(No Model.)

C. COERPER.

ELECTRIC ARC LAMP.

No. 429,787. Patented June 10, 1890.

Fig. 1.

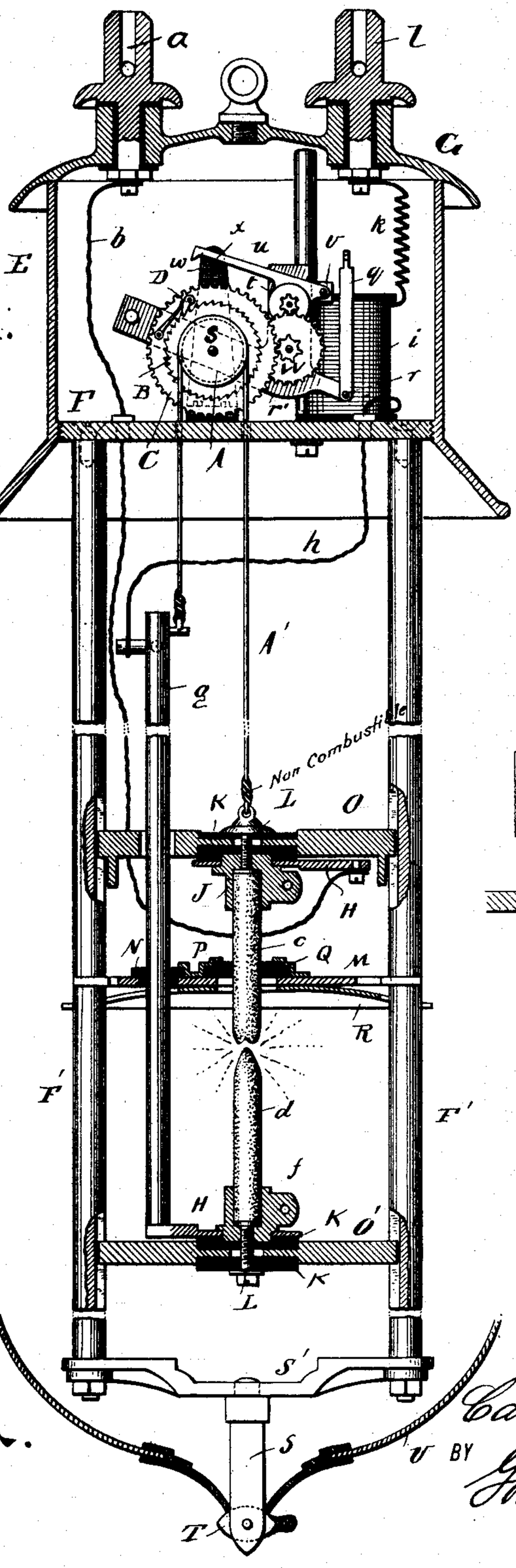
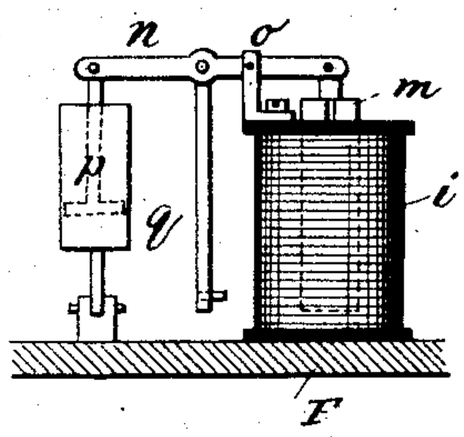


Fig. 2.



WITNESSES:

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CARL COERPER, OF EHRENFELD, GERMANY, ASSIGNOR TO HELIOS ACTIEN-GESELLSCHAFT FÜR ELEKTRISCHES LICHT UND TELEGRAPHENBAU, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 429,787, dated June 10, 1890.

Application filed January 25, 1889. Serial No. 297,550. (No model.) Patented in England December 14, 1888, No. 18,245.

