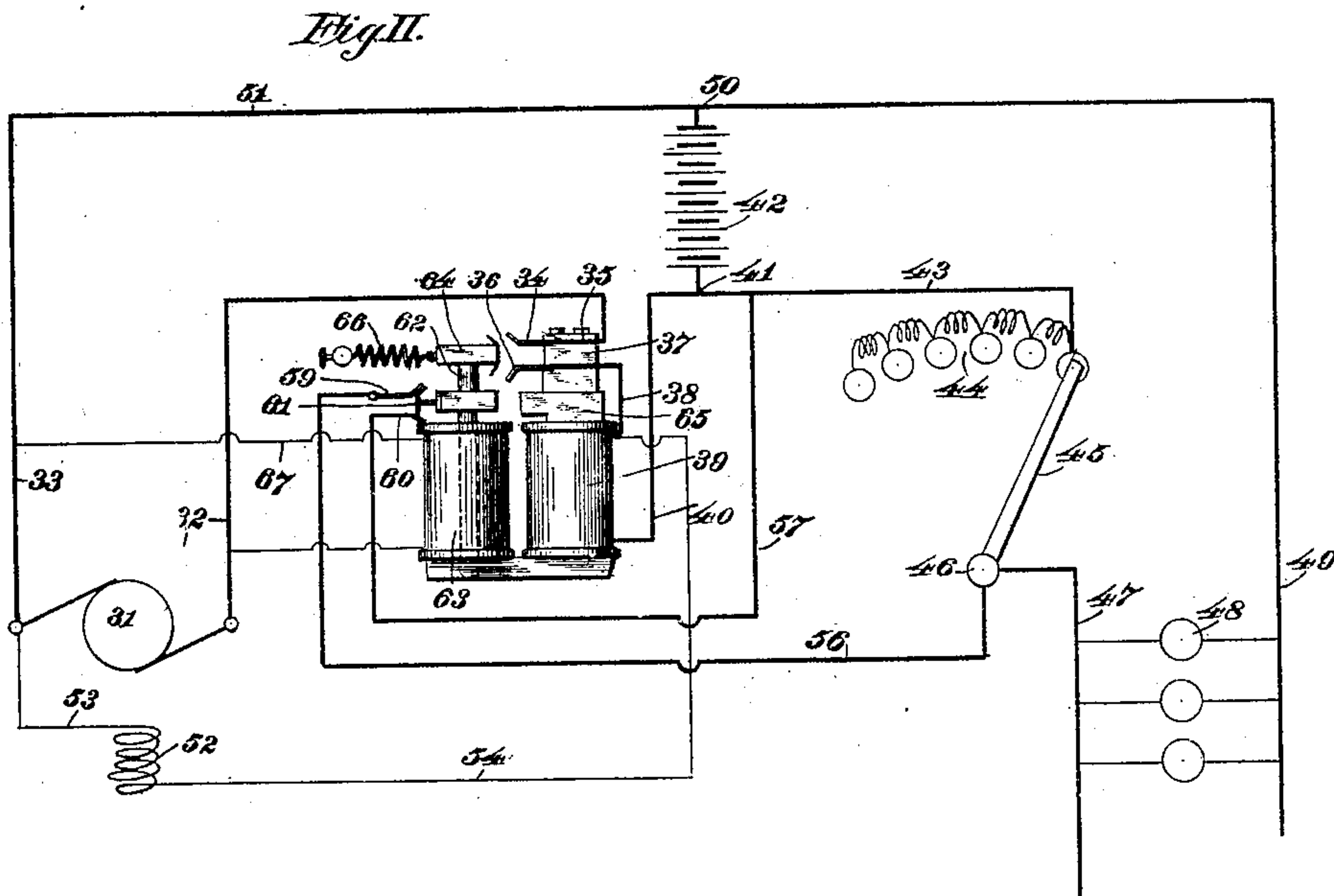
