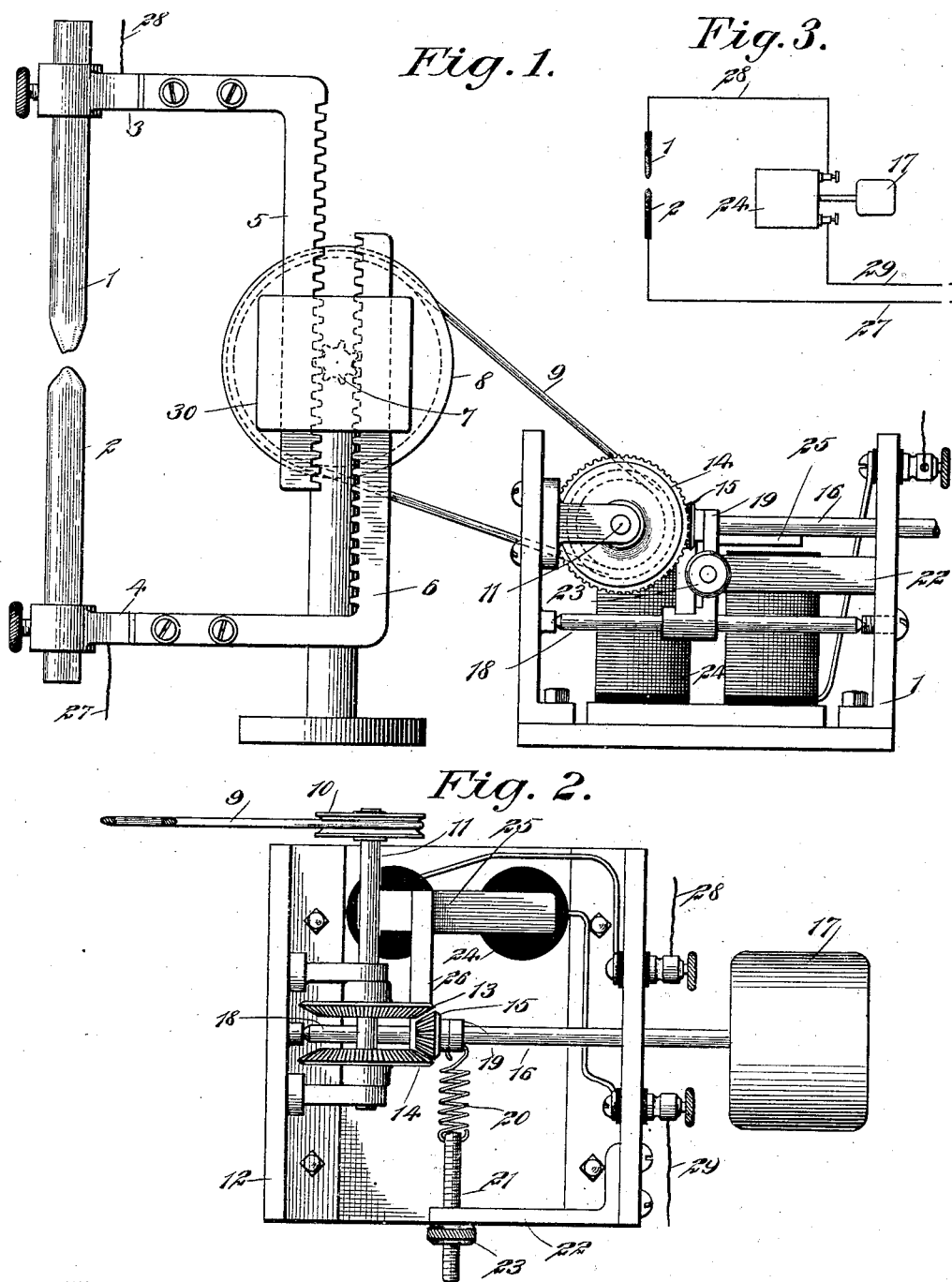


No. 645,784.

Patented Mar. 20, 1900.

E. L. BOWEN.
ELECTRIC ARC LAMP.
(Application filed Dec. 8, 1899.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

EDWARD LEE BOWEN, OF McCOMB CITY, MISSISSIPPI.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 645,784, dated March 20, 1900.

Application filed December 8, 1899. Serial No. 739,657. (No model.)

To all whom it may concern:

Be it known that I, EDWARD LEE BOWEN, a citizen of the United States, and a resident of McComb City, in the county of Pike and State of Mississippi, have invented a new and Improved Electric-Arc Lamp, of which the following is a full, clear, and exact description.

