No. 859,011. PATENTED JULY 2, 1907.

N. H. RAYMOND & J. C. VETTER.

ELECTROTHERAPEUTIC APPARATUS.

APPLICATION FILED AUG. 24, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

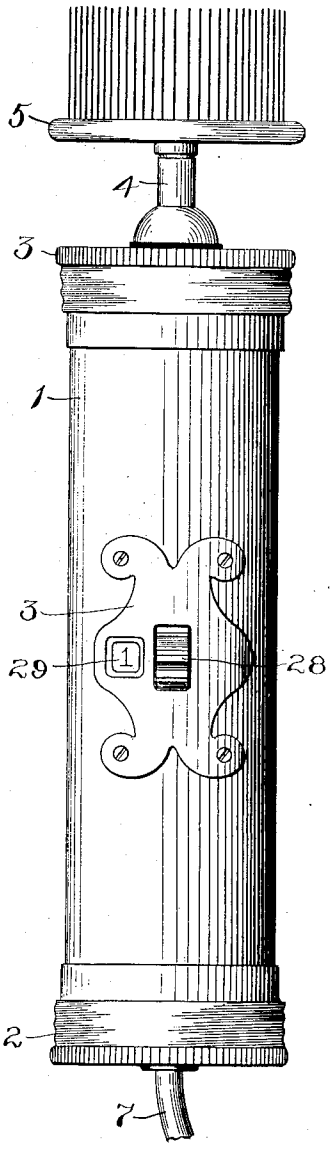

Fig. 3.

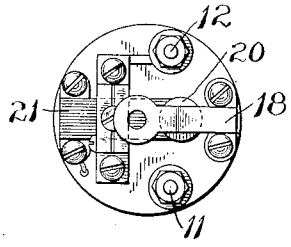

Fig. 5.

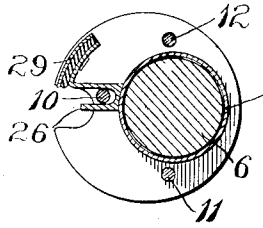

Fig. 4.

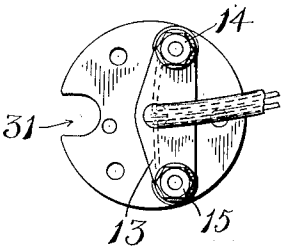

Fig. 2.

