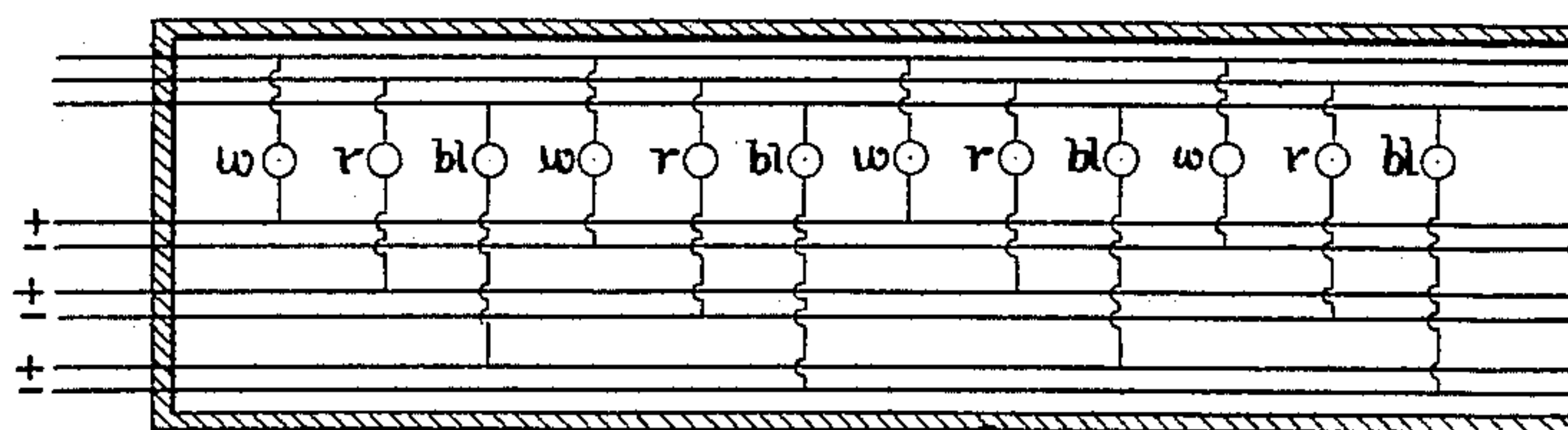
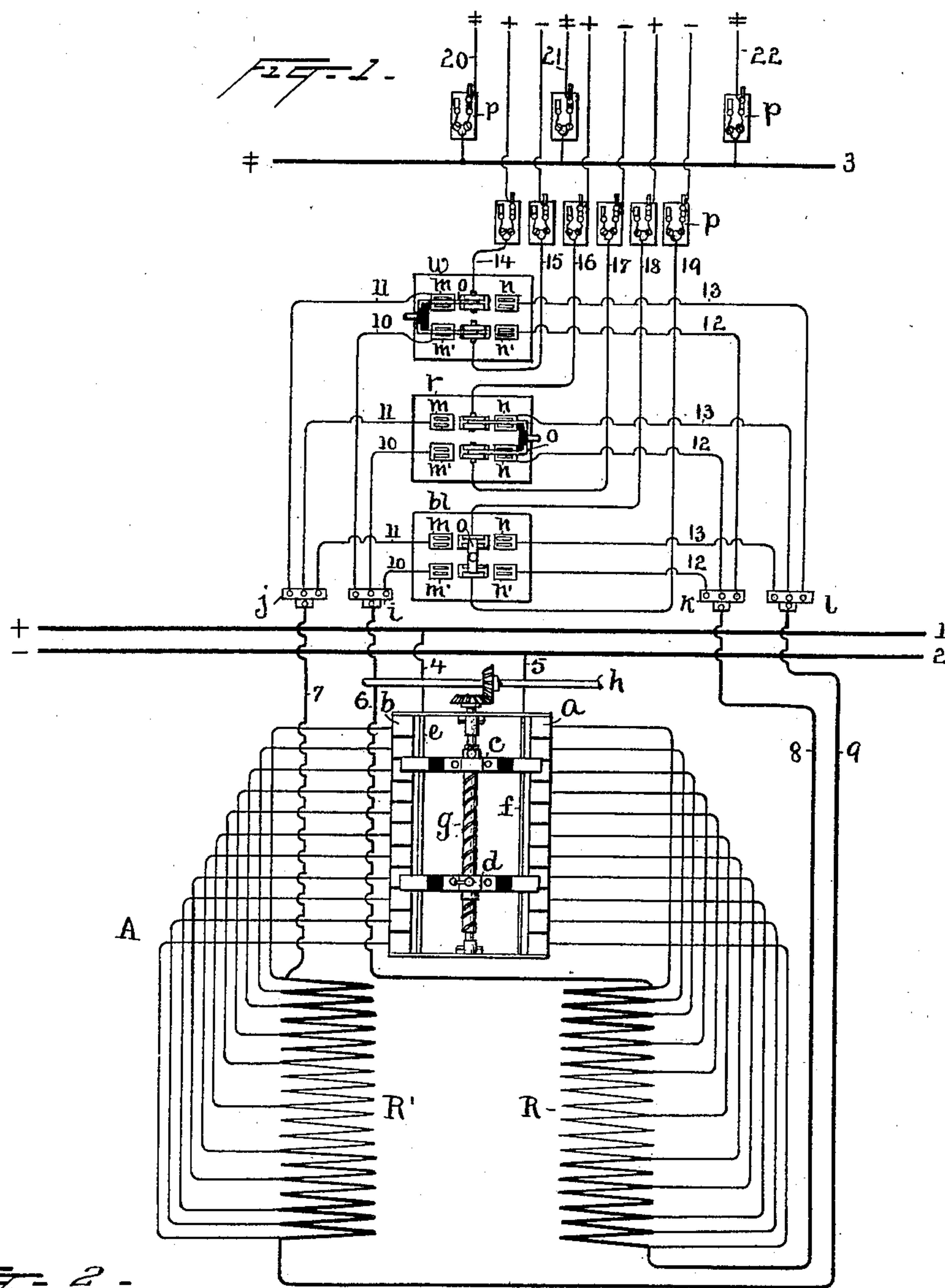


