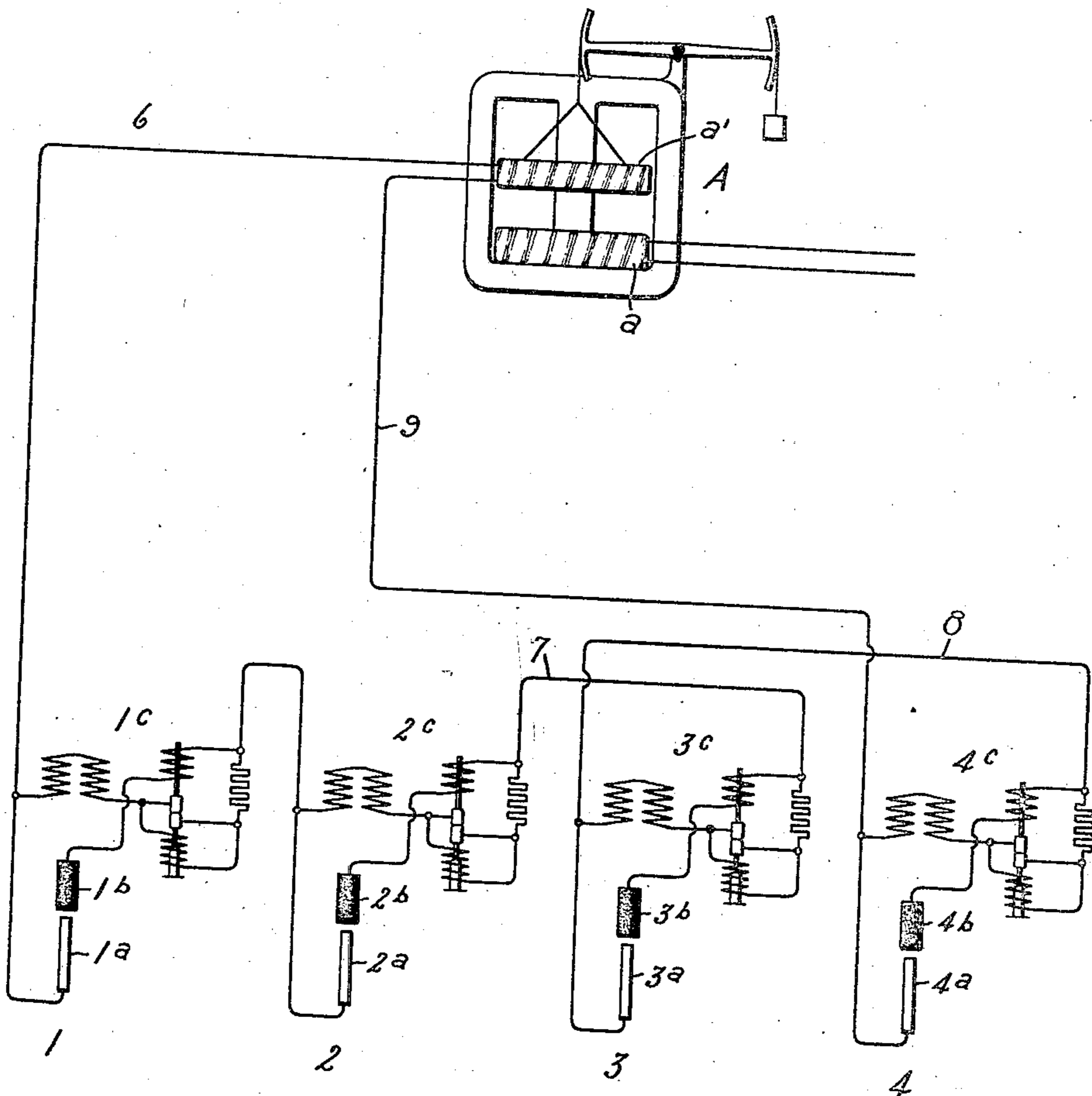


910,658.

R. FLEMING.
SYSTEM OF LIGHTING BY ARC LAMPS.
APPLICATION FILED MAR. 6, 1907.

Patented Jan. 26, 1909.



