

G. S. RIDER.  
ELECTROMEDICAL APPARATUS.

APPLICATION FILED APR. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1,

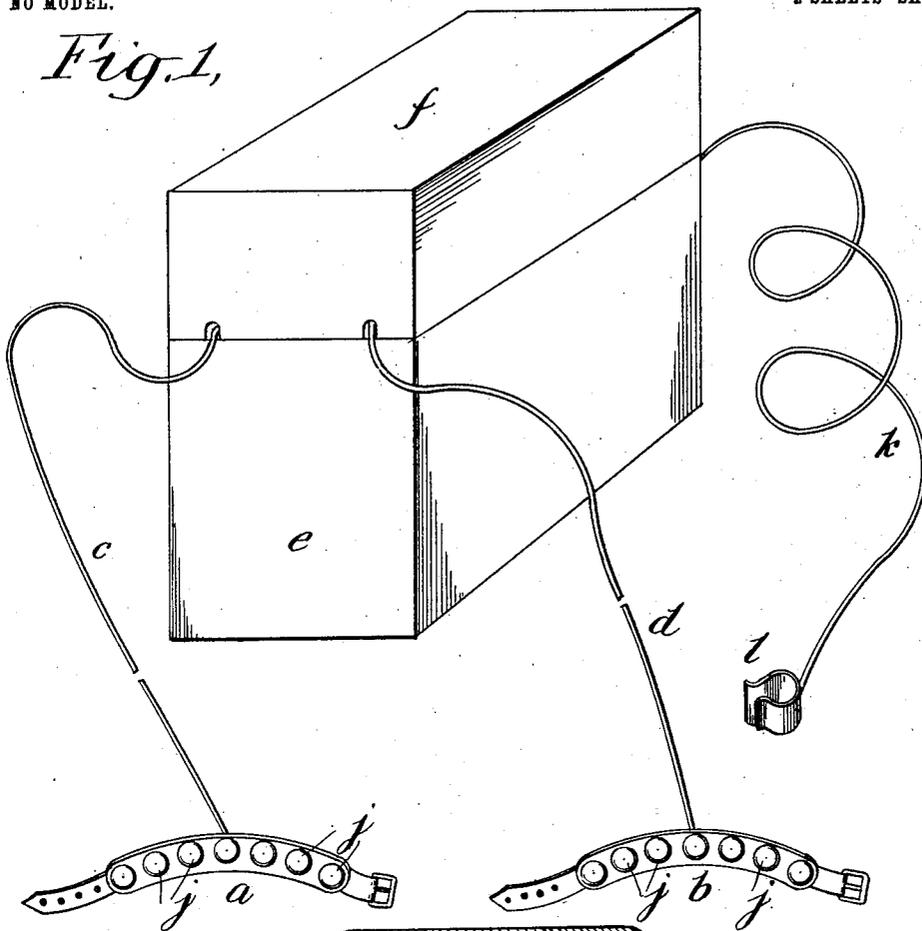
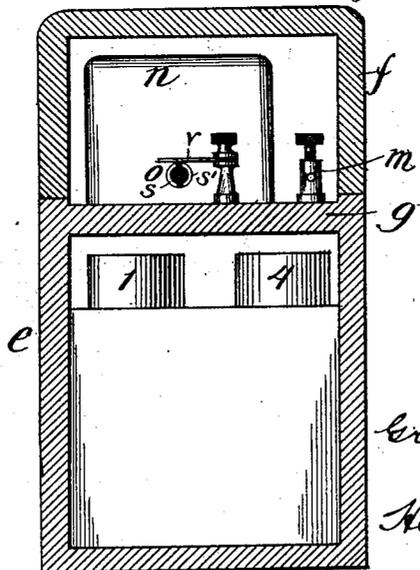


