(No Model.)

C. J. SCHWARZE.

ELECTRIC ARC LAMP.

No. 446,297. Patented Feb. 10, 1891.

Fig. 1.

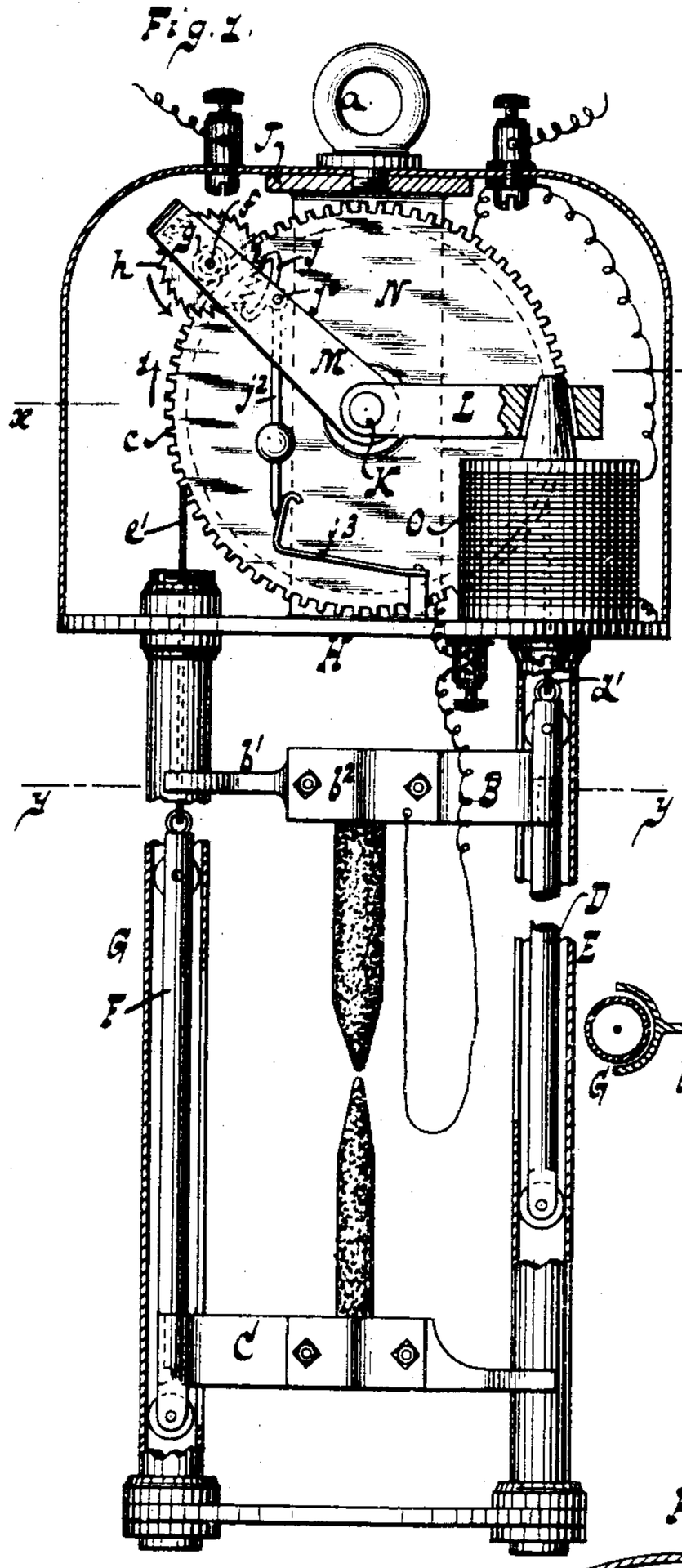


Fig. 2.