J. C. MAYRHOFER.
ELECTRIC LIGHTING SYSTEM.

No. 552,496.

Patented Dec. 31, 1895.



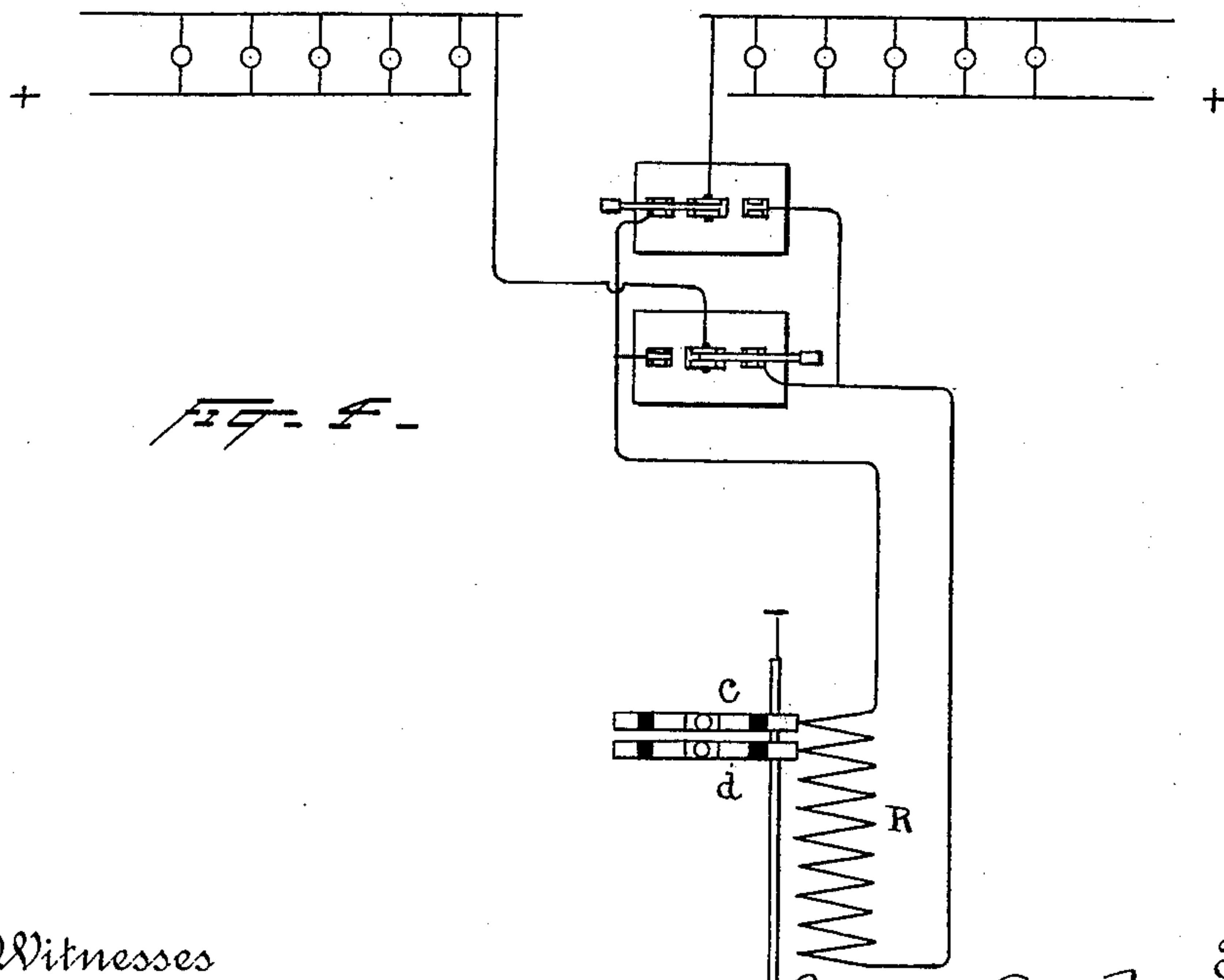
