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May 25, 1926.

M. SPETER

1,585,795

ELECTROTHERAPEUTIC APPARATUS

Filed Nov. 22, 1922

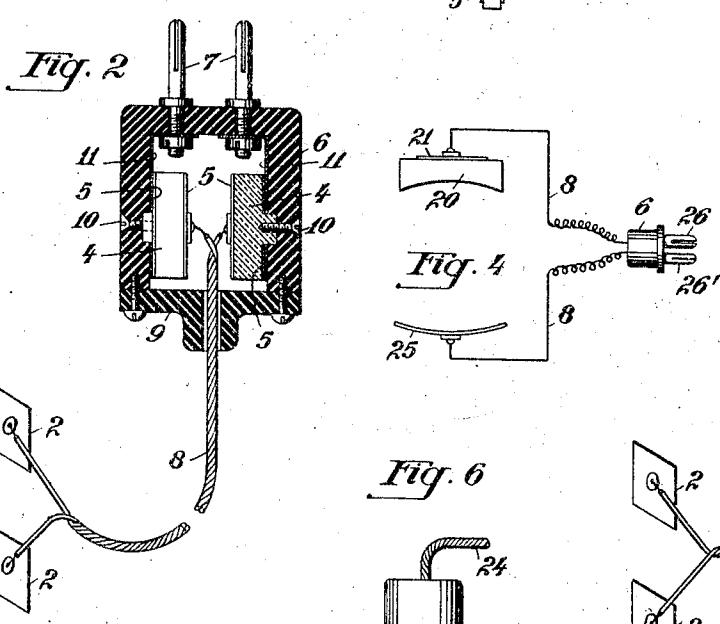
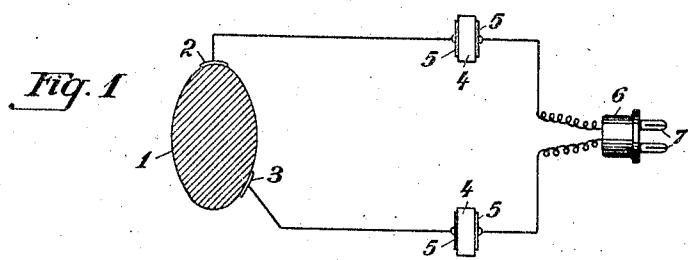


Fig. 3

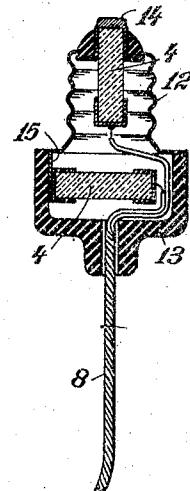


Fig. 6

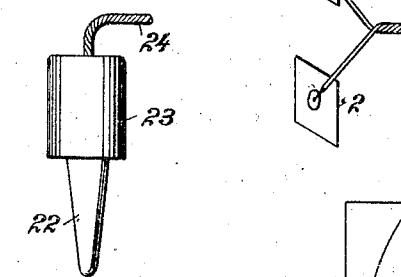


Fig. 5

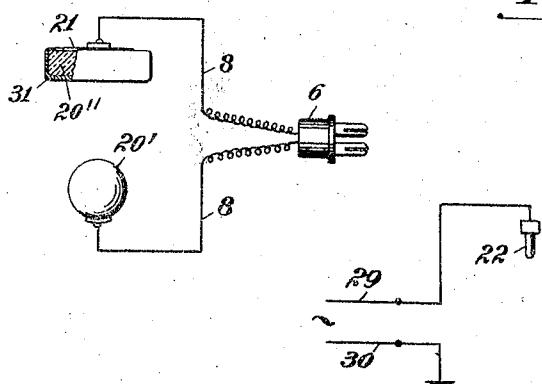
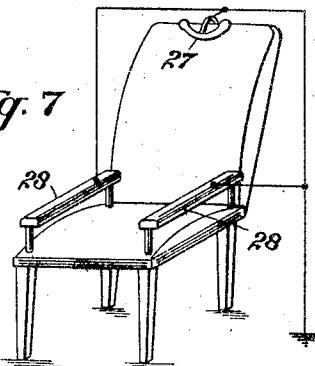


Fig. 7



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Patented May 25, 1926.

1,