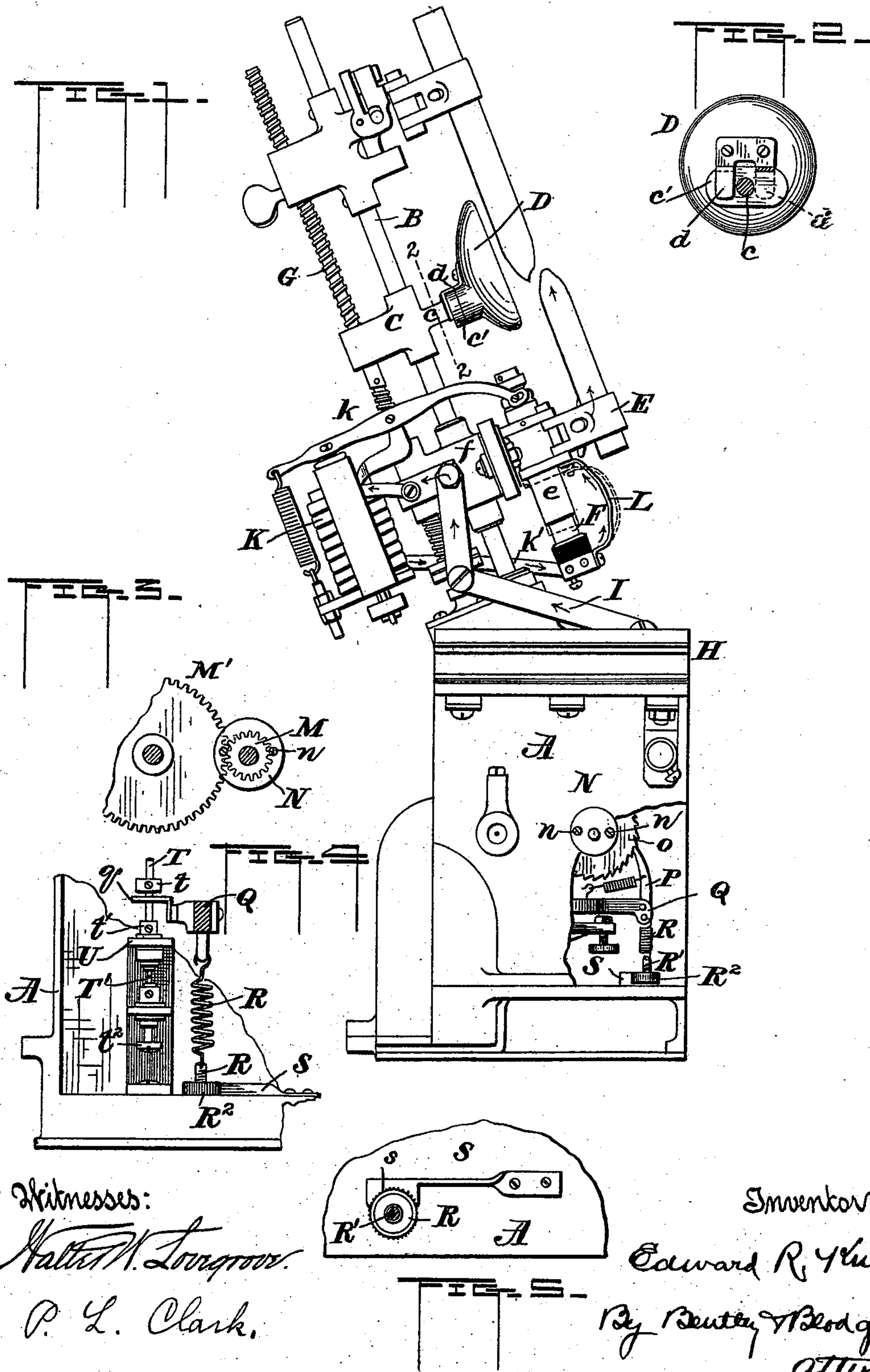


(No Model.)

E. R. KNOWLES.  
ELECTRIC ARC LAMP.

No. 516,826.

Patented Mar. 20, 1894.



