

No. 663,981.

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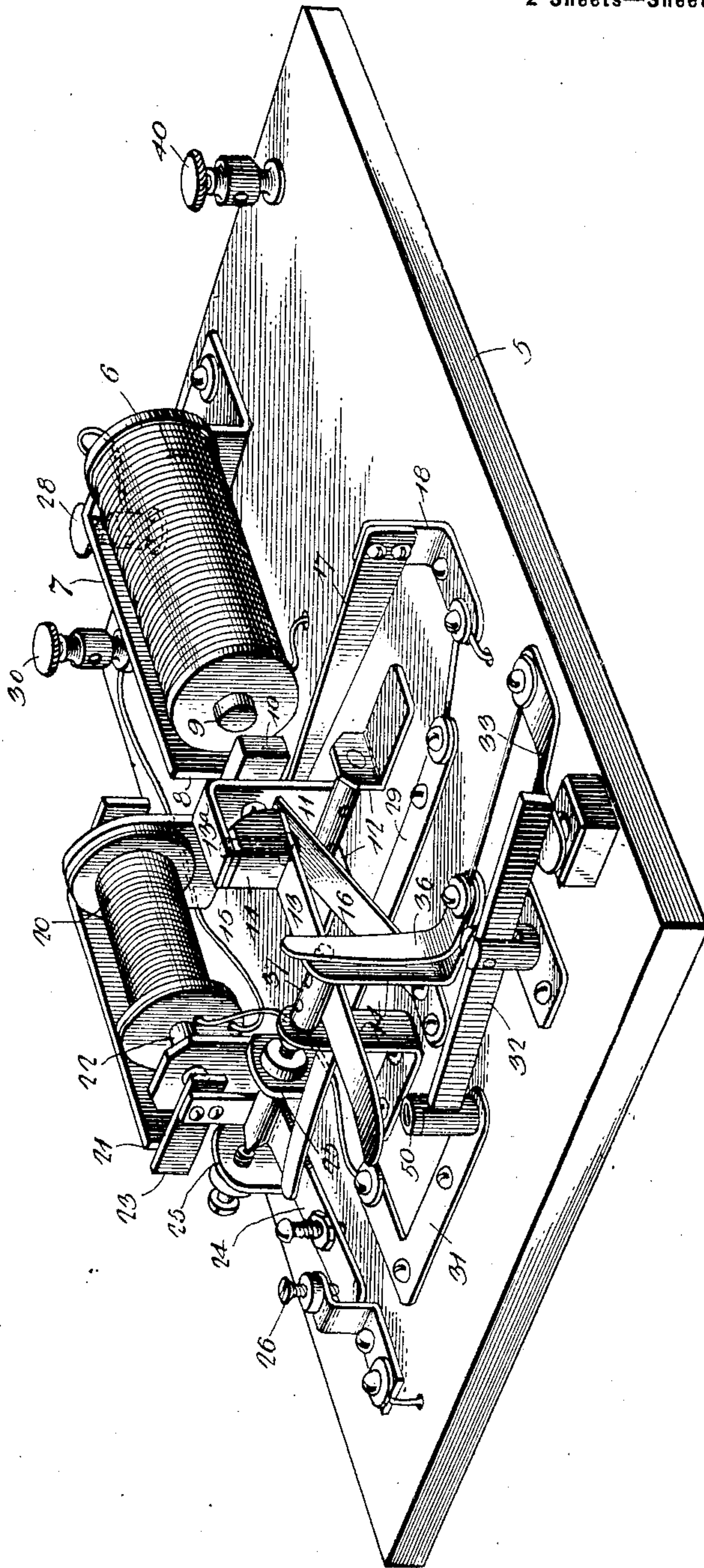
A. PETERS.
ELECTRIC LIGHTING APPLIANCE.

