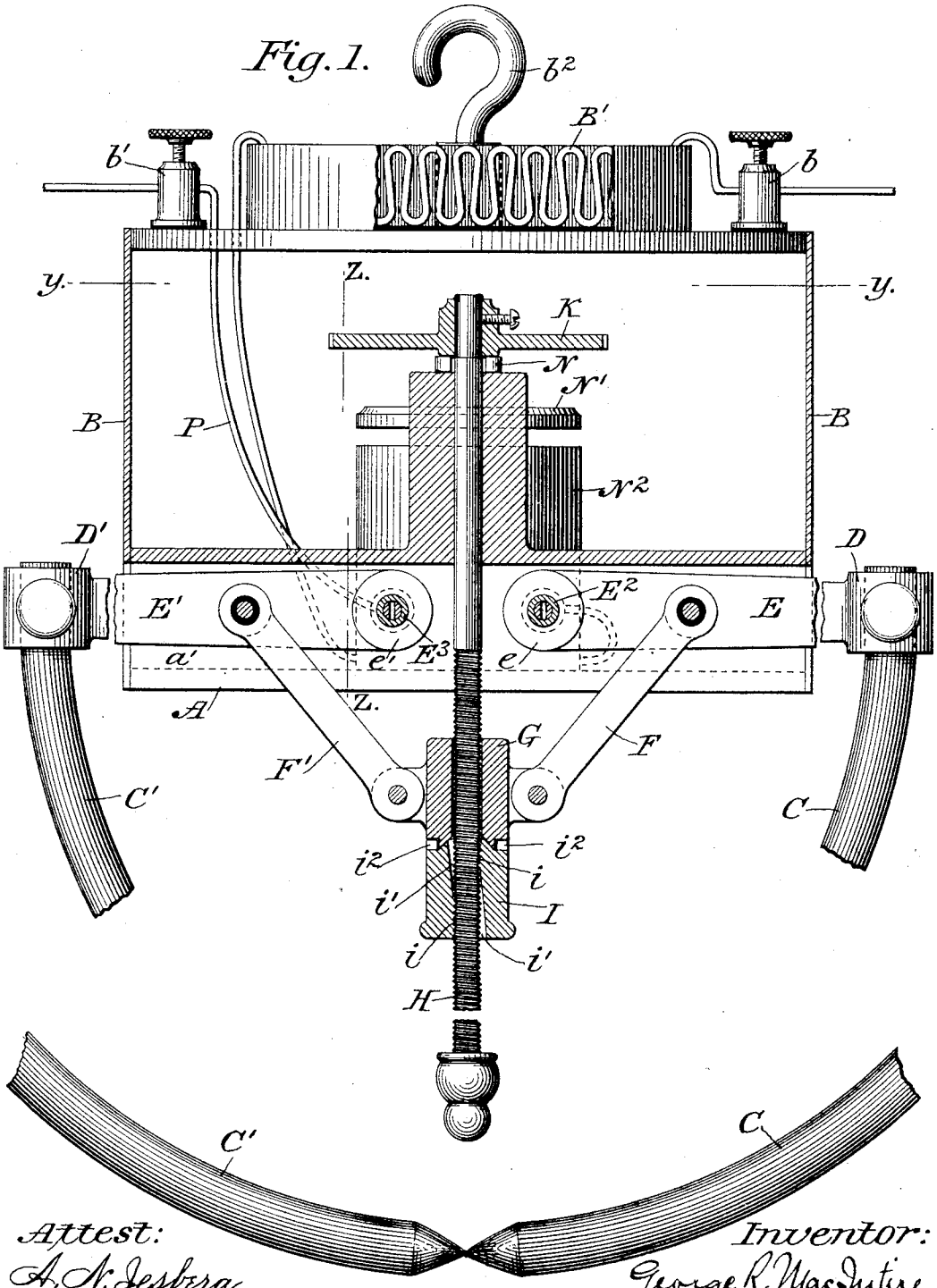
(No Model.) 2 Sheets—Sheet 1.

