

No. 771,700.

PATENTED OCT. 4, 1904.

H. BOEHM & F. H. WAPPLER.
VACUUM TUBE.

APPLICATION FILED JUNE 24, 1904.

NO MODEL.

FIG. 2

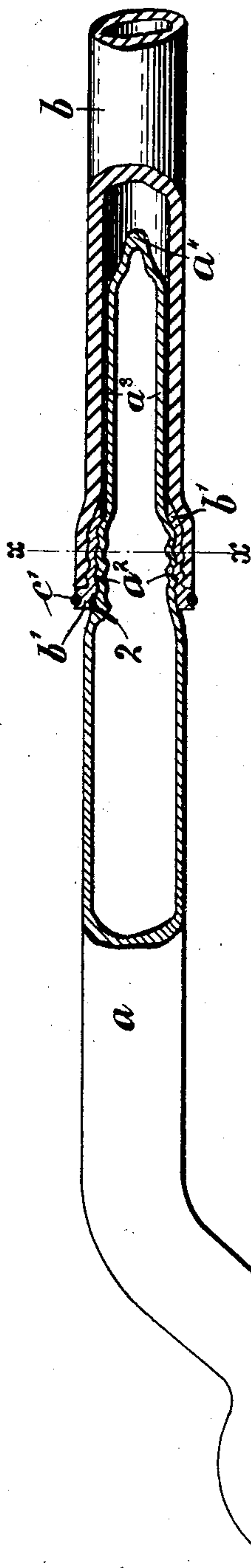


FIG. 1

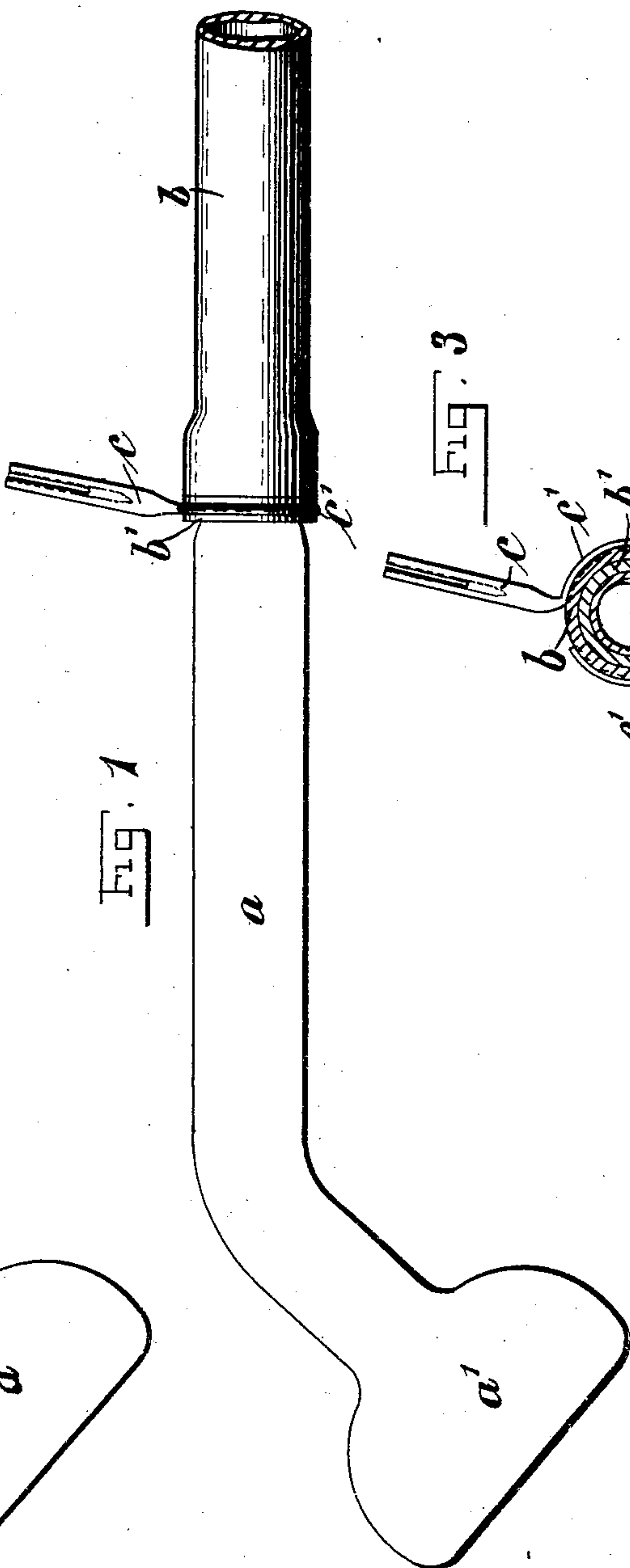
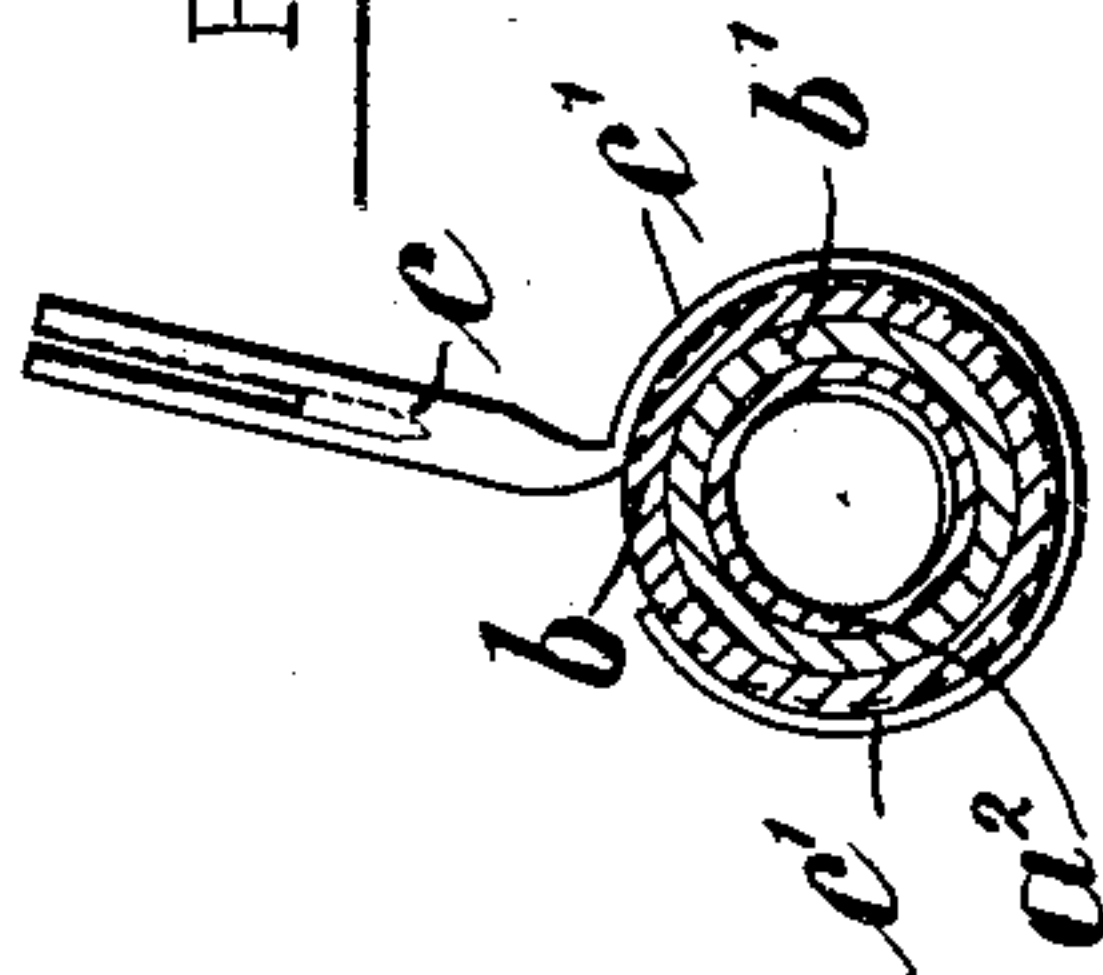


FIG. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

HERMAN BOEHM AND FREDERICK H. WAPPLER, OF NEW YORK, N. Y.,
ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO SAID WAPPLER
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VACUUM-TUBE.

