

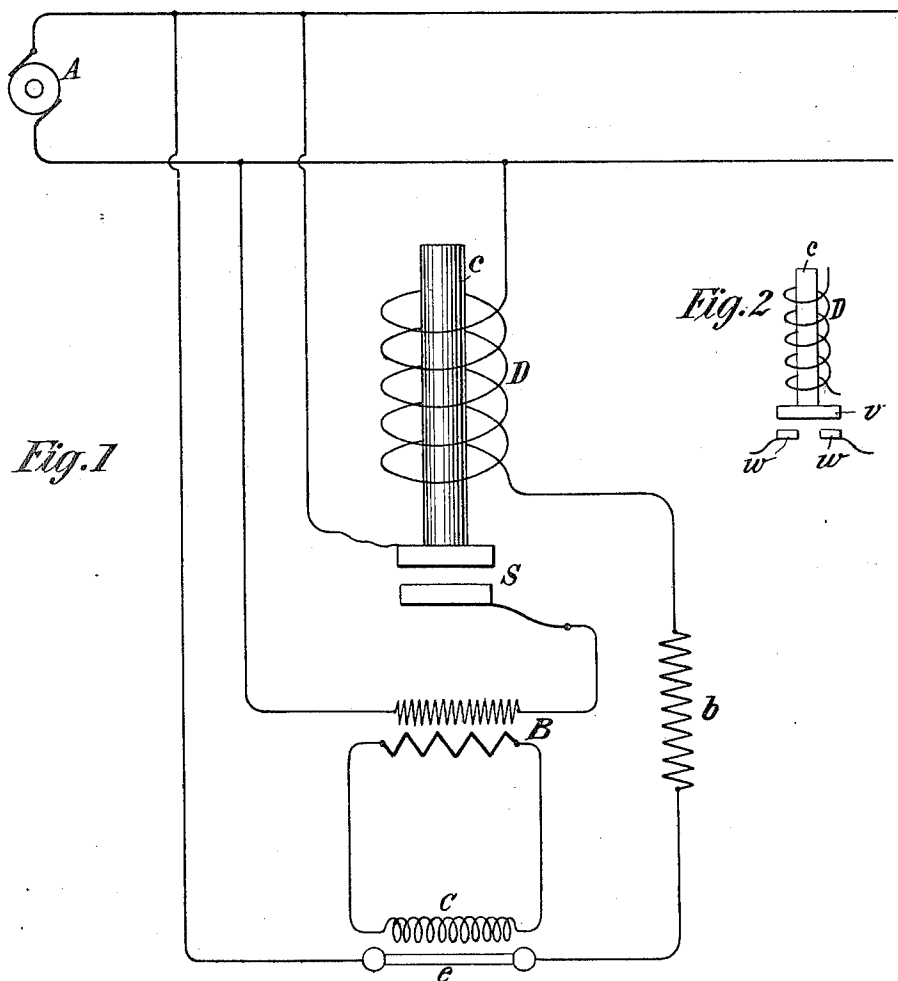
No. 673,935.

Patented May 14, 1901.

A. J. WURTS.
ELECTRIC LIGHTING SYSTEM.

(Application filed Apr. 21, 1899.)

(No Model.)



Witnesses:
Raphael Ketter
J. H. Jones

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UNITED STATES PATENT OFFICE.

ALEXANDER JAY WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
GEORGE WESTINGHOUSE, OF SAME PLACE.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 673,935, dated May 14, 1901.

Application filed April 21, 1899. Serial No. 713,837. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER JAY WURTS, a citizen of the United States of America, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Lighting Systems, of which the following is a specification.

In the practice of the art of electric lighting wherein illuminants or glowers composed of the rare earths or mixtures thereof are brought to a conductive temperature by artificial devices, such as electric heaters, it is of advantage and is customary to operate the heaters by means of currents having a lower potential than that which is employed for maintaining the glowers at incandescence. It is also of advantage at times to have the circuits of the glowers and that of the heaters independent of each other, it having been discovered that there was danger of flashing taking place between the glowers and the heater-wire when the circuits supplying these parts were connected. I have found that a convenient device for reducing the tension and at the same time for making the circuits independent is to put the heaters in the low-potential secondary circuits of converters, while the glowers are in a circuit of higher potential supplied by the same generator as the converter is energized by or by an independent generator. The use of such a secondary circuit for the heating apparatus and the combination therewith of a circuit-breaker for the heater-circuit form the subject-matter of the present invention and are illustrated in the accompanying drawings, forming a part of this specification.

