

M. FORTUNY.
ARC LAMP.

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948,971.

Patented Feb. 8, 1910.

Fig. 2.

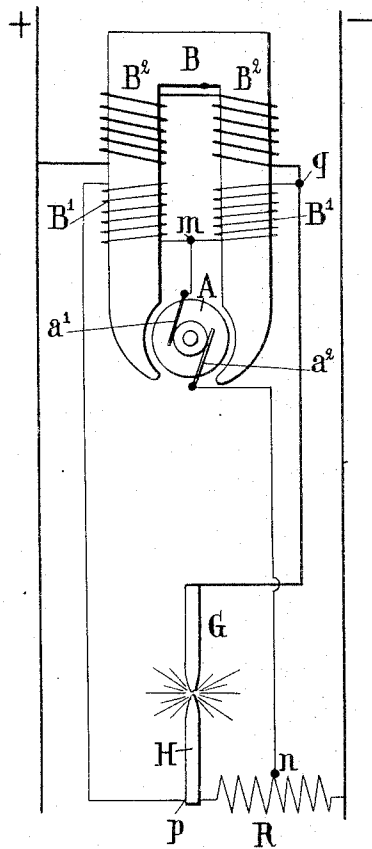
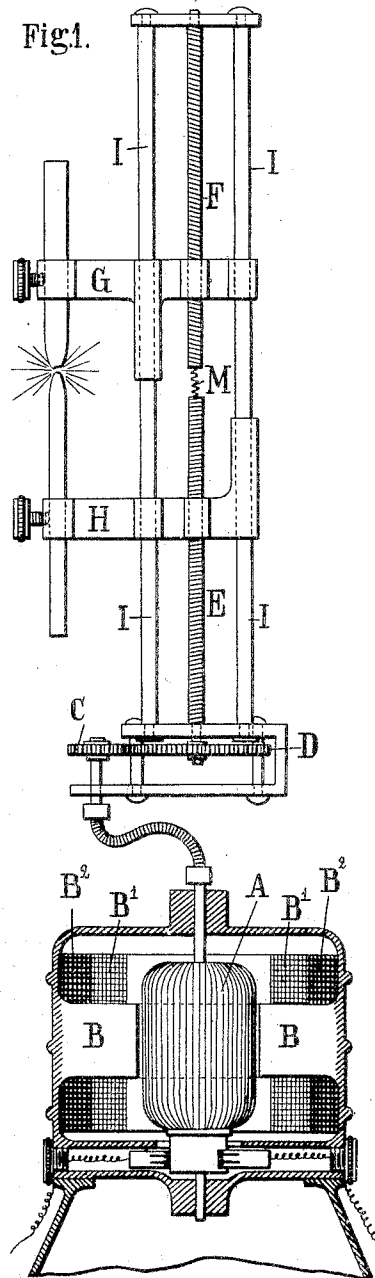


Fig. 1.



WITNESSES

Paul A. Blair
Halter abn

INVENTOR

Mariano Fortuny
BY

Horstmann & Son

ATTORNEYS

UNITED STATES PATENT OFFICE.

MARIANO FORTUNY, OF PARIS, FRANCE.

ARC-LAMP.

948,971.

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Patented Feb. 8, 1910.

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To all whom it may concern:

Be it known that I, MARIANO FORTUNY, a subject of the King of Spain, residing at 19 Boulevard Berthier, Paris, France, decorative artist, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a specification.

My invention relates to electric arc lamps, and more especially to lamps of the type in which the movements of the electrodes are produced solely by an electric motor. In such lamps, the field magnet of the controlling motor is usually provided with two differential coils, one of which is in series and the other in shunt with the voltaic arc. The operation of such lamps is therefore very similar to that of the ordinary differential arc lamp, the solenoids being replaced by the controlling motor.

The object of my invention is to provide improved means for regulating the voltaic arc. With this object in view I provide the field magnet of my lamp-controlling motor with three coils, one being of coarse wire and arranged in series with the light arc, and the two others being of fine wire arranged in shunt with the arc, but in series with each other. The armature of the motor is connected from one of its brushes to a point between the two fine wire windings and from its second brush to a point in the main circuit beyond the arc. By this arrangement I obtain a greater sensitiveness of my lamp to variations of voltage and it has been found by experience that a variation of one-half volt is quite sufficient to cause a movement of the electrodes.