SPECIFICATION forming part of Letters Patent No. 771,700, dated October 4, 1904.

Application filed June 24, 1904. Serial No. 213,924. (No model.)

To all whom it may concern:

Be it known that we, HERMAN BOEHM and FREDERICK H. WAPPLER, citizens of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented an Improvement in Vacuum-Tubes, of which the following is a specification.

Our invention relates to an improved vacuum-electrode for therapeutic purposes; and the same is an improvement upon the device shown and described in Letters Patent granted to R. H. Wappler October 8, 1901, No. 684,326, with the object of improving the electrode and the handle therefor in the matter of the coacting, connecting, and supporting devices. Our present improvement, like the device of said patent, is a vacuum-electrode, of vitreous material, employed in electrotherapeutics for effecting electrical asepsis and stimulation by passing high-tension currents through said electrode, and thereby decomposing the air surrounding the same into ozone, which in proximity to the diseased surface quickly oxidizes all toxic matter present therein.

In carrying out our invention the sealed end of the vacuum-electrode is of reduced area from the major portion of the electrode-tube, and in a portion of intermediate diameter there is a screw-thread pressed into the glass or vitreous material. The tubular handle is to be of any suitable insulating material—such, for instance, as hard rubber—having an interiorly-threaded tubular metal end, preferably of slightly larger diameter than the main portion and into which the threaded portion of the vacuum-electrode screws with the reduced end farther within the tubular handle. This handle is adapted for interchangeable vacuum-electrodes—that is, vacuum-electrodes where the bulb or free ends are of different shapes, according to the use to which the vacuum-electrodes are to be put. A unipolar terminal is sealed in the vacuum-electrode close to the threaded portion, and the part thereof that projects is in the sur-

face glass and contacts with the tubular metal end. An adjacent terminal support is secured to the said tubular metal end.

In the drawings, Figure 1 is an elevation representing our improvement. Fig. 2 is a longitudinal section and partial elevation of the same, and Fig. 3 is a cross-section and partial elevation at $x x$ of Fig. 2.

The electrode comprises two essential parts—a part of vitreous material containing a vacuum, and a handle. The part of vitreous material comprises a tube a , of glass, a bulb end a' , blown to the desired form or shape, according to the disease to be treated. The same also includes a reduced threaded portion a^2 and a further reduced parallel-sided part a^3 and sealed end a^4 . The threaded part a^2 is pressed into the glass, and between the same in its diameter and the tube of glass there is a tapering portion, and between the threaded portion a^2 and the further reduced parallel-sided portion a^3 there is also a tapering portion, and 2 represents a sealed-in unipolar terminal. The wire forming this terminal projects within the vacuum-tube and also extends outside, where the same is bent over and partially embedded in the surface glass.

b represents a handle, of suitable insulating material, preferably hard rubber, although we do not limit ourselves in this respect, as any suitable insulating material may be employed. We have shown the handle in the drawings as broken off at one end, because the same may be of any desired length. One end of this insulating-material handle b is preferably slightly enlarged, as shown in the drawings, and placed therein is an interiorly-threaded tubular metal end b' , the outer surface of which at one end is preferably of the diameter of the enlarged portion of the tubular handle, extends beyond the insulating material of the handle, and is provided with a circumferential groove.

The interior diameter of the interiorly-threaded tubular metal end is slightly in excess of the interior diameter of the main tu-

bular handle, the threaded portion agreeing with the threaded portion a^2 of the part of vitreous material. The parallel-sided part of vitreous material a^3 is of slightly less diameter than the interior diameter of the tubular handle. Consequently when the part of vitreous material is brought into relation with the handle the part a^3 is freely received into the tubular handle and the threaded portion engages the threaded portion of the tubular metal end b' , the parts screwing together, so that the inclined portions at the respective ends of the threaded portion engage conforming inclined portions at the outer end of the tubular metal end b' and at its inner end, the sealed-in unipolar terminal 2 at the same time forming metallic and electric contact metal to metal with the end of the tubular metal end b' . The parts are thus connected quite firmly and rigidly for the uses to which the electrode is to be put and so firmly as to prevent accidental separation.