(Application filed Nov. 11, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

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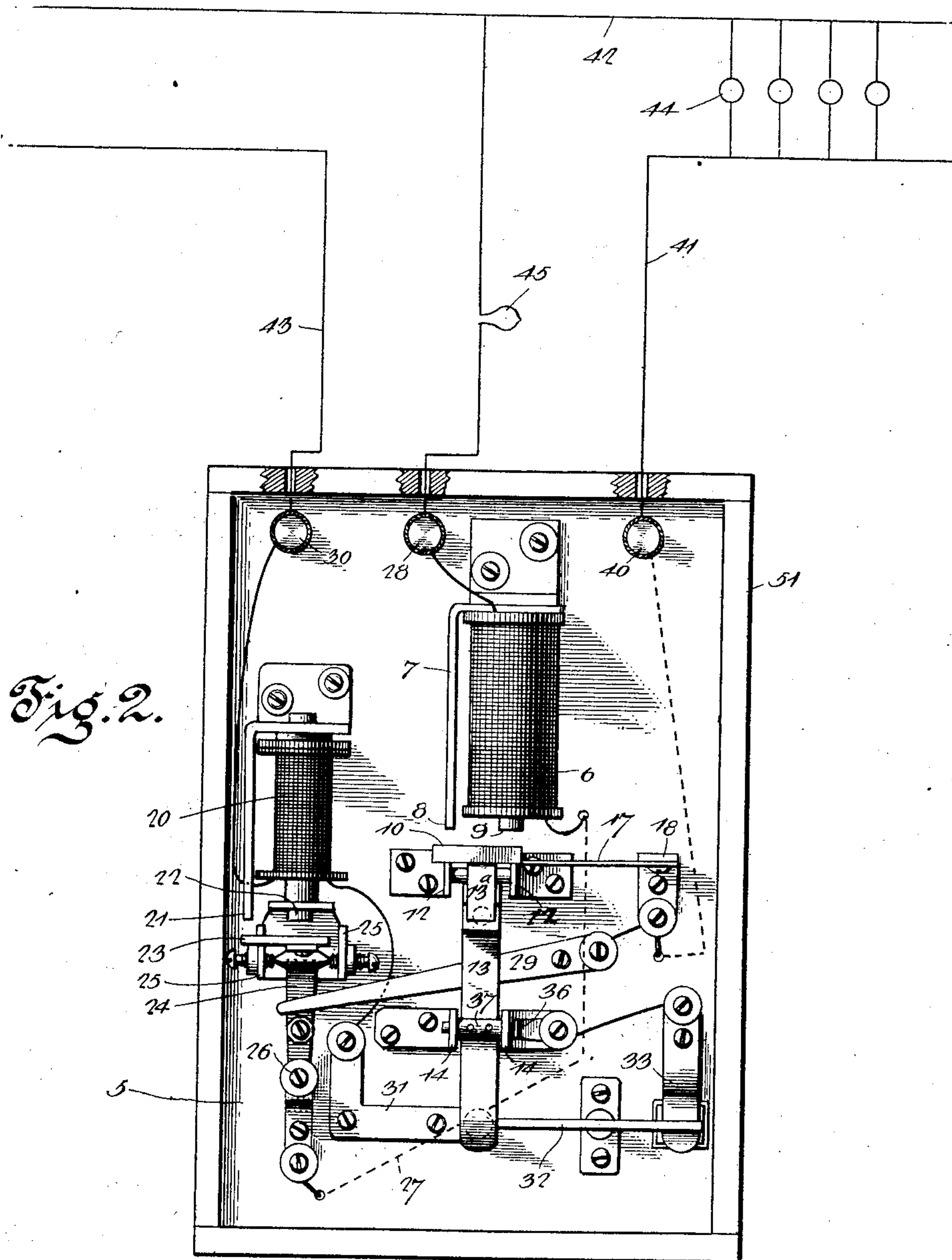
Patented Dec. 13, 1900.

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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ARTHUR PETERS, OF MANITOU, COLORADO.

ELECTRIC-LIGHTING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 663,981, dated December 18, 1900.

Application filed November 11, 1899. Serial No. 736,616. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR PETERS, a citizen of the United States, residing at Manitou, in the county of El Paso and State of Colorado, have invented a new and useful Electric-Lighting Appliance, of which the following is a specification.

This invention relates to systems of electrical distribution, and more particularly to means for preventing excessive consumption of current; and it has for its object to provide an improved cut-out mechanism which may be employed in a system of either continuous or alternating current and in which a main or cut-out electromagnet will be cut into or out of the circuit under the influence of a relay which is connected in series with the translating devices.

In the drawings forming a portion of this specification, and in which similar numerals of reference designate like and corresponding parts in both views, Figure 1 is a perspective view showing the complete apparatus detached from the consumer's circuit. Fig. 2 is a plan view showing the cut-out mechanism and illustrating its connection with the circuit-wires.