Fig. 2

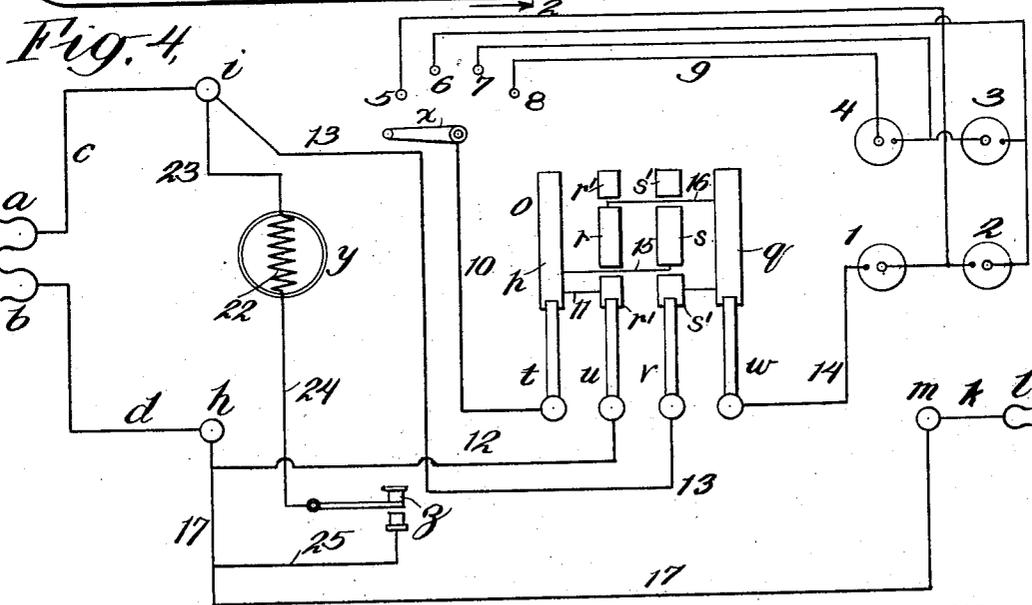
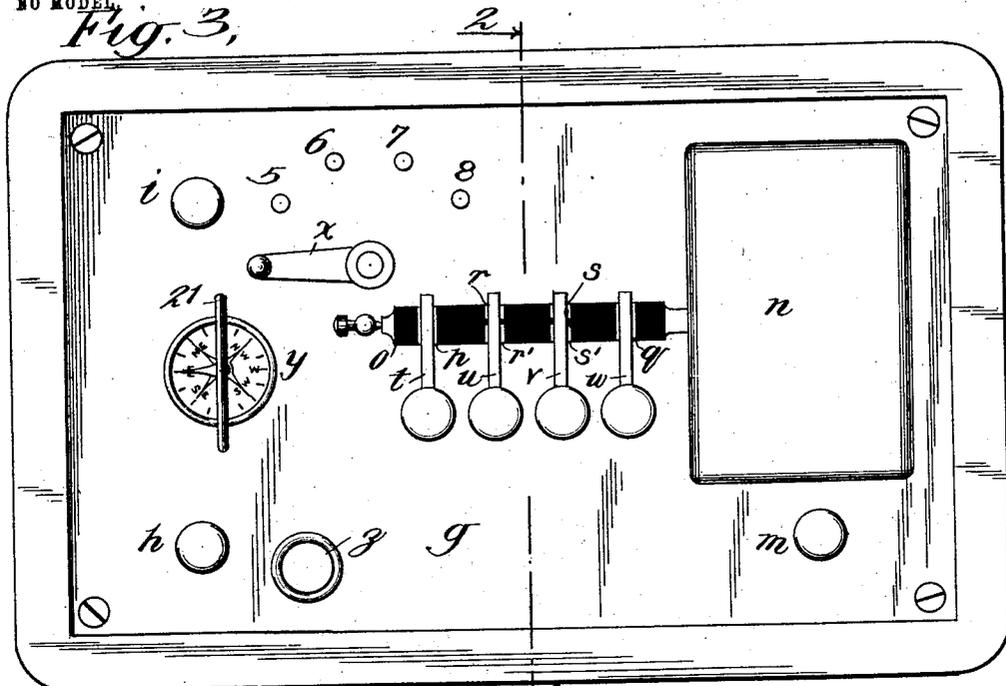


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# UNITED STATES PATENT OFFICE.

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## ELECTROMEDICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 720,483, dated February 10, 1903.

Application filed April 17, 1902. Serial No. 103,319. (No model.)

*To all whom it may concern:*

Be it known that I, GRANVILLE S. RIDER, a citizen of the United States, residing in the borough of Manhattan, in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Electromedical Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to electromedical apparatus, and has for its objects to improve the construction and increase the effectiveness of such devices.

According to my invention I provide for the action of an electric current with periodic reversals of direction and also provide in combination therewith an earth connection for the body.

I will now describe the construction of electromedical apparatus embodying my invention illustrated in the accompanying drawings and will thereafter point out my invention in claims.

Figure 1 is a perspective exterior view of the complete apparatus. Fig. 2 is a transverse vertical section of the same on the line 2 2, Fig. 3. Fig. 3 is a plan view of the apparatus with the cover removed. Fig. 4 is a diagrammatic view of the electric connections, showing the commutator in development.

The electrodes *a* and *b* are located at the ends of conducting-wires *c* and *d*, respectively, and these conducting-wires extend from a box or case *e*, in which are located the various operative devices. The box or case *e* is shown as provided with a hinged lid or cover *f*, and upon the upper piece or base *g* of the body of the box are located the binding-posts *i* and *h*, to which the conducting-wires *c* and *d* are respectively connected, and these binding-posts are connected, through intermediate devices to be hereinafter described, to a source of electric current of low electromotive force, shown as an electric battery of four cells 1, 2, 3, and 4 of the type denominated as "dry batteries." I have found in practice that the direct current from such a battery, although of low electromotive force, has effective curative

action upon the human body when employed in accordance with my invention.