This invention relates to improvements in electric-arc lamps; and the object is to provide a simple means for automatically regulating and controlling the carbons to keep a constant and even light, making the device particularly useful for search-lights, magic lanterns, vitascopes, and the like.

I will describe an electric-arc lamp embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of an arc-lamp and controlling mechanism embodying my invention. Fig. 2 is a plan view of the controlling mechanism, and Fig. 3 is a diagrammatic view showing the system of wiring.

Referring to the drawings, 1 2 designate two carbons held, respectively, in holders 3 and 4. The holder 3 is supported on a rack 5, while the holder 4 is supported on a rack 6, and the racks 5 and 6 engage with a pinion 7 at opposite sides thereof. On the shaft of the pinion 7 is a band-wheel 8, from which a band 9 extends to a pulley 10 on a shaft 11, mounted in a frame 12. On the shaft 11 are miter-gears 13 and 14, each of which is adapted to be engaged by a miter-pinion 15 on a laterally-movable shaft 16, having bearings through the frame 12 and kept in constant rotation by a suitable motor—such, for instance, as a spring-motor—arranged in a casing 17.

Below the shaft 16 is a rock-shaft 18, from which an arm 19 extends upward and engages with the shaft 16. An adjusting-spring 20 is connected at one end to the arm 19 and at the other end to a screw 21, extended through an arm 22, attached to the frame 12, and having at its outer end an adjusting-nut 23. An electromagnet 24 is arranged in the casing 12, and coacting with this electromagnet is an ar-

mature 25, having a lever connection 26 with the rock-shaft 18.

A feed-wire 27 leads to one of the carbons, and from the other carbon a wire 28 leads to one end of the electromagnet 24, and from the other end of the electromagnet a wire 29 leads out.

In operation the spring 20 will first draw the pinion 15 into engagement with the gear 14. This will rotate the shaft 11 in such direction as to cause the racks 5 and 6 to move the carbons 1 and 2 into engagement. This of course closes the electric circuit, which passing through the electromagnet will energize the same, attracting the armature 25 and rocking the shaft 18 to move the pinion 15 into engagement with the gear 13. This will rotate the shaft 11 in the opposite direction, causing the carbons to separate and form an arc. When the arc is formed, the spring 20 will balance the attractive force of the armature and the pinion 15 will move to a point intermediate of the gears 13 and 14 and not touch either one of them. As the carbon burns away the resistance of course will be increased and eventually the current will be wholly cut out, permitting the spring 20 to again draw the pinion 15 into engagement with the gear 14 to again close the circuit, so that the before-mentioned operation again takes place.

The tension of the spring 20 may of course be regulated by the nut 23. The racks 5 and 6 are held in vertical alinement by passing through a boxing or guide 30. By this construction it is obvious that the lamp will require no attention excepting that of winding the spring in the motor when necessary until the carbons are exhausted.

Having now fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In an arc-lamp, carbon-holders, racks to which said holders are attached, a pinion meshing with the racks for moving them in opposite directions, a rotary shaft having driving connection with the pinion, gear-wheels on said shaft, a laterally-swinging shaft, a pinion on said shaft adapted for engagement with either one of the gear-wheels on the rotary shaft, means for rotating the laterally-

swinging shaft, an electromagnet arranged in the lamp-circuit and adapted to move the pinion-carrying shaft in one direction, and a spring for moving said shaft in the opposite
 5 direction, the strength of the electromagnet and spring being so related that when an arc is formed between the lamp-electrodes, the laterally-swinging shaft will be held in position to hold the pinion thereon out of engage-
 10 ment with both of the gear-wheels, substantially as specified.

2. A regulating device for an electric-arc lamp, consisting of a motor, a shaft rotated by said motor and adapted to swing laterally,
 15 a pinion carried by said shaft, another shaft arranged at right angles to the first-named shaft, gear-wheels on said other shaft with either one of which the pinion is designed to engage, an operating connection between said

other shaft and electrode-carrying devices, 20
 an electromagnet arranged in the lamp-circuit and adapted to move the first-named shaft laterally in one direction, a spring for moving said shaft laterally in the opposite
 25 direction, an adjusting device for the spring, the strength of said spring and electromagnet being so related that when an arc is formed between the carbons of the lamp, the pinion will be held out of engagement with both of
 30 the gear-wheels, substantially as specified.

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

EDWARD LEE BOWEN.

Witnesses:

W. R. CASTON,
 W. T. EVANS.