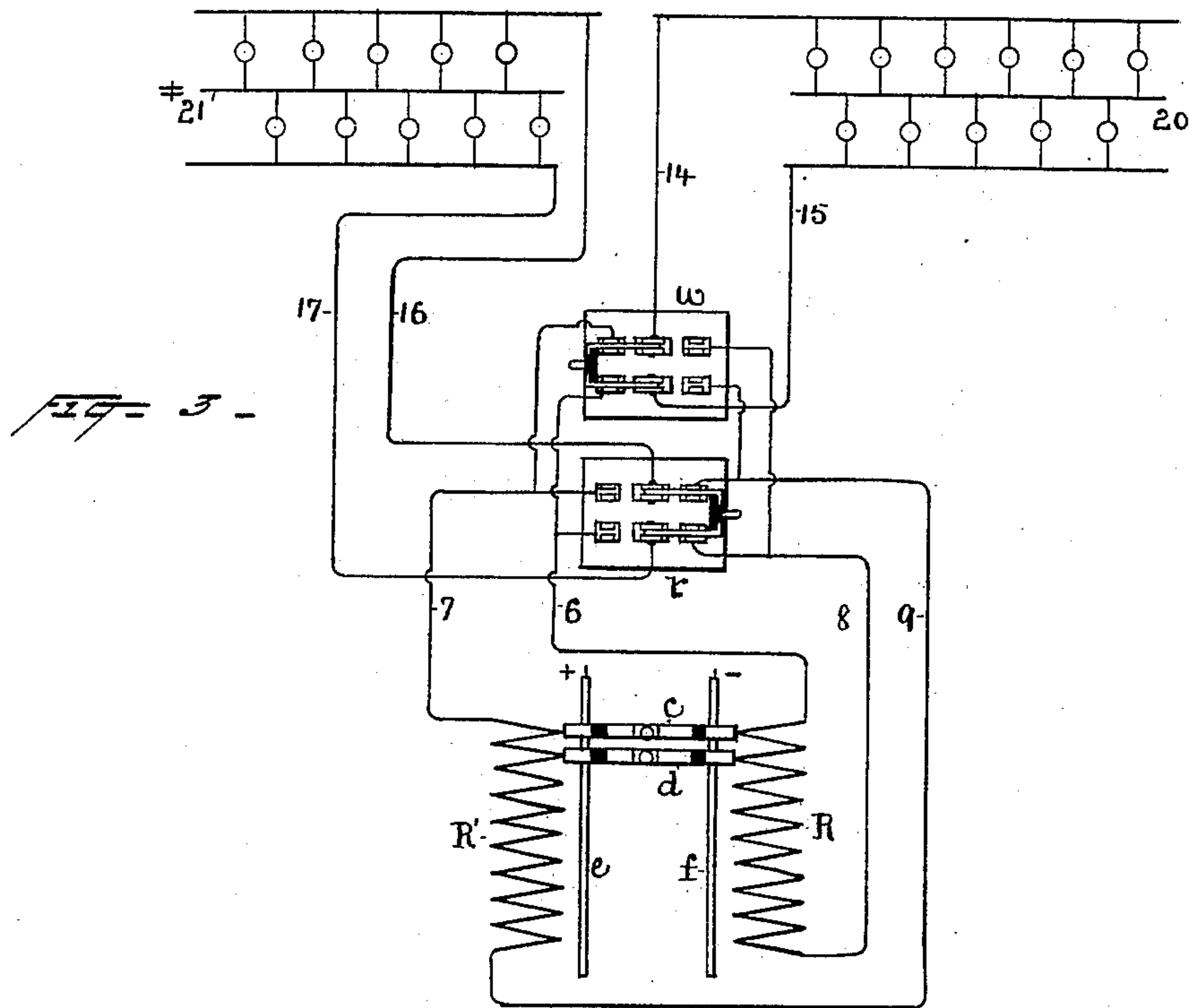
Witnesses
Norris A. Clark.
John R. Taylor.

