April 8, 1930. A. FISCHER 1,753,854

ELECTRO GALVANIC MEDICAL APPARATUS

Filed March 31, 1928

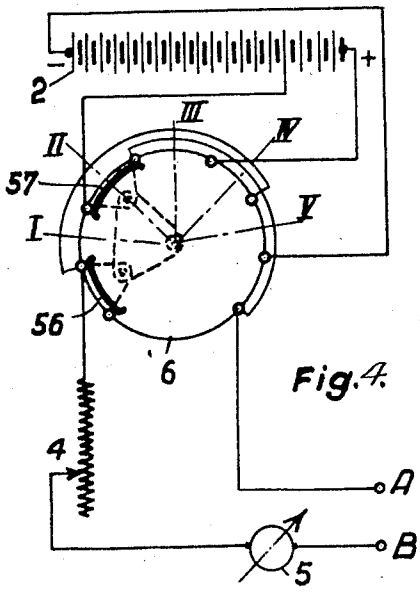


Fig. 4.

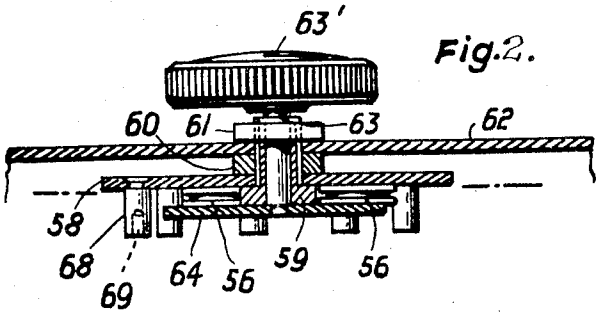


Fig. 2.

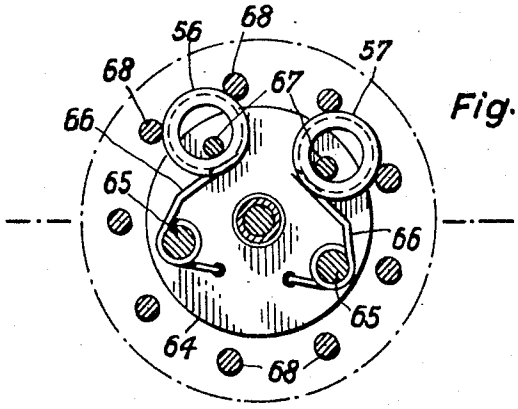


Fig. 3.

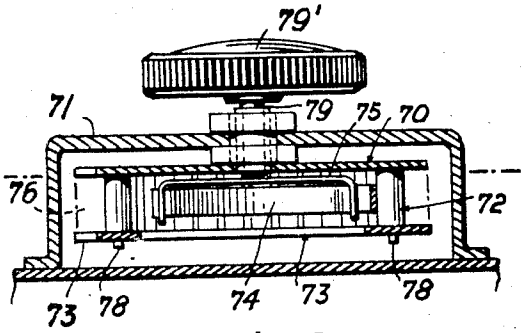


Fig. 5.