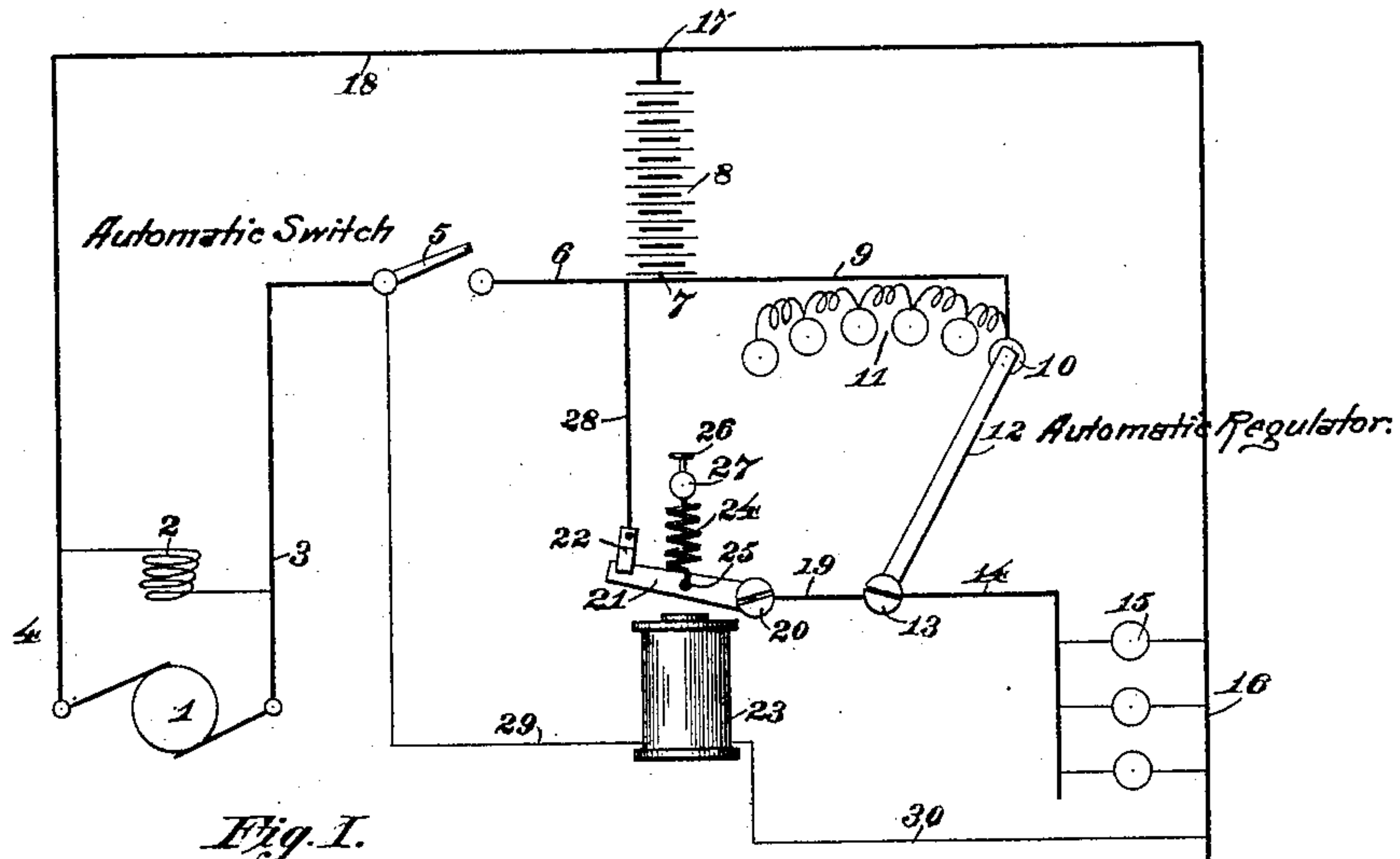


