(No Model.)

G. G. DUKE.

ELECTROTHERAPEUTIC APPARATUS.

No. 603,815. Patented May 10, 1898.

Fig. 1

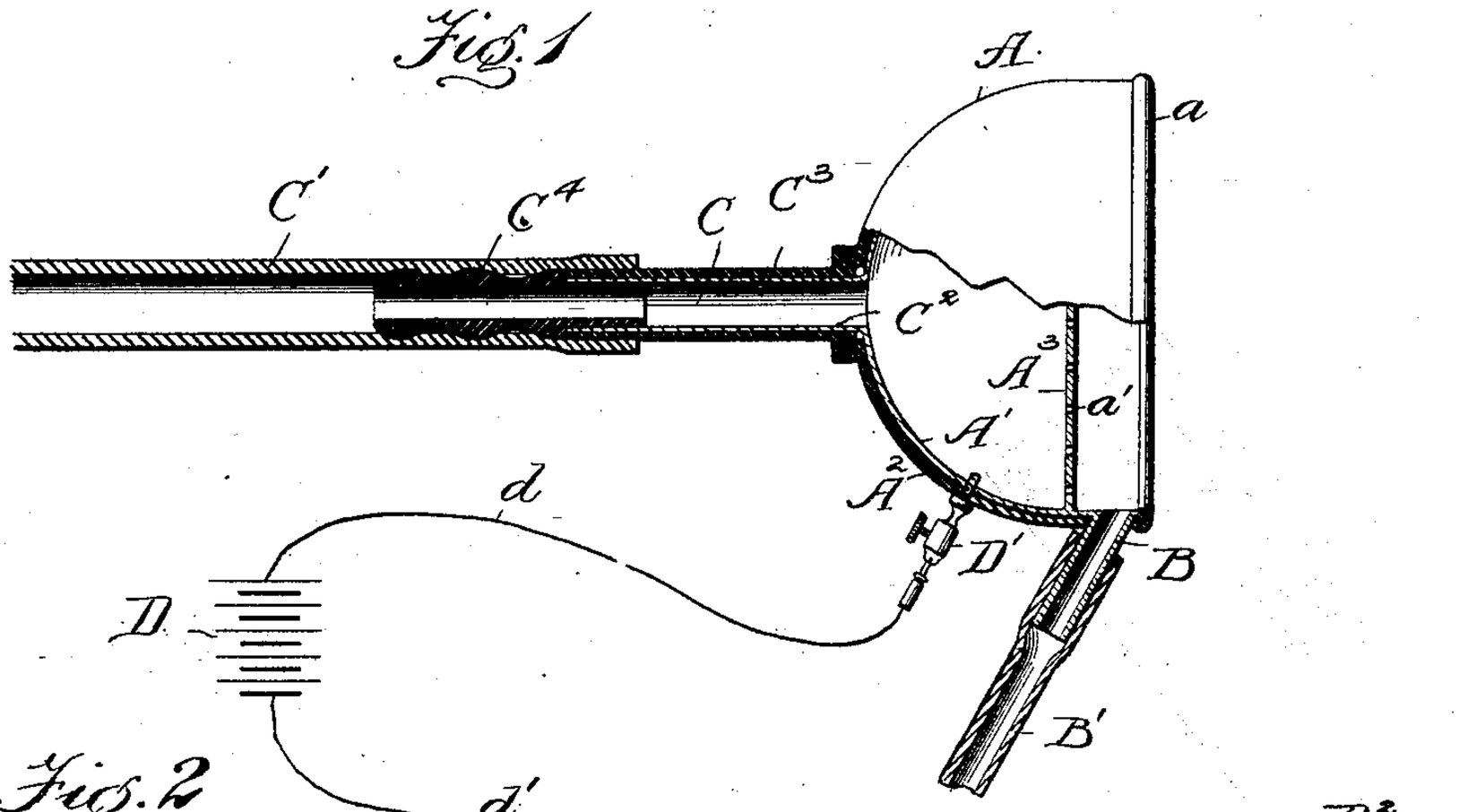


Fig. 2

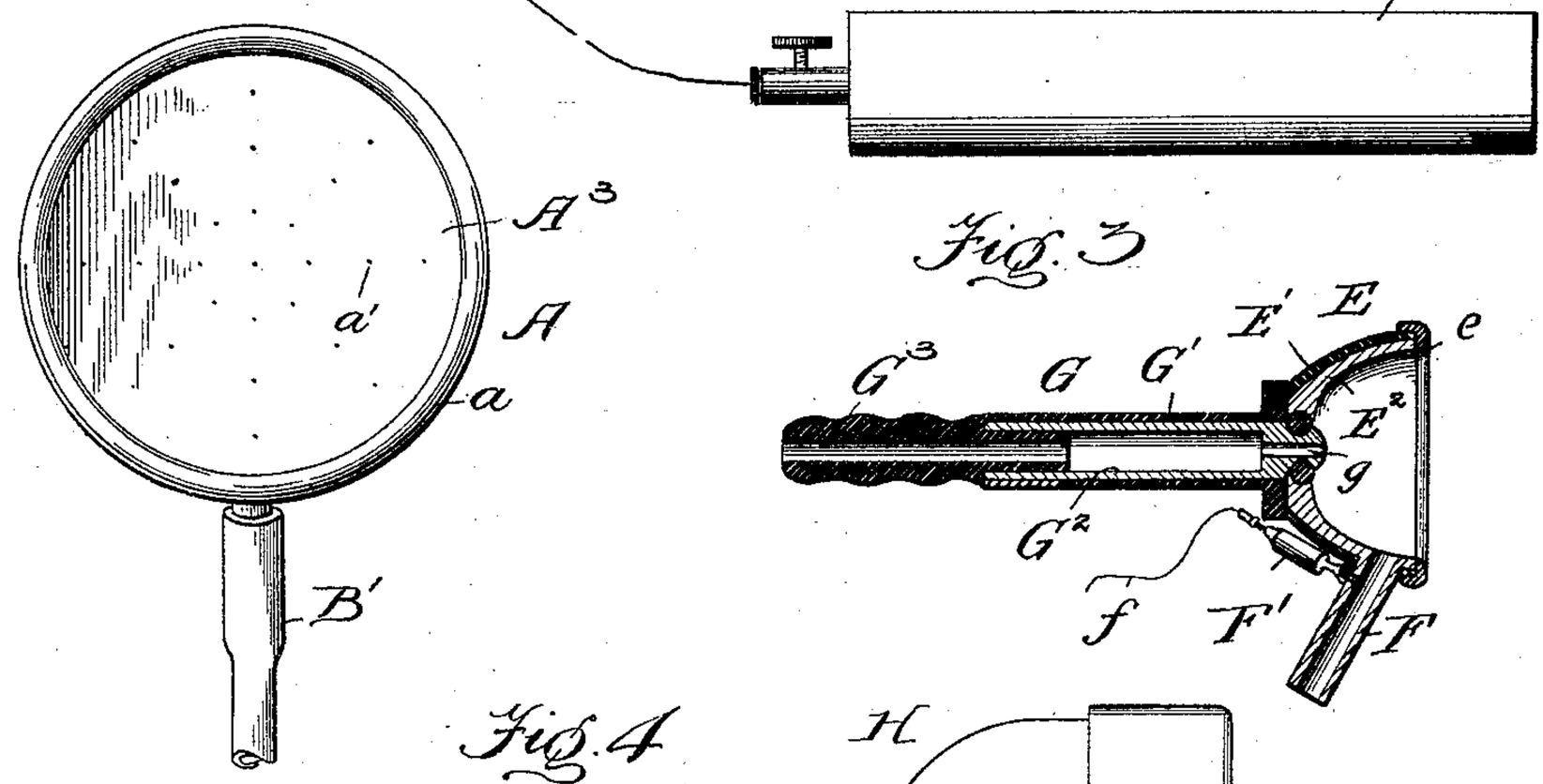
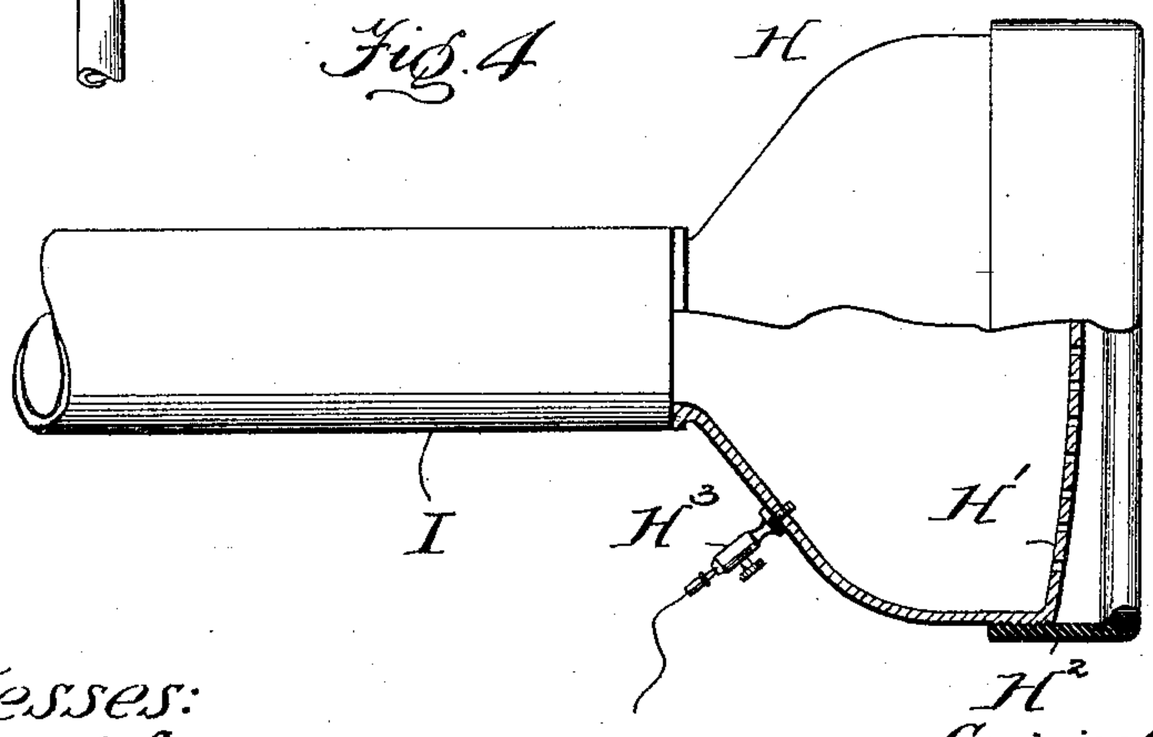