Referring now to the drawings, 5 represents a base upon which is mounted a relay-electromagnet 6, comprising the usual core and spool of wire, and to one end of which core is secured a soft-iron pole-piece 7, which extends forwardly of the magnet and lies with its outer end even with the end of the magnet-core, the result being the formation of two adjacent pole-pieces 8 and 9. A soft-iron armature 10 is provided for the relay-electromagnet and is mounted upon a pivoted lever 11, the lower end of which is connected with ears 12 upon the base 5 and the upper end of which is bent rearwardly, as shown at 13^a.

In the rear of the lever 11 is disposed a lever 13, pivoted between its ends to uprights 14, mounted upon the base. The end of the lever 13 adjacent the lever 11 has an insulating-block 14 upon its upper surface surrounded by a metallic plate 15, which is in electrical connection with the lever 13, as indicated in dotted lines in Fig. 1. A spring-finger 16 is fixed to the base 5 between the uprights 14 and engages the lever 13 and

tends to lift it. Normally the rearwardly-bent portion 13^a of the lever 11 projects over the plate 15 and lies in contact therewith; but when the lever 11 is moved by the attraction of the electromagnet upon the armature 10 the upper end of the lever 11 is moved from engagement with the plate 15, when the lever 13 rises under the influence of the spring-finger 16, so that the outer curvilinear face of the insulating-block 14 engages the rearwardly-bent end 13^a of the lever 11, and thus breaks an electric circuit which has been previously completed through the mutual contact of the portion 13^a with the plates 15.

In order to press the lever 11 outwardly, a spring-arm 17 is fixed to an upright 18, which is mounted upon the base 5, the arm 17 being of conducting material and being adapted to conduct current to the lever 11.

A second or main electromagnet 20 is mounted upon the base 5 and has pole-pieces 21 and 22, similar in form and construction to the pole-pieces of the relay-magnet 6. Coöperating with these pole-pieces is an armature 23, secured to an angular rock-lever 24, which is pivotally mounted between ears 25, secured to the base, and which rock-lever 24 when moved under the influence of the main electromagnet 20 engages the contact-point 26, which is connected with one terminal of the winding of the relay-electromagnet 6 through the medium of a conductor 27, (shown in dotted lines in Fig. 2,) the opposite terminal of the winding of the magnet 6 being connected with the binding-post 28. The rock-lever 24 is normally held from engagement with the contact 26 by means of a spring-arm 29, electrically connected with the base of the upright 18 and which bears upon the lever 24 and is adapted to convey current from the upright 18 to said lever. One terminal of the winding of the main magnet 20 is connected with a binding-post 30, while the other terminal is connected with a contact-plate 31, upon which normally rests one end of a metallic lever 32, which is held normally in intimate contact with said plate by means of a spring-finger 33, mounted upon the base 5 and bearing upwardly upon the lever 32 at its opposite end from the plate 31. This finger 33 is electrically connected with the contact-

finger 36, which bears at one end against the axle 37, through the medium of which the lever 13 is pivoted in the uprights or ears 14.

In practice the base of the upright 18 is
5 connected with a binding-post 40, and with this binding-post is also connected a conductor 41 of the house-circuit, the other wire 42 of the house-circuit being connected with the feed-wire in any desired manner. The sec-
10 ond feed-wire (represented at 43) is connected with the binding-post 30, the translating devices, which in this instance are a series of lamps 44, being connected in parallel to the conductors 41 and 42. Thus the current nor-
15 mally which enters by way of conductor 43 passes through the winding of the main magnet 20, thence to plate 31, to lever 32, to spring-finger 33, to finger 36, to axle 37, to lever 13, to plate 15, to the rearwardly-bent end of lever 11,
20 to spring-finger 17, to upright 18, to binding-post 40, and thence through the lamps to conductor 42 and outwardly to the feed-wire. The binding-post 28 is connected with the conductor 42 through a suitable resistance, such as
25 a lamp 45, the value of which is equal to that of the lamps or other translating devices 44. Thus with the current flowing over the circuit above described if the resistance of the consumer's circuit be decreased, such as by
30 the addition of one or more lamps in parallel than is provided for, or if too much current be consumed from any other cause, the electromagnet 20 will be energized to an extent sufficient to overcome the mechanical resistance
35 of the spring 29 and the rock-lever 24 will engage the contact 26, the result being that a circuit excluding the lamps 44 is completed through the electromagnet 6 and its resistance-lamp through the electromagnet 6, which
40 in turn will attract its armature 10, and by withdrawing the lever 11 from the plate 15 the house-circuit will be broken, the lamp 45, together with the main electromagnet 20, acting to compensate for the resistance of the
45 lamps 44 when the relay-electromagnet 6 is cut into circuit by the action of the main electromagnet 20. In my system of electrical distribution the electromagnet 6 operates as a relay and cuts in the main electromagnet 20
50 to the line, and said main electromagnet is in a complete path for the current before or in advance of the lamps or other translating devices 44, and the resistance of the lamp 45 (assuming that the same is a lamp) is sub-
55 stantially equal to that of the translating devices 44. For instance, should the automatic cut-out be intended for a direct current of one hundred and ten volts a fifty-candle-power one-hundred-and-ten-volt lamp should be
60 used in series with the main electromagnet. If the automatic cut-out be intended to operate in a fifty-two-volt current, a fifty-candle-power fifty-two-volt lamp goes into the circuit. The effect of the lamp is to check the
65 flow of current through the main magnet, which would otherwise act practically as a dead short circuit, except for the slight ohmic