J. L. CREVELING.
SYSTEM OF ELECTRICAL DISTRIBUTION.

(Application filed Dec. 7, 1900.)

(No Model.)



Witnesses
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JOHN L. CREVELING, OF NEW YORK, N. Y.

SYSTEM OF ELECTRICAL DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 704,865, dated July 15, 1902.

Application filed December 7, 1900. Serial No. 39,050. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. CREVELING, of New York, in the county of New York, State of New York, have invented a certain Improved System of Electrical Distribution, of which the following is a complete specification, reference being had to the accompanying drawings.

My invention relates generally to systems of electrical distribution, especially lighting systems, in which the lighting system or translating device is supplied with current from a storage battery and intermittently from a generator; and it relates particularly to systems of this class in which resistance in the main circuit designed to prevent excess of current therein when the generator is in operation is regulated mechanically, as by mechanism depending for its operation upon the speed of the armature-shaft.

My invention is especially but not exclusively adapted for use in car-lighting systems, and comprehends in its broader scope a regulator in the work-circuit of such a system as is above described, dependent upon the speed of rotation of the rotative member of the generator combined with independent means of nullifying the regulator whenever the generator is ineffective. A variety of apparatus may be employed to accomplish this object, and in the accompanying drawings I illustrate, by way of example solely, two forms of apparatus adapted for the purpose.

In the accompanying drawings, Figure I is a diagrammatical view of apparatus comprehending one form of embodiment of my invention. Fig. II is a similar view illustrating a modified form of my invention.

Referring to the numerals on the drawings and first with respect to Fig. I, 1 indicates a generator, which may be of any preferred type, the one illustrated being a plain shunt-machine, having a field-coil 2 in shunt across the leads 3 and 4. The lead 3 connects with a switch 5, which is intended to be either electrically or mechanically operated to close circuit when the voltage of the generator is substantially equal to that of the battery. This switch may be of any preferred form—for example, the one shown in United States Letters Patent No. 644,409, issued to me February

27, 1900. From the switch 5 the main 6 communicates with a pole 7 of a storage battery 8 and continuing through the wire 9 communicates with the first of a series of plates 10 of a resistance device or rheostat 11. Across the segment of plates 10 sweeps in operative contact a movable member or lever 12, pivoted, as indicated at 13, and there connecting with the main 14, that connects with one pole of the translating device or lamp-circuit 15, from the other pole of which a main 16, communicating with the pole 17 of the battery, returns through the main 18 to the generator through its lead 4. The lever 12, with its coöperative connections and resistances, represents, by way of example, a regulator. From the pivot 13 of the lever 12 a wire 19 leads to the pivotal support 20 of a make-and-break arm 21. This arm oscillates between a contact-piece 22 and an electromagnet 23, being normally supported against the contact-piece 22, as by a spring 24, secured at one end, as indicated at 25, to the arm 21 and at the other end as to an adjustment-screw 26, working in a stud 27. The contact-piece 22 connects with the main 6 as through a wire 28. The arm 21 constitutes an armature of the magnet 23, which when sufficiently excited is adapted to attract it against the force of the spring 24. When the arm 21 is in the position shown in the drawings, it is obvious that it will produce a short-circuit through its connection with the wires 28 and 19; but when it is attracted by the magnet 23 current in the main circuit must pass through the rheostat, when the position of the lever 12 will determine the amount of resistance in the lamp or translating circuit.

Adapted to accomplish the purpose above specified the magnet 23 has its windings placed across the generator-circuit, as by the wires 29 and 30.

The diagrammatical illustration is referred to as sufficient for the purposes of this specification; but it is assumed that the lever 12 is adapted to be operated mechanically, as by means of centrifugally-actuated mechanism connected with the armature-shaft of the generator. Apparatus of this character is shown and described in my application, Serial No. 28,525, filed August 30, 1900. Such mechan-

ism constituting no part of my present invention is not illustrated herein and is referred to only in order to clearly explain the applicability and utility of this invention. If therefore the several mechanical members of the apparatus be in their respective positions, (illustrated in Fig. I,) current from the battery 8 will supply the translating device or lamp-circuit 15 through the wires 9 and 28, arm 21, wires 19 and 14, communicating with one pole of the translating device, and the main 16 connecting with the other pole thereof and also through wire 9, lever 12, and wire 14. If now the armature of the generator begin to revolve, its field will be built up by the action of the shunt-coil 2, and when the voltage of the generator has reached the predetermined amount the magnet will attract the arm 21, breaking the branch of the circuit first above described, and the current will continue through the rheostat 11 and lever 12, the position of which is determined by the mechanism assumed to be connected with it. If, however, the voltage produced by the rotation of the armature be materially disproportionate to the speed of rotation of the armature—as, for example, by the breaking of one of the leads 3 or 4—or should the shunt-coil 2 become disconnected the position of the lever 12 with respect to the rheostat 11 would be fixed to regulate an amount of current which would not be generated. If therefore the current from the battery were compelled to pass through the rheostat under such conditions, it would be insufficient to properly support the lamp-circuit. It, however, such an intervention of the current from the generator should occur the magnet 23 would not be made to attract the arm 21, owing to the failure of current in the generator. The short circuit through the arm 21 would be accordingly maintained and the voltage of the battery through the lamp-circuit would continue unimpaired regardless of the position of the lever 12.