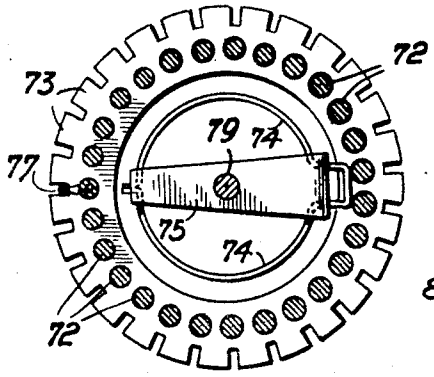
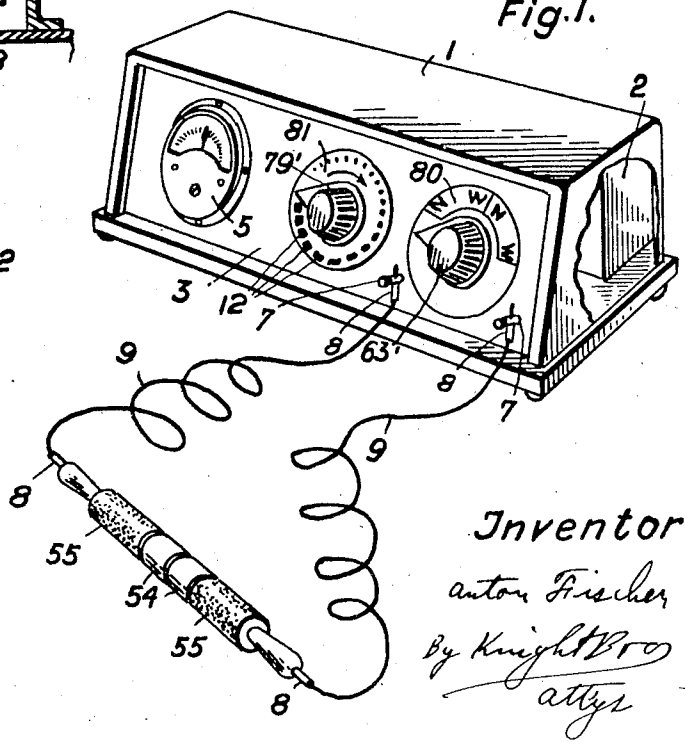


Fig. 6.

Fig. 1.



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UNITED STATES PATENT OFFICE

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ELECTRO-GALVANIC MEDICAL APPARATUS

Application filed March 31, 1928. Serial No. 266,251.

The invention relates to an electro-galvanic medical apparatus for supplying the parts of the human body with very feeble and exactly measurable currents, facilitating thereby treatment, as well as convenient reading of the controlling apparatus.

The electro-galvanic medicinal apparatus according to the present invention consists in a receptacle, casing, or the like, containing the required source of current, as, for instance, a dry cell battery, an electric regulating-resistance (rheostat), a milliampere-meter and a pole-reverser, to which the connecting cords of the electric means for treatment are attached and by means of which, the galvanic current can be supplied to the parts of the body to be treated in different directions according to adjustment.

The pole-reverser, according to the invention is so arranged, that it is, for instance, fitted with 5 or more switching positions, making it possible to switch either a part, or the entire battery into the circuit. A very fine regulation of the feeble currents can thus be obtained for applications, not requiring any comparatively intensive currents, as, for instance, the treatment of the heart and head.

The pole-reverser consists of contact-bolts, arranged in certain distances in a circle, a rotary insulated plate, and spring pressed contacts on said insulated plate adapted to close the contact between two adjacent contact bolts.

Some parts of the subject of the invention are in themselves known and protection is not claimed for such parts.

Some modes of embodying the invention are illustrated in the drawings by way of example.

Fig. 1 shows the medical apparatus according to the present invention with rotary resistance, pole-reverser, several switching-positions and apparatus for treatment connected thereto in elevation, and partly in section.

Fig. 2 shows the pole-reverser in side view, in section and partly in elevation.

Fig. 3 shows the same from below and partly in section.

Fig. 4 is a scheme of connections of the pole-reverser, with several switching positions.

Fig. 5 illustrates a construction of the regulating resistance in the form of a rotary resistance in side view and partly in section.

Fig. 6 shows the rotary resistance from below and partly in section.

The electro-galvanic medical apparatus illustrated in Fig. 1 consists of a receptacle, or casing 1 for the source of current, which may, for instance, be a dry cell battery 2. Upon a special switch-board cover 3, an electric regulating resistance (rheostat) 81, a milliampere-meter 5 and a pole-reverser 80, all arranged in full view. The pole-reverser 80 is provided with connecting terminals 7, with which the connecting plugs 8 of the cords 9 engage.

The milliampere-meter 5, the multi-stepped pole-reverser 80 and the rotary resistance 81 are disposed with their active parts below the apparatus plate 3. Only the revolving button 63′ of the pole-reverser, the revolving button 79′ of the resistance, together with the readily visible scale arrangement of the same, the scale of the milliampere-meter and the casing of the same and the connecting terminals 7 for the plugs 8 are visible on the switch-board.

