

(No Model.)

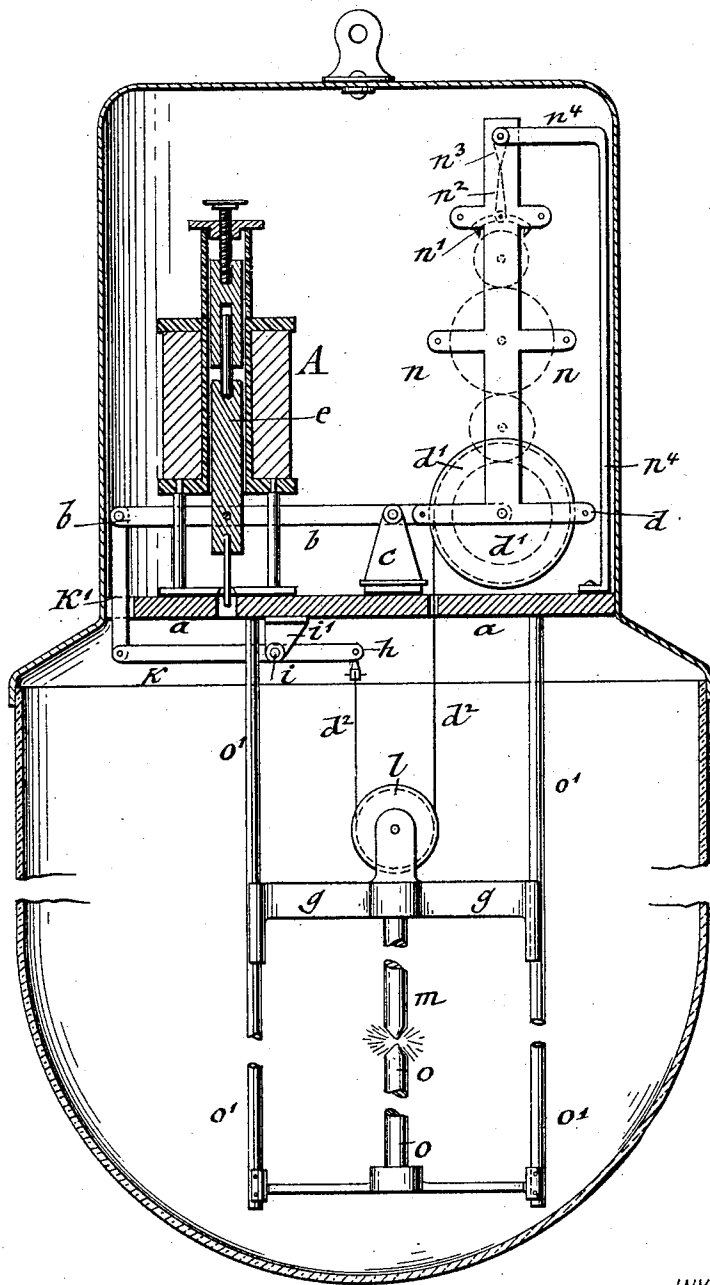
2 Sheets—Sheet 1.

R. & H. NIEWERTH.
ELECTRIC ARC LAMP.

No. 549,075.

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.

