

No. 837,636.

PATENTED DEC. 4, 1906.

G. P. McDONNELL.
BELL RINGING CIRCUIT.
APPLICATION FILED DEC. 28, 1905.

Fig. 1.

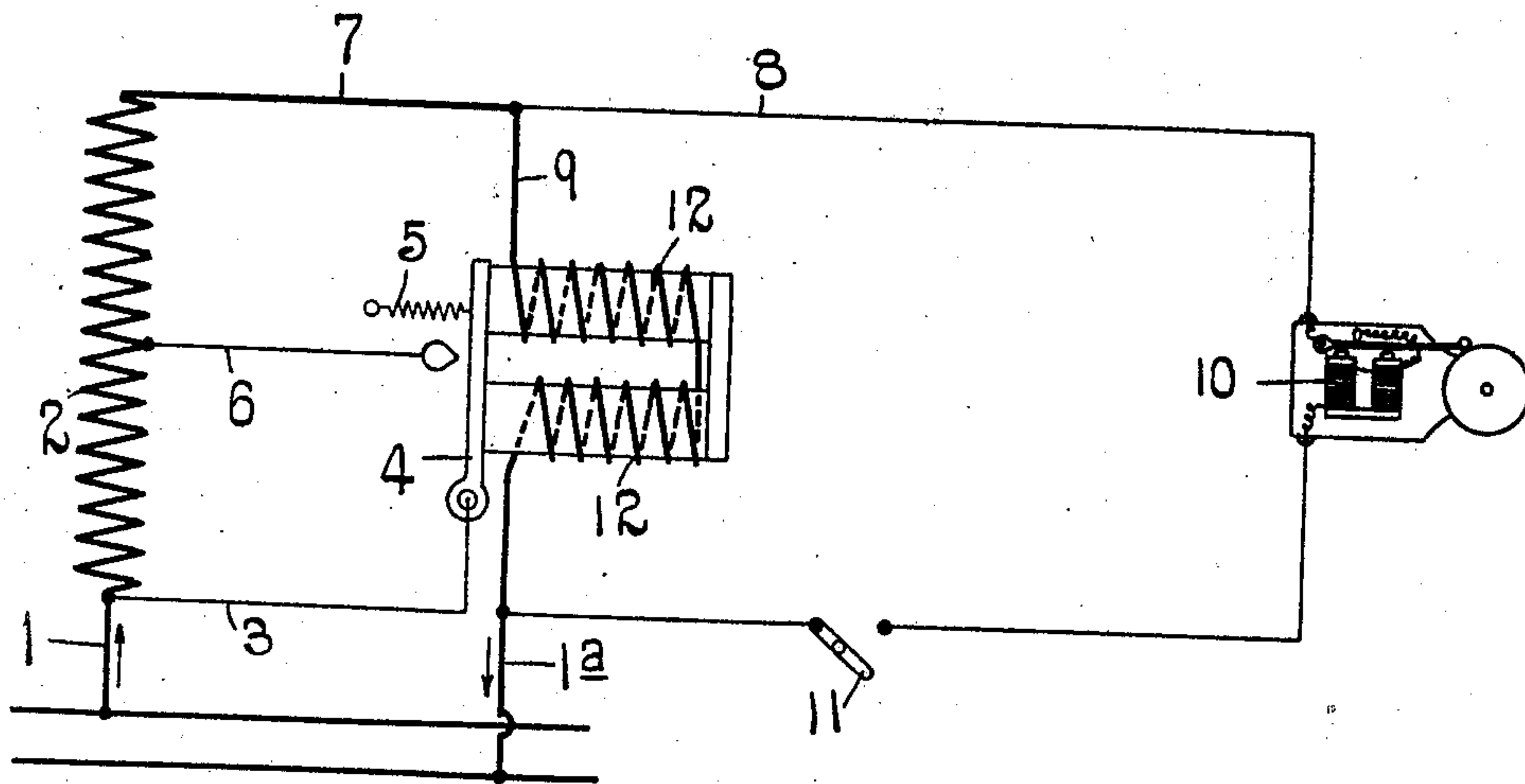
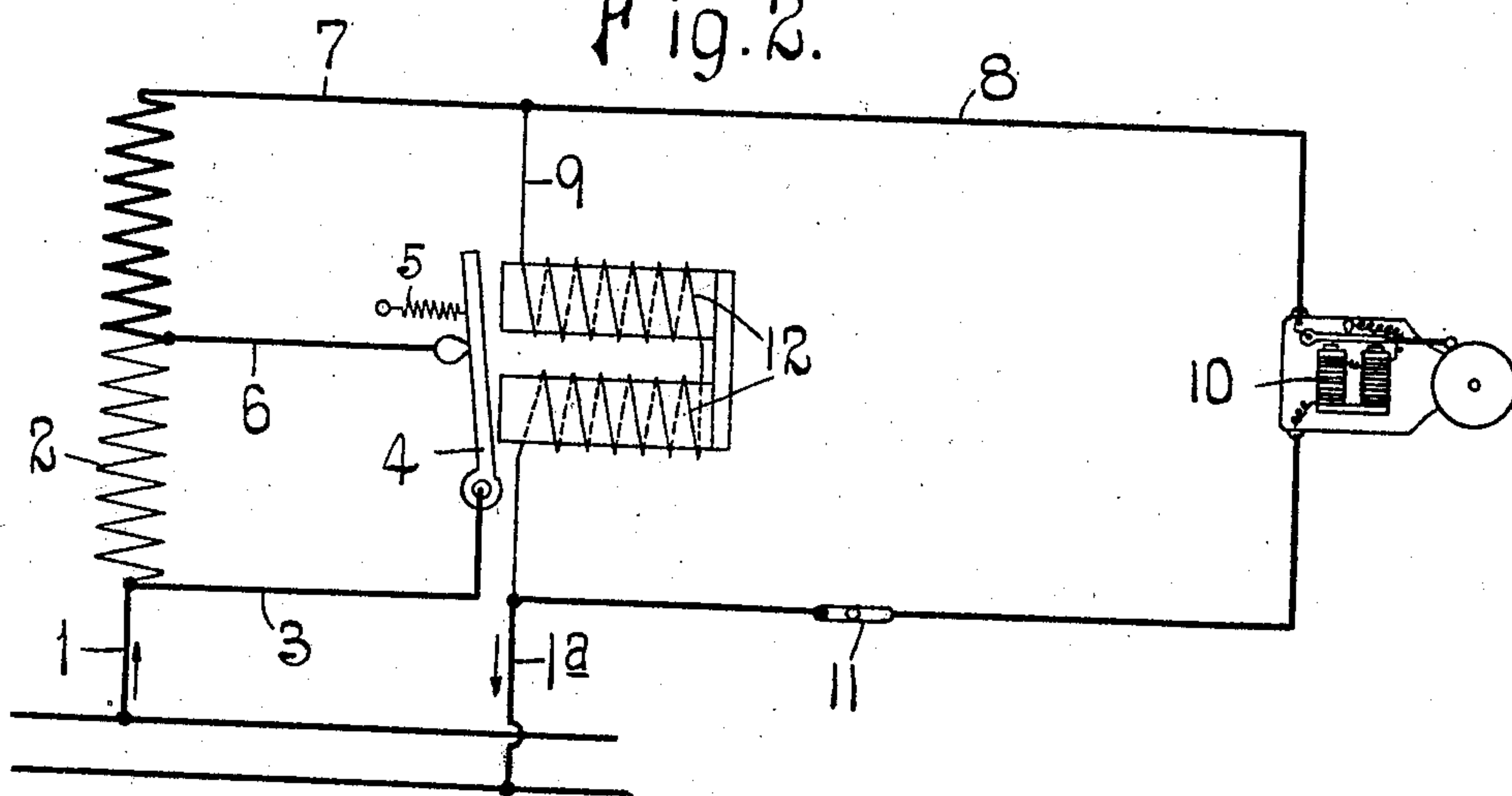