My invention will be fully understood by reference to the accompanying drawings, in which—

Figure 1 represents a side elevation partly in section, of a lamp embodying my invention. Fig. 2 is a diagrammatic view of the circuit.

In Fig. 1 A represents the armature and B the field magnet of the motor. On the armature shaft is fixed a pinion C, which meshes with the toothed wheel D on a shaft E. The latter is supported in suitable bearings formed on the lamp frame and is connected, by means of any suitable flexible connection, for example the spiral spring M, with a second shaft F in line with and of the same diameter as the shaft E. The shafts E, F are screw-threaded, the threads being inverse to each other. Slidably

mounted on vertical rods secured to the lamp frame are the carbon holders G and H, to which the carbons are secured by means of little set-screws. The carbon-holders G, H have inner-threaded circular portions forming the nuts for the threaded shafts E, F, so that, when the latter are rotated the carbon-holders are moved together or separated from each other. The field magnet B of the motor is U-shaped and has on each of its legs two windings B¹ and B², the former being of fine wire, the latter of coarse wire. As appears from Fig. 2, the coarse wire windings B² are wound in the same sense and connected in such a manner that they may practically be regarded as one winding B². The fine wire windings B¹ however, act sometimes in the same and sometimes in an inverse sense, as will be clearly understood from the following. The main circuit flows from the + pole through the coarse wire winding B² to point q, thence through the carbons to the point p and through the rheostat R to the - pole. Between the points q and p the fine wire windings B¹ are arranged, so that they are in shunt with the arc, while the winding B² is in series with the latter. The armature A of the motor is connected from one of its brushes to the point m between the fine wire windings B¹, while the other brush is connected with a suitable point n upon the rheostat R.

The operation is as follows: Assuming that the electrodes are in contact with each other and current is switched on to the lamp. A main circuit is from the + pole through the coil B² to point q and through the carbons and the rheostat R to the - pole. A shunt circuit is established from the point q through the right hand winding B¹ to the point m and thence through the armature A to the point n by reason of the cutting out of portion of the resistance R. As long as the electrodes are in contact with each other, the resistance between the points q and p is comparatively small and the points p and q are at practically the same potential. The point n being thus at a lower potential than the points q and p since portion of the resistance R is cut out by the connection from m to n, a third current passes from point p through the left hand coil B¹ to the point m. The two windings B¹ thus act in an inverse sense, the left-hand winding aiding the action of

the coarse wire winding B^2 . The electrodes therefore are separated very quickly by the rotation of the motor and the arc is formed.

When on the contrary, the electrodes are separated from each other so far that the arc is lengthened, then the resistance between the points q and p is so increased and the main current consequently so decreased, that the shunt circuit passes from q through both the fine wire windings B^2 to the point p and the said windings B^2 consequently now act in the same sense and the electrodes are again brought together.

It is evident that a point of equilibrium exists between the action of the three coils, which point is reached when the arc-voltage has a predetermined value. It appears further that as long as the arc-resistance is lower than the resistance of the right-hand coil B^1 , current will flow from p to m and the action of the coils B^1 will be inverse to each other and that, when the arc-resistance is greater than that of the right-hand winding B^1 , the two coils B^1 will act in the same sense and reinforce each other. Having thus an auxiliary field magnet coil (left-hand coil B^1), which automatically and instantly reinforces the action of that one of the differential windings which is just overbalancing the other, I obtain a considerably greater sensitiveness of the arc-

regulation than would be possible with a lamp as heretofore used having only two differential field magnet coils.

I do not limit myself to the details of construction as shown in the drawing, but various other forms of motors and of transmission devices between the motor and the electrodes may be used without departing from the principle of my invention.

I claim as my invention:

In a device of the character described, an electric motor, a field magnet therefor provided with three windings, one of which is arranged in series with the arc, and the two others in shunt with the arc but in series with each other, in combination with a connection from a point between the two windings in the shunt circuit to one of the brushes of the armature and a connection from the other brush of the armature to a point in the main circuit beyond the arc together with a suitable resistance between said point and the arc.

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

MARIANO FORTUNY.

Witnesses:

GUSTAVE DUMONT,
HANSON C. COXE.