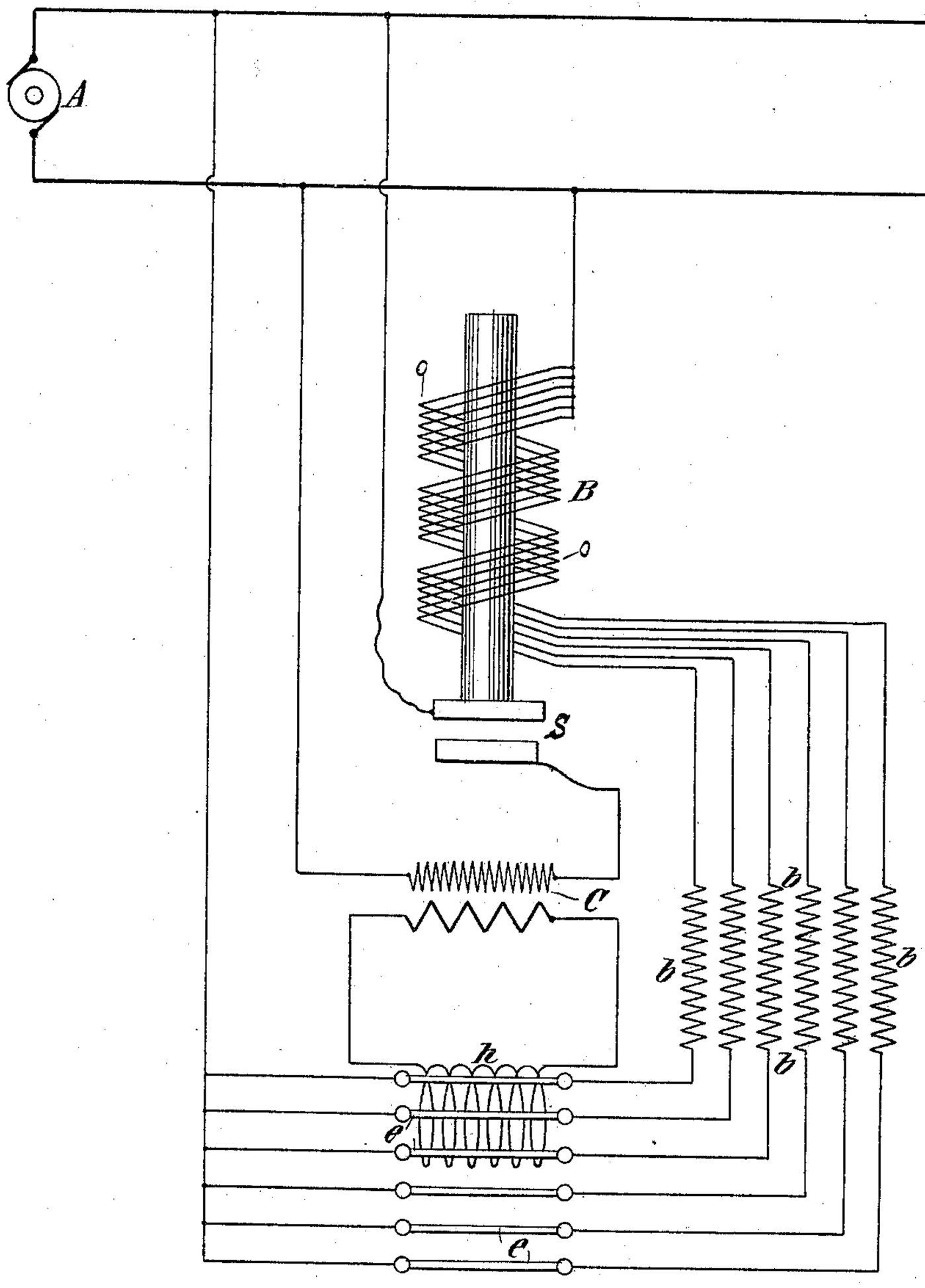
No. 652,699. Patented June 26, 1900.

A. J. WURTS.

MULTIPLE GLOWER LAMP.

(Application filed Apr. 21, 1899. Renewed Jan. 17, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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

MULTIPLE-GLOWER LAMP.

SPECIFICATION forming part of Letters Patent No. 652,699, dated June 26, 1900.

Application filed April 21, 1899. Renewed January 17, 1900. Serial No. 1,760. (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 Multiple-Glower Lamps, of which the following is a specification.

One of the requirements in connection with incandescent lighting through the medium of glowers formed of materials which are practically non-conductors when cold and relatively-good conductors when hot relates to the means whereby the illuminants or glowers are changed from a non-conductive state to a condition in which they are sufficiently good conductors to be made and kept incandescent by the electric current traversing them. Whenever electric heaters are made use of for bringing the illuminants or glowers to the proper degree of heat for the initial operation of the glowers, it is usually desirable that the heater-circuit should be interrupted as soon as possible, both to prevent the undue consumption of energy in the heater-circuit and to postpone the destruction of the heaters themselves. Such heating devices, together with both manual and automatic means for breaking the heater-circuit, have been employed with lamps having single glowers or incandescent bodies, as well as with lamps having two or more glowers. In both instances the custom has been to cause the rupture of the heating-circuit (when automatic circuit-breakers are used) by the action of a coil or magnet in the glower-circuit upon the movable switch-terminal in the heater-circuit. This action of the coil or magnet in multiple-glower lamps has been caused to intervene at the moment when all the glowers have been brought to the proper conductive state through the influence of the heater. I have discovered that it is not necessary to continue the operation of the heating-circuit until all the glowers have been thus heated, for I find that if a sufficient number of glowers are made hot the rest will be brought to a proper degree of heat through the influence of those already heated. Accordingly I provide in the present invention for the rupture of the heating-circuit at the moment when a certain predetermined number of the glowers are heated to the right temperature, leaving the remainder to be acted upon by the heat of this selected number. By adopting the described method of lighting lamps of this class I provide not only for preventing undue waste of energy and the undue and unnecessary use of the heaters and the consequent deterioration thereof, but I am enabled to employ smaller heaters than if all the glowers were to be heated by outside means. Since in the present state of the art the material usually employed for the heaters is platinum, this saving of the material that enters into the composition of the heaters is no less important than the prevention of needless wear and tear upon the heaters after they are made.

