

L. C. H. MENSING.
ELECTRIC ARC LAMP.

No. 537,696.

Patented Apr. 16, 1895.

Fig. 1.

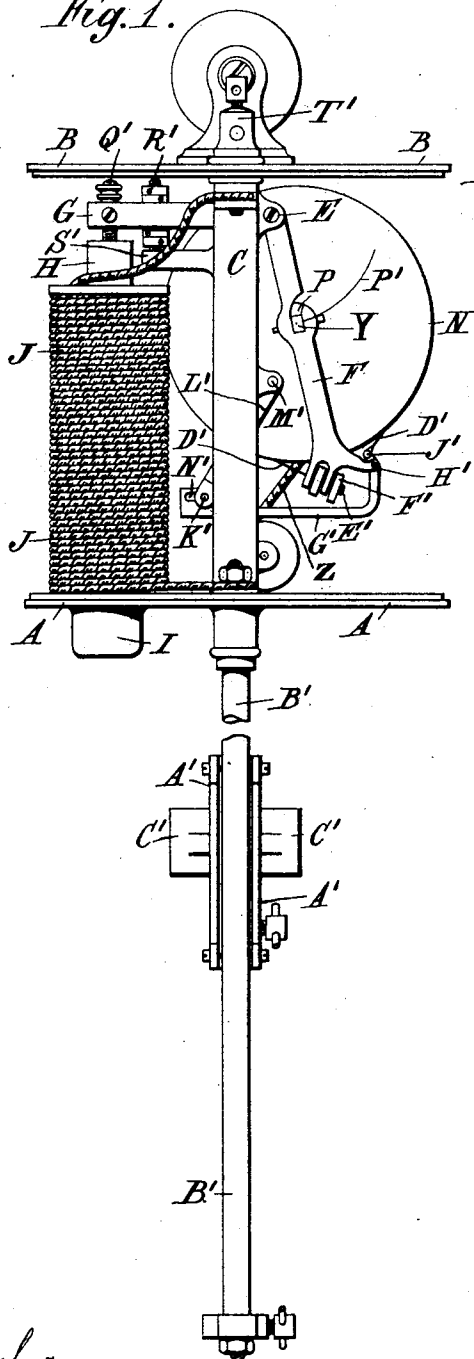
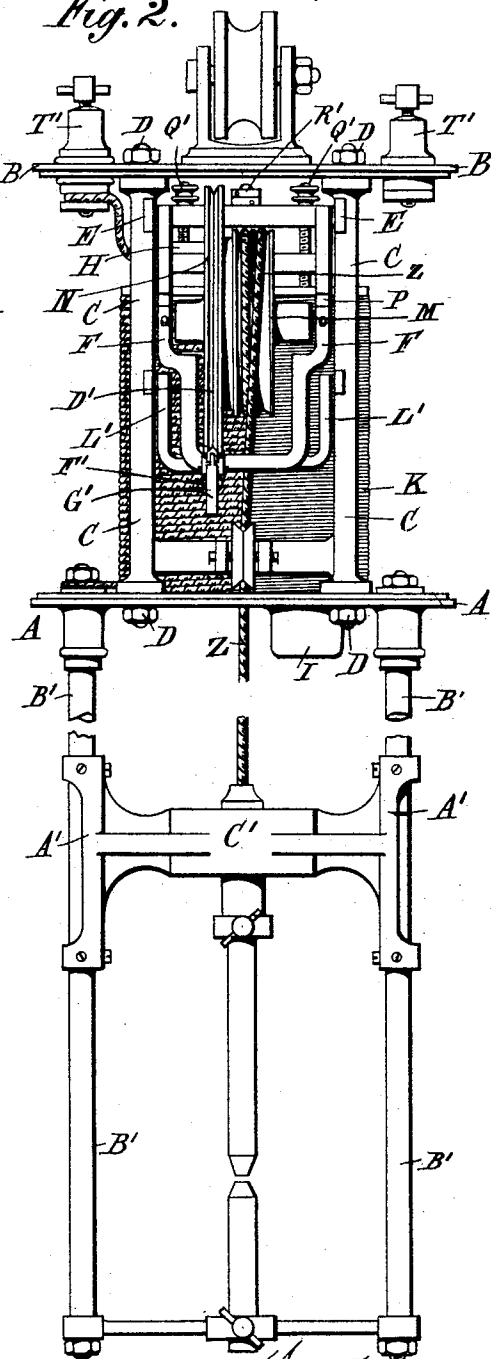


Fig. 2.