G. R. MACINTIRE.

ELECTRIC ARC LAMP.

No. 535,842. Patented Mar. 19, 1895.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

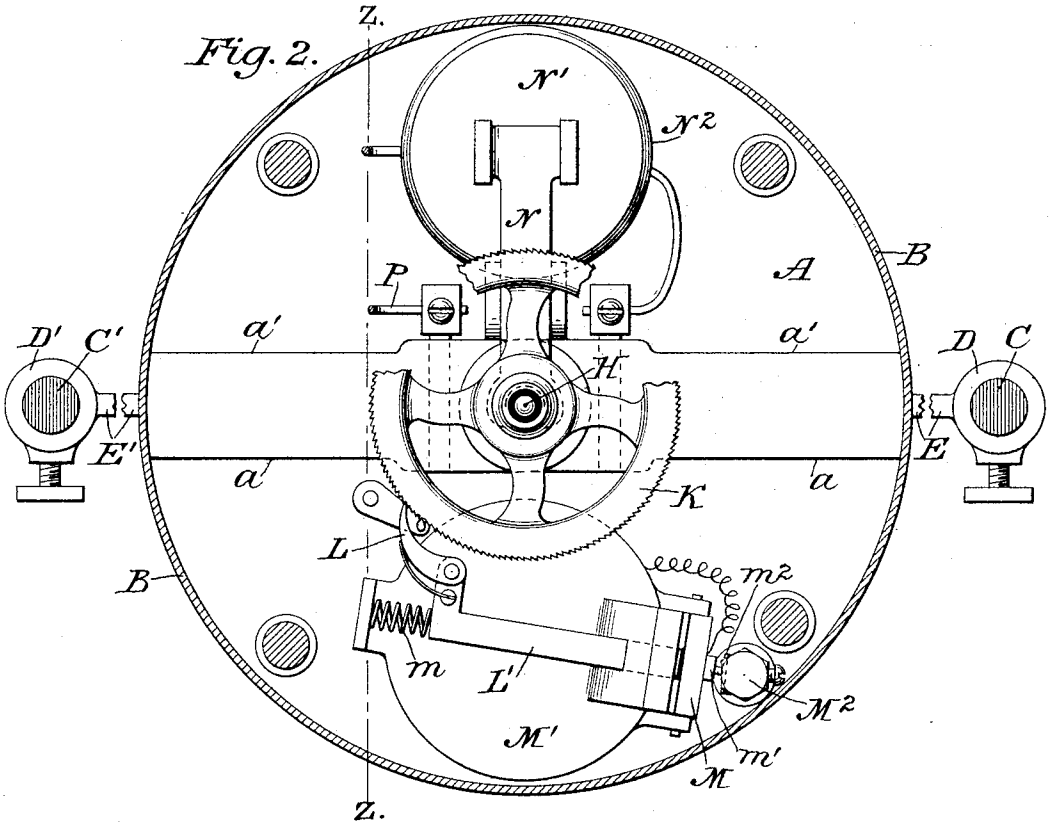
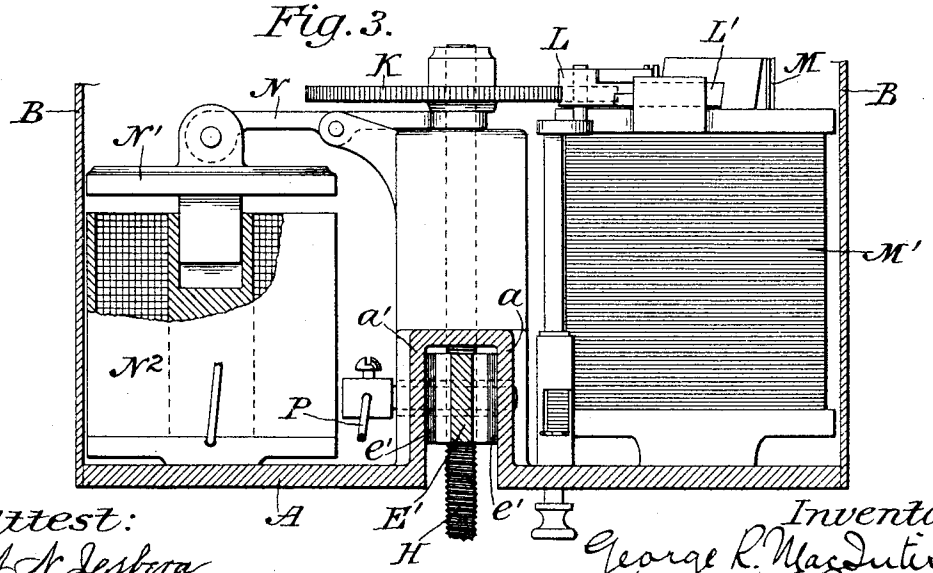


