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HIGH FREQUENCY APPARATUS.

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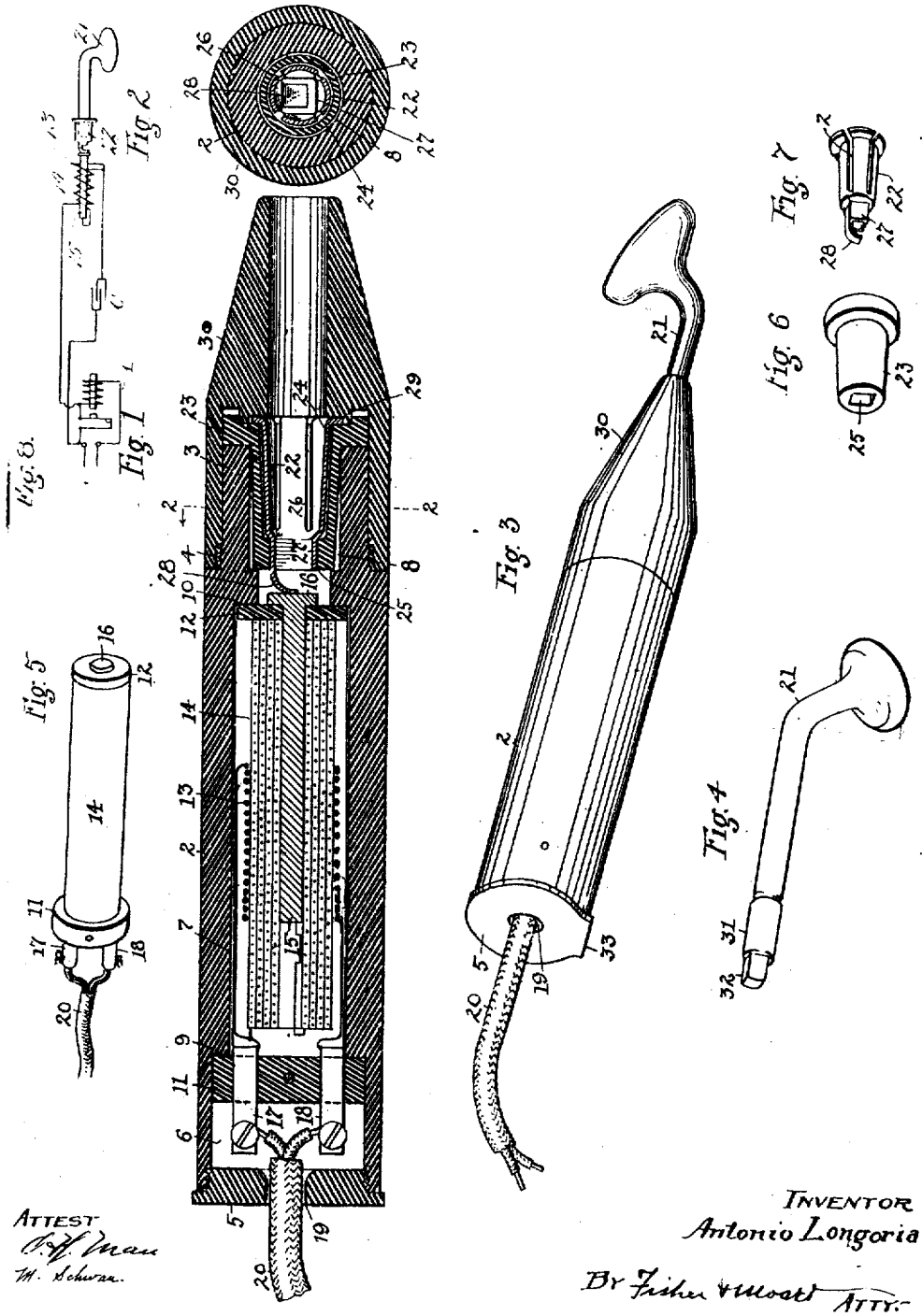
1,266,287.

Patented May 14, 1918.



ATTEST

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ANTONIO LONGORIA, OF CLEVELAND, OHIO, ASSIGNOR TO THE ROGERS ELECTRIC LABORATORIES COMPANY, OF CLEVELAND, OHIO, A CORPORATION.

HIGH-FREQUENCY APPARATUS.

1,266,287. Specification of Letters Patent. Patented May 14, 1918.