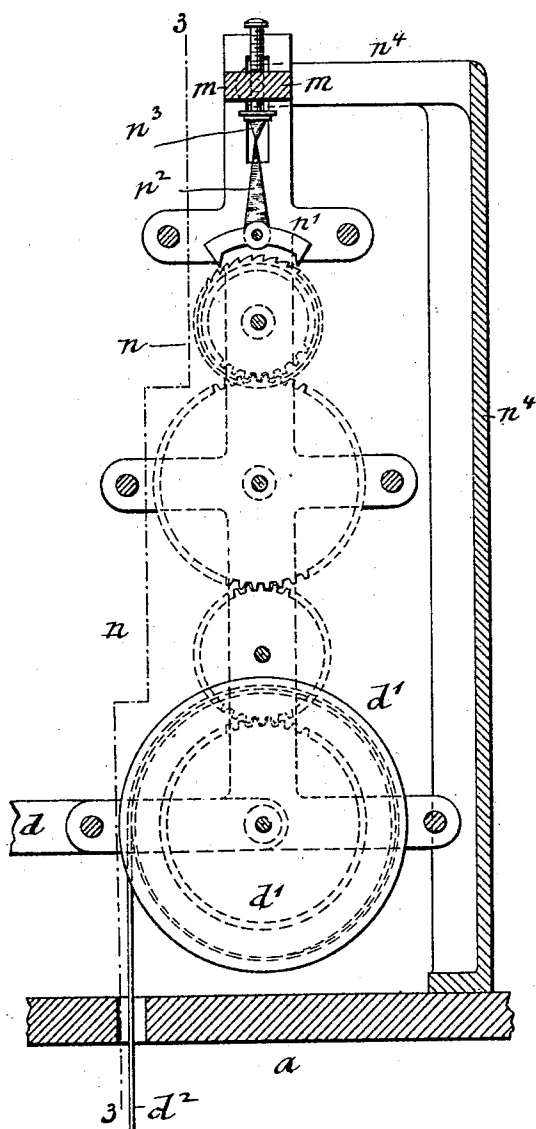
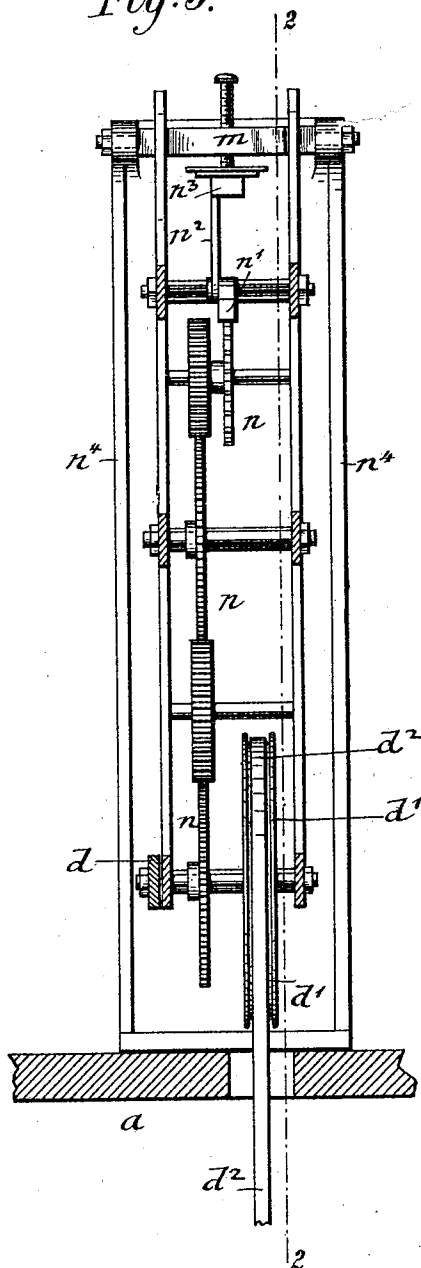


Fig: 3.



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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. 549,075, dated October 29, 1895.

Application filed April 30, 1895. Serial No. 547,709. (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, Germany, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

This invention has reference to certain improvements in electric-arc lamps of that class in which the upper carbon is actuated by a solenoid that is placed in a shunt of the main circuit and fed forward to the stationary carbon by a suitable regulating mechanism; and the invention consists of an electric-arc lamp in which the upper movable carbon is supported by a vertically-sliding holder which is suspended from a band or chain, one end of which is connected with a fulcrumed auxiliary lever that is connected with a fulcrumed main lever actuated by the core of a solenoid. The opposite end of the band or chain is passed around a drum which is connected with the main lever and which forms the lower member of a regulating mechanism that is provided with an escapement, said regulating mechanism being released from the escapement when the main lever is oscillated, so that the suspending band or chain of the carbon-holder is unwound from the drum and the movable-carbon holder fed in downward direction, as 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 respectively 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 on which the actuating parts of our improved arc lamp are mounted. On the supporting-plate *a* is mounted an insulated support *c*, to which is fulcrumed a main lever *b d*. The lever *b d* is connected at the end *b* with a soft-iron core *e*, that is located in a solenoid *A* and guided in a suitable manner in its up-and-down motion. To the opposite end of the lever *b d* is mounted a drum *d'*, around which is wound a