Fig. 2.



Witnesses

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GEORGE P. McDONNELL, OF ST. LOUIS, MISSOURI, ASSIGNOR TO
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BELL-RINGING CIRCUIT.

No. 837,636.

Specification of Letters Patent.

Patented Dec. 4, 1906.

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To all whom it may concern:

Be it known that I, GEORGE P. McDONNELL, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Bell-Ringing Circuits, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it ap-
10 being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic view illustrating my improved bell-ringing circuit, the switch being open; and Fig. 2 is a similar
15 view with the switch closed.

This invention relates to a new and useful improvement in bell-ringing circuits, the object being to operate said circuit from the main-line circuit of high voltage, the voltage
20 of the bell-ringing circuit being cut down to such limits as will render it available for the demands made upon it.

My present improvement is useful in connection with electric street-cars and other
25 places where there is a high-voltage current capable of being reduced by the interposition of resistance to a small-voltage current useful for ringing bells or other like purposes.

With this object in view the invention consists in the construction, arrangement, and combination of the several parts, all as will be hereinafter described, and afterward pointed
30 out in the claims.

In the drawings, 1 indicates the feed-wire from the main-line circuit, which connects with the resistance 2. Leading from wire 1 is a wire 3, which connects with a movable contact 4—such, for instance, as the armature of a relay-magnet. A spring 5 is preferably
40 connected to armature 4, its energy being directed to moving said armature 4 against a fixed contact, from which leads a wire 6, tapping the resistance 2 at some predetermined point, depending upon the amount of
45 resistance it is desired to leave in the bell-ringing circuit when the switch is closed. It will be observed by reference to Fig. 2 that the wires 3 and 6 and the armature 4 constitute a by-pass around part of the resistance
50 2, so that such part of said resistance is cut out or short-circuited when the relay-magnets are deenergized and the current passes through the bell-ringing circuit.

Leading from the end of resistance 2 opposite to that to which the wire 1 is connected
55 is a wire 7, which wire branches at 8 and 9, the former having in its length a magnet 10 of the bell-ringer and a switch 11, said wire connecting with the return-wire 1^a, which leads back to the main-line circuit. Wire 9
60 includes in its length coils 12 of the relay-magnet, and when the switch 11 is open, as shown in Fig. 1, all the current passing through wire 7 is forced to pass through wire
65 9 and the coils of the relay-magnet back to the return-wire 1^a. When the switch 11 is closed, however, as shown in Fig. 2, coils 12 of the relay-magnet serve to shunt the current in wire 8 through the coil to the bell-
70 ringing magnet and back to wire 1^a, in this manner deenergizing relay-magnets 12 and permitting the spring 5 to force the armature 4 to close the by-pass around part of the resistance 2, thus cutting down said resistance
75 and sending a predetermined voltage of current through the bell-ringing circuit. When the switch is open, as shown in Fig. 1, the relay-magnets are energized, attracting the
80 armature 4 away from the terminals at the end of wire 6, thus breaking the by-pass and forcing the current in wire 1 to pass through
85 all the resistance 2, the current being thus cut down, so as to reduce the waste to a minimum, and only allow a sufficient amount to pass to energize the coils 12 and normally
break the by-pass.

From the above it will be seen that when it is desired to ring the bell it is only necessary to close the switch 11, when part of the resistance 2 will be cut out by the by-pass, and
90 when the switch 11 is opened the by-pass will be opened and all the resistance cut in.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made
95 and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described the invention, what
100 is claimed as new, and desired to be secured by Letters Patent, is—

1. In a bell-ringing circuit, the combination with the main-line circuit of relatively high voltage, a resistance in said main-line
105 circuit, a by-pass around part of said resist-

ance, a bell-ringing circuit of relatively low voltage which is derived from said main-line circuit, and a switch in said bell-ringing circuit whereby when the bell-ringing circuit is closed said by-pass will be closed and the part of the resistance excluded by said by-pass will be cut out; substantially as described.

2. In a bell-ringing circuit, the combination with a main-line circuit, of a resistance therein, a by-pass around a part of said resistance, a magnetically-controlled element which forms part of said by-pass, a bell-ringing circuit, a switch in said bell-ringing circuit, and a magnet which is energized and de-energized by the opening and closing of the switch in the bell-ringing circuit, which magnet influences the element in said by-pass to cut in and cut out a part of the resistance short-circuited by the by-pass; substantially as described.

3. The combination with the main-line cir-

cuit having a resistance therein, a by-pass around part of said resistance, an armature constituting part of said by-pass, means co-operating with said armature and tending to close said by-pass to cut out the part of the resistance excluded by said by-pass, a magnet coöperating with said armature, said magnet when energized operating said armature to open said by-pass, a bell-ringing circuit, and a switch in said bell-ringing circuit whereby when said switch is closed said magnet is deenergized, and when said switch is open said magnet is energized; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 23d day of December, 1905.

GEORGE P. McDONNELL.

Witnesses:

LENORE WILSON,
GEORGE BAKEWELL.