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE R. MACINTIRE, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 535,842, dated March 19, 1895.

Application filed July 10, 1894. Serial No. 517,097. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. MACINTIRE, of the city, county, and State of New York, have invented certain new and useful Improvements in Electric Lamps, (Case D;) and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

In another application for Letters Patent of the United States filed July 5, 1894, and bearing the serial number 516,558 (Case A,) I have described certain improvements in electric arc lamps which have for their object the production of a simple, compact and durable lamp containing various novel features of construction which contribute to the attainment of the desired objects and to the general efficiency of the lamp. The lamp described in the application referred to is arranged to be hung from a support above it and certain parts of the structure are so disposed with reference to the position of the arc as to intercept some of the rays of light which are directed laterally or downward from the arc. In the present case there are features of construction which resemble to some extent corresponding features of the lamp described in the application referred to but the present lamp is so arranged that no parts of the structure shall interfere with the laterally or downwardly directed rays of light, this lamp being adapted, like the other, to be supported from above.

The construction of the improved lamp will be described in detail hereinafter.

In the accompanying drawings, Figure 1 is a vertical central section of a lamp constructed in accordance with my improvements, the carbons and the carbon supporting arms being represented as broken out to save space on the drawing. Fig. 2 is a horizontal section of the same on the line *y—y* of Fig. 1. Fig. 3 is a vertical section through the upper part of the lamp on the line *z—z* of Fig. 2.

The carbons, their carriers and the mechanism for feeding the carbons are preferably supported upon or by a plate A. The feed controlling mechanism is located upon the upper side of the plate A and is inclosed by a shell B. The latter may support the resistance coil B′ and may have secured to itself a hook b^2 by which the lamp may be suspended and suitable binding posts *b*, *b′*, to which the terminals of the main line may be connected respectively.

The carbons C, C′, are preferably curved and are secured respectively in holders D, D′. The latter are so supported as to swing downwardly toward each other as the carbons are consumed so that the arc is formed at a point below the plate A and below all of the mechanism of the lamp whereby no obstruction is interposed in the path of the laterally or downwardly directed rays of light. The holders D, D′, for this purpose are mounted upon arms E, E′, which are preferably pivoted between vertical flanges *a*, *a′*, of the plate A. The arms are insulated from the plate A by washers *e*, *e*, and sleeves *e′*, *e′*, slipped upon the pivot pins E^2 and E^3.

The arms E, E′, would naturally swing toward each other by reason of their own weight and the weight of the carbons but the movement is regulated and made positive by mechanism presently to be described. Each plate E and E′ is connected by a corresponding insulated link F, F′, to a sleeve G which is mounted loosely upon a screw-threaded shaft H, the latter being supported to rotate freely in a suitable bearing carried by the plate A. The sleeve G might be threaded to engage the shaft H directly, but in order to permit the arms to be swung upwardly without rotating the shaft I prefer to make the sleeve G smooth interiorly and to allow it to rest upon an independent nut I which is screw-threaded to engage the shaft. The bore of the nut is formed as represented in Fig. 1 so that the nut may be tilted upon the shaft to disengage the threaded portions *i*, *i*, from the threads of the shaft. Portions *i′*, *i′*, of the bore of the nut are smooth so that when the nut is tilted from its true vertical position it may be slipped easily in either direction upon the shaft H. For the purpose of maintaining the nut normally in a position to engage the threads of the shaft H it is provided around the upper end of the bore with a conical flange which enters a conical recess in the bottom of the sleeve G and thereby holds the nut in true vertical position whenever the sleeve rests upon it. The nut also is provided with lugs i^2, i^2, to enter corresponding notches in the

lower end of the sleeve G for the purpose of holding the nut from rotation.