Witnesses:

*Walter W. Longgrove.*

*P. L. Clark.*

Inventor:

*Edward R. Knowles*

*By Bentley & Blodgett,*  
*attys.*



# UNITED STATES PATENT OFFICE.

EDWARD R. KNOWLES, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO THE SCHUYLER ELECTRIC COMPANY, OF CONNECTICUT.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 516,826, dated March 20, 1894.

Application filed July 17, 1893. Serial No. 480,688. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

These improvements relate especially to details in the focusing arc lamp used in search lights, though applicable of course to other styles of lamp. They have reference to the manner of attaching the shield, the electrical connection between the sliding negative carbon holder and its support, the feeding gear, the tension device for the feed-pawl armature, and the make and break contacts in the shunt circuit.

In the drawings: Figure 1 is a side elevation of a focusing arc lamp embodying my improvements. Fig. 2 is a rear view of the shield on the line 2—2. Fig. 3 is a detail of the feed gear. Figs. 4 and 5 are details of the tension device.

Rising from the base A is an inclined post B, on which is rigidly fastened a sleeve C having on one side an arm c having a T-shaped head c'. The shield D rests against the face of this head c', and is provided with two flat spring fingers d which slip down over the back of the head c' and hold the shield firmly in place, but permit it to be easily and quickly removed by sliding it upward off the head.

The holder E for the negative carbon is attached to a carrier e which slides on a bar F rigidly fastened to the block f mounted to slide on the post B, and actuated by the feed screw G. Electrically connected with one of the lamp contacts H, by means of a jointed arm I, is the series or arc striking electro-magnet K, carried on the block f. The armature lever k of this magnet is connected with the sliding carrier e, whereby the magnet is enabled to separate the carbons, by depressing the carrier as indicated by dotted lines in Fig. 1. The electrical connection between the carrier and the magnet coil is by means of a link k' running from the terminal of the coil to an insulated collar on the bar

F, and a flexible copper conductor L between said collar and the carrier e. This conductor is of one or more separate strands or layers, thin enough to give it great flexibility, so that it can accommodate itself to the relative movements of the block and carrier.

In order to take up wear, and prevent backlash between the pinion M and gear M' of the feeding mechanism, the pinion is journaled eccentrically in a cylindrical bushing N mounted in a cylindrical hole in the side of the lamp base. After turning the bushing to adjust the pinion toward or away from the gear-wheel, the bushing can be fastened by the screws n. On the same shaft as the pinion is the ratchet wheel O, which is driven by the pawl P carried on the lever Q which is vibrated by the shunt electro-magnet of the feed mechanism, in the usual manner. The lever has a tension spring R, which is fastened to the end of the screw R' on which is a circular nut R<sup>2</sup> for adjusting the tension of the spring. A spring arm S is fastened to the lamp-base, and its free end has a curved face s to fit the periphery of the nut R<sup>2</sup>. The nut and the curved face on the arm are milled or roughened, so that the arm serves to lock the nut against accidental movement, as by the jarring of the mechanism, while yet permitting it to be readily turned by the attendant when necessary.

The make and break of the shunt circuit are effected by the lever Q, which has an arm q playing between adjustable stops t t' on the movable contact T, which slides stiffly in a holder U. The opposite contact T' is also adjustable by means of a screw t<sup>2</sup>. By adjusting the stops, the feed can be made coarse or fine at will.

Having thus described my invention, what I claim is—

1. In a focusing arc lamp, the combination with a T-shaped head, of a shield adapted to rest against the face of the head, and having spring-fingers to slide down over the back of the head, substantially as shown and described.

2. In a focusing arc lamp, the combination with the pinion M and gear M' of the feed mechanism, of the cylindrical bushing N in

which said pinion is eccentrically journaled, said bushing being mounted in a cylindrical hole in the lamp base, and provided with means for locking it when adjusted, substantially as shown and described.

5 3. In a focusing arc lamp, the combination with the shunt circuit, of a pair of contact points, one of which slides in a holder and is provided with adjustable stops, and a vibrat-

ing arm playing between said stops, substantially as shown and described.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

EDWARD R. KNOWLES.

Witnesses:

D. J. GLAZIER,  
JOS. T. ELLIOTT.