Inventor
Joseph Carl Mayrhofer
By his Attorneys
Oyer & Driscoll

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UNITED STATES PATENT OFFICE.

JOSEPH CARL MAYRHOFER, OF NEW YORK, N. Y., ASSIGNOR TO DENMAN THOMPSON, OF WEST SWANZEY, NEW HAMPSHIRE.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 552,496, dated December 31, 1895.

Application filed July 5, 1895. Serial No. 555,085. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CARL MAYRHOFER, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in the Regulation of Electric Lights for Theaters, of which the following is a specification.

The object I have in view is to provide apparatus for the regulation and control of the electric lights in a theater, whereby in a simple and effective manner the different colors and intensities of light desired can be secured.

In the accompanying drawings, forming part hereof, Figure 1 is a diagram illustrating one section of my apparatus and its connections. Fig. 2 is a diagram showing the circuit connections for one series of lamps, such as one of the rows of border-lights of a theater; and Figs. 3 and 4 are illustrative diagrams showing the principle of operation.

The regulator A, Fig. 1, is preferably of the construction described in another application of even date herewith. It is composed of two resistance-coils R R' connected to two sets of commutator-bars *a b*, over which play commutator-brushes carried by cross-bars *c d*, the commutator-brushes at the opposite ends of the cross-bars being insulated from each other and making contact also with circuit-strips *e f*. Either one or both of the cross-bars are adapted to be locked to a worm-shaft *g*, which is operated by a shaft *h* through beveled gear-wheels, which shaft is connected with other similar regulators. The resistance-coils are connected at intervals with the plates of the two commutators.

1 2 are the positive and negative conductors of the supplying-circuit, and 3 is the neutral conductor of the supplying-circuit, a three-wire circuit being illustrated. The conductors 1 2 are connected by wires 4 5 with the contact-strips *e f* of the regulator. Connections 6 and 7 are taken from the upper ends of the coils R R' independently of the commutators, and similar connections 8 9 are taken from the lower ends of the coils. These connections 6, 7, 8 and 9 terminate in distributing-blocks *i j k l*. From these distributing-blocks connections 10, 11, 12 and 13 extend to the stationary contacts *m m'* and *n n'*

of three switches *w, r* and *bl*. Three of these switches with circuit connections are shown because it is usually desired to control lamps of three colors—white, red and blue—but the number of switches will correspond with the number of colors which the lamps of the particular plant have, and this number may be two or more. Each of these switches has a central pivoted piece *o* of inverted-U shape, the opposite sides of which are insulated from each other, and with the pivots of the U-shaped piece *o* are connected the wires 14 and 15, 16 and 17, and 18 and 19, each pair constituting the two outside wires for the three-wire circuit which includes the lamps of one color. The neutral or middle wires of these circuits are numbered 20, 21 and 22. These wires include suitable safety-catches *p*, preferably arranged with one safety-catch normally in circuit and with an idle safety-catch adapted to be thrown in by a swinging latch when the first one breaks. The circuit-wires 14 to 22 are extended to the lamps *w' r' bl'*, which constitute one group of the theater lights—as, for instance, the lights of a single border.

