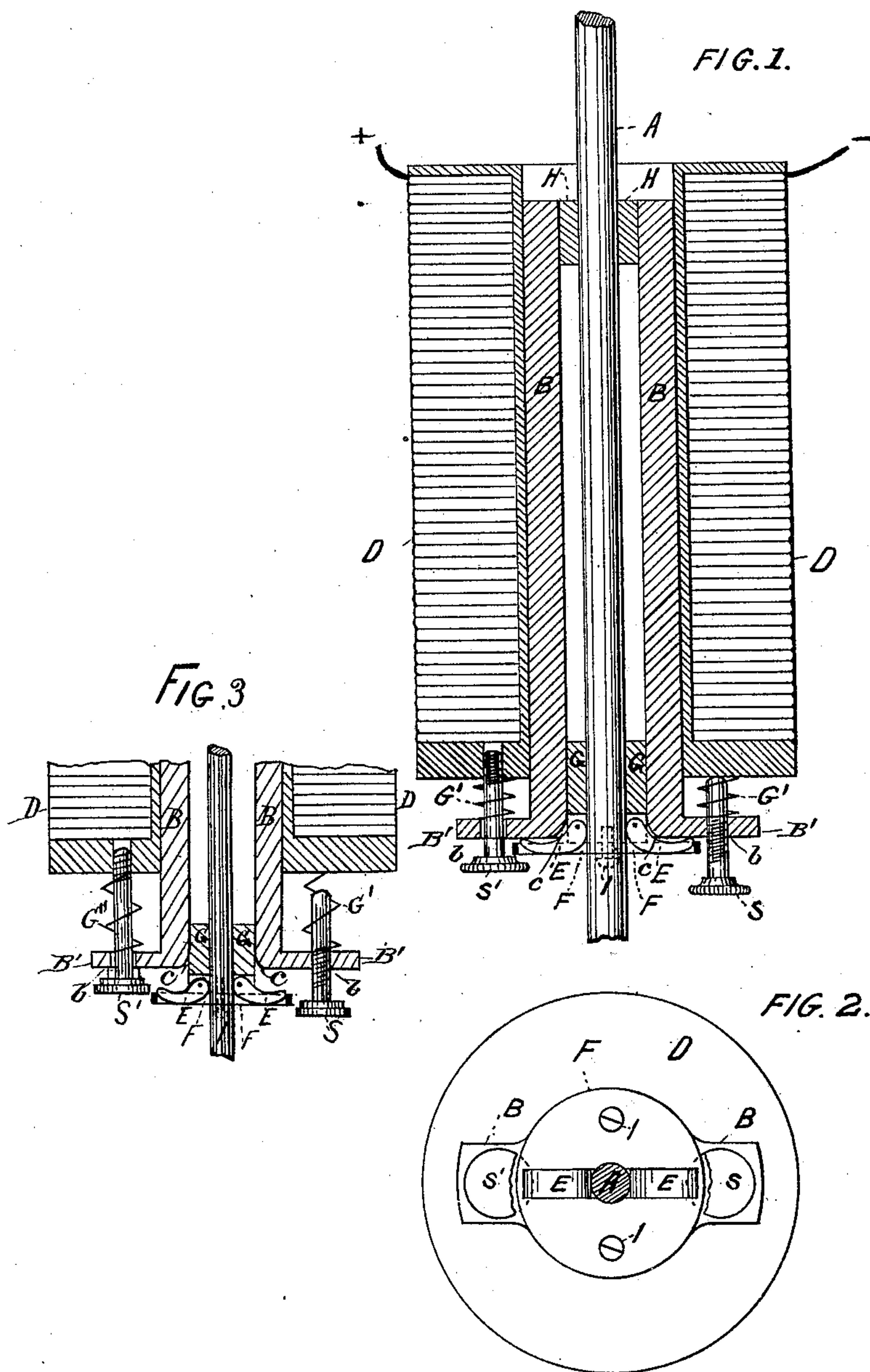


(No Model.)

E. R. KNOWLES.
ELECTRIC LIGHT.

No. 246,956.

Patented Sept. 13, 1881.



WITNESSES:

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EDWARD R. KNOWLES, OF BROOKLYN, NEW YORK.

ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 246,956, dated September 13, 1881.

Application filed June 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Lights; 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in the feeding and lifting mechanism of electric-arc lights.

The objects of my invention are, first, to provide means by which the rod carrying the upper carbon is clutched and firmly held; second, means by which the clutching device is forced into position and released at the proper time, so as to allow the rod to be fed downward. I attain these objects by means of the mechanism shown in the accompanying drawings, and which will be more fully described in the specification and pointed out in the claims.

