

(No Model.)

P. KIRKEGAARD.
ELECTRIC ARC LAMP.

No. 522,735.

Patented July 10, 1894.

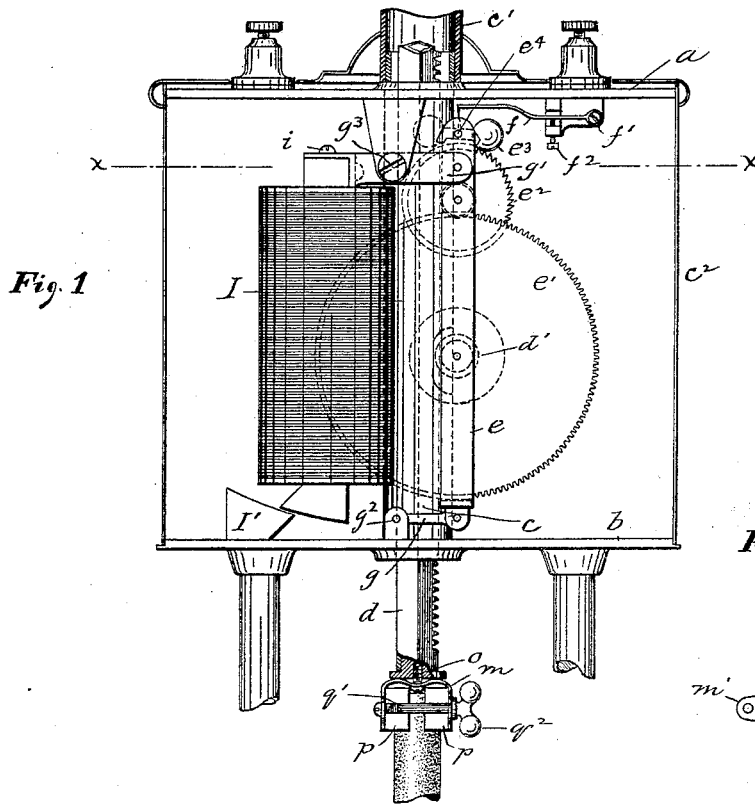


Fig. 2

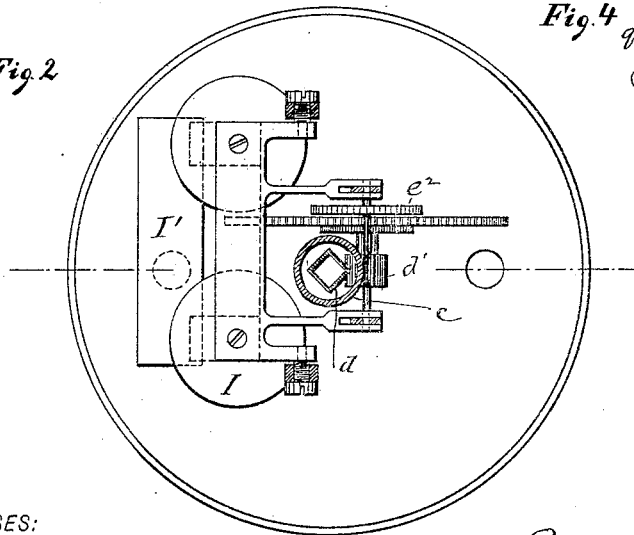


Fig. 3

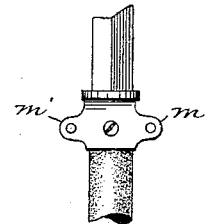
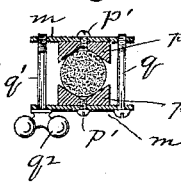


Fig. 4



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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 522,735, dated July 10, 1894.

Application filed September 28, 1893. Serial No. 486,687. (No model.)

To all whom it may concern:

Be it known that I, PETER KIRKEGAARD, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a full, clear, and exact description.

This invention relates to electric arc lamps, the object being to produce a lamp with a simple and efficient regulating mechanism in which the dash pot or other cushioning device to prevent hammering is dispensed with.

A further object is to cheapen and improve the construction of the lamp box or casing, and a still further object is to produce a simple and efficient carbon holder which shall occupy a small amount of space.

With these ends in view my invention consists of the construction hereinafter described and particularly pointed out in the claims.

Referring to the accompanying drawings: Figure 1 represents a vertical section of the lamp casing showing the regulating mechanism in side elevation. Fig. 2 is a transverse section of the lamp casing on the line $x-x$ in Fig. 1. Fig. 3 is a side elevation of the carbon holder, and Fig. 4 is a section of the carbon holder.

The lamp casing consists of top and bottom plates a and b respectively connected together at their centers by means of a tube c . These two plates and the tube are preferably cast in one piece, although the tube may be made separate from the plates and connected thereto by means of screw threads. This central tube is the only supporting device between the top and bottom plates. The tube serves as a housing for the upper carbon carrying rod and for this purpose may be provided with an upward extension c' . The sides of the casing may be inclosed by a cylinder c^2 of brass or other suitable material. This method of constructing the casing is simple and cheap.

The carbon rod is indicated by the letter d . It is rectangular in cross section and moves in the central tube c ; it is engaged by the pinion d' , the tube c being cut away to permit of this engagement. The pinion is carried on a shaft mounted horizontally in a frame consisting of two vertical side pieces e con-

nected together above and below by cross pieces. This frame is substantially parallel to the carbon rod and it carries a train of gear e ending in an escapement e^2 , of which the vibrating anchor and weight is indicated by e^3 . The anchor is provided with an upwardly projecting finger or tail piece e^4 , which normally stands adjacent to a detent f . This detent consists of a lever pivoted at f' and provided with an adjusting screw f^2 to regulate its distance from the finger of the escapement anchor. The whole frame carrying the clockwork is pivoted above and below on two pairs of arms g and g' , the said arms being in turn pivoted at the points g^2 g^3 . This forms a parallel ruler arrangement which always maintains the frame e parallel to the carbon rod and insures that the pivot of the escapement anchor will always be in a vertical line above the axis of the escapement wheel without regard to the position or height of the frame.