Fig. 3

Fig. 4



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UNITED STATES PATENT OFFICE.

GERVAISE GRAHAM DUKE, OF CHICAGO, ILLINOIS.

ELECTROTHERAPEUTIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 603,815, dated May 10, 1898.

Application filed December 6, 1897. Serial No. 660,857. (No model.)

To all whom it may concern:

Be it known that I, GERVAISE GRAHAM DUKE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrotherapeutic Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in electrotherapeutic apparatus designed for applying electricity to the body of a person through the medium of a jet or spray of liquid.

The invention consists generally in a spray or jet with a metallic outlet or nozzle which is electrically connected with one terminal of a primary battery or other source of electrical supply, the opposite terminal of such battery being provided with an electrode adapted for contact with some portion of the body of the person being treated, whereby a circuit is completed through the body and the jet or jets of liquid directed against the same.

The invention embraces also an improved construction in a spraying apparatus adapted for therapeutic uses.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings which illustrate certain practical forms in which my invention may be embodied, Figure 1 is a view, partly in elevation and partly in section, of a spray-applying device constructed in accordance with my invention. Fig. 2 is a bottom plan view of the same. Fig. 3 is a central longitudinal section of another form of spray device having the form of a depurator. Fig. 4 is a view, partly in section and partly in elevation, of an ordinary rose-spray nozzle constructed in accordance with my invention.

First describing the construction shown in Figs. 1 and 2, A represents a cup-shaped casing having a perforated wall or diaphragm A^3 and a marginal flange *a*, projecting beyond said wall or diaphragm.

B designates an outlet or discharge tube leading from one side of the casing, adjacent to the marginal flange *a* thereof and exterior to the diaphragm A′. Attached to the said tube is a long rubber tube B′, forming an extension thereof.

C designates an inlet-tube attached to the casing A, and to which is connected a rubber tube C′, leading from the source of liquid-supply, which will usually be a receptacle elevated to give the required force or head. Said casing A is composed of an inner wall of metal A′, to which the electrical apparatus will be connected, as hereinafter to be described, and an outer covering-wall of insulating material A^2, such as hard rubber or the like. The inlet-tube C will also be covered by a tubular covering C^3, of hard rubber or other insulating material. Said tube is herein shown as provided at its outer end with a short detachable tube-section C^4, which fits tightly within the interior of the inlet-tube C, and is provided on its outer surface with corrugations by which the pipe C′ may be more certainly held in place. Said inlet-tube C serves as a handle by which the device may be manipulated in the usual manner, and for this purpose is provided with an insulating-covering, as described.

The diaphragm A′ is provided with a plurality of minute jet-openings *a*′, by means of which the liquid is applied to the surface to be treated in the form of a plurality of small jets. The outer edge of the marginal flange *a* is covered by insulating material, herein shown as formed by the marginal part of the covering-layer A^2, which is extended around said outer edge, as shown. The insulating-layer *a*′ prevents contact of the metallic part of the casing with the body when said casing is placed against the same.

