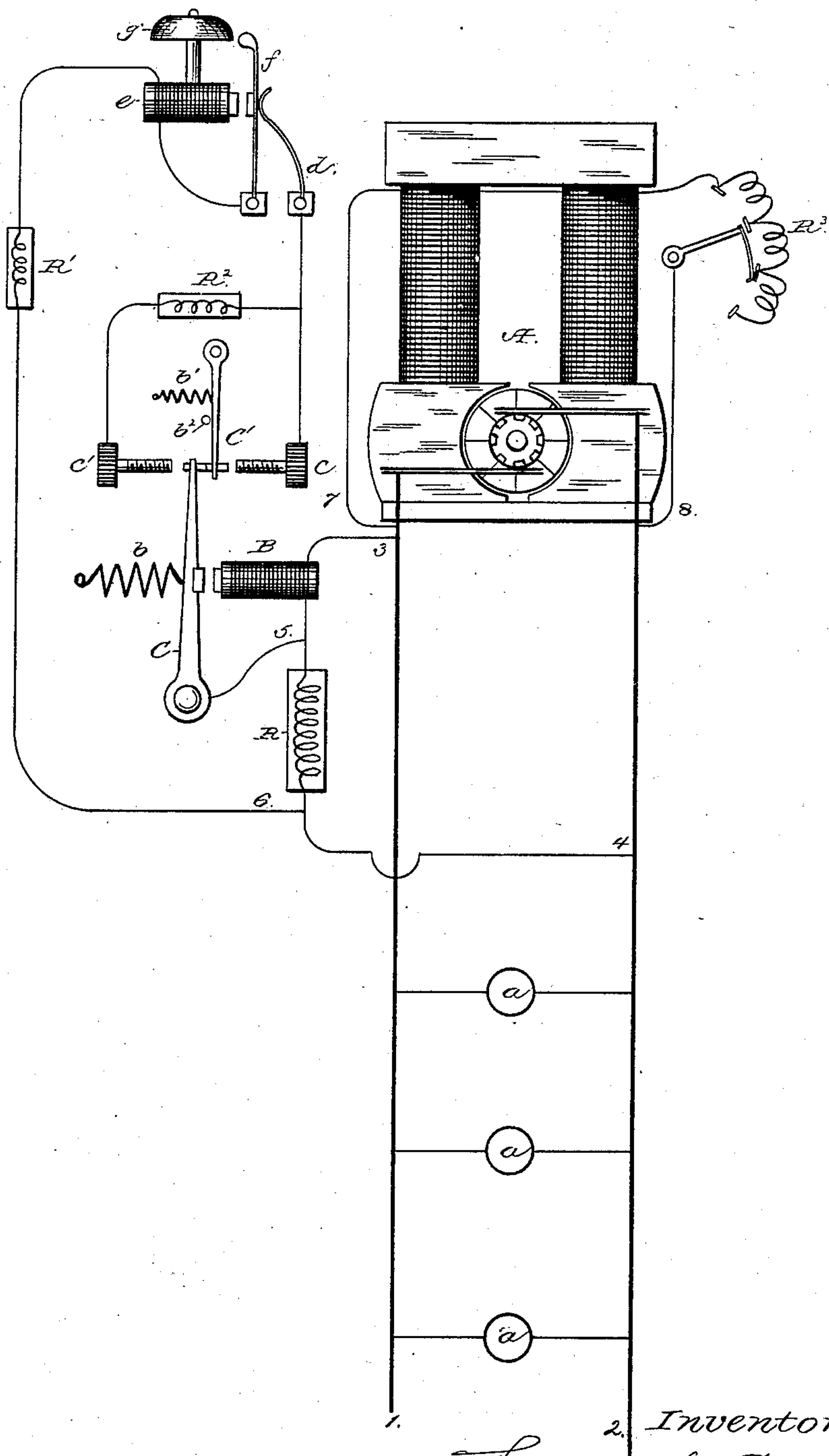


(No Model.)

T. A. EDISON.  
ELECTRIC LIGHTING SYSTEM.

No. 265,776.

Patented Oct. 10, 1882.



Witnesses;

J. O. Clark.  
N. A. Clark.

2. Inventor;

Thomas A. Edison  
By Rich. A. Dyer,  
Attorney.

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY, ASSIGNOR TO THE  
EDISON ELECTRIC LIGHT COMPANY, OF NEW YORK, N. Y.

## ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 265,776, dated October 10, 1882.

Application filed November 11, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Electric-Lighting Systems, (Case No. 354;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The object I have in view is to produce devices to be used in connection with dynamo or magneto electric machines and electric lights, which will notify the engineer when the lights are above or below the desired limit of candle-power, so that he can regulate the generative capacity of the machine or machines in accordance therewith. These devices are especially adapted for use in "isolated work," or with plants for lighting separate buildings or small areas, and in connection with incandescing electric lamps arranged in multiple arc. This object I accomplish by arranging an electro-magnet in a derived or multiple-arc circuit from the main or consumption circuit, such magnet-circuit having many times more resistance than one of the lamp-circuits, a wire or other resistance being placed therein for that purpose. An incandescing lamp may, however, be used for this resistance. In a shunt-circuit around this resistance are arranged the armature-lever of the magnet and a vibrating bell. The free end of the armature-lever plays between two contacts the making of each of which completes a circuit through the bell-hammer vibrator. Between the armature-lever and the front contact is a yielding stop, which may be an arm held back against a fixed pin by a spring. This yielding stop-arm determines the central position of the armature-lever. One of these bell-circuits has considerably more resistance than the other, so that alarms varying noticeably in their loudness will be produced. When the lamps are within the fixed limits of candle-power the magnet will attract the lever sufficiently against the retractile force of its spring to separate it from the back contact, and will hold it forward against the spring stop-arm, so as to open the bell-circuit. Now, if the current increases so as to raise the lamps above

the limit of candle-power, the armature-lever will be attracted by the magnet and will overcome the spring stop-arm and force the same against the front contact, completing the bell-circuit through a definite resistance, and causing a loud alarm to be sounded, which will continue until the engineer regulates the generator or generators so as to reduce the candle-power of the lights. If the lights drop below the limit of candle-power, the magnet will at the same time be weakened and the lever will make the back contact. This completes the bell-circuit through greater resistance than when the front contact is made, and a continuous alarm will be sounded, which will be noticeably feebler than in the instance first described. As soon as the lights are brought up to the desired degree of luminosity the alarm will cease to sound, the bell-circuit being broken by the attraction of the lever to a central position against the spring.

It is evident that, instead of using a single vibrating bell with two circuits having different resistance, two bells might be used, in which case the bell-circuits might have different resistances, or the circuits could have the same resistance and the bells be constructed to give sounds of different pitch, or both features could be combined.

Instead of bell-alarms alone, an indicator might be used consisting of a pointer traveling upon a scale to right or left, and operated by the armature-lever of the electro-magnet in the multiple-arc circuit, and in connection with the indicator an alarm could be arranged to strike when the pointer reached a certain point on either side of its normal position.

The foregoing will be better understood by reference to the drawing, in which the figure is a diagrammatic view.

A represents a dynamo or magneto electric machine; 1 2, the main or consumption circuit, and *a a* incandescing lamps in multiple-arc or derived circuits.

3 4 represent a multiple-arc or derived circuit from 1 2, having resistance R and the coils of an electro-magnet, B, placed therein. From 3 4 is a shunt, 5 6, around the resistance R. The armature-lever C, retracted by spring *b*, is in this circuit. Front and back contacts,



$c c'$ , are connected with the spring  $d$  of the vibrating-bell mechanism, which consists of electro-magnet  $e$ , armature-lever  $f$ , forming bell-hammer, and gong  $g$ . Resistances  $R^1 R^2$  are arranged in the bell-circuit, resistance  $R^1$  being in the circuit of each contact  $c c'$ , while  $R^2$  is only in the circuit of the back contact,  $c'$ . A yielding stop-arm,  $C'$ , is placed between lever  $C$  and front contact,  $c$ , and is drawn back by a spring,  $b'$ , against a fixed pin,  $b^2$ .

The field-of-force circuit of the machine  $A$  may be a multiple-arc circuit, 7 8, from 1 2, and be provided with an adjustable resistance,  $R^3$ , for regulating the generative capacity, as required by the sounding of the alarm.

The alarm described is useful with other translating devices besides lamps to show corresponding conditions.

What I claim is—

1. The combination, with one or more electrical generators, means for regulating such generator or generators, and electric lamps arranged in multiple arc, of an electrically-operated alarm or indicator for indicating predetermined limits above or below or both above and below the desired or normal condition of the current, and an electro-magnet located in a multiple-arc circuit and controlling the cir-

cuits of such alarm or indicator, substantially as set forth.

2. The combination, with one or more electrical generators, means for regulating such generator or generators, and electric lamps arranged in multiple arc, of an electrically-operated alarm or indicator for indicating predetermined limits above or below or both above and below the desired or normal condition of the current, an electro-magnet located in a multiple-arc circuit, the armature-lever of such magnet, making and breaking the circuits of such alarm or indicator at its contacts, and means for determining the central position of such armature-lever, substantially as set forth.

3. The combination of a main circuit, an electro-magnet in a derived circuit, and an armature-lever therefor, completing circuits at both its front and back contacts, resistances differing in amount, located in said circuits, and a vibrating magnetic alarm, substantially as set forth.

This specification signed and witnessed this 27th day of September, 1881.

THOS. A. EDISON.

Witnesses:

H. W. SEELY,  
RICHD. N. DYER.