(No Model.)

J. A. MOSHER.

ARC LAMP.

No. 437,502. **Patented Sept. 30, 1890.**

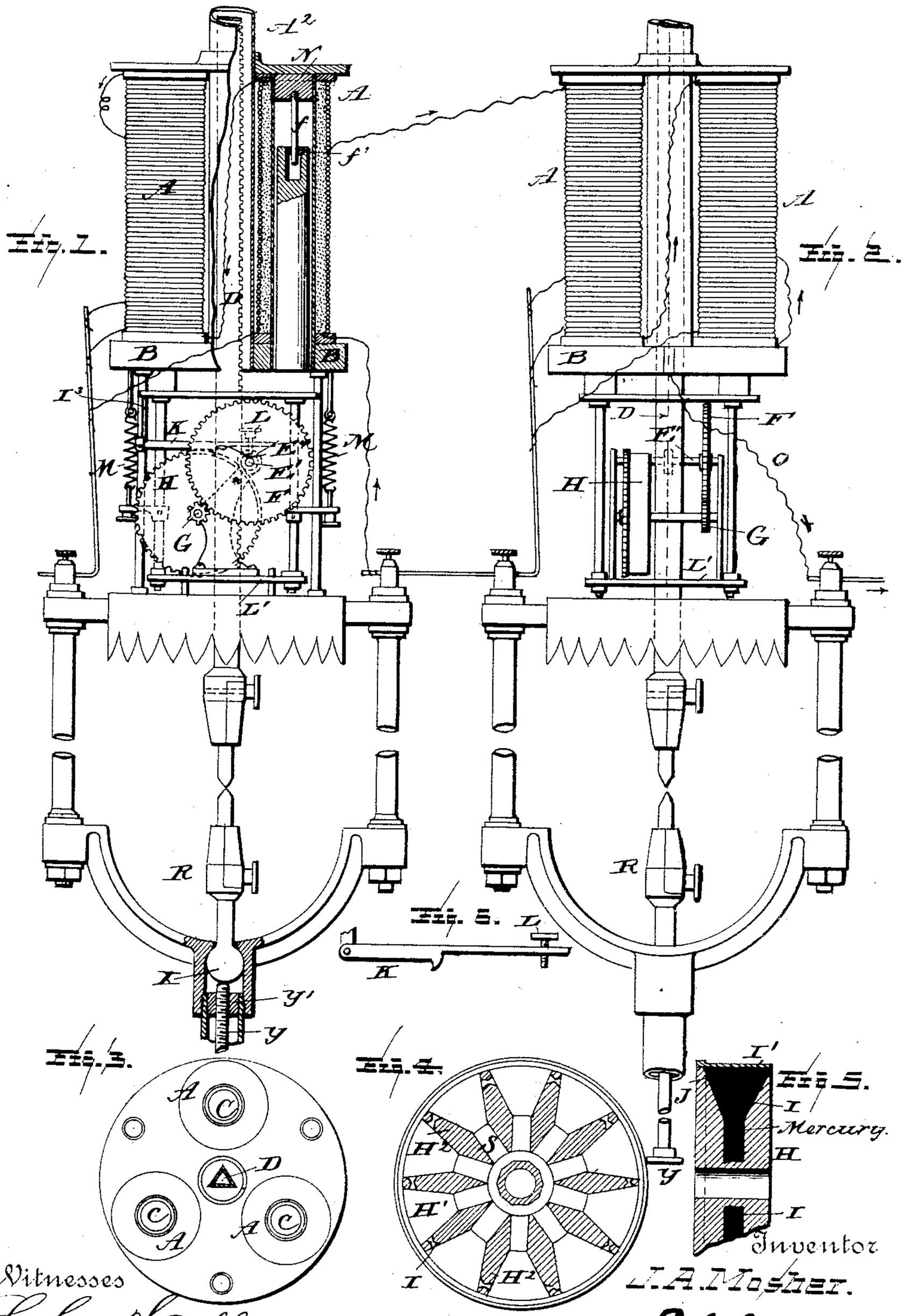

Fig. 1.

Fig. 2.

Fig. 6. L

Fig. 3.

Fig. 4.

Fig. 5.

Witnesses
L. C. Hills.
E. H. Bond.