Referring now to the electrical part of the apparatus, D indicates a primary battery, one terminal of which is connected by a conductor *d* with a binding-post D′, which is attached to the casing A and has electrical connection with the inner metallic lining thereof. The other terminal of said battery D is connected by means of a conductor *d*′ with an electrode D^2, shown as having the form of a handpiece, but which may be a sponge or of any other common form which is designed to be placed in contact with the body of the person being treated.

The use of the device may be briefly stated as follows: The casing A having been con-

nected to the battery D, as described, and said casing having been applied to the part of the body to be treated water is supplied to afford jets of liquid, and the electrode D^2 of the form herein shown or other form will be brought into contact with the body of the person by grasping the handpiece or otherwise, whereby a circuit will be established from the battery to the casing and from the liquid therein in the form of spray to the body of the person being treated, thence through the electrode D^2 to the other terminal of the battery D.

In Fig. 3 my invention is shown as applied to a form of depurator described in Letters Patent of the United States granted to Ellick H. Gollings, No. 517,274, on the 27th day of March, 1894. In said figure, E designates the casing, which consists of an outer insulated wall E′ and an inner metallic lining E^2 and is provided with a marginal insulating-ring *e*, which, as herein shown, is made detachable and of hard rubber or like insulating material. F designates an outlet-tube formed upon or made a part of the inner lining E^2 of the casing. G designates the inlet-tube, which consists of an outer insulating-covering G′ and an inner metallic tube G^2, which is in communication at its inner end with the interior of the casing E through a relatively small discharge-opening *g*, which, as herein shown, opens centrally into said chamber of said casing. Said outlet-tube G is also provided with a detachable corrugated tube-section designed for detachment of a flexible or other tube which leads from the source of liquid-supply.

The parts thus far described are substantially like that of the prior patent above referred to. The electrical connection with the metallic interior wall E^2 of the casing of said construction is provided through the medium of a binding-post F′, which is mounted upon and has electrical connection with the tube F, which latter, as above stated, is attached to said inner lining E^2 of the casing. Said binding-post is connected by a wire *f* with one terminal of the primary battery or other source of current-supply, while the circuit will be completed through the jet from the outlet-tube and the body of the patient in the manner described in connection with Figs. 1 and 2.

In Fig. 4 I have shown my invention as applied to an ordinary rose-spray nozzle. In said figure, H designates the head or casing of the nozzle, which is provided at one end with a flexible rubber supply-tube I, connected with any suitable source of liquid-supply. The outer wall H′ of said head or casing is perforated in the usual manner, so that the liquid is forced therethrough in small jets. The form of device shown in this figure is not designed to act as a depurator like that of the previous figures, but to be employed merely to throw the liquid against the skin in small streams or jets in the ordinary manner. The nozzle or outlet end of said spray-nozzle will therefore be held at some distance from the surface being treated; but in order to prevent the possibility of contact of a person's body with the metallic portion of the nozzle said outer end of the head is provided with an annular ring of insulating material H^2, which, as herein shown, is interiorly screw-threaded to have screw-threaded engagement with exterior screw-threads on the outer walls of said casing or head H. The electrical connection with the metallic portion of the head H is provided through the medium of a binding-screw H^3, attached to the nozzle, and the operation of said device is like that stated in the description of the previously-described devices, the rubber tube I being grasped by the hand in manipulation of the nozzle and affording insulation between the metallic nozzle and the hand which grasps the tube.

So far as the broad idea of the feature of applying an electrical current to the body through the medium of a metallic nozzle adapted to throw a stream or jets of liquid against the body is concerned, I do not wish to be limited to the particular forms of spray device herein shown, as such forms may be varied, and the invention may be applied to stationary forms of said jet devices as well as to the portable forms thereof herein shown and illustrated. The spray-applying nozzle (shown in Fig. 1) is, however, in itself novel and is herein claimed as part of my invention.

I claim as my invention—

1. The combination of an open-ended metallic casing provided with a jet orifice or orifices and with a marginal flange of insulating material, an outlet-tube leading from said casing inside of said flange and a primary battery or other source of electrical supply, one terminal of which is electrically connected with said metallic casing and the other terminal of which is provided with an electrode.

2. The combination with a metallic casing provided with a perforated diaphragm and an insulated marginal flange, an outlet-passage opening from said casing outside of said diaphragm, and a primary battery or other source of electrical supply, one terminal of which is connected with said metallic casing and the other terminal of which is provided with an electrode.

3. An open-ended casing provided adjacent to its open end with a perforated diaphragm, with an inlet-tube opening into said receptacle behind said diaphragm, and with an outlet-tube leading therefrom between said diaphragm and the outer margin of the casing.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 3d day of December, A. D. 1897.

GERVAISE GRAHAM DUKE.

Witnesses:

C. CLARENCE POOLE,

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