Means similar to those described and shown in the other application referred to are provided for effecting the rotation of the shaft H so that the carbon holders may not only be permitted to swing toward each other but are moved positively toward each other. Upon the other end of the shaft H is fixed a ratchet wheel K which is adapted to be engaged and actuated by a pawl L. The latter is seated upon the end of a lever L'. The other end of the lever L' rests against the armature M of the shunt magnet M' so that when the latter is energized the pawl L advances the ratchet wheel. A spring *m* acts upon the lever L' to move the armature in the opposite direction. The shunt wire is connected to the coils of the magnet M' from the main line at any convenient point and thence to an insulated back contact *m'* which is supported by the armature M mounted on the magnet M'. An insulated contact spring m^2 is carried by the post M^2 supported by the plate A. From thence connection is made in any convenient manner to the other side of the main circuit.

A forked lever N which is pivoted upon a suitable support, embraces the shaft H just below the ratchet wheel K and at its other end is connected to the armature N' of the series magnet N^2. By means of the lever N the shaft H is lifted bodily when the current is completed through the series magnet and the arms E, E', are swung apart to separate the carbons sufficiently for the formation of the arc.

The connection of the main line to the series magnet N^2 is preferably effected through the resistance B'. From the magnet N^2 the circuit is continued to the pivot-pin E^2 and thence through the arm E, holder D, carbons C, C', holder D' and arm E' to the pivot-pin E^3 from which it is completed by a suitable conductor P to the other binding post *b'*.

The operation of the lamp herein described is in general the same as other lamps of like character and need not be set forth herein.

I claim as my invention—

1. In an electric lamp, the combination of carbon holders supported to swing toward each other, a screw-threaded shaft, a traveling nut mounted on said shaft, means intermediate said nut and holders to control the movement of the latter from the former and means to rotate said shaft, substantially as shown and described.

2. In an electric lamp, the combination of arms mounted to swing toward each other, carbon holders supported by said arms, a screw threaded shaft, a traveling nut mounted on said shaft, means intermediate said nut and arms to control the movement of the latter from the former, means to rotate said shaft, a lever engaging said shaft to move the same longitudinally in its bearings, and a magnet and armature to actuate said lever, substantially as shown and described.

3. In an electric lamp, the combination of arms mounted to swing toward each other, carbon holders supported by said arms, a screw-threaded shaft, a traveling nut mounted on said shaft, and intermediate means between said nut and arms to swing the latter, substantially as shown and described.

4. In an electric lamp, the combination of arms mounted to swing toward each other, carbon holders supported by said arms, a screw-threaded shaft, a traveling nut mounted on said shaft, a sleeve mounted on said shaft to rest upon said nut and connections from said sleeve to said arms, said nut having its bore formed to permit the nut to be tilted upon the shaft to disengage its threaded portions from the thread of the shaft, substantially as shown and described.

5. In an electric lamp, the combination of arms mounted to swing toward each other, carbon holders supported by said arms, a screw-threaded shaft, a traveling nut mounted on said shaft, a sleeve mounted on said shaft to rest upon said nut and connections from said sleeve to said arms, said nut having its bore formed to permit the nut to be tilted upon the shaft to disengage its threaded portions from the thread of the shaft, said nut being also engaged by said sleeve to hold it from rotation and to maintain it in normal position with its threaded portions in engagement with the threads of the shaft, substantially as shown and described.

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

GEO. R. MACINTIRE.

Witnesses:
A. N. JESBERA,
A. WIDDER.