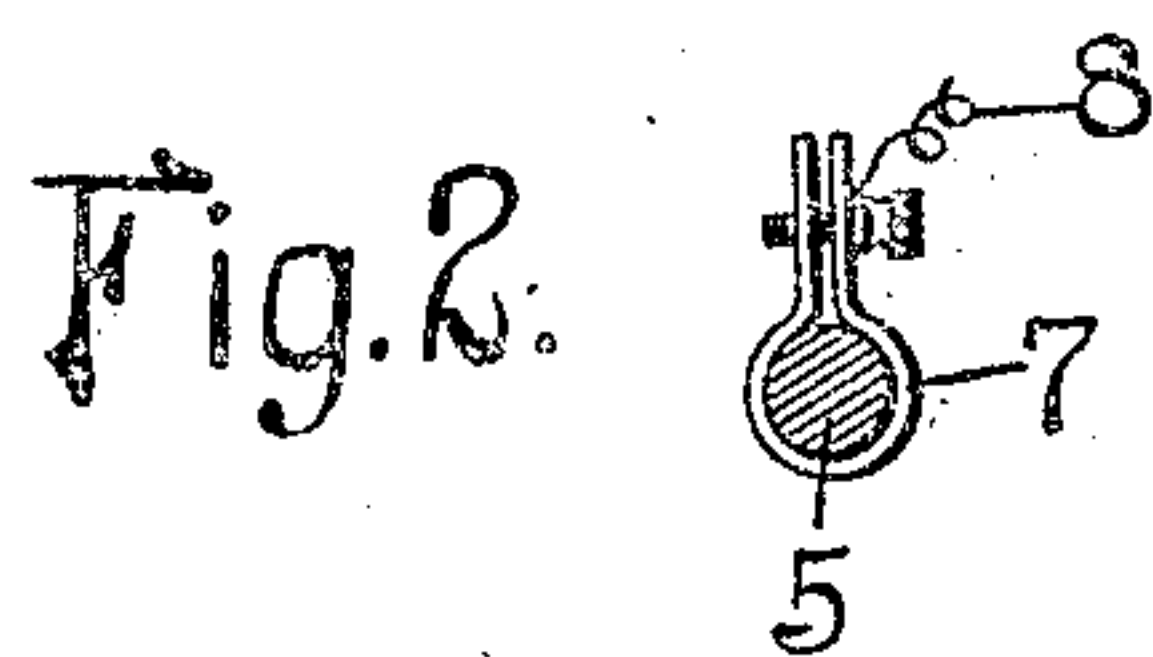