Inventor
J. A. Mosher.
E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

JOHN ARTHUR MOSHER, OF ABILENE, KANSAS, ASSIGNOR OF ONE-FOURTH TO ANN M. MOSHER, OF SAME PLACE.

ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 437,502, dated September 30, 1890.

Application filed December 31, 1889. Serial No. 335,554. (No model.)

To all whom it may concern:

Be it known that I, JOHN ARTHUR MOSHER, a citizen of the United States, residing at Abilene, in the county of Dickinson, State of Kansas, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in arc lamps; and it has for its object to provide an arc lamp to be used on an incandescent system.

It has for a further object to secure an arc lamp to burn in series on a circuit of constant potential or incandescent system that will be at once effective, simple, and economical.

The invention also aims at improved regulating-magnets and feed-controlling mechanism.

Other objects and advantages of the invention will hereinafter appear, the novelty residing in the special features specifically pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation showing the magnets and feed-controlling mechanism constructed and arranged in accordance with my invention, one of the solenoids being shown in vertical section to better illustrate the construction. Fig. 2 is an elevation at right angles to that of Fig. 1. Fig. 3 is a top plan of the coils in Fig. 1, showing the carbon-rod in cross-section. Fig. 4 is a vertical section through the fiber-wheel. Fig. 5 is a vertical section through the same at right angles to the section of Fig. 4—that is, in the direction of the axis of the wheel. Fig. 6 is an enlarged side elevation of the dog and its thumb-screw.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the three main-current coils or solenoids of the feed-controlling mechanism, of coarse wire, also a derived-circuit coil inclosed within each of the same, as shown best in section in Fig. 1. All are mounted on a vulcanized-fiber or non-conducting frame B. The position of the coils is shown in Fig. 3.

C, Figs. 1 and 3, indicates the movable cores, which cores depend from the coils, as shown, so as to be lifted by the action of the currents circulating in the coils A A.

D indicates the usual carbon holder or rod, which rod extends axially through the frame B, and is surrounded by the three solenoids A, as shown in Fig. 3, and is engaged by the feed-controlling mechanism hereinaftor described. This feed-controlling mechanism consists of the devices now to be described.

E is a pinion carried by the shaft E′ and engaging in the cogs A^2 or teeth cut in the carbon rod or holder D.

F is a gear-wheel mounted on the same shaft with the pinion E, said wheel F engaging the small wheel G, mounted on the same shaft, with a vulcanized-fiber wheel H, as shown in section in Figs. 4 and 5. This wheel H is provided with holes or pockets H′, drilled at equal distances around the circumference, with a partition H^2 between each pocket and a small hole I drilled through these partitions connecting the pockets, as shown in Figs. 4 and 5. This wheel is further provided with an iron band I′ around it, thus sealing the pockets. This iron band has a rib turned on the face, as shown in Fig. 5 at J, and this rib has teeth K′ cut in it to receive the dog K, hereinafter described. This dog K is pivoted or supported at one end, as shown best in Fig. 1. The fiber-wheel H is designed to contain mercury to limit the speed of the carbon-carrier to any desired speed, the amount of the mercury depending upon the weight of the carbon rod or holder entirely. The greater the weight of the carbon rod or holder the greater the amount of mercury. As the weight of the carbon-rod D causes the mechanism to revolve, the mercury in the pockets of said wheel is carried from its point of gravity toward a point horizontal from the shaft upon which the wheel is mounted, and it follows that the descent of the carbon-rod would be regulated by the flow of the mercury through the holes that connect the pockets. These pockets H′ also have small holes connecting them to-

gether near the axis of said wheel for the purpose of carrying any mercury that may have been elevated above the horizontal line from the shaft, as shown at S in Fig. 4, back to its point of gravity. One end of the dog K is supported by a post I^8, secured to the frame B, as shown in Fig. 1. The free end rests upon the shaft E′, that supports the cog-wheels E and F, and is regulated by a thumb-screw L, as shown in said Fig. 1, which thumb-screw is tapped through the end of the dog and bears on the said shaft E′. It will thus be seen that by this arrangement the weight of the said dog is never removed from the movable magnet-cores and operates as follows: When the cores are lifted, the dog K is engaged in the notches or teeth which are cut in the rim J, encircling the wheel H, and stops the rotation of said wheel, so that the carbon-rod cannot descend. When the cores are depressed, the free end of the dog rests on the shaft of the wheels E and F and releases the wheel H, and the carbon-rod feeds downward slowly, which movement is steadier than clock-work.