In the drawing which accompanies and forms part of the present specification I have illustrated diagrammatically a lamp having six illuminants or glowers and a heater arranged in such proximity to certain of the glowers as to supply them with the necessary heat for making them conductors of electricity. In practice it is usually sufficient to bring such glowers to a dull-red heat, and I have found also in a lamp of the character illustrated it is quite sufficient to bring three of the glowers to the indicated temperature, after which the heating-current may be cut off, while the three remaining glowers will be brought to proper temperature by reason of their proximity to the three already heated.

I by no means limit myself to the proportions described between the heated and unheated glowers, as this is a matter which may vary with glowers of different character. I only point out at this time the advantage of rupturing the heater-circuit at the moment that the lamp is in a condition to take care of itself, as broadly indicated in the foregoing statement. The number of glowers originally heated may be one or more than one, and the proportion that this number bears to the total number of glowers in the lamp may vary according to the circumstances of different cases. The heater employed in raising the temperature of the glowers may be fixed in its relation to the glowers or movable with relation thereto.

The character of the present invention is

not affected in any way by the circumstance that the heater is illustrated in this application as being located in the secondary circuit of a converter. It might be located in parallel with the glowers.

The accompanying drawing is a diagrammatic view showing a multiple-glower lamp combined with a suitable heater and with automatic means for breaking the heater-circuit when a certain chosen number of the glowers have been sufficiently heated.

In the drawing, A is a source of electric currents, appearing in this instance as an alternating-current generator, supplying on the one hand six glowers *e e* and on the other the primary of a converter C, the secondary circuit of which is connected with the terminals of an electric heater *h*, arranged in the present instance as a coil of wire in proximity to three of the glowers *e e*. In the circuit of the generator is a magnet or solenoid B, having six strands *o o*—that is to say, one strand for each of the glowers *e e* of the lamp. Between the terminals of the strands *o o* as they emerge from the magnet or solenoid I generally interpose additional steadying resistances *b b* for the glowers, although the strands in themselves may provide sufficient steadying resistance for the glowers. It will be seen that the part B is shown in the drawing as a solenoid, the core of which is secured to the movable portion of a switch S, controlling the primary circuit of the converter C. In practice I so adjust the weight of the core and the parts which it carries with relation to the strength of the solenoid that the said core will be moved so as to operate the switch S whenever a predetermined number—say three—of the coils or strands of the solenoid-windings are energized by a current sufficient to operate the same number of glowers at a fixed potential. The operation of the switch will accordingly only take place when a certain number of the glowers have been duly heated, after which the remainder of the glowers will be brought to the proper temperature by the heat of those already sufficiently affected by the heater.

While I prefer to use the automatic circuit-breaker described in the foregoing specification, yet it would be within the scope of the present invention, if for any reason one should prefer, to break the heater-circuit by hand after a sufficient number of glowers have become hot. In some cases it will be sufficient to heat only one glower in the first instance, after which the remaining glowers will be duly heated in succession.

I claim as my invention—

1. The combination of multiple glowers which are normally non-conductors and require heating to become conductors, located within such proximity to each other as to receive heat from each other, an electric heater for heating a selected number of the glowers to conducting temperature, means for causing currents to flow through the heater and also through the selected glowers, and means for cutting out the heater when the selected glowers become conductive.

2. The combination of multiple glowers which are normally non-conductors and require to be heated to become conductors, located within such proximity to each other as to receive heat from each other, a heater for bringing a selected number of the glowers to the proper degree to become conductive, means for causing currents to flow through such selected number when thus rendered conductive and means for withdrawing the heater from action when such selected number have become conductive.

3. In an electric-lighting apparatus wherein a number of glowers normally non-conducting are brought to conductive temperature by means of an electric heater, a heating-circuit containing a heater in proximity to the glowers and provided with a suitable switch and a strand or strands in series with each glower, the said strand or strands being wound to form a magnet or solenoid, whose core or armature is connected to the movable part of the switch, the relation of the parts being such that on the passage through the said magnet or solenoid of a current sufficient to maintain a certain number of the glowers in operation at a fixed potential, the said core or armature will be moved and the heating-circuit broken.

4. In an electric glow-lamp the combination of multiple glowers, which require to be heated to be rendered conductive, a heater for bringing one or more thereof to a conducting temperature and means for automatically withdrawing from action the heater when only a portion of the glowers have been brought to such temperature.

5. In an electric lamp having multiple glowers which require to be heated, to be rendered conductive of electricity, a heater for one or more of said glowers, means for withdrawing said heater from action when a portion of the glowers are in operation, comprising a solenoid and a circuit-interrupting device actuated thereby said solenoid being wound with multiple coils, each of said coils having its circuit connections through a corresponding glower.

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

ALEXANDER JAY WURTS.

Witnesses:

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