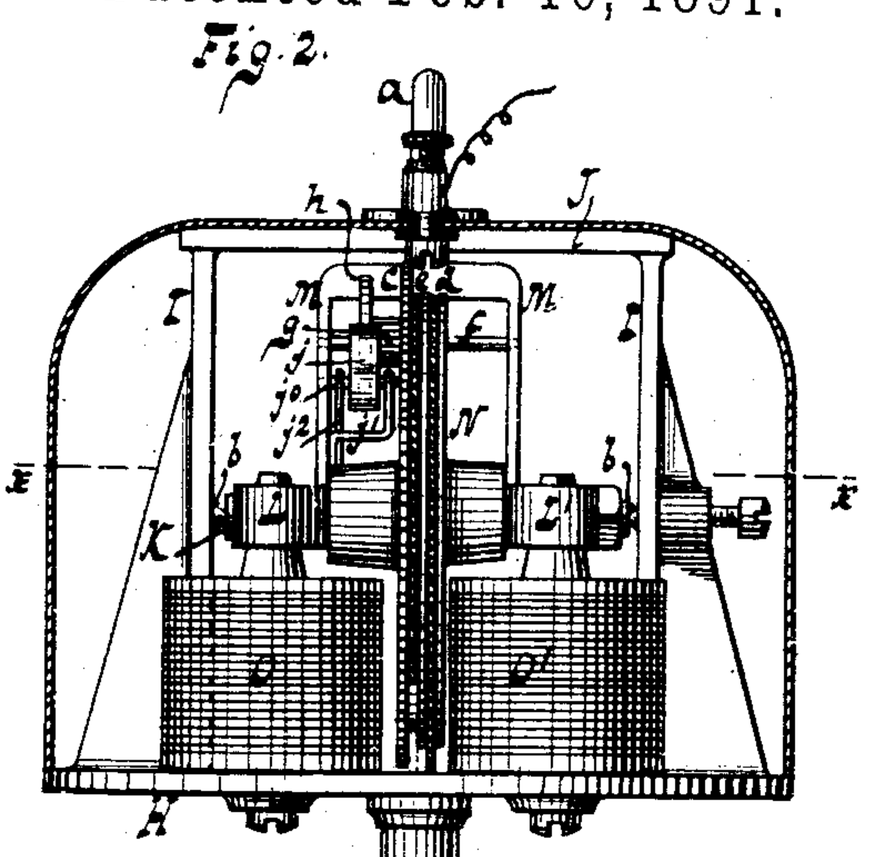


Fig. 4.

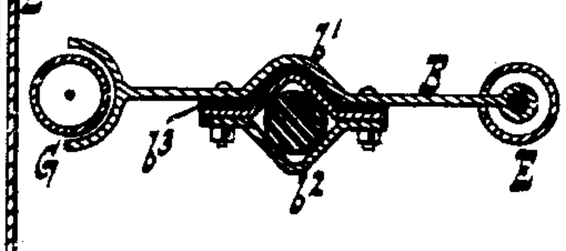
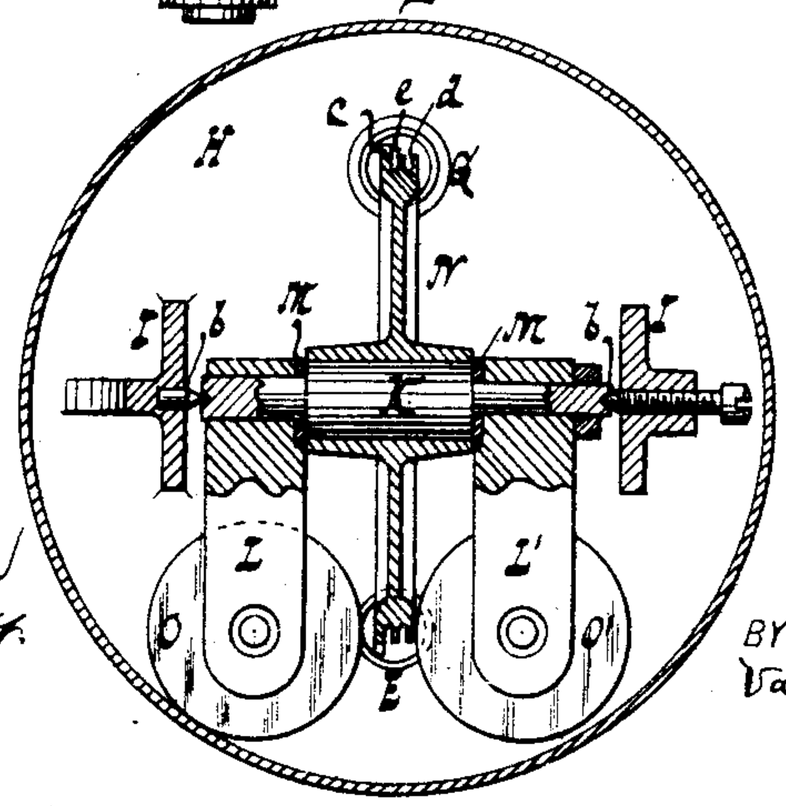


Fig. 3.



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UNITED STATES PATENT OFFICE.

CARL JOSEPH SCHWARZE, OF BROOKLYN, NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 446,297, dated February 10, 1891.

Application filed October 2, 1890. Serial No. 366,808. (No model.)

To all whom it may concern:

Be it known that I, CARL JOSEPH SCHWARZE, a citizen of the German Empire, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Electric Lamps, of which the following is a specification.

