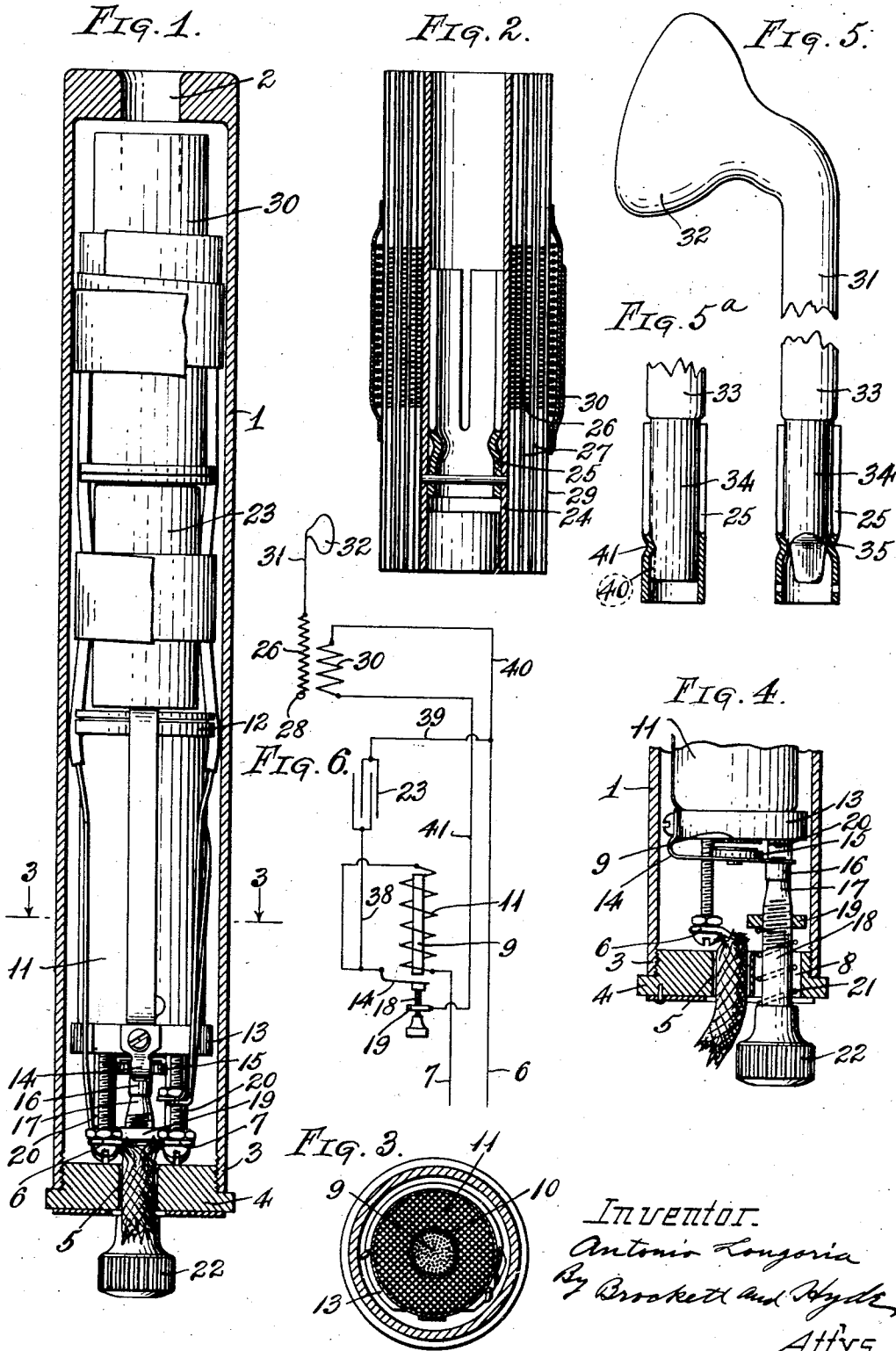


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HIGH FREQUENCY APPARATUS.  
APPLICATION FILED JUNE 2, 1916.

1,302,391.

Patented Apr. 29, 1919.



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# UNITED STATES PATENT OFFICE.

ANTONIO LONGORIA, OF CLEVELAND, OHIO, ASSIGNOR TO THE STERLING ELECTRICAL CORPORATION COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## HIGH-FREQUENCY APPARATUS.

1,302,391.

Specification of Letters Patent.

Patented Apr. 29, 1919.

Application filed June 2, 1916. Serial No. 101,299.