M are springs attached at one end to the frame B and at the other end to the disk or frame L′, which supports the cores and the wheels E, F, and H and assists in sustaining the weight of the said cores and attached parts.

N is a brass plug securing the top of the solenoid, and has a brass pin or stem *f* extending therefrom and entering a brass plug *f′* in the top of each magnet-core to guide the same and also to form a circuit through the cores and connected parts to the carbon rod or holder. The main-circuit coil is divided into three circuits, each going to one of the solenoids.

O is a derived circuit of fine wire coiled around and underneath each of the main-circuit coils or solenoids and wound in the same direction as the main circuit.

The lower-carbon holder R is provided with a ball-joint X, and Y is a regulating-screw tapped through a suitable support or cap Y′ and bearing against the said ball for the purpose of adjusting the lower carbon in relation to the upper one.

To operate two or more lamps in series the derived circuit is connected up in the following manner: commencing at the main current between the two lamps and going around the main circuit, so that the current is in the same direction in both series and derived coils, as shown by the arrows in Fig. 1. The derived circuit then passes to the second lamp and is connected so that the current is in the opposite direction to the main-circuit coils or differential to the same. It will thus be seen that the derived circuit includes all of the solenoids of both lamps, but is practically connected between the main connecting-posts of one lamp only. The direction of the current is indicated by arrows in Figs. 1 and 2. The lamps thus connected and arranged work as follows: When there is no current on the circuit, the carbons are together and the cores C in both lamps are lowered to their fullest extent. When the current is turned on, the cores in both lamps rise, thus separating the carbons and forming the arc. The purpose of the derived circuit is to keep the arc in both lamps the same length. If the arc becomes shorter in lamp 1 than in lamp 2 the derived circuit would increase in power and help to lengthen the arc in lamp 1 and at the same time prevent the arc in lamp 2, from increasing, thus bringing both lamps to the same balance they were regulated at when started. Now reverse the case, and the arc becomes shorter in lamp 2 than in lamp 1. Then the derived circuit diminishes in power and lengthens the arc in lamp 2, owing to the differential current in that lamp, and lamp 1, not having as much help from the derived circuit, would prevent the arc from increasing, and both lamps would balance once more and also be compelled to feed the carbons alike in both lamps.

Various modifications in detail may be resorted to without departing from the spirit of the invention.

What I claim as new is—

1. The combination, with the magnets and the movable cores, of the carbon-rod holder, the frame connected with the movable cores, the feed-controlling mechanism on said frame, and the dog having a tooth between its ends engaging one of the wheels of said feed-controlling mechanism and having its free end bearing on the shaft of the geared wheels, substantially as specified.

2. The combination, with the magnets, the movable cores, and the carbon-holder, of the geared wheels movable with the cords, the dog resting on the shaft of the geared wheels, a pocketed wheel having teeth engaged by the tooth of the dog, and means for adjusting the dog, substantially as and for the purpose specified.

3. In a feed-controlling mechanism for electric lamps, a wheel formed with pockets, with a communication between them at the periphery and also near the axis of the wheel, and a band around the periphery of the wheel sealing the pockets, substantially as shown and described.

4. In a feed-controlling mechanism for electric lamps, a wheel formed with pockets having communication with each other both at the periphery and near the axis of the wheel and formed around one edge with a toothed rim, and a band around the periphery of the wheel and sealing the pockets and carrying said toothed rim, substantially as and for the purpose specified.

5. The combination, with the lower-carbon holder provided with a ball-joint and a cap on the lower holder, of a set-screw tapped through said cap and bearing against the ball for the purpose of adjusting the lower carbon, substantially as described.

6. In a feed-controlling mechanism for electric lamps, a wheel formed with pockets, combined with a metallic band around the periphery of the wheel and sealing the pockets, substantially as described.

7. In a feed-controlling mechanism for electric lamps, a wheel provided with pockets having communication with each other near the periphery and also near the axis of the wheel, combined with a metallic band encircling said wheel and sealing the pockets and formed with a toothed rib upon its face at one edge, substantially as shown and described.

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

JOHN ARTHUR MOSHER.

Witnesses:
C. M. McCLAREN,
L. D. TOLIVER.