(No Model.)

O. A. MOSES.

ARC LAMP.

No. 343,188. Patented June 8, 1886.

Fig. 1

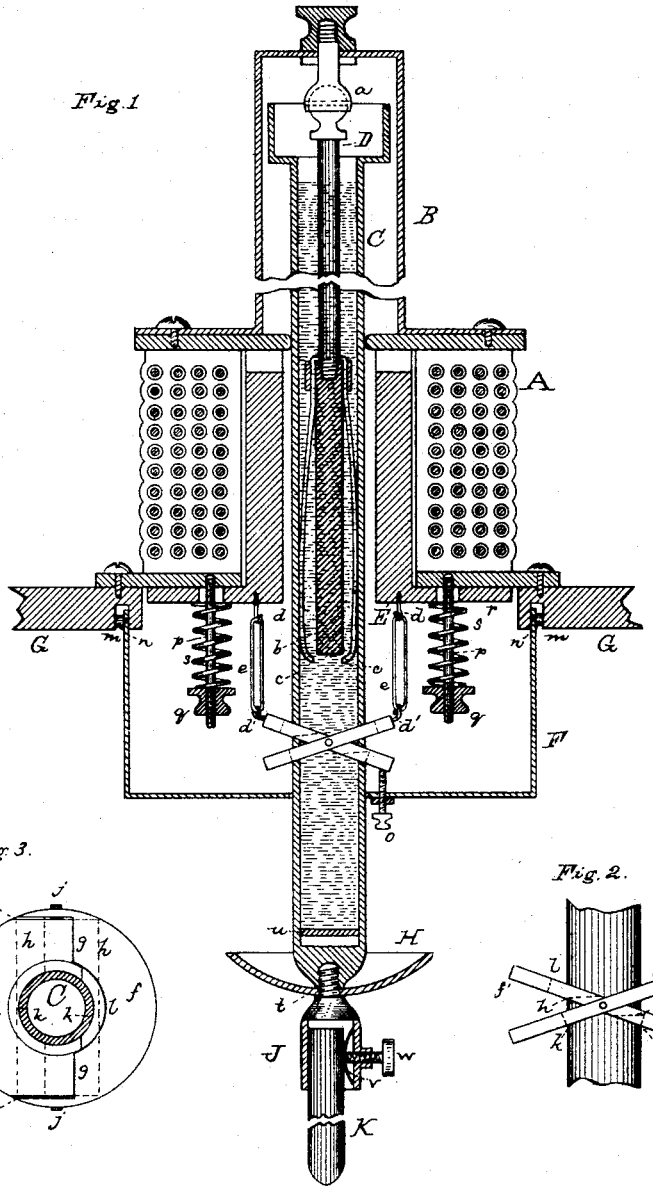

Fig. 3.

Fig. 2.

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OTTO A. MOSES, OF NEW YORK, N. Y.

ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 343,188, dated June 8, 1886.

Application filed February 17, 1883. Serial No. 85,408. (No model.)

To all whom it may concern:

Be it known that I, OTTO A. MOSES, of New York city, in the county and State of New York, have invented a certain new and useful Improvement in Voltaic-Arc Lamps, (Case G,) of which the following is a specification.

The object I have in view is to provide simple and efficient mechanism for regulating the feed of the movable carbon in a voltaic-arc lamp, and also generally to improve the construction and efficiency in operation of electric lamps of this class.

My invention consists in certain improvements on those set forth in my prior applications for Letters Patent. In the lamp described in said applications a single solenoid or electro-magnet was employed having a divided core or armature placed within a hollow carbon-carrying tube containing a viscous liquid, the divided core or armature being constantly pressed against the sides of the tube, and being affected by variations in the energy of the magnet or solenoid regulated or assisted in regulating the movement of the tube. In my present invention, in addition to the divided core or armature within the tube, said tube is surrounded by a hollow movable core, from which is suspended a double clamp, consisting of two rings, disks, or washers, provided with apertures, one passing through and pivoted upon the other, and both encircling the tube at an angle with said tube and with each other. The upper edge of each ring is connected with the hollow core, so that when such core rises the rings would clasp the tube at two points. The upper edges of the apertures in the rings are, however, cut away, so that they will not come in contact with the tube, and said tube is clamped only by the lower edges, the contact of the clamp with the tube being in one plane. This produes a very efficient and sensitive clamp, as the smallest movement of the core or armature instantly loosens or tightens the pressure of the rings on the tube. Such a clamp also keeps the tube constantly in a true vertical position.

In my former applications the rod which carries the divided core or armature within the tube was suspended by a spring from above, so that it would have a vertical movement within said tube. In the present instance I dispense with the spring, so that the rod cannot move vertically, although I may employ a ball-and-socket joint, so as to keep the core or armature in a central and vertical position. The divided core or armature therefore acts as a regulator for the double clamp to prevent too sudden movements of the tube by the quick action of said clamp. The lower end of the divided core or armature always remains somewhat below that of the outer core, so that all the magnetic lines of force are never prevented by the latter from reaching the former; but under variations in the magnetic influence the pressure of the divided core or armature upon the tube is varied, the movement of the tube being thus regulated.

I provide means for adjusting the extent of the movement of the outer core or armature, and also means for adjusting the angle of the double clamp.