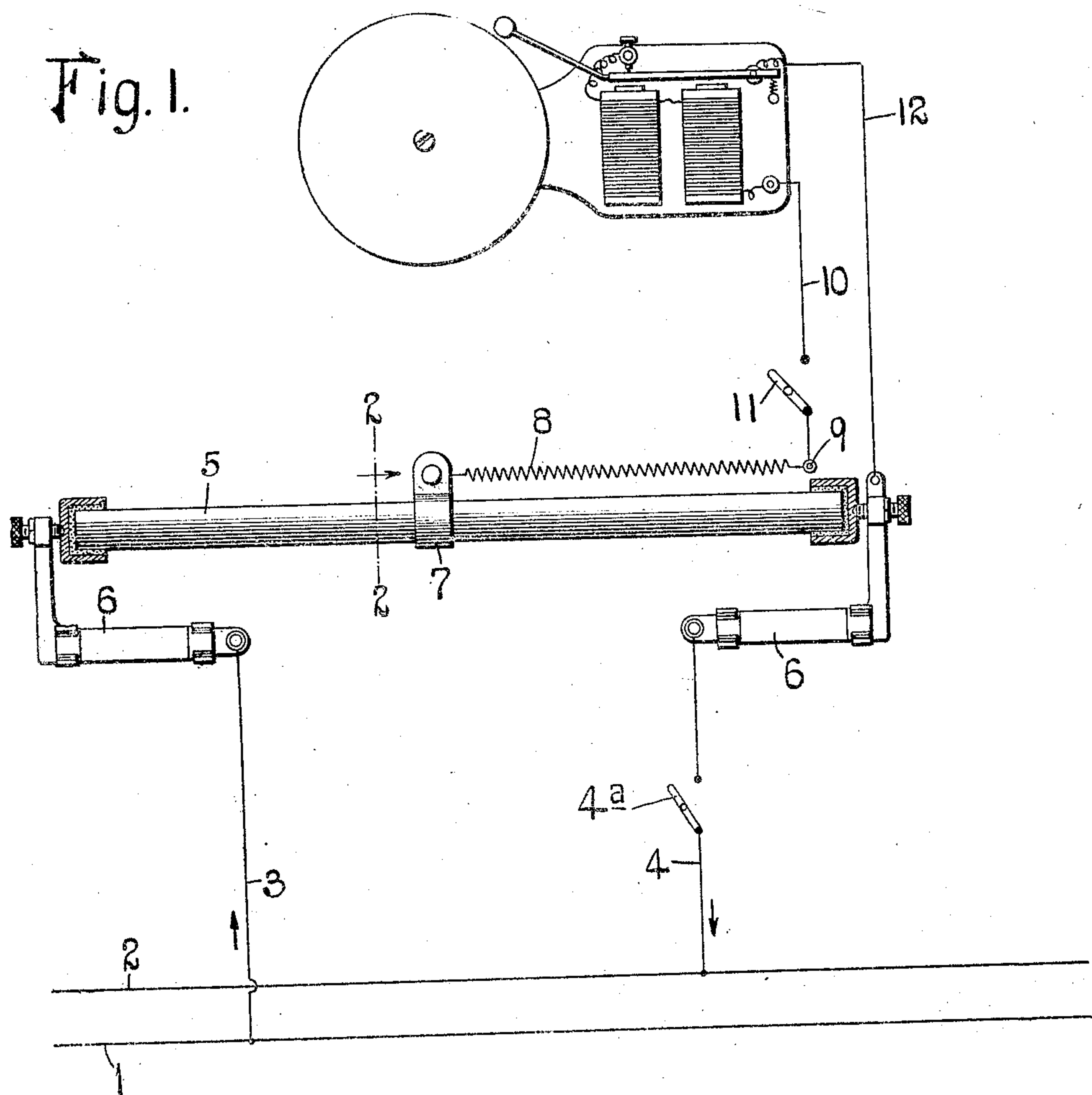