Witnesses:
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By James L. Norris
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Fig. 3.

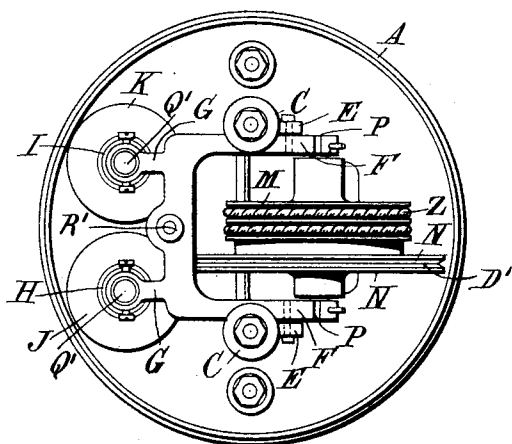


Fig. 4.

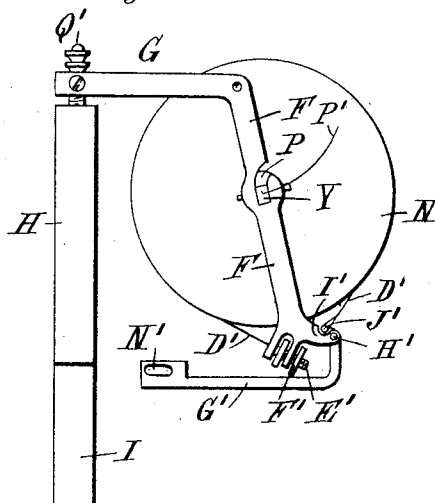


Fig. 5. Fig. 6.

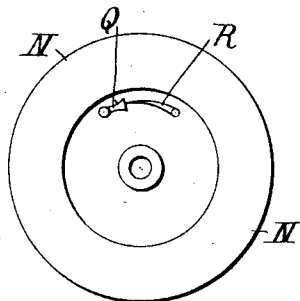


Fig. 7.

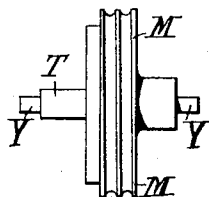


Fig. 8.

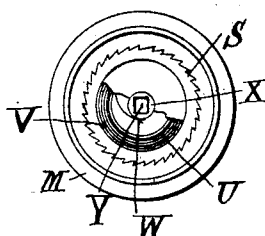
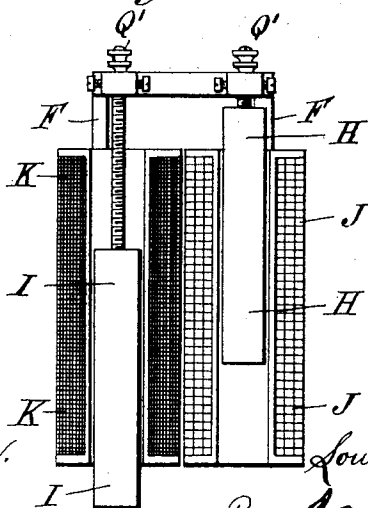


Fig. 9.



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UNITED STATES PATENT OFFICE.

LOUIS CARL HENRY MENSING, OF LONDON, ENGLAND.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 537,696, dated April 16, 1895.

Application filed October 29, 1894. Serial No. 527,340. (No model.) Patented in England January 1, 1894, No. 67.