In the groove surrounding the end of the tubular metal end b' is a wire ring c' and adjustable terminal support c , the terminal support being adapted to receive one end of a lead-wire or electric conductor. This adjustable terminal and the wire ring connected therewith may be turned around upon the tubular metal end b' to be brought into any desired position where the same will be most out of the way of the operator.

We do not herein limit ourselves to the employment of an interiorly-threaded tubular metal end b' nor to the screw-threaded portion a^2 pressed into the tube of vitreous material, as any well-known means of removably connecting these parts so as to prevent accidental separation may be employed instead of the precise manner shown.

In the present case, as in the former patent, the high-tension currents that are necessary to operate the vacuum-electrode may be produced in any desired manner, and they are in the present case produced in substantially the same manner as is described in the aforesaid patent, in connection with which a Ruhmkorff coil may be employed, one terminal of the secondary being connected electrically to a plate upon which the patient to be treated is placed and the other terminals of the secondary insulated. The current is then complete from the plate upon which the patient is placed by the patient, the vacuum-electrode, and to the insulated terminal of the secondary through the air, and in treating the patient the operator grasps the handle and employing the vitreous-material electrode with the desired form of end moves the same over the diseased parts and is not hampered by wires or electrical connections.

We claim as our invention—

1. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in di-

ameter, a handle of insulating material adapted to receive said reduced end, and means for connecting the parts to prevent accidental separation.

2. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter, a sealed-in unipolar terminal adjacent to this end, a handle of insulating material having a tubular metal end received within one end of the handle, and said parts adapted to receive the reduced end of the electrode of vitreous material, and means for connecting the parts to prevent accidental separation.

3. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter, a sealed-in unipolar terminal adjacent to this end, a handle of insulating material having a tubular metal end received within one end of the handle and said parts adapted to receive the reduced end of the electrode of vitreous material, means for connecting the parts to prevent accidental separation, and means for connecting one end of a lead wire to the tubular metal end.

4. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter and sealed and with an adjacent part of intermediate diameter having a screw-thread pressed therein, a handle of insulating material having in one end an interiorly-threaded tubular metal end, said parts adapted to receive the reduced end of the part of vitreous material so that the screw-threads interlock and the reduced end passes farther within the handle to hold the parts in their connected relation and prevent accidental separation.

5. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter and sealed and with an adjacent part of intermediate diameter having a screw-thread pressed therein, a sealed-in unipolar terminal, a handle of insulating material having in one end an interiorly-threaded tubular metal end, said parts adapted to receive the reduced end of the part of vitreous material so that the screw-threads interlock and the reduced end passes farther within the handle to hold the parts in their connected relation and prevent accidental separation, said unipolar terminal making metallic and electrical contact with the inner surface of the tubular metal end when the parts are connected.

6. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter and sealed and with an adjacent part of intermediate diameter having a screw-thread pressed therein, a sealed-in unipolar terminal, a handle of insulating material having in one end an interiorly-threaded tubular

metal end, said parts adapted to receive the reduced end of the part of vitreous material so that the screw-threads interlock and the reduced end passes farther within the handle 5 to hold the parts in their connected relation and prevent accidental separation, said unipolar terminal making metallic and electrical contact with the inner surface of the tubular metal end when the parts are connected, and 10 a movable device connected to the tubular metal end of the handle and to which a lead-wire may be connected.

7. An electrode for therapeutic purposes, comprising a part of vitreous material containing a vacuum with one end reduced in diameter and sealed and with an adjacent part of intermediate diameter having a screw-thread pressed therein, a sealed-in unipolar terminal, a handle of insulating material having in one end an interiorly-threaded tubular metal end, said parts adapted to receive the 20

reduced end of the part of vitreous material so that the screw-threads interlock and the reduced end passes farther within the handle 25 to hold the parts in their connected relation and prevent accidental separation, said unipolar terminal making metallic and electrical contact with the inner surface of the tubular metal end when the parts are connected, and a wire ring surrounding the exposed portion 30 of the tubular metal end in an exterior groove thereof, and a terminal support connected to one end of the wire ring and adapted to receive one end of a lead-wire, substantially as set forth. 35

Signed by us this 18th day of June, 1904.

HERMAN BOEHM.

FREDERICK H. WAPPLER.

Witnesses:

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S. T. HAVILAND.