No. 837,635.

PATENTED DEC. 4, 1906.

G. P. McDONNELL.
BELL RINGING CIRCUIT.
APPLICATION FILED NOV. 20, 1905.

2 SHEETS—SHEET 1.



Witnesses
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W. L. Church.

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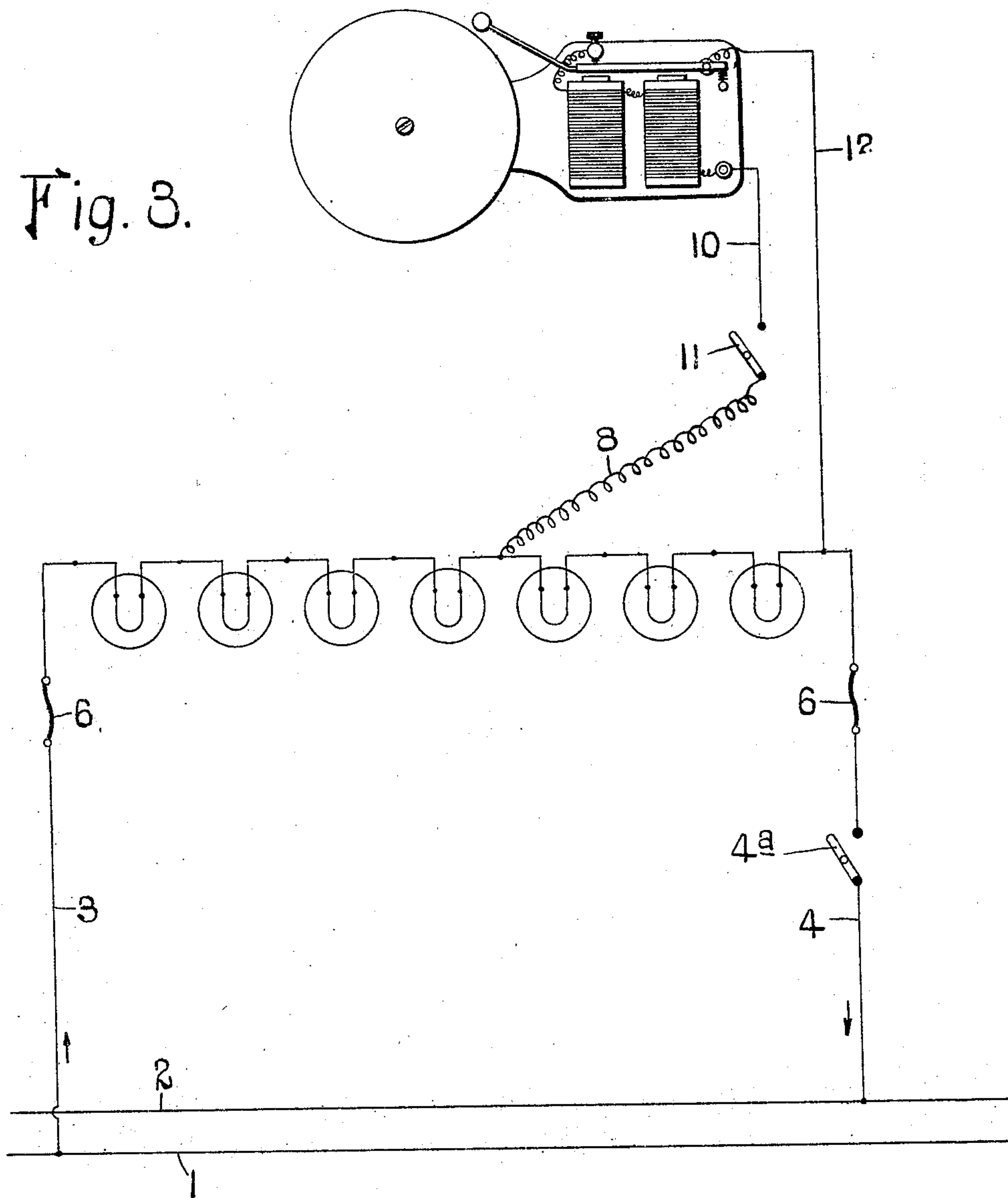
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2 SHEETS—SHEET 2.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE P. McDONNELL, OF ST. LOUIS, MISSOURI, ASSIGNOR TO
AMERICAN ELECTRIC COMPANY, OF EAST ORANGE, NEW JER-
SEY, A CORPORATION OF NEW JERSEY.

BELL-RINGING CIRCUIT.

No. 837,635.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed November 20, 1905. Serial No. 288,220.

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 appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic view of my improved bell-ringing circuit. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1, and Fig. 3 is a diagrammatic view of a modified form of circuit.

This invention relates to a new and useful improvement in bell-ringing circuits, the object being to derive from the main-line circuit of high-current strength a weaker bell-ringing circuit and to provide means whereby the weakness (or strength) of the derived circuit can be regulated according to the strength of the main-line circuit or according to the amount of current required to ring the bell.

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 out in the claim.

My present invention is designed particularly as an improvement upon the circuit-interrupter shown in United States Patent No. 800,315, granted to me September 26, 1905, wherein the interrupter-disk is mounted on the armature-shaft of a motor and a resistance-coil is arranged in series with the interrupted bell-ringing circuit.

My present invention dispenses with the use of a motor and interrupter-disk, and instead of making and breaking the circuit and deenergizing the bell-magnets I supply a constant current of low voltage and am thus enabled to use an ordinary bell-magnet whose armature is provided with a current maker and breaker, as is well understood.