The rheostat 81, illustrated in Fig. 1 is provided with scale-marks 12, consisting of lines or dots. These scale-marks 12 are made stronger towards one end and weaker towards the other, the increasing scale-marks corresponding to boosting of the electric current and the decreasing marks to a weakening of the electric current. This construction of the scale makes it possible to perceive at once, towards which side the rheostat 81 must be displaced by the revolving button 79′ in order to amplify or weaken the electric current. On one end of the scale-bar 11, the word "Strong" and at the other end the word "Weak" may be inscribed in order to facilitate handling still more. The scale-marks 12 may be of different form and design, i. e. instead of the line and dot form, any other form may be used.

In Figs. 2 and 3 a mode of constructing the pole-reverser is illustrated by way of example.

58 is a round insulating base-plate, being screwed to a part 59 by a nut 60, and to a plate 62 of a special casing (by another nut 61), which may however be replaced by the switch-board 3 of the apparatus-casing 1 and attached by a one-hole fastening. The axle 63, operated by means of a revolving button 63′, is riveted into the insulating part 64. The latter carries the two bolts 65, two springs 66, two oscillating rollers 56 and 57, representing the movable contact-surfaces of the pole-reverser, and two bolts 67 riveted into the plate 64. The large bore of the rollers 56, 47 enables a safe snapping-in into the rests formed by the contact-bolts 68, arranged in a circle. The bolts 68 are riveted to the insulating part 58. The connection of the bolts 68 with the other parts of the medical apparatus is effected by soldering the connecting wires into axially drilled holes 69.

Fig. 4 shows a scheme of connections of the pole-reverser with, for instance, 5 positions. In this scheme of connections, A, B are the electrode-connections, 6 the pole-reverser proper, 2 the source of current, 4 the regulating resistance, 5 the milliampere-meter and 56, 57 represent the contact surfaces of the pole-reverser.

In the position, indicated in the scheme of connections by I, the pole-reverser is switched on "Out".

The positions II (A+B−) and III (A−B+) indicate feeble currents and the positions IV (A+B−) and V (A−B+) intensive currents. With this pole-reverser it is possible to switch either part of the battery, or the whole battery into the circuit.

By employing the just above-described pole-reverser, the below described rotary resistance is advantageously used, which can, as explained further down, readily be made in pairs with the pole-reverser.

The rotary resistance illustrated in Figs. 5 and 6, consists of an insulating disc 70, being likewise connected with the plate 71 by one-hole fastening the same as the corresponding disc 62 of the pole-reverser. A large number of contact-bolts are riveted to the disc 70, in a circle carrying at their other ends an insulating ring 73. This insulating ring has an opening from which the disc 64 of the pole-reverser has been stamped out for the purpose of saving material. Within the hollow space formed by the studs 72, an anuular spring moves in tensioned condition, abutting with its open end firmly against a flap of the U-shaped bow 75, being with its closed end however guided by another flap of the part 75 and sliding on the bolts 72. This arrangement has been made in order to obtain a winding space of as large diameter as possible, which is, in its rectangular cross-section indicated by 76. It will be possible to wind upon this winding space on account of its large diameter a thin resistance wire of about 80,000–100,000 ohms. The total resistance is so subdivided, that after winding up part of the wire, a loop of the latter is drawn through the slot 77 around a shoulder 78 of the bolts 72 shown in Fig. 5 and the wire drawn again through the slot 77 and wound up further. The next loop passes through the slot to the right of the one marked 77 to the next bolt and is soldered firmly together with the same, simply by a drop of tin. Mechanical fastening of the U-shaped bow 75 carrying the spring 74 with the pivot bolt 79 is, like in the pole-reverser, done by riveting. Turning the pivot-bolt 79 can be effected by means of button 79′ attached to the bolt.

The individual parts of the apparatus may be designed in any desired manner, without transgressing the scope of the invention.

I claim:

In an electro-galvanic medical apparatus the combination of a casing containing a source of current, a rheostat, a milliampere-meter and a pole-reverser on said casing, said pole-reverser having several positions for switching in stronger and weaker currents and consisting of contact-bolts arranged at certain distances in a circle, a rotary insulating plate, and spring pressed contacts on said insulating plate adapted to close the contact between two adjacent contact bolts.

In testimony whereof I have affixed my signature.

ANTON FISCHER.