In the drawings, Figure 1 is a vertical section of my device; Fig. 2, a plan view of the plate holding the clamps, and Fig. 3 a sectional detail view of the lower end of the device, showing one position of the rod-clamping mechanism.

Referring more particularly to the drawings, A represents the ordinary carbon-holding rod; D, a bobbin or solenoid of insulated wire; B, an iron core sliding therein, and capable of being drawn into the solenoid by virtue of its magnetic attraction when it is excited by electric action. This core B is provided with two arms, B', projecting at right angles to the body of the core, and perforated at b' for the passage of adjusting-screws S S'.

G is a brass tube or sleeve adapted to move in and out of the core B, and has pivoted to it two cams, E E, and attached to it, by screws or otherwise, a thin metal plate, F. This plate acts as an armature to the core B when said core becomes magnetized by the solenoid.

E E are two cams or eccentric clutches, which are pivoted to a hollow sleeve, G, mov-

ing within the core B and surrounding the upper carbon-holding rod. These cams are so pivoted to the sleeve that their inner convex surfaces may grasp the holding-rod and act as a clutch, as will be hereinafter described.

To the lower end of sleeve G a thin iron plate is secured, which acts as an armature to core B. This plate is rigidly attached to the sleeve and movably attached to the core by screws I I, Fig. 2. Passing through the projecting arms B' are two adjusting-screws, S S', surrounded by springs G' G'', the distance-core B can emerge from the solenoid being determined by said screws.

In operation the action of the device is as follows: The current enters at the + point and passes around coil D, thus rendering it magnetic and causing it to magnetize, by induction, the core B, which, becoming strongly magnetic, attracts its armature F, drawing it up, and, of course at the same time the sleeve G, to which the armature F and cams E are secured, is forced into the core B and the cams caused to turn around their pivots, so that the larger curved surface of their inner convexities is brought against the rod A, thus grasping and holding it firmly as long as the strong magnetic action continues. The core B gradually becomes magnetized to such a degree that it is drawn into the bobbin D, and in so doing lifts with it the magnet F and the cams, which still grasp the rod A. This action separates the points of the carbons, and the electric arc is formed between them. As the length of the arc becomes greater the electric strength of the bobbin becomes weaker, and the core B gradually descends therefrom until it rests on the head of screw S'. At this time the magnetic attraction of the core for its armature has become so reduced that it will no longer hold the armature-plate F, but allows it to fall, and as it falls it draws down the sleeve G, and at the same time the cams are turned about their pivots in the opposite direction from the first movement, thus releasing their hold on rod A and permitting it to descend until a new contact is made. This action is intermittent, and the arc established and re-established successively.

The proper length of the arc is determined by the screws S S', the screw S' being screwed into the plate surrounding the solenoid to a greater or less degree, as may be required.

The springs G G'', passing around the screw-shanks and abutting against the projections B' and the solenoid plate, are compressed as the core B is drawn up, and constantly act to force
5 the core downward.

Having thus described my invention, what I claim is—

1. In an electric light, the combination, with a magnet and a hollow armature-core, of a
10 movable sleeve within such core, an armature-plate suitably secured to the sleeve, and two cams acting as a clutch for the carbon-holding rod, said cams being pivoted to the sleeve
15 in such manner that when the armature-plate is drawn up to the armature-core the sleeve is forced into the core and the cams are turned on their pivots, so that their inner convex surfaces are pressed against and hold the carbon-supporting rod, as set forth.

20 2. In an electric light, the combination of a magnet, a hollow armature-core provided with two projecting arms perforated to receive adjusting-screws, a metallic sleeve moving in the

armature-core, two cams pivoted to the sleeve and acting as a clutch, as described, an iron
25 plate rigidly attached to said sleeve and adjustably attached to the armature-core, said plate being an armature for the core, and thereby acting through the cams to raise and lower the carbon-holding rod, substantially as set
30 forth.

3. In an electric light, a metallic sleeve, G, adapted to move in a hollow armature-core, and provided with two pivoted cams, E, and an armature-plate, F, substantially as and for
35 the purpose set forth.

4. In an electric light, the combination, with magnet D, core B, and armature F, of the
40 clamps E, sleeve G, rod A, and set-screws S S', as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD RICHARDSON KNOWLES.

Witnesses:

WM. H. BROADNAX,
SAML. R. TAYLOR.