This invention relates to a novel device for retaining the carbons at the proper distance from each other. The peculiar and novel construction of my adjusting device is pointed out in the following specification and claim, and illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation, partly in section. Fig. 2 is a side elevation. Fig. 3 is a horizontal section in the plane *x x*, Figs. 1 and 2. Fig. 4 is a horizontal section in the plane *y y*, Fig. 1.

In the drawings, the letter A designates the frame which contains the holder B for the upper carbon and the holder C for the lower carbon. The holder B extends from a guide D, fitted into the hollow bar E of the frame A, while the holder C extends from guide F, fitted into the hollow bar G of the frame A. The hollow bars E and G depend from a platform H, from which rise two standards I I, which are connected by the traverse J, in which is secured the suspension-ring *a*. In the standards I I are secured the center points *b b*, which form the bearings for a rock-shaft K, and on this rock-shaft are firmly mounted two armature-levers L L′, which are connected to each other by the yoke M. A wheel N is loosely mounted on the rock-shaft K between the armature-levers L L′. This wheel is connected on opposite sides with the carbon-holders B C, and the means illustrated in the drawings for the purpose of forming this connection consist of a toothed rim *c* and two circular grooves *d e*, a cord *d′*, secured in the groove *d*, and a cord *e′*, secured in the groove *e*, the cord *d′* being connected to the guide D of the upper-carbon holder B, while the cord *e′* is connected to the guide F of the lower-carbon holder C. The weight of the carbon-holder B, however, is greater than that of the carbon-holder C, so that if the wheel N is left free it is turned in the direction of arrow 1 by the weight of the carbon-holder B.

By referring to Fig. 1, it will be seen that when the wheel N is turned in the direction of arrow 1, the upper-carbon holder B is lowered and the lower-carbon holder C is raised, or, in other words, the carbons are moved toward each other. For the purpose of moving the wheel N automatically I use an electro-magnet O, which co-operates with the armature L, and in the example illustrated in the drawings I have shown two electro-magnets O O′, one for the armature L and the other for the armature L′ These electro-magnets are connected with the main circuit, so that they become vitalized more or less intensely, according to the power or tension of the main circuit. It will be seen that the cores *o o′* of the electro-magnets O O′ are tapering and extend through correspondingly-tapering holes in the armatures, so that their action is not affected by the changes in the position of the armatures. In the yoke M is mounted an arbor *f*, which carries a pinion *g* and a ratchet-wheel *h*. The pinion *g* is in gear with the toothed rim *c* of the wheel M and the ratchet-wheel *h* engages an anchor *j*, which is mounted on an arbor j^0. This arbor has its bearing on one end in the yoke M, and on its opposite end in a bracket j', secured to said yoke, Fig. 2, and from said arbor extends a pendulum j^2, and when the carbons are in the proper position, as shown in Fig. 1, the lower end of said pendulum bears against a spring j^3, which is fastened to the platform H. As long as the parts remain in this position, the anchor *j*, the ratchet-wheel *h*, and the pinion *g* form a coupling device between the armature L and the wheel N, whereby the movements of said armature L are transmitted to the wheel, and through this wheel to the carbon-holders; but whenever the carbons become separated from each other to an unusual distance—for instance, if the point of one of the carbons splits off—the armature L is attracted by its electro-magnet to such an extent that the end of the pendulum j^2 is thrown out of engagement with the spring j^3, the wheel N is turned in the direction of arrow 1 by the weight of the upper-carbon holder B, and the pendulum j^2, anchor *j*, and ratchet *h* act as a check, which compels the wheel N to follow the action of the weight of the carbon-holder B slowly, and as the carbons are brought closer and closer the force of the current passing through the

electro-magnet O is gradually decreased, and the armature L falls back until the pendulum j^2 strikes the spring j^3 and the movement of the wheel N is arrested.

By referring to Fig. 4, it will be seen that the carbon-holder B is constructed of an arm b', a cover b^2, and a sheet b^3 of rubber or other insulating material, so that the electric current has to pass through the carbons.

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

In an electric lamp, the combination of the wheel N, mounted loosely on the shaft K, the toothed rim *c*, formed on said wheel, the independent cords d' e', engaging opposite sides of the wheel and winding and unwinding in reverse directions, the carbon-holders B C, suspended, respectively, by the said independent cords, the electro-magnet O, the armature-lever L, mounted firmly on the shaft K, the arm or yoke M, extending from the armature-levers and turning with the shaft, the ratchet-wheel *h*, and pinion *g*, mounted in said arm or yoke, the anchor *j*, the pendulum j^2, pivoted to the arm or yoke, the spring j^3, acting to stop the motion of the pendulum when the armature is released from the magnet, and suitable electric connections for the electro-magnet and the carbon-holders, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CARL JOSEPH SCHWARZE.

Witnesses:
WM. C. HAUFF,
E. F. KASTENHUBER.