Application filed August 10, 1914. Serial No. 856,009.

To all whom it may concern:

Be it known that ANTONIO LONGORIA, a subject of Spain, residing at Cleveland, in the county of Cuyahoga and State of Ohio, has invented certain new and useful Improvements in High-Frequency Apparatus, of which the following is a specification.

This invention relates to improvements in high-frequency apparatus for therapeutical purposes, and the improvements consist in a handle constructed to hold a transformer or high-frequency coil and an electrode in coöperating relations, all substantially as herein shown and described and more particularly pointed out in the claims.

The object of the invention is to provide a small cylindrical device adapted to be held in the hand during curative treatments, the application of the electric current to the patient being by an electrode removably mounted within one end of the device in separable electrical connection with a high-frequency coil which is also removably confined within the cylinder in axial alinement with the electrode. According to a common practice; the device is used with a condenser and a current interrupter in an electrical circuit receiving its current from ordinary community service lines, and the coil employed is wound and electrically connected substantially as shown in the Letters Patent to G. D. Rogers, assignor to The Rogers Electric Laboratories Company, of Cleveland, Ohio, No. 1,119,119, December 1, 1914. One form of condenser and current interrupter adapted to be used with the device is shown in my pending application, Serial Number 856,008, filed concurrently herewith on August 10, 1914.

In the accompanying drawings, Figure 1 is a longitudinal section centrally through the handle and its assembled parts, and Fig. 2 is a cross section on line 2—2, Fig. 1. Fig. 3 is a perspective view of the handle showing an electrode in place therein, and Fig. 4 is a side view of an electrode having a square contact end for use with the device. Figs. 5, 6 and 7 are perspective views of the transformer, bushing, and split sleeve, respectively.

Fig. 8 is a diagrammatic view of the invention electrically connected with a condenser and interrupter.

The device comprises a tubular handle in the form of a cylindrical body 2 made of suitable insulating material and having one end 3 reduced in diameter and screw-threaded externally at 4. The opposite end of the body is screw-threaded internally to receive a screw plug 5 for the large bore 6, and the central portion of the body has a smaller bore 7 which opens into a still smaller bore 8 within the reduced end 3. The said differential bores provide a set of shoulders 9 and 10 which seat the fiber or hard-rubber disk-shaped ends 11 and 12 of the transformer or high-frequency coil 14, and a metal core 15 is confined within said transformer with an enlarged contact head 16 projected outside of the end disk 12. Binding posts 17 and 18 are mounted upon the larger end disk 11 and electrically connected to the primary coil 13 of the transformer 14, and the screw plug 5 has a central opening 19 to accommodate the cable connections 20 leading to the binding posts. Removal of the screw plug 5 permits the transformer to be removed bodily without disconnecting any of the wires, and a separable electrical connection for the electrode 21 is provided by the contact head 16 and a separate spring-clamping sleeve and conductor 22 which is removably confined within a flanged bushing 23 of fiber or hard rubber. This bushing has a round flaring opening 24 terminating in a square opening 25 and the clamping sleeve 22 has a tapered split body 26 terminating in a square open end 27. A spring lip 28 on said extension is bent inwardly toward the axis to make contact with the core head 16 when the sleeve and bushing are both in place within the reduced end 3 of body 2 and especially when locked therein against rotation by the annular internal shoulder 29 of the relatively long tapered hose and projecting holder 30 which is screw-engaged with the screw-threaded reduced end 3. The electrode 21 is made usually of glass with a round stem which is provided with a metal cap for electrical contact purposes, and the split sleeve 22 will frictionally engage either a round cap, or a round cap 31 having a square end 32 as shown in Fig. 4. The latter form of electrode is my own conception and preferred and the sleeve 22 is constructed as described to grip the elec-

trode and hold it in place with good electrical contact between the parts and to co-act with the square end 32 to prevent the electrode from turning in the handle while in use. A straight edge 33 on the screw plug 5 prevents the handle from rolling or turning when laid down on its side.

The detachable nose or holder 30 and the removable sleeve 22 and bushing 23 permit convenient assembling and replacement of the parts without removing or disturbing the transformer in body 2, and the contacts can also be easily examined and kept in good condition.

This apparatus is used for therapeutical purposes by direct application to the body, externally or internally, and the casing or body 2 necessarily is of insulating material so that the user or holder of the instrument as it is grasped in the hand will not feel the shock of the high frequency current. The function, of course, is to apply the current to the body through the electrode, which transmits what may be regarded as the violet rays, and different electrodes are employed according to the treatment wanted.