Witnesses:

George H. Tilden.
J. Ellis Allen.

Inventor:

Richard Fleming,

by *Albert Davis*
Att'y

UNITED STATES PATENT OFFICE.

RICHARD FLEMING, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY,
A CORPORATION OF NEW YORK.

SYSTEM OF LIGHTING BY ARC-LAMPS.

No. 910,658.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed March 6, 1907. Serial No. 360,809.

To all whom it may concern:

Be it known that I, RICHARD FLEMING, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Systems of Lighting by Arc-Lamps, of which the following is a specification.

When an arc lamp having electrodes of dissimilar material is operated on alternating current, a certain amount of rectification takes place, the extent thereof depending upon the nature of the electrodes. When a number of such arc lamps are connected in series with each other, the rectifying action of all of the lamps is cumulative so that, when they are operated from a constant current transformer in the ordinary way, an extremely poor power factor is obtained. I have found that these difficulties may be overcome by connecting half the total number of lamps reversely with respect to the others. In this way a balancing action is obtained, for the reason that no more resistance is offered to the flow of current in one direction than in the other, and the load on the transformer does not change at each alteration of the current.

In the accompanying drawing I have shown diagrammatically a circuit including a constant current transformer and a number of arc lamps arranged in accordance with my invention.

Referring to the drawing, A is a constant current transformer of any usual or preferred type having a primary winding *a* and a secondary winding *a'*.

1, 2, 3 and 4 are four arc lamps which, for the sake of convenience and as indicating a type of lamps to which my invention is applicable, I have illustrated as lamps of the character disclosed in application Serial No. 357,460, filed jointly by myself and Emile J. Guay, wherein one of the electrodes is carbon and the other titanium carbide. My invention is not limited, however, to this particular form of lamp, but is applicable to any lamps wherein a tendency to current rectification exists.

1^a to 4^a indicate the titanium carbide electrodes, and 1^b to 4^b, the carbon electrodes

of the four lamps. The lamps are also provided with individual regulating mechanism 1^c to 4^c, which, however, constitute no part of the present invention. Electrode 1^a of the first lamp is connected to one terminal of the transformer through conductor 6; electrode 2^b is connected to electrode 3^b through conductor 7; electrode 3^a is connected to electrode 4^b through conductor 8; and electrode 4^a is connected to the other terminal of the transformer through conductor 9. Thus it will be seen that lamps 1 and 2, and lamps 3 and 4, are connected reversely to each other, namely: The carbon electrodes of the two groups are connected to opposite sides of the circuit, so that when corresponding electrodes in the first two lamps are the negative electrodes the same electrodes in the other two lamps are the positive electrodes. When current is flowing, lamps 1 and 2 tend to rectify in one direction, while the lamps 3 and 4 tend to rectify in the opposite direction. Therefore, the balance of the system is preserved and the power factor improved.

While I have illustrated my invention by means of four arc lamps divided into two similar groups, it is of course evident that my invention is applicable to any number of lamps divided into any desired number of groups each containing one or more lamps connected in series and reversely with respect to each other. Furthermore, while my invention is of particular value where the current is supplied by a constant current transformer, it may be employed to advantage in connection with any suitable source of alternating current.

What I claim as new, and desire to secure by Letters Patent of the United States, is,—

1. In combination, an alternating current circuit, a pair of arc lamps each having dissimilar electrodes, a connection between the corresponding electrodes of the lamps and connections between each of the other electrodes and opposite sides of the circuit.

2. In combination, a constant current transformer, a pair of arc lamps which offer greater resistance to flow of current in one direction than in the other, an electrical connection between corresponding terminals of

the lamps, and connections between the other terminals of the lamps and the terminals of the secondary of the transformer.

3. In combination, an alternating current
5 circuit, a plurality of arc lamps which offer greater resistance to flow of current in one direction than in the other, and means for connecting said lamps in series in the circuit

in groups connected reversely with respect to each other. 10

In witness whereof, I have hereunto set my hand this fourth day of March, 1907.

RICHARD FLEMING.

Witnesses:

JOHN A. McMANUS, Jr.,
PHILIP F. HARRINGTON.