The electrodes *a* and *b* are shown in the drawings in the form of belts or bands, each provided at one end with a buckle and at the other end with a suitable tab, and these belts or bands are adapted to be buckled upon a human wrist or ankle or other suitable part of the body, and each belt or band is shown as provided on its surface with circular and convex metallic plates *j*, electrically connected together and to the conducting-wires. It is of course evident that various forms of electrodes may be employed; but it is usually desirable that these electrodes should be capable of attachment to the body, as in the use of my apparatus the electrodes are usually allowed to remain in contact with the body for periods of several hours.

An earth connection is provided to connect the patient with the earth at the same time that the current from the battery is caused to flow through the body of the patient, such earth connection being made through the conducting-wire *k*, shown as provided with a clip *l* at its ends, such clip being adapted to be sprung over a gas-pipe or other device adapted to form a ground connection. The conducting-wire *k* is held in the binding-post *m* on the base *g* of the box or case and connected in the circuit, as will be hereinafter described, so that when the electrodes *a* and *b* are in contact with the body of a patient the devices just described complete a connection from the body of the patient to the earth, whereby the patient is subjected to an electric current from the battery and at the same time connected to the earth, so that an equal electric potential between the body of the patient and the earth will be at all times maintained.

For the purpose of periodically reversing the direction of the current passing through the body of the patient I provide automatic means, which, as shown, comprises a clock-work located in a casing *n*, furnishing the motive power to a commutator *o* and the commutator reversing the current at intervals determined by the speed of its revolution. The commutator *o* is shown as divided into

four cylindrical sections, the end sections comprising continuous cylindrical rings *p* and *q*, respectively, and the medial sections comprising semicircularly-divided rings *r* *r'* and *s* *s'*, respectively. Commutator-brushes *t*, *u*, *v*, and *w* coact with these plates.

The circuit connections are completely shown in Fig. 4. The number of cells of battery at any time in operation is determined by the switch *x*, which when in contact with the stop 5 connects one cell 1, when in contact with the stop 6 connects two cells 1 and 2, when in contact with stop 7 connects three cells 1, 2, and 3, and when in contact with stop 4 connects all four cells 1, 2, 3, and 4 in series with the other parts of the apparatus. Assuming this switch *x* to be in contact with the stop 8 and the commutator to be in the position shown in Fig. 4, the current will flow in series through the cells 1, 2, 3, and 4 and by wire 9 to stop 8, through switch *x*, wire 10, commutator-brush *t*, plate *p*, wire 11, plate *r'*, brush *u*, wire 12, post *h*, conductor *d*, electrode *b*, body of patient, electrode *a*, conductor *c*, post *i*, wire 13, commutator-brush *v*, plate *s'*, wire 14, plate *q*, brush *w*, and wire 15 back to battery. When the commutator rotates, so as to bring the plates *r* and *s* into contact with the brushes *u* and *v*, the current will flow from the plate *p* by wire 15 to the plate *s*, brush *v* and wire 13 to post *i*, and by conductor *c* and electrode *a* to the body of the patient, and will pass through the body of the patient in a direction the reverse of that formerly described, and then by electrode *b*, conductor *d*, post *h*, wire 12, brush *u*, plate *r*, wire 16, plate *q*, brush *w*, and wire 14 back to battery. The earth connection is from the binding-post *h* or wire 12 through wire 17 to post *m* and by conductor *k* and clip *l* to the earth.

I provide means for indicating the strength of the current flowing through the conductors

above described, thereby showing whether or not the battery is active and also indicating the resistance of the circuit, such indicator comprising a magnetic needle (not shown) in the compass-case *y*, a magnetic bar 21 to hold the needle in a normal position, and a deflecting-coil 22, connected by wires 23, 24, 25, and 17, in a branch circuit from the post *h* to the post *i*, such circuit including a normally open contact device, shown as a push-button *z*.

It is evident that various modifications may be made in the construction shown and above particularly described within the spirit and scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In an electromedical apparatus, the combination of a source of electric current of low electromotive force, electrodes connected thereto and adapted to make contact with a body, a periodically-operated current-reverser interposed in the circuit between the electrodes and source of electric current, and means for maintaining an earth connection from said body.

2. In an electromedical apparatus, the combination of a source of electric current of low electromotive force, electrodes connected thereto and adapted to make contact with a body, a periodically-operated current-reverser interposed in the circuit between the electrodes and source of electric current, and an earth connection joined to one of said conductors between the electrodes and current-reversing means.

In testimony whereof I have affixed my signature in presence of two witnesses.

GRANVILLE S. RIDER.

Witnesses:

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