The method of operating the apparatus will be understood by reference to the diagrams Figs. 3 and 4, in which (for clearness of illustration) two lighting-circuits are shown—namely, the circuit 14 15 20 controlling the white lamps, and the circuit 16 17 21 controlling the red lamps—but it should be understood that the lamps of these two circuits are grouped together, as shown in Fig. 2. If the switch *w* is thrown to the left and the switch *r* is thrown to the right, as illustrated in Fig. 3, the white lamps will be connected with the circuit 6 7 from the tops of the resistance-coils and will receive the full pressure of the current, while the red lamps will be connected with circuit 8 9 from the bottoms of the resistance-coils and will have their current diminished by the resistance of the coils, since both cross-bars *c d* are at the upper ends of the coils. Now if both cross-bars *c d* are moved together toward the other end of the coils, resistance will be gradually introduced into the circuit of the white lamps and will be gradually cut out of the circuit of the red lamps, and the white lamps will be diminished

in candle-power, while the red lamps are increased in candle-power. If, on the other hand, the cross-bar *c* is left where it is in the figure and the cross-bar *d* is moved the red lamps will be brought up in candle-power without diminishing the candle-power of the white lamps. If the two cross-bars are at opposite ends of the coil, and are moved toward the center simultaneously, both sets of lamps will be diminished in candle-power simultaneously, while if the two cross-bars are moved simultaneously away from the center of the coils both sets of lamps will be increased in candle-power simultaneously. By this means the shading of one color into another can be accomplished, or two colors can be used at the same time with any desired relative degree of brightness. If the lighting-circuits are two-wire circuits, as illustrated in Fig. 4, the same effects can be attained by using one-half of the regulator, and it is also evident, as shown in Fig. 1, that more than two lamp-circuits can be connected with the same regulator; but if three lamp-circuits are put in connection with the regulator at once two of the circuits will be under the control of one of the cross-bars and will be regulated as one circuit. As illustrated in Fig. 2, the lamps of different color will be arranged in succession in a group of lamps, and if a three-wire circuit is employed the lamps of each color are preferably divided between the two sides of the circuit, so as to avoid fluctuation in the current during regulation, due to changing the balance between the two sides of the three-wire system.

What I claim is—

1. In a theater light regulator, the combination with a resistance coil, a series of commutator plates connected at intervals with said coil, and a contact movable over said commutator plates and connected with the supply circuit, of two or more lighting circuits, and an independent switch for one side of each lighting circuit having connections with both ends of the resistance coil whereby said lighting circuits may at the same time be connected with the same end or with different ends of said resistance coil, the other

sides of said lighting circuits being connected with the supply circuit, substantially as set forth.

2. In a theater light regulator, the combination with a resistance coil, a series of commutator plates connected at intervals with said coil, and two contacts connected with the supply circuit and movable over said commutator plates, of two or more lamp circuits and two or more independent switches for connecting one side of each of said lamp circuits independently with either end of said resistance coil, the other sides of said lamp circuits being connected with the supply circuit, substantially as set forth.

3. In a theater light regulator, the combination with two resistance coils, two series of commutator plates connected with said resistance coils, and a pair of contacts connected together and moving simultaneously over said commutator plates, said contacts being connected with the outside wires of a three-wire supply circuit, of two or more three-wire lamp circuits, and switches for connecting the outside wires of each of said lamp circuits independently with the ends of said resistance coils, the central wires of said lamp circuits being connected with the middle wire of the supply circuit, substantially as set forth.

4. In a theater light regulator, the combination with two resistance coils, two sets of commutator plates connected with said coils, and two pairs of contacts independently and simultaneously movable over said contact plates, said movable contacts being connected with the outside wires of a three-wire supply circuit, of two or more three-wire lamp circuits, and switches connecting the outside wires of each of said lamp circuits independently with the ends of said resistance coils, the middle wires of said lamp circuits being connected with the middle wire of the supply circuit, substantially as set forth.

This specification signed and witnessed this 20th day of June, 1895.

JOS. CARL MAYRIIOFER.

Witnesses:

EUGENE CONRAN,
JOHN R. TAYLOR.