*To all whom it may concern:*

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

This invention relates to electrical apparatus, and more particularly to apparatus for the production of high tension electrical discharges for therapeutical use, although capable of application for other purposes. The objects of the invention are to generally simplify and improve the construction and arrangement of the apparatus and also to improve the circuits so as to secure a more even and effective discharge with no disagreeable shock to the user. Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

The invention comprises the construction and arrangement of parts and the system of circuits and devices hereinafter described and claimed.

In the drawings Figure 1 is a longitudinal sectional view of the device; Fig. 2 is a similar section of the high tension device; Fig. 3 is a cross section on the line 3—3 Fig. 1; Fig. 4 is a detail sectional view of the interrupter; Fig. 5 is a view partly in elevation and partly in section of the electrode and its socket; Fig. 5\* is a detail view of another form of socket; and Fig. 6 is a diagrammatic view of the circuits.

Referring to the drawings, 1 represents the casing which is preferably made of insulating material and is provided with an electrode opening 2 in one end and an internally threaded portion 3 at the other to receive a cap or plug 4 having an opening 5 for the lead wires 6 and 7. This plug is also provided with an opening 8 at one side of its center to receive a combined adjusting screw and contact to be described.

The working parts are all inclosed in the casing and consist of an interrupter, a condenser, and a high tension device all properly wired and connected and now to be described.

The interrupter comprises a core 9 of soft

iron wires surrounded by a tube 10 carrying a winding 11. Secured to the tube 10 are end pieces 12 and 13 the latter carrying the make and break device.

Secured to the end piece 13 is an armature spring 14 bent to extend over the core 9 and carrying a button 15 in position to cooperate with the core 9. It is also provided with a contact piece 16 adapted to engage the contact portion 17 of the contact and adjusting screw 18, which is threaded into a bridge 19 mounted on screws 20 secured to the end piece 13 as shown. A coiled spring 21 is arranged upon the shank of this screw 18 and engages between the bridge and a head 22 and serves to prevent accidental movement of the screw. The screw 18 projects through the opening 8 in the cap or plug.

The condenser 23 is of any approved type and since its structure has no particular bearing on the other mechanism it will not be described or shown in detail. It is shown however, in a diagrammatic way.

In alinement with the condenser and the interrupter coil and within the casing is the high tension device comprising an inner tubular member 24 containing the split electrode socket 25 and has wound about it the high tension coil 26. This coil has several layers wound one upon the other, the layers near the outside of the coil being spaced farther apart by greater thickness of insulation since it is at points near the periphery that the greatest tendency to puncture the insulation occurs. Any suitable insulating strips may be used but I have shown the device provided with paper strips 27, the strips being thin and increased in number to give the proper insulation, it being obviously impossible to properly indicate the layers in a drawing. The inner end of the high tension coil is connected to the electrode socket 25 and the outer end is turned upon itself to form a return loop 28 (Fig. 6) whose function is to prevent electrical discharge at the free end of the secondary winding. This loop is one complete turn of the wire coil, the free end being brought around and soldered or brazed to the body of the wire at the joint, the whole coil being well insulated to prevent current leakage. Upon the out-

side of an insulating strip 29 surrounding the complete high tension coil is a low tension coil 30 preferably comprising a single layer or winding and co-extensive with the layers of the high tension coil.

The electrode itself may be of any suitable form but as shown comprises a tubular portion 31, an enlarged head 32, and a base 33 provided with a shank 34 adapted to engage the lugs 35 of socket 25 to be frictionally held therein. In Fig. 5 the electrode has a squared end portion, while in Fig. 5<sup>a</sup> its end portion or shank 34 is round and provided in its side with a longitudinal groove 40 to receive a teat or projection 41 on the socket. Both arrangements prevent rotation of the electrode in its socket.

What I claim is:—

1. In a high frequency device, a primary winding, means for producing electrical impulses therein, a secondary winding, means for connecting an electrode to one end of said secondary winding, the other end of said secondary coil being free of connection to any other part, and means for preventing

electrical discharge at the free end of said secondary winding.

2. In a high frequency device, a primary winding, means for producing electrical oscillations in the primary winding, a secondary winding, means for connecting an electrode to one end of said secondary winding, and a loop formed by the conductor at the other end of said secondary winding.

3. In a high frequency device, a cylindrical casing, an interrupter, a condenser, and a high tension device inclosed in said casing and arranged end to end and electrically connected to each other, said casing at one end having an opening through which an electrode may be coupled to said high tension device, and at its opposite end having an opening to receive an adjusting device for said interrupter.

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

ANTONIO LONGORIA.

Witnesses:

ELBERT L. HYDE,  
D. TOZER.