

(No Model.)

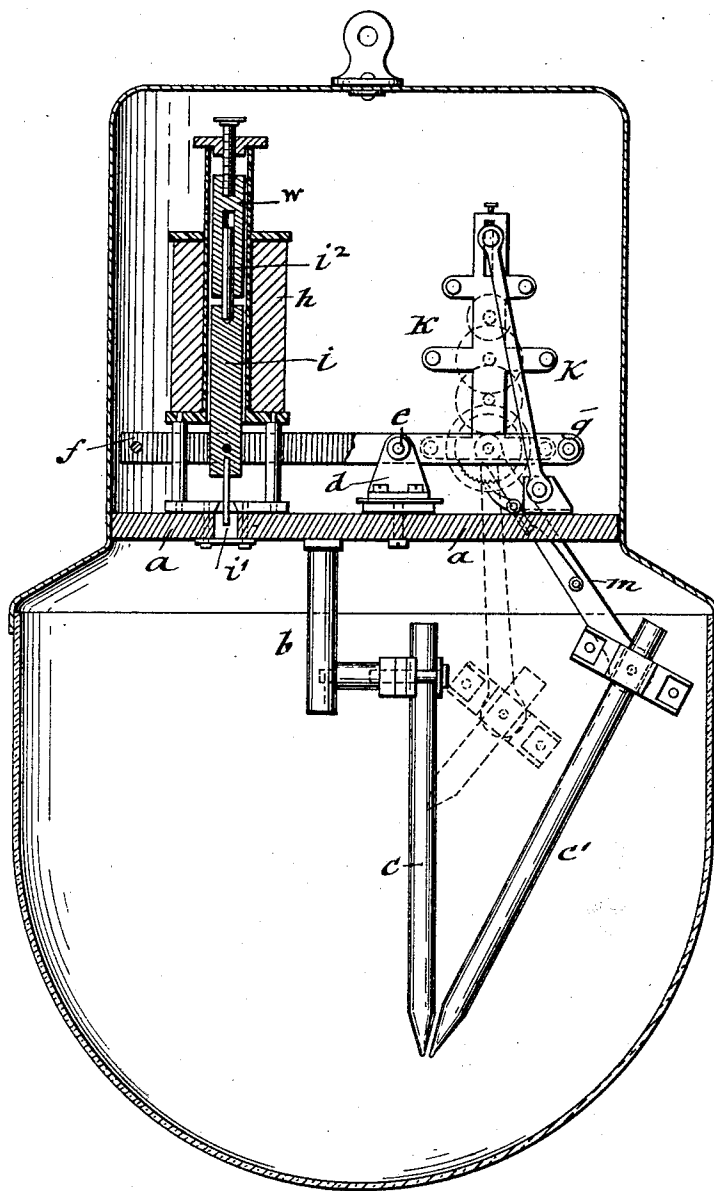
2 Sheets—Sheet 1.

R. & H. NIEWERTH.
ELECTRIC ARC LAMP.

No. 549,074.

Patented Oct. 29, 1895.

Fig: 1.



WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

R. & H. NIEWERTH.
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Fig: 2.

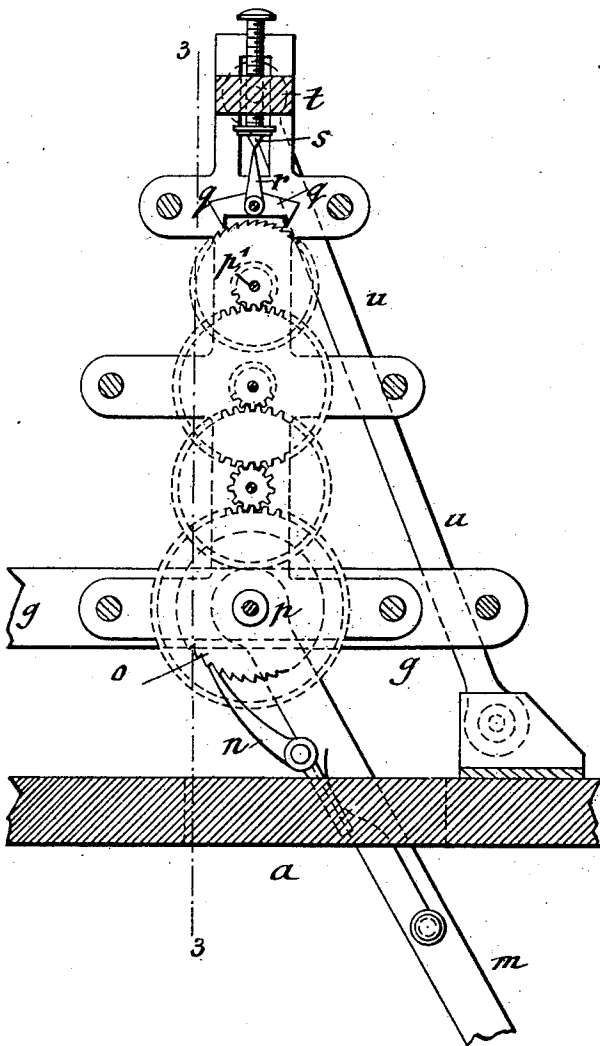
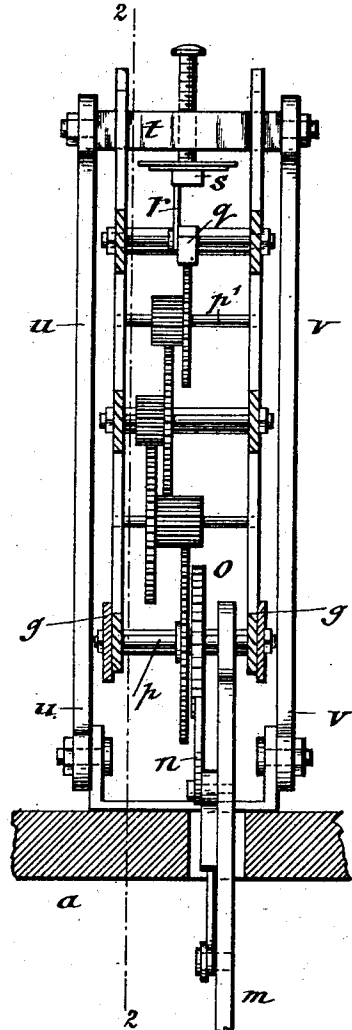


Fig: 3.



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UNITED STATES PATENT OFFICE.

REGINA NIEWERTH AND HERMANN NIEWERTH, OF BERLIN, GERMANY,
ASSIGNORS TO NIEWERTH & CO., OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 549,074, dated October 29, 1895.

Application filed April 25, 1895. Serial No. 547,167. (No model.)

To all whom it may concern:

Be it known that we, REGINA NIEWERTH and HERMANN NIEWERTH, citizens of the German Empire, and residents of the city of Berlin, in said Empire, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

Our invention relates to certain improvements in electric-arc lamps of that class in which the mechanism for feeding one of the carbons is operated by the action of the current on a solenoid, the soft-iron core of which is connected with the regulating mechanism; and the invention consists of an electric-arc lamp which comprises a fulcrumed double lever that is acted upon at one end by the core of a solenoid, while its opposite end is connected with an oscillating regulating mechanism, from which one of the carbons is suspended, while the other carbon is arranged stationary.

The invention consists, further, of certain details of construction which will be fully described hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a sectional side elevation of our improved electric-arc lamp, and Figs. 2 and 3 are a vertical longitudinal section and a vertical transverse section, respectively, on lines 2 2, Fig. 3, and 3 3, Fig. 2.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, *a* represents a horizontal supporting-plate, to which the holder *b* for the carbon *c* is attached. On the upper side of the horizontal supporting-plate *a* is arranged an insulated support *d*, on which is mounted the fulcrum *e* of a double lever *f g*. Above one end of the lever *f g* is arranged a solenoid *h*, which is supported by suitable pillars on the plate *a*, into which is drawn a soft-iron core *i*, which is pivoted at its lower end to the end *f* of the levers *f g*, so as to permit it to move freely in the solenoid and impart thereby an oscillating motion to the lever *f g*. To the opposite end *g* of the double lever *f g* is pivoted the frame of a regulating mechanism *k*, which consists of a train of transmitting gear-wheels. From the shaft *p* of the lowermost gear-wheel of the

regulating mechanism *k* is suspended the holder *m* of the second carbon *c'*, said holder being placed loosely on the shaft *l* and adapted to engage by a pivoted and spring-actuated pawl *n* on the same a ratchet-wheel *o*, which is keyed to the shaft of the lowermost wheel of the regulating mechanism *k*. The weight of the carbon-holder *m* is sufficient to set the train of gear-wheels in motion as soon as the escapement *q* at the upper end of the regulating mechanism *k* is released.