To all whom it may concern:

Be it known that I, LOUIS CARL HENRY MENSING, a subject of the Queen of Great Britain, and a resident of 89 Worship Street, London, England, have invented certain new and useful Improvements in and Connected with Arc Lamps, (patented in Great Britain, No. 67, dated January 1, 1894,) of which the following is a specification.

This invention relates to automatic carbon feeding mechanism for arc lamps and consists in the construction and combination of parts embraced in such mechanism, as hereinafter described and claimed.

My invention will be fully understood upon reference to the accompanying sheet of drawings, in which—

Figure 1 is a part side elevation of an arc lamp as constructed according to my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a plan, while Figs. 4, 5, 6, 7 and 8 are detail views of some of the parts. Fig. 9 is a partly sectional view illustrating the solenoids and the adjusting supports for their cores.

Between the base plate A and top plate B, I arrange the standard or frame C, C, secured thereto by the nuts D, D, and upon this frame or standard C', C', is pivoted at E a lever or pendulum or swing frame F having two arms G, G, for carrying the cores H, I, of a series and shunt wound coil J, K, respectively and between said frame F at a given distance from the point of suspension of the lever F a double groove cord pulley M and brake wheel N are arranged in the slotted bearings P for easy insertion into and removal therefrom.

The brake wheel N is recessed upon one side as at Fig. 6, and has a pawl Q and spring R for engaging the ratchet teeth S formed on one side of the cord pulley M, so that when the brake pulley N is fitted upon the sleeve T of the cord pulley M with the pawl Q entering the teeth S said ratchet wheel S is completely inclosed.

The cord pulley M is hollowed for the reception of a coiled band or tape U, one end V of same being attached to the inside periphery of the pulley M, and the other end W to the arbor X which having square ends Y and fittings similarly shaped bearing P in the frame

F is prevented from turning, whereby the coil band or tape U is wound up when the pulley M is rotated by the lowering of the top carbon carrier A'.

A flexible copper cord or tape Z has one of its ends fixed into one of the grooves of the pulley M and wrapped around same for the other end to be fixed to the top carbon carrier A'.

The top carbon carrier A' is arranged to slide up and down the guide rods B', B', by gravity, a lump C' being formed or attached to same to act as a weight to turn the cord pulley M in opposition to the internally arranged coil band or tape which being of a comparatively great length relatively to the circumferential travel of the pulley M offers practically no greater resistance to the gravity fall of the carbon carrier at the end of its stroke than it does in the beginning, it being just sufficient in all cases to rotate the wheel M in the opposite direction to wind and take up the slack of the flexible connection Z when the carrier A' is lifted for the insertion of a fresh carbon. This is very important, as by this means there is no tendency for the arc to lengthen as the carbon carrier descends to feed the carbons, the resistance to the brake band hereinafter described being always the same throughout the total range of feed, whereby an absolutely steady and reliable light is maintained.

The brake wheel N is encircled preferably by a fine silver wire D' one end being suitably retained in hollow set screw E' for adjustment by the nut F' in the end of the frame F. A lever G' is fulcrumed at H' to an extension or horn I' of the pen pendulum or frame F, the short end of the latter having a stud J' to which the other end of the before-mentioned wire D' is fastened.

The long end of the lever G' is attached at K' to a radial link L' pivoted to the standard C by a set screw M'. A slot N' in the end of the lever G' allows of a certain amount of freedom of action to said lever when the pendulum or frame F is moved outward by the attraction of the series solenoid core.

The series wound solenoid J under the action of the current tends to draw down the core H and move the pendulum outward be-

yond the vertical center and thereby cause the lever G' to draw the wire D' to grip the brake wheel N to prevent same from turning under the weight of the carrier A'. Such outward radial motion of the pendulum or frame F also by its upward motion as indicated by the arc P' of a circle lifts by its leverage the flexible cord Z to draw the carbons apart and widen the arc and increase the resistance, whereby a portion of the current will traverse the high resistance solenoid K, the core I of which projects below so that it is lifted upward by the solenoid K in opposition to the downward pull of the series coil J upon the core H.