To all whom it may concern:

Be it known that I, CARL COERPER, a subject of the King of Prussia, German Empire, residing at Ehrenfeld, near Cologne-on-the-Rhine, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Electric-Arc Lamps, (for which I have obtained Letters Patent No. 18,245, of December 14, 1888, in Great Britain,) of which the following is a specification.

This invention relates to an improved electric-arc lamp in which a continuous or an alternating current can be utilized.

The object of my invention is to provide an electric-arc lamp which is simple in construction and which regulates itself rapidly and accurately according to the current.

The invention consists in the construction and combination of parts and details, as will be fully described hereinafter, and finally be pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical transverse sectional view of my improved electric-arc lamp, parts being broken out. Fig. 2 is a detail side view of the solenoid suction-core and levers connected with the same.

Similar letters of reference indicate corresponding parts.

One line-wire is connected with the binding-post *a*, which is insulated in the cover G of the casing E, surrounding the regulating mechanism, such as gear-wheels and solenoid. Said casing E is screwed on the top plate F, from which the rods F′ extend downward. They guide the carbon-holders, and are connected at their lower ends by a cross-piece S′. The other line-wire is connected with a binding-post *l*, also insulated in the cover G, said binding-post being connected by the wire *k* with the solenoid *i* on the top plate F, in which solenoid the suction-core *m* is provided, which is suspended from one end of a lever *n*, pivoted on the bracket *o* on said solenoid. With that end of the lever *n* opposite the one connected with the suction-core *m* an air-brake *p* is connected. Between that end of the lever *n* connected with the brake *p* and the pivot *o* a connecting-rod *q* is pivoted to the lever *n*. The lower end of said connecting-rod *q* is pivoted at *r* to one end of a rock-frame *r′*, which is mounted to rock on the pivot *s* in the standards *w* on the top plate F. The said rock-frame *r′* supports a train of gearing W, which rocks with it.

The suspension-cord drum A, over which the cord A′, supporting the carbon-holders, passes, is mounted loosely on the shaft *s* and is provided with a ratchet-wheel B, which is engaged with a spring-pawl D on a gear-wheel C, that is fixed on the shaft *s*, said gear-wheel C engaging with a train of gearing W on the rock-frame *r′*. A brake-wheel *t* is mounted on the rock-frame and is operated by the train of gearing, and on the said brake-wheel a brake-lever *u* can act, which is pivoted at *v* to the frame *r′* and has its opposite end resting upon a pin *x* in one of the standards *w*. When the frame *r′* swings down, the free end of the brake-lever *u* will be in the raised position and the said lever disengaged from the brake-wheel *t*.

The upper carbon *c* is held on a cross-piece O, mounted to slide between the rods F′, and the lower carbon *d* projects upward from a cross-piece O′, also mounted to slide between the rods F′. The upper carbon *c* is held by a clamp J, which is insulated by non-combustible insulating-pieces K K from the cross-piece O, to which it is fastened. The lower carbon is held by a clamp *f* on the cross-piece O, also mounted to slide between the rods F′, said clamp *f* being insulated from the cross-piece O′ by insulating-pieces K K, also made of non-combustible material. Screws L L press and hold the clamps J *f* against metal clips H H, of which the one on the upper cross-piece O is connected by the wire *b* with the binding-post *a*, and the clip H on the lower cross-piece O′ is connected with the vertical rod *g*, passing through an aperture in the upper cross-piece O. The upper end of the rod *g* is connected by a wire *h* with the solenoid *i*. The ends of the cord A′ are connected with the cross-piece O and the upper end of the rod *g*, respectively. The upper carbon passes through and is guided by an insulating-piece Q on a fixed cross-bar M, unit-

ing the rods F′. The rod *g* also passes through an insulating-piece N on the cross-bar M, which insulating-pieces N and P are held on the cross-bar M by clips Q.

A reflector R may be secured to the under side of the cross-bar M.