In Fig. II of the drawings means of short-circuiting the resistance are provided through the direct instrumentality of an automatic switch, such as the above-mentioned switch 5 is assumed by preference to be, and which, as above specified, is described in my United States Letters Patent No. 644,409. In that figure 31 indicates a generator, and 32 one of the leads—for example, the positive, which communicates with the contact 34 of the main switch, as indicated at 35. The other contact 36, insulated, as by a block 37, from the contact 34, is in communication as through the windings of a magnet 39, from which a wire 40 leads to the pole 41 of a storage battery 42. From the pole 41 a wire 43 leads to the rheostat 44, its cooperating lever 45, pivoted, as indicated at 46, and thence to the main 47 of the translating device or lamp-circuit 48, from the opposite pole of which a main 49, communicating with the pole 50 of the bat-

tery, connects through the main 51 with the lead 33 of the generator. The battery shunt-circuit 52 in this instance is connected, as by the wires 53 and 54, respectively, with the lead 33, the windings of the magnet 39, and the wire 40. In this instance the short circuit, by which the resistance is cut out, is established through the wires 56 and 57, connected, respectively, with the lever 45, as at 46, and with the main 43, and terminating in contact-pieces 59 and 60, with which contact is designed to be made, as by an insulated conductor 61 upon the oscillatory core 62 within the magnet-coil 63 of the main switch, of which the magnet 39, above referred to, is a part. The switch comprising the magnets 39 and 63 is the one described in my United States Letters Patent No. 644,409, above referred to, and does not herein require detailed description. It will suffice in this connection to state that the core 62 carries the insulated contact-making block 64, by which when the core 62 is attracted toward the pole-piece 65 of the magnet 39 the contacts 34 and 36 are united. The conductor 61, in conjunction with the contact-pieces 59 and 60, takes the place of the back-stop described in said patent, and connection between these three members last specified is normally maintained by tension of the spring 66. It should also be specified that the magnet-coil 63 is laid across the brushes of the generator, as by wires 67 and 68. With reference to this form of embodiment of my invention, as with respect to that shown in Fig. I, the lever, in this instance indicated by 45, is mechanically actuated. In order, therefore, that its position with respect to the rheostat 44 may not interfere with the current derived to the lamp system from the battery 42, it is short-circuited by the wires 56 and 57, connected by the conductor 61, which, as has just been specified, normally connects the terminals of those wires. If now the generator be set in motion, its field will be excited by the coil 52; but until the voltage from the generator reaches the prescribed amount the rheostat 44 will continue to be short-circuited and the current from the battery proceed accordingly independently of the mechanically-determined position of the lever 45. Should the voltage from the generator fail for any reason to reach the prescribed amount, as on account of breakage, for instance, in the leads 32 and 33, or should the main switch fail to operate, the short circuit will continue closed. When, however, the voltage reaches the predetermined minimum limit, the main switch will operate, as explained in my above-mentioned patent. The core 62 will vibrate, causing the conductor 61 to break contact between the terminals 59 and 60 and the block 64 to make contact between the terminals 34 and 36. Thereupon the short circuit being broken the main circuit will be established through the rheostat 44 and lever 45, and when so established the

position of the lever 45 with respect to the rheostat will be such as to properly regulate the current in the lamp-circuit.

What I claim is—

5 1. The combination with a generator comprising a rotative member, a storage battery and a work or translating circuit, of a regulator in said circuit dependent upon the speed of rotation of said rotative member, and independent means of nullifying the effect of
10 the regulator whenever the generator is ineffective.

15 2. The combination with a generator comprising a rotative member, a storage battery and a work or translating circuit, of a regulator in said circuit dependent upon the speed of rotation of said rotative member, and independent means of cutting out the regulator whenever the generator is ineffective.

20 3. The combination with a generator comprising a rotative member, a storage battery

and a work or translating circuit, of a regulator in said circuit dependent upon the speed of rotation of said rotative member, independent means of cutting out the regulator when-
25 ever the generator is ineffective, and electromagnetic means for inserting the regulator when the generator is in effective operation.

4. The combination with a generator comprising a rotative member, a storage battery
30 and a work or translating circuit, of a regulator in said circuit dependent upon the speed of rotation of said rotative member, a shunt-circuit around the regulator, and independent automatic means for controlling said
35 shunt-circuit.

In testimony of all which I have hereunto subscribed my name.

JOHN L. CREVELING.

Witnesses:

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