band or chain *d²*, the end of which is attached to the drum *d'*. The band or chain *d²* passes through a pulley *l*, that is applied to the upwardly-extending lugs of a vertically-guided frame or holder *g*, to which the upper carbon *m* is applied. The opposite end of the band *d²* is attached to a fulcrumed auxiliary lever *h k*, the fulcrum *i* of which is supported by a hanger *i'*, attached to the under side of the supporting-plate *a*. The outer end *k* of the lever *h k* is connected by a pivot-link *k* with the outer end *b* of the lever *b d*, so that when said lever *b d* is oscillated the lever *h k* is compelled to follow the oscillations of the same. The shaft of the drum *d'* is supported by the frame of a regulating mechanism *n*, the upper slotted end of the frame being guided along a transverse block *m*, supported by stationary arms *n⁴*. On the transverse block is a stop *n³*, which serves to arrest the tongue *n²* of an escapement *n'* at the upper part of the regulating mechanism *n*. The regulating mechanism consists of a train of gear-wheels interposed between the shaft of the drum *d'* and the escapement *n'*, by which the feed of the upper carbon is controlled in connection with the oscillations of the lever *b d*. As soon as the tongue *n²* of the escapement *n'* of the regulating mechanism *n* is released from the stationary stop *n³*, which is applied to a stationary pillar *n⁴*, the regulating mechanism permits the drum *d'* to turn on its axis, so that the band *d²* is unwound by the tension of the weight of the carbon-holder *g*, whereby the downward feeding of the upper carbon *m* is produced. The lower or negative carbon *o* is supported in the usual manner on the lower ends of the stationary guide-rods *o'*, that are attached to the supporting-plate *a*.

As soon as current is supplied to the lamp the solenoid *A* will draw in the core *e* and compel the levers *b d* and *h k* to follow the motion of the core, so that the end *d* of the lever *b d* and the end *h* of the lever *h k* will move in downward direction, which produces the release of the regulating mechanism *n* from the escapement *n'*, so that the drum *d'* can turn on its axis, whereby the upper carbon is permitted to turn in downward direction, so as to form contact with the lower carbon. As

the current passes then through the carbons the solenoid permits the core to move downward, whereby the ends *d* and *h* of the levers *b d* and *k h* are raised, the carbon points separated, and the arc formed. The regulating mechanism is re-engaged by its escapement and released again by the drawing in of the core, and so on alternately, whereby the upper carbon is intermittently moved downward toward the lower carbon.

The regulating of the distance of the carbon points from each other is accomplished by the solenoid and its core, the intermediate oscillating levers *b d* and *k h*, and the regulating mechanism and its escapement. The play of these parts is so sensitive that the carbon points are held at a uniform distance from each other, whereby an arc of regular size is formed.

The lamp described is shown as being placed in a shunt-circuit. The lamp can also be arranged directly in the main circuit, in which case, however, the relative position of the lever *k h* toward the solenoid has to be changed by being placed above the same. It is obvious that the arrangement of the solenoid, with its core, and of the regulating mechanism can be carried out in many different ways, and we do not desire to confine ourselves to the special construction shown. The actuating parts of the lamp are preferably inclosed in a sheet-metal casing that is attached to the supporting-plate *a*, while the carbons are inclosed by a glass globe which is supported on the lower outwardly-converging portion of the casing, so that the rays of the arc are thrown in downward direction, while at the same time the direct access of the air to the carbons is prevented.

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

1. An electric arc-lamp, consisting of a sta-

tionary lower carbon, an upper movable carbon, a fulcrumed main lever actuated by a solenoid, a drum on the opposite end of the main-lever, a regulating-mechanism connected with said drum and a band or chain from which the upper carbon is suspended, said band being applied at one end to the drum and connected with the opposite end of the main-lever, substantially as set forth.

2. An electric arc-lamp, consisting of a stationary lower carbon, an upper movable carbon, a fulcrumed main-lever, a solenoid above one end of the lever, a soft iron core located in said solenoid and connected with said main-lever, a drum applied to the opposite end of the main-lever, a regulating-mechanism for said drum, a band or chain wound around said drum, and passed through the holder of the upper carbon, and a fulcrumed auxiliary lever connected with said band or chain and with the main-lever, substantially as set forth.

3. An electric arc-lamp, consisting of a lower stationary carbon, an upper movable carbon, a vertically-guided holder for the upper carbon, a fulcrumed main-lever, a drum mounted at one end of the main-lever, a regulating mechanism for said drum, a band or chain applied to said drum, and passed through the upper carbon-holder, a fulcrumed auxiliary lever, connected at one end with the band or chain and at the other end with the main-lever, a soft iron core connected with the main lever at the end opposite to the drum, and a solenoid surrounding said core, substantially as set forth.

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

REGINA NIEWERTH.
HERMANN NIEWERTH.

Witnesses:

CARL LINNEWEBER,
EDWIN ZWICK.