The drawings referred to show in Figure 1 a diagram of a simple circuit such as I have described, one glower only being illustrated. In Fig. 2 a detail of the circuit-controller contacts is shown.

Referring to the drawings by letter, A is a source of alternating current, and B is a converter, the primary of which is supplied from the said source. In the low-potential secondary circuit of the said converter is a heater C, the same being arranged in proximity to a glower *e*, which constitutes the chief operating portion of an electric lamp of the charac-

ter above set forth. In the primary circuit of the converter B is a switch S, the movable terminal of which is joined to the core *c* of the solenoid D. The said solenoid is arranged in series with the glower *e*, and between the coil of the solenoid and the glower is a steadying-resistance *b*, which may be dispensed with under certain conditions.

When the glower has been sufficiently heated to become conductive—when, say, it has been brought to a dull-red heat—the current passing through the coil of the solenoid D is sufficient to draw up the core *c* and operate the switch S, so as to break the primary converter-circuit.

The converter B might be placed in a circuit entirely independent of the generator A, being supplied from some independent generator, but controlled by the action of the solenoid D or a magnet corresponding to the said solenoid and equivalent thereto. In that case the generator supplying the glower *e* might be a direct-current generator instead of a source of alternating current.

The switch S, which is typically shown in Fig. 1, appears more in detail in Fig. 2. Here the circuit-wires are connected to stationary carbon contact-terminals *w w*, while a carbon contact-disk *v*, attached to the core *c*, is free to move without obstruction from the wires. When the carbon switch-terminals are used, sparking is reduced and the sticking of the contact parts is prevented.

I claim as my invention—

1. In an electric lamp wherein a glower composed of rare earths or a mixture thereof is the incandescing body, an electric heater included in the low-potential secondary of a converter and an electromagnetic device in circuit with the glower, the said electromagnetic device being operatively connected with a circuit-breaking switch in the heater-circuit.

2. In an electric-lighting system, a source of alternating current, a glower of rare earths or a mixture thereof in circuit with the said source, a converter, and an electric heater in the secondary circuit of the said converter and located in proximity to the said glower.

3. In an electric-lighting system, a source of alternating current and a circuit therefrom

- including a glower composed of rare earths or a mixture thereof and also including an electromagnetic device, a converter arranged between the mains from the said source, a
 5 heater in the secondary circuit of the said converter, and a switch included in the primary thereof and having its movable terminal attached to the said electromagnetic device.
- 10 4. In an electric-lighting system, a source of electric current and a circuit therefrom including one or more glowers composed of rare earths or mixtures thereof, an electric heater arranged in proximity to the said glower or
 15 glowers, a converter supplying the said heater and a switch controlling the circuit of the said heater.
- 20 5. In an electric-lighting system a source of electric current and a circuit therefrom including one or more glowers composed of rare earths or a mixture thereof and also including an electromagnetic device, a converter and a heater in the secondary circuit thereof, the said heater being arranged in proximity

to the said glower or glowers, and a switch 25 included in the primary circuit of the said converter and having its movable terminal attached to the said armature or core of the said electromagnetic device.

6. An incandescing electric lamp of the described type consisting of a filament or rod 30 of refractory material, in combination with means for heating said filament or rod to the desired current-carrying capacity, said heating means being included in the low-resistance secondary circuit of a converter, the 35 primary of which is included in circuit with a source of electrical energy, the arrangement being such that currents of relatively great heating capacity are generated in the heating means, substantially as described. 40

Signed by me at East Pittsburg, Pennsylvania, this 12th day of April, 1899.

ALEXANDER JAY WURTS.

Witnesses:

WESLEY G. CARR,

H. C. TENER.