The release of the escapement is accomplished in the following manner: Above a spur-wheel on the uppermost shaft *p'* of the regulating mechanism is arranged the escapement *q*, which is provided with an upwardly-extending tongue *r*, that is arrested by a stop *s*, which is vertically adjustable on a transverse beam *t*. The beam *t* is supported at the upper ends of two inclined supporting-arms *u* and *v*, which are rigidly attached by means of clamping-screws to lugs on the supporting-plate *a*. The upper slotted ends of the frame of the regulating mechanism *k* are vertically adjustable on the ends of the beam *t*. When the regulating mechanism is in a position of rest, the tongue *r* abuts against the stop *s* and prevents thereby any motion of the regulating mechanism. As soon as the double lever *f g* is oscillated and its end *g* moved in downward direction, then the beam *t* is prevented from following this motion, as it is held in position by the arms *u* and *v*, but the tongue *r* is released from contact with the stop *s* on the beam, so that the train of gear-wheels can be set in motion without being arrested by the escapement *q*.

Above the movable core *i* of the solenoid *h* is arranged a second core *w*, which can be adjusted by means of a screw *w'*, and which serves to increase the magnetic force of the solenoid *h*. A pin *i'* extends from the upper end of the movable core *i* into a longitudinal bore in the upper stationary core *w*, while a second guide-pin *i''* extends from the lower end of the movable core *i* into an opening in the supporting-plate *a*, said guide-pins *i'* *i''* serving for guiding the core in its upward and downward motion when under the influence of the current flowing through the coils of the solenoid. As soon as the current is applied

to the lamp the core *i* is drawn into the solenoid, whereby the double lever *f g* is raised at the end *f* and lowered at the end *g*, so that the points of the carbons *c' c* are placed in
 5 contact with each other, but immediately separated again by the lowering of the core *i*, so that the arc is formed between the points of the carbons in the well-known manner. While the carbon *c* is burned, the core is
 10 gradually drawn more and more in the solenoid, so that the uniform position of the carbons is retained. As soon as the core is sucked beyond its median position in the solenoid, the regulating mechanism is released
 15 from escapement *q*, as by the upward motion of the core *i* the double lever *f g* is moved in downward direction at its end *g*, so that thereby the train of gear-wheels is released from the escapement *q* and actuated by the
 20 weight of the carbon *c'* and its holder *m*, so that the carbon *c'* is moved by gravity toward the carbon *c*, while the core *i* is returned to its median position.

The weight of the carbon-holders *m* and of
 25 the carbon *n* imparts by the pawl-and-ratchet device motion to the train of gear-wheels, which is at this time checked by the escapement, so that the carbon is moved toward the carbon *c*, and so on, so that the regular size
 30 of the arc is obtained. As soon as the double lever *f g* is raised again by the lowering of the core *i* the tongue *r* of the escapement *q* is engaged again by the stop *s*, and thereby the regulating mechanism prevented from
 35 moving the carbon *c'* toward the carbon *c*.

The construction described is adapted for arc lamps placed in a shunt-circuit. When the lamp is placed in the main-circuit, the core *i* is located in the opposite end of the
 40 solenoid in such a manner that it is drawn into the same in downward direction, while the connection of the core with the double lever *f g* is made by a non-magnetic piece. The regulation of the oscillating carbon is

produced in the same manner as before de- 45 scribed. The actuating and regulating mechanisms for the oscillating carbon are inclosed by a suitable sheet-metal casing, which is attached to the supporting-plate *a*, while the carbons are inclosed by a glass globe, which 50 is inclosed at the lower end and supported at its upper end by the casing, so that no shadows are formed below the carbons.

Having thus described our invention, we claim as new and desire to secure by Letters 5 Patent—

1. An electric arc-lamp, consisting of a stationary carbon, a movable carbon, a fulcrumed actuating lever, a core connected with one end of said lever, a solenoid surrounding said 60 core, a regulating-mechanism connected with the opposite end of the lever, a holder for the movable carbon suspended from the lower part of the regulating-mechanism, and an escapement for the regulating-mechanism, substantially as set forth. 65

2. An electric arc-lamp, consisting of a stationary carbon, a movable carbon, a holder for supporting the movable carbon, a regulating-mechanism from the lower end of which 70 the carbon-holder is suspended, a pawl and ratchet-mechanism between the carbon-holder and the lowermost member of the regulating-mechanism, an escapement at the upper end of said regulating-mechanism, a fulcrumed lever 75 connected with the regulating-mechanism, a core connected to the opposite end of said fulcrumed lever, and a solenoid surrounding said core, substantially as set forth.

In testimony that we claim the foregoing as 80 our invention we have signed our names in presence of two subscribing witnesses.

REGINA NIEWERTH.
 HERMANN NIEWERTH.

Witnesses:

CARL LINNEWEBER,
 E. ZWICK.