My invention further includes means for preventing the heat of the arc from reaching the upper portions of the mechanism, and also a simple device for securing the upper carbon in its holder.

In the accompanying drawings, Figure 1 is a sectional view of the main portions of an arc lamp embodying my invention; Fig. 2, an elevation of the double clamp surrounding the carbon-carrier, and Fig. 3 a top view of the same.

A is the magnet or solenoid, placed directly in the main circuit with the arc, and B is a tube extending above it and above the top of the lamp-frame, which is not shown. This tube B incloses the carbon-carrying tube C, which contains a viscous fluid, such as glycerine. The rod D is suspended within the tube C from top of tube B, through a ball-and-socket joint, *a*. This rod carries the divided core or armature, which consists of a body, *b*, surrounded by wires or springs *c c*, which press against the interior of tube C.

Surrounding the tube C is the hollow core E, whose lower end is always somewhat above the lower end of the divided core *b c*. To the bottom of core E are attached hooks *d d*, from which, by links *e e* and hooks *d' d'*, is suspended the double clamp, which consists of two disks or rings, *f* and *f'*. Disk *f* is slotted at *g g*, and the edge of disk *f'* is made straight at *i i*, said disk being also beveled at *h h*, so that the disk *f'* passes through disk *f*. The

two disks are pivoted together by pins *j j*. The apertures in the disks are not circular, but are so formed that the tube is clamped only by the lower part of the clamp at *k k* and not by the upper part at *l l*. A metal cage, F, surrounds the carbon-carrier below the magnet or solenoid A, such cage being removably secured to a cross-piece, G, of the lamp-frame, the edge of the cage entering the slots *m m*, and the pins or projections *n n* pressing firmly against the sides of said slots to hold the cage in place. By means of the screw *o* passing through the bottom of the lamp-frame and touching the clamp *f f'*, the relative angle of the clamp and tube and the point at which the tube will be clamped may be adjusted. Rods *p p* extend below the magnet or solenoid into the cage F, passing through the flange *r* of core E, the lower portions of said rods being screw-threaded, and thumb-screws *q q* being placed thereon. A spring, *s*, encircles each of said rods, and by screwing the thumb-screws up and down the pressure of the springs against the flange *r* may be adjusted, and consequently the movement of the core E regulated.

Into the lower end of the carbon-carrying tube C is screwed the narrow screw-threaded rod *t*, upon which is placed the heat-reflector H. The reflector H is used to prevent the radiation of heat from the arc to the upper portion of the lamp, while the small area of the rod *t* serves to prevent the conduction of much heat. In addition I place within the tube C, near its lower end, a disk, *u*, of slate or similar non-heat-conducting material, to prevent the glycerine in the tube from becoming heated. The rod *t* extends upwardly from the upper-carbon holder, which consists of a tube, J, within which is placed the carbon K. A spring, *v*, is attached within tube J, and a screw, *w*, is forced against said spring to hold the carbon. The carbon may be adjusted to the proper position, and then by turning the screw against the spring may be maintained rigidly in such position. It is evident that an increase in the energy of the magnet or solenoid A, caused by the shortness of the arc, will cause the attraction of the core E, which will raise the clamp *f f'*, gripping the tube at *k k*, and raising said tube with the upper carbon to restore the proper length of the arc, while a downward movement of said core, caused by the weakening of the magnet or solenoid, loosens the clamp so that the tube can slip through it until the right point is reached, when it will be again clamped. The divided core or armature within the tube acts to retard or regulate the movements of the clamping device to prevent too sudden movements of the tube. The double clamp shown is in contact with the tube at points in one plane only, wherein it differs from those clamps which consist of a single ring, which clamps the tube obliquely, and this makes a more efficient clamp than the single ring, the points of contact being always close to the tube and ready for instant action, besides keeping the tube always in a true vertical position, which cannot be accomplished by an oblique clamp.

What I claim is—

1. In a voltaic-arc lamp, the combination, with the regulating magnet or solenoid, its movable core or armature, and the movable carbon-carrier, of a clamp suspended from said core or armature, composed of two disks, rings, or washers pivoted one upon or within the other and encircling said carbon-carrier, substantially as set forth.

2. In a voltaic-arc lamp, the combination of the regulating magnet or solenoid, a movable core or armature therefor, the movable carbon-carrier, the double clamp consisting of two rings, disks, or washers pivoted one upon or within the other and encircling said carbon-carrier, and links or equivalent devices connecting the upper edges of said rings, disks, or washers with said movable core or armature, substantially as set forth.

3. In a voltaic-arc lamp, the combination, with the double clamp formed of disks, rings, or washers encircling the movable carbon-carrier, of means for adjusting the angle of said clamp relative to said carbon-carrier, substantially as set forth.

4. In a voltaic arc lamp, the combination, with a carbon-carrying tube filled with liquid, of an interposed section of non-heat-conducting material to prevent the conduction of heat by said liquid, substantially as set forth.

5. In a voltaic-arc lamp, the carbon-holder described, consisting of a tube in which the carbon is inserted, a spring-piece for holding the carbon therein, and means for increasing and decreasing the pressure of the spring upon the carbon, substantially as set forth.

This specification signed and witnessed this 26th day of January, 1883.

OTTO A. MOSES.

Witnesses:
H. W. SEELY,
EDWARD H. PYATT.