The object of having metallic contact between the core and the electrode is the more effective transmission of the current and to avoid possible leakage which might creep out to the hand.

The primary and secondary windings of the transformer 14 are electrically connected as shown in the Letters Patent No. 1,119,119 hereinbefore referred to, that is, the terminals of the primary coil are connected to binding posts and the terminals of the secondary coil are connected to the metal core and one of the binding posts of the transformer.

In Fig. 8, I show one way of electrically connecting the device in a circuit containing an interrupter 1 and condenser C, but the invention is not limited to this mode of electrically connecting the parts.

What I claim is:

1. In a high-frequency apparatus, a tubular handle, a transformer having an end contact and a bushing removably seated opposite thereto within said handle, an electrode gripping sleeve removably seated within said bushing in contact relations with said end contact, and a nose portion for said handle to hold said bushing and sleeve in place, said nose portion of the handle having a central opening opposite the sleeve to receive an electrode.

2. In a high-frequency apparatus, a tubular handle, a transformer and an electrode gripping device confined within said handle in electrically connected relations, said device having locking means to prevent rotation of an electrode when inserted within said handle.

3. In a high-frequency apparatus, the combination of an electrode having an angular end, with a tubular handle, a transformer, a gripping sleeve for said electrode confined within said handle, and angular portions on said sleeve to engage the angular end of said electrode to prevent the turning of the electrode within said handle.

4. In a high-frequency apparatus, an electrode having a stem provided with a metal cap with a flat side, in combination with a handle having a split metal sleeve provided with a flat-sided socket portion to receive said metal cap.

5. In a high-frequency apparatus, a tubular body having a removable bushing provided with a square opening, and a spring metal clamping sleeve having a square extremity removably seated in said square opening.

6. In a high-frequency apparatus, a tubular body, and an electrode clamping sleeve removably seated within one end of said body having a spring contact lip, in combination with a transformer removably seated within the opposite end of said body having an electrical contact engaged with said lip.

7. In a high-frequency apparatus, a handle comprising a tubular body and a high-frequency transformer confined therein having a core connected with its secondary coil, and an electrode-clamping sleeve removably seated within the center of said body in advance of and in permanent contact with said transformer core.

8. In a high-frequency apparatus, a handle member having a longitudinal bore, a transformer having a core connected with its secondary coil and a combined clamping sleeve and conductor for an electrode removably seated in said bore and in contact with said core.

9. In a high-frequency apparatus, a handle having a central bore, a transformer therein having a core connected with its secondary coil and a bushing removably seated within said bore in advance of said transformer and an electrode holding sleeve mounted within said bushing having spring contact with said core.

10. In a high-frequency apparatus, a tubular handle, a transformer having a central core connected with its secondary coil, and a split metal sleeve mounted in conducting relation with said core in said handle, a bushing about said sleeve and a holder on the end of said handle to removably secure said parts in place within the handle.

11. In a high-frequency apparatus, a tubular handle, a transformer having a central core connected with its secondary coil and a clamping conducting sleeve member in contact with said core, and a removable holder on the end of said handle to maintain said transformer and sleeve in electri-

cal engagement, in combination with an electrode having a stem projected into said sleeve.

12. In a high-frequency apparatus, a handle having a differential bore, a transformer having a core connected with its secondary coil and a combined electrode gripping sleeve and current conductor removably confined within said bore, in contact with said core and a removably secured nose portion on said handle having a central bore in axial alinement with and open to said gripping sleeve.

13. In a high-frequency apparatus, a tubular handle having a nose portion provided with an axial bore adapted to receive an electrode, a spring clamping sleeve seated at the inner end of said bore and constructed to grip and hold said electrode and having a spring lip, and a transformer removably confined within said handle having a core connected with its secondary coil and in contact with said spring lip.

14. In a high-frequency apparatus, a tubular handle having a removable nose portion provided with an axial bore, a non-conducting bushing and a split metal sleeve therein removably held in place by said nose portion, a transformer removably confined within said handle having an end conducting contact with said sleeve and means at the opposite end of said handle from said nose portion to confine said transformer within the handle.

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

ANTONIO LONGORIA.

Witnesses:
R. B. Moser,
F. J. Greer.