From the cross-piece S′, uniting the lower ends of the rods F′, a short stem S projects downward, and in the lower slotted end of the same a latch T is pivoted, one end of which is weighted, so that the latch hangs vertically when free. The lamp-globe V is provided in its lower end with an aperture through which the stem S can be passed. To secure the globe the same is raised, so that the edges of its aperture will be above the latch T, and then said latch is turned to be at right angles to the stem S, and the edges of the bottom opening of the globe rested on said latch, whereby the latch is held in position and prevents the globe from dropping. When it is necessary to remove the globe, the same is moved upward a short distance, when the latch *t* drops into the vertical position, permitting the globe to be removed, as then the stem and latch can pass through the bottom aperture of the globe.

The operation is as follows: If the points of the carbon are in contact and the current is admitted into the lamp, the core *m* is drawn into the solenoid *i*, and thereby the connecting-rod *q* is raised and the right-hand end of the rock-frame *r′* is raised, whereby the lower carbon is permitted to descend and the upper carbon is raised sufficiently to form the arc. The solenoid *i* is so constructed that the core *m* has a certain fixed position for a certain current. As long as the current is not changed the brake-lever *u* keeps the brake-wheel *t* locked, and thus the position of the carbons is not changed. In case the strength of the current decreases, the solenoid *i* releases the cord in *m* and the frame *r′* swings down, whereby the brake-lever *u* is disengaged from the brake-wheel *t*, permitting the drum A to rotate under the action of the weight of the upper-carbon holder, whereby the lower-carbon holder is raised sufficiently to feed the regular length of carbon. As soon as the current again has its normal power the core *m* is drawn into the solenoid *i*, the frame *r′* is raised, and the brake-wheel *t* engaged with the brake-lever *u* and the entire feeding mechanism stopped, and so on. This feeding mechanism works very accurately, so that variations in the current of more than one-quarter ampère are excluded.

The especial advantage of this lamp is that none of the current is conducted through any of the parts of the casing or frame of the lamp, but from the binding-posts directly to the solenoid and carbon-holders. This not only permits of interchanging parts easily or removing defective parts, but also permits isolating all the constructive parts of the lamp from the current. When it is desired to place new carbons into the holders, the lower-carbon holder is pulled downward, whereby the upper one is raised, the pulley A turning from right to left, which it can do without operating the train of gearing on the frame *r′*. The pulley A cannot turn in the reverse direction from left to right without operating the train of gearing, and this train of gearing can only be operated when the brake-lever *u* is disengaged from the brake-wheel *t*—that is, when the frame *r′* is in lowered position.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an electric-arc lamp, the combination, with a solenoid, of a core in the same, a pivoted lever connected with said core, an air-brake connected with the opposite end of the said lever, a connecting-rod also connected with said lever, a rock-frame connected with said connecting-rod, and a train of gearing for operating the carbon-holders, which train of gearing is mounted on said rock-frame, substantially as set forth.

2. In an electric-arc lamp, the combination, with two rods, of two cross-pieces sliding between the same, a carbon-holder on each cross-piece, and a rod passing from the lower cross-piece through the upper cross-piece, with which rod one conducting-wire is connected, substantially as set forth.

3. In an electric-arc lamp, the combination, with two rods, of cross-pieces mounted to slide between the same, a fixed cross-bar having an insulated guide-piece for guiding the carbon on the upper cross-piece, and a rod projecting upward from the lower movable cross-piece, and an insulating-plate in said fixed cross-bar for guiding said rod, substantially as set forth.

4. In an electric-arc lamp, the combination, with two rods, of a fixed cross-bar uniting the same, sliding carbons supporting cross-pieces between the rods and above and below the fixed cross-bar, and a reflector on the under side of said fixed cross-bar, which reflector has a concave surface on its under side, substantially as set forth.

5. In an electric-arc lamp, the combination, with a frame, of a stem projecting from the lower end of the same, a latch pivoted in said stem and having one end weighted, and a globe supported by said latch, substantially as set forth.

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

CARL COERPER.

Witnesses:
PETER RINER,
MAX SCHOCT.