or inductive resistance of the coils of the winding thereof.

From the above description it will be seen 70 that if more than the specified quantity of current is consumed the mechanism will operate to cut out the entire house-circuit, and this circuit can only be reestablished by re-engaging the plate 15 with the lever 11. This 75 engagement may be accomplished by operating the lever 32 against the tendency of the spring 33, when the opposite end of the lever will rise and will lift the adjacent engaged end of the lever 13, dropping the opposite end 80 of the lever 13, carrying the plate 15, when the finger 17 will move the lever 11 rearwardly and cause its rearwardly-bent end to lie against the plate 15.

In order to prevent a shock to the operator 85 when depressing the lever 32, that end of said lever which engages with the lever 13 is provided with an insulating-block 50, which directly engages the lever 13.

It will of course be understood that the lever 32 may be operated directly or through 90 the medium of a plunger operating through the cover of the casing 51, in which the mechanism is inclosed, and that the windings of the electromagnet may be varied to operate 95 under different conditions, and that any suitable resistance may be substituted for the lamp 45, and that the value of this resistance may be varied in accordance with the voltage of the circuit employed. 100

Upon reference to the drawings it will be noted that the lever 32 is in the circuit of the electromagnet 20 and is located between it and the parts 15 and 13^a of the make-and-break. Therefore when the parts 15 and 13^a 105 are disengaged there is no flow of current through the lever 32. When this lever 32 is operated to reset the mechanism, the enlarged end of the lever leaves its plate 31 before it is moved sufficiently far to engage the plates 110 13^a and 15. Therefore when these plates are being moved into engagement there can be no sparking or fusing and consequent wear or other deterioration. The circuit through the relay-coil 6 is then not completed until the 115 lever 32 has again engaged the plate 31. By this means excessive wear of the parts is prevented and the life of the instrument is maintained.

Having thus described the invention, what 120 is claimed is—

1. An automatic cut-out comprising a main electromagnet, an armature therefor having an overhanging contact-plate, a spring-pressed lever, adapted for connection in series with 125 the translating devices of the circuit to be governed, having a contact-plate at one end connected electrically therewith and insulation between said contact-plate and said lever, said contact-plate adapted to normally con- 130 tact with that of the armature, one terminal of the winding of the said main electromagnet being adapted for connection with a conductor of the circuit to be governed, a relay-

electromagnet having one terminal of its winding connected with one of the said contact-plates, the other terminal thereof being adapted for connection with the opposite conductor of the circuit to be governed, the opposite terminal of said winding being connected with one of the contact-plates, and an armature for the relay-electromagnet adapted for engagement with the contact connected with the main electromagnet, substantially as described.

2. In a system of electrical distribution, in combination with a relay-electromagnet in circuit with the conductors, including translating devices, a main electromagnet in shunt-circuit with the relay-magnet and conductors, said shunt-circuit excluding the translating devices and including a resistance of like value to that of the translating devices, a make-and-break operable by the relay-mag-

net and included in circuit with the main magnet, and a make-and-break operable by the main magnet and included in one of the conductors to the translating devices, whereby upon an addition to the translating devices the relay-magnet will be actively energized by the consequent increased flow of the current and caused to cut in the main electromagnet, cut out the translating devices, and establish a continuous current through the shunt-circuit and conductors, and excluding said translating devices, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ARTHUR PETERS.

Witnesses:

EUGENE W. SHINE,
C. H. RICH.