I is an electro magnet consisting of two spools arranged upside down and normally in a plane substantially parallel to the carbon rod. The back yoke of the magnet is above and the pole pieces are below; the back yoke is secured to the arms g' which are extended beyond the pivotal point g^3 and suitably shaped to be secured to the back yoke by means of screws i , or in any other suitable manner. The armature of the magnet consists of a block of iron I' fixed to the lower plate of the lamp casing and having its working face curved to correspond with the working faces of the pole pieces of the magnet and upon a circle, the center of which is the pivot g^3 . The magnet is located in a branch circuit, shunting the electrodes of the lamp.

The operation of the regulating mechanism thus described is as follows: When the lamp is not burning the carbons are separated. The circuit being completed, the shunt magnet I is swung outward and the gear frame lowered until the escapement is released. The carbon rod feeds downward by gravity until the electrodes touch; then the shunt magnet is practically short circuited, and the magnet by its own weight swings inward and lifts the upper carbon rod, thus establishing the arc and stopping the escapement of the gear train. The consumption of the carbons by the arc correspondingly strengthens the

magnet and the rod is thus permitted to feed down. It will be observed that in this operation the arc is struck by the weight of the electro-magnet, which becomes operatively heavier and lighter with the variation of the arc. The magnet being arranged on one side of the pivot g^3 and the frame, a clock train on the other side, will cause a balance between these moving parts, which will obviate the necessity of a dash pot or other cushion, as all of the movements will be made in a gradual and easy manner. It will be observed that the arms g are substantially horizontal and in swinging from one side to the other of the horizontal plane which they occupy, they will cause but a slight variance in the distance between the pinion d' and the carbon rod. The pinion will therefore always be in proper mesh with the rack. The arrangement whereby the pivot of the escapement anchor and the axis of the escapement wheel are always maintained in the same vertical plane is a good one, because the vibrating weight of the escapement will not be thrown out of balance. It will be observed that the pivots g^3 are formed with downwardly projecting lugs from the upper plate of the lamp casing.

The carbon holder herein referred to is designed particularly to be short in length and to provide for a universal movement of the carbon pencil after it has been adjusted, so that it may be brought into line with the lower carbon pencil. The holder consists of a U-shaped piece of metal m which is inverted and secured to the lower end of the carbon rod by means of a screw o . The screw passes freely through the piece m and serves as a vertical axis upon which the latter may be turned. The portion through which the screw passes may be curved, as shown in Fig. 1, to form a spring which, when it is pressed against the end of the carbon rod by the head of the screw will furnish sufficient friction to hold the piece in any position in which it is left. The inner faces of the arms of this piece m are each provided with a jaw p which is secured thereto by means of a screw p' located at the center of the jaws and passing through the arms of the piece m . These screws p' furnish pivots upon which the jaws may swing independent of the piece m , and the pivots are in line with each other. The faces of the jaws are suitably notched or otherwise formed to grasp the end of the carbon pencil as shown in the drawings. The piece m which is really a yoke is provided with ears m' two on each arm, and the two arms are connected together by bolts q q' which pass through these ears. One of these bolts is threaded and provided with a thumb piece q^2 by which the two arms of the yoke may be drawn together or separated, or allowed to separate by the resiliency of the metal. This

thumb piece is loosened and the jaws spring apart sufficient to admit the end of the carbon pencil. The thumb piece is then screwed up to grip the pencil, after which the point of the pencil may be adjusted as desired to bring it into exact line with the lower carbon pencil. This adjustment is permitted, it will be observed, by the double pivotal arrangement of the holder.

Having thus described my invention, I claim—

1. In an arc lamp, the combination of a lever pivoted between its extremities, an electro-magnet located in a circuit shunting the arc and attached to one end of said lever, a frame carrying a gear train attached to the other end of said lever, and a stationary armature for said electro-magnet, substantially as and for the purpose set forth.

2. In an arc lamp, the combination of a lever pivoted between its extremities, an electro-magnet located in a circuit shunting the arc and attached to one end of said lever, a frame carrying a gear train attached to the other end of said lever, a carbon rod, said frame arranged to be always parallel to the carbon rod and the gear train in engagement with said rod and a stationary armature for said electro-magnet, substantially as described.

3. In an arc lamp, the combination of an electro-magnet suspended from a pivotal point located above it, a frame carrying a train of gear, the magnet and frame counterbalancing each other, and a stationary armature for the magnet, substantially as described.

4. In an arc lamp, a frame carrying a gear train controlled by an escapement, said frame being pivotally mounted on parallel arms, said arms being pivoted to fixed supports, whereby the frame will always be parallel to a given plane, in combination with an electro magnet located in the shunt circuit of the lamp and attached to the frame and an armature permanently fixed with respect to the magnet, substantially as described.

5. In an arc lamp, a carbon holder, consisting of a U-shaped yoke pivotally connected with the end of the carbon rod, in combination with two jaws pivoted respectively to the arms of said yoke, for the purpose set forth.

6. In an arc lamp, a carbon holder, consisting of a U-shaped yoke pivotally connected with the end of the carbon rod, in combination with two jaws pivoted respectively to the sides of the yoke, and means for closing and opening said jaws, for the purpose set forth.

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

PETER KIRKEGAARD.

Witnesses:

FRANK S. OBER,
C. V. EDWARDS.