It is to be particularly noticed as it constitutes an important feature of my invention that the outward radial movement of the pendulum or frame F under the action of the series coil J and its core H attached to the arm G materially increases the effective pull of the weighted carbon carrier upon the flexible cord Z, which pull augments in increasing ratio as the pendulum or frame F is moved farther beyond the center of gravity of the said pendulum or frame F, the wheels M and N thus serving to proportionally assist the pull of the shunt wound solenoid K in its opposition to the pull of the series coil J, the weight of the said frame and divided double wheels with the carbon carrier acting as a balance against the pull of the current in the solenoid, whereby I am enabled to dispense with dashpots, and the lamp is rendered so sensitive in action that the feeding of the arc is indistinguishable to the eye.

The cores H, I, can be regulated as to their length by the screws and nuts Q', Q', and the movement of the pendulum or frame F can be limited by the set screws R' making contact with the obstruction S'.

As the pull upon the shunt coil core I increases with the increasing resistance in the arc due to the consumption of the carbons, the pendulum or frame F is moved assisted by its own weight to the center, and the lever G' is lifted by the rise of the radial link L' to loosen the grip of the wire D', and allow the brake wheel N by the weight of the carrier turning the cord pulley M, the teeth S of which engage the pawl Q on the wheel N before mentioned, to turn and thus let out the cord Z to feed the carbon gradually down until a reaction takes place to again cause the lever G' to brake the wheel N and arrest further feeding of the carbon, the engagement of the ratchet teeth S with the pawl Q preventing any further rotation of the cord pulley M.

The current is led to the lamp and distributed from the terminals T', T'.

From the foregoing it will be seen that the wheels M and N move together in one direc-

tion under the weight of the carbon carrier when the grip of the brake is released, but the wheel M is free to rotate in the opposite direction under the tension of the internal coiled band or tape when the carbon carrier is lifted.

When the lamp is required to burn uniformly the cord is not attached to the divided wheel but is passed over same and down the carrier guides to the bottom carbon holder.

What I claim, and desire to secure by Letters Patent, is—

1. In an arc lamp, the combination with the upper carbon carrier, of a swing frame or open pendulum F having pivotally supported therein a double or divided wheel composed of the grooved cord pulley M and the brake wheel N connected by pawl and ratchet mechanism, the differential solenoid coils J, K, having their cores H, I, supported from arms of said swing frame or pendulum, a lever G' carried by said frame and connected to a band D' on the brake wheel, a cord Z connecting the pulley M with the fixed carbon carrier, and a coiled band or tape U inclosed in said pulley and having one end attached thereto and its other end secured to a fixed arbor, substantially as described.

2. In an arc lamp, the combination with the upper carbon carrier, of a swing frame or pendulum F carrying a double or divided wheel composed of the pulley M and the brake wheel N connected by pawl and ratchet mechanism, the cord Z connecting the pulley M and carbon carrier, the brake band D' on the wheel N, the lever G' connected to said band and to the swing frame, series and shunt wound solenoids having their cores H, I, supported by arms of the swing frame, and the coiled tape U in the pulley M, the said brake wheel and pulley being adapted to rotate together in one direction by the pull of the carbon carrier when the grip of the brake band is released by varying resistance of the arc and the said pulley being adapted to rotate in the opposite direction under the action of its internally arranged coiled band or tape to take up the slack of the carrier cord when said carrier is lifted, substantially as described.

3. The combination with a balance or swing frame F and the link L', of a brake lever G' fulcrumed to said frame at H' for controlling the grip of a wire or band D' upon the brake wheel N under the combined radial movement of the frame F and connecting link L'.

In witness whereof I have hereto signed my name in the presence of two subscribing witnesses this 11th day of September, 1894.

LOUIS CARL HENRY MENSING.

Witnesses:

A. E. PRIDHAM,
W. F. HEWITT,