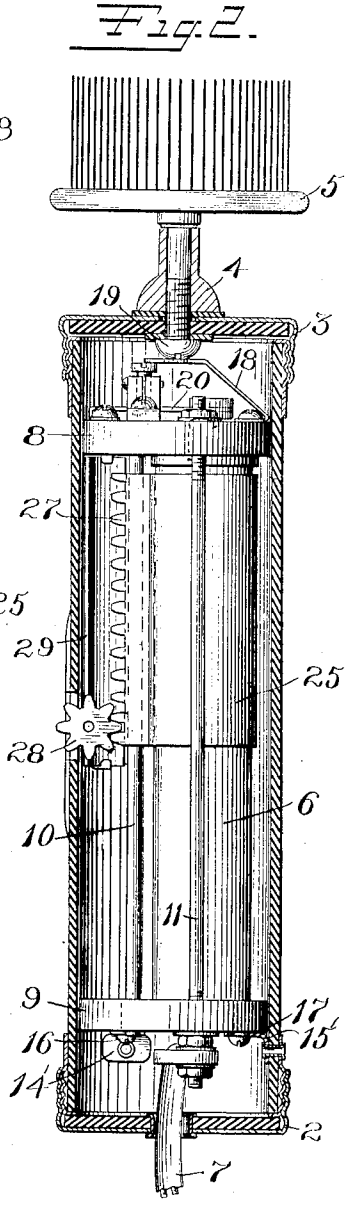

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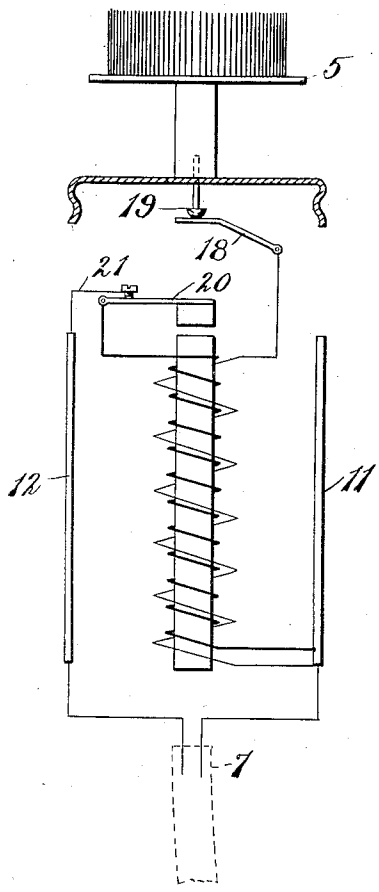
Fig. 6.



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UNITED STATES PATENT OFFICE.

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ELECTROTHERAPEUTIC APPARATUS.

No. 859,011. Specification of Letters Patent. Patented July 2, 1907.

Application filed August 24, 1905. Serial No. 275,652.

To all whom it may concern:

Be it known that we, NELSON H RAYMOND and JOSEPH C. VETTER, citizens of the United States, residing at Brooklyn, Kings county, State of New York, and Coney Island, Kings county, State of New York, respectively, have invented certain new and useful Improvements in Electrotherapeutic Apparatus, of which the following is a full, clear, and exact description.

Our invention relates to improvements in electrical apparatus, and particularly for electro therapeutic purposes.

The object of the invention is to provide a construction for applying an electrode to the body by which the current may be adjusted by simple manual or digital movement. It is customary in an apparatus of this character to have one electrode of the apparatus of such a character that it may be held in one hand and moved from point to point as may be desirable. We have endeavored to so construct these parts that the amount of current flowing may be controlled by a simple movement, as of the thumb, while the body of the instrument is gripped in the hand.

The principles of our invention are illustrated in the accompanying single sheet of drawings. It would be obvious, however, that changes may be made in the details of construction without departing from the spirit or scope of our invention.

Figure 1 is a side elevation of a hand implement for carrying one electrode of an apparatus. This implement embodies the improvement of our invention herein claimed. Fig. 2 is a longitudinal section of the casing, showing the interior mechanism in side elevation at right angles to the position in Fig. 1. Fig. 3 is an end view of the interior mechanism showing the vibrator. Fig. 4 is a rear view of the other end of the interior mechanism. Fig. 5 is a cross sectional view of the interior mechanism. Fig. 6 is a view in diagram, showing conventionally the complete circuit of both the primary and secondary coils.

1 represents the casing, which is constructed of suitable material, preferably of insulating character.

2 represents the rear end, which is preferably screw threaded and removable, and provided with a passage or opening for the connecting wires or cable.

3 represents the cap or front end, which is also preferably removably connected to the casing by means of a screw threaded portion.

4 represents a socket carried by the cap 3.

5 is a terminal or electrode of brush form. It may, however, be of any character.

6 is the coil of the induction member, provided with suitable primary and secondary windings.

7 represents a cable or insulation carrying the conductors for the primary circuit.

8 and 9 represent the upper and lower heads of the induction coil frame or spool

10, 11 and 12 represent rods connecting the two heads of the spool.

13 is a cross bar formed for instance of ebonite and secured to the ends of the two rods 11 and 12 by means of nuts 14 and 15. This cross bar has a passage or opening for the conductor cable 7, the ends of the conductors being connected respectively to the rods 11 and 12.

14′ and 15′ are brackets which are secured to the interior of the casing 1.

16 and 17 are screws for removably attaching the head of the spool 9 to these brackets. The induction coil frame 4 is in this manner secured in the casing, and all longitudinal pulls on the cable 7 are thus taken up by the casing directly from the head of the spool.

18 is a spring arm connected to the head 8, forming a portion of the secondary circuit of the induction coil.

19 is a screw which passes through the cap 3 into the socket 4 and provides electrical connection with the spring arm 18.