In the drawings, 1 and 2 indicate main-line wires of the electric circuit, which we will assume is a circuit of high voltage or considerable strength. Leading from the wires of this circuit are wires 3 and 4 to the ends of a resistance-bar 5. Interposed in the lengths

of the wires 3 and 4 are fuses 6, which for convenience may be the well-known cartridge-fuses of commerce.

Assuming that the current is flowing through the wires 3 and 4 and the resistance-bar 5 in the direction of the arrows, it will be obvious that if the derived circuit is tapped from the resistance-bar close to the point of connection of wire 3 therewith, but a small amount of resistance will be cut in the derived circuit, and consequently the derived circuit will be one of relatively great strength or high voltage. On the other hand, if the derived circuit is tapped from the resistance-bar at a point where a portion of said resistance is cut in said derived circuit said derived circuit will be made proportionately weaker.

Slidably mounted on the resistance-bar 5, which resistance-bar is made up of composition including graphite, is a band or collar 7, which may be clamped in position at any desired point along the length of the bar 5. A wire 8 leads from this clamp 7 to the fixed binding-post 9, said wire 8 being preferably coiled so as to accommodate the movement of clamp 7 to its different adjusted positions. From binding-post 9 leads a wire 10, in the length of which is a switch 11, wire 10 being connected to one of the binding-posts of an ordinary electric bell. From the other post of this electric bell leads a wire 12 to a point where the wire 4 connects with the resistance-bar 5.

The resistance-bar 5 and the fuse-cartridges 6 may be mounted on any suitable insulation-support and arranged in any convenient place. Where it is desired to utilize the power-current of an electric railway to ring the signal-bells of the car, it is only necessary to substitute my improved resistance-bar and its attachments for the batteries now usually employed and connect the proper terminals from the bell-ringing circuit to the adjustable collar 7 and the point of connection of wire 4 to the end of the resistance-bar and make connection between the ends of the cartridge-fuse supports with the main-line circuit. Say that a two-hundred-and-twenty-volt current was being employed as the power-current and it required twenty volts to ring the bells. The clamp 7 would be adjusted along the bar 5 until the derived bell-ringing circuit possessed the requisite

strength. By clamping the collar 7 on the bar no further adjustment would be necessary.

In the modification shown in Fig. 3 I have shown a number of incandescent lamps in series as taking the place of the resistance-bar 5, one leg of the derived circuit being connected at a proper point between any two lamps in the series after having determined the strength of the current desired in the derived circuit. By having incandescent lamps arranged in series, as shown, it is obvious that lamps of different resistances can be employed, and consequently varied degrees of current strength in the derived circuit can be obtained by tapping into the line of the series of lamps or changing the resistance of the several lamps in the series.

The lamps above described act in the same way as resistance-coils in a rheostat, and, in fact, if desired, an ordinary rheostat could be used in place of the bar or of the lamps and the derived circuit tapped into the resistance at desired points to obtain the required strength in the derived circuit.

A switch 4^a is preferably used in the primary circuit, so as to make and break the same when desired. This switch 4^a may be used instead of the switch 11 to complete the primary circuit and the bell-ringing circuit simultaneously.

I am aware that changes in the construction, arrangement, and combination of the several parts of my device can be made 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 is claimed as new, and desired to be secured by Letters Patent, is—

The combination with a main-line circuit of high-voltage strength, of a resistance-bar across said main-line circuit, fuses interposed between the ends of said resistance-bar and said main-line circuit, a bell-ringing circuit having one end connected to one end of said resistance-bar, an adjustable clamp slidingly mounted on said resistance-bar, a coiled wire connecting said clamp to a binding-post to which the other leg of said bell-ringing circuit is connected, means for locking said clamp in position on said bar and a switch for making and breaking said derived circuit; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 17th day of November, 1905.

GEORGE P. McDONNELL.

Witnesses:

F. R. CORNWALL,
GEORGE BAKEWELL.