20 is an armature vibrator member for the primary circuit. 21 is a stationary contact co-operating therewith, and affording a point at which the primary circuit is broken, so as to correspondingly affect the secondary circuit and produce the necessary interruptions as customary in induction coil apparatus. The primary circuit may be traced through one of the wires in the cable 7 to rod 11, through rod 11 to the primary winding, through the primary winding to the vibrating armature 20, thence to the stationary contact 21, then through rod 12 and out through the other wire of the cable 7 to the battery (not shown). The secondary circuit may be traced through one of the wires of the cable 7 to rod 11, thence through the secondary winding to the spring contact 18, screw 19, electrode 5, thence through the part to which the apparatus is being applied and from the other electrode (not shown) back through one of the wires of the conducting cable.

25 is the sleeve for moving longitudinally on the coil 6, and thus varying the induced field in the secondary circuit. In the position shown, the field is at its weakest. The projecting member 26 affords a groove for guiding the sleeve 25 in its longitudinal movement, the rod 10 resting in this groove.

27 is a rack carried by the sleeve 25.

28 is a pinion pivotally carried by the casing having a portion projecting from the casing for digital engagement. This pinion on the interior engages the teeth of the rack 27 and thus affords means for longitudinally moving the sleeve 25.

29 is a scale member carried by the sleeve back of an opening in the plate 30, carried by the casing. This scale carries a series of numerals, for instance from 1 to 10, indicating that the secondary circuit will be increased as the sleeve is moved downward in the casing by rotation of the pinion 28 (in a clock-wise direction, as viewed in Fig. 2). The adjustment of this sleeve by the rotation of the pinion may be readily affected, as the implement is grasped in the hand, by a simple movement of the thumb, either slowly, gradually or rapidly as may be desired, so that the current may be increased or diminished accordingly.

31 is a recess cut in the head 9 of the spool or induction frame of a size slightly larger than the pinion 28, so that when the cap 3 is removed and the screws 16 and 17 unseated from the head 9, the spool may be withdrawn from the casing without interfering with the pinion 28, the recess 31 being in line with the pinion.

The advantages of this construction are its simplicity and strength, together with its ease of adjustment and the facility for taking the apparatus apart for repairs or such investigation as may be necessary.

What we claim is:

1. In a device of the character described, the combination of a casing provided with a suitable terminal, of an induction coil mounted therein, an adjusting sleeve for the coil, a rack carried thereby, and a pinion pivotally carried by the casing engaging said rack and accessible from the exterior of said casing, for digital operation.

2. In a device of the character described, the combination of a casing having a suitable electrode, an induction coil mounted in said casing, a frame therefor including a longitudinally arranged rod, a sleeve for said coil, a projecting member having a groove co-operating with said rod, and a scale carried by said sleeve, said casing having an opening for permitting the readings of said scale to be seen successively.

3. In a device of the character described, the combination of a cylindrical insulating casing having a removable cap at one end and a passage for the conductor cable at the other end, an induction coil frame removably mounted in said casing and including a pair of longitudinal rods, a cross bar connecting said rods at one end, and provided with a perforation for the passage of the conductors, a spring arm carried by the other end of said frame, and an electrode carried by said removable cap adapted to form an electrical connection with said frame when said cap is in place.

4. In a device of the character described, a casing, an induction coil removably secured therein, a screw threaded removable cap at each end, an electrode connected to one cap, the other cap having an opening for the conductors, and a bridging block affording a rigid connection for the conductors inside said casing.

5. In a device of the character described, a casing, an induction coil having two heads, means for removably mounting the same in said casing, an adjusting member for said coil, an operating member carried by said casing for engagement therewith, one head of said coil having a recess for permitting the passage of said head by said operating member when said coil is withdrawn from said casing.

6. In a device of the character described, a core, coil windings thereon, two heads for said coil, two rods connecting said heads and forming part of the electric circuit, a vibrator carried by one of said heads and connected to one of said coil windings, a spring contact carried by one of said heads connected to the other winding and means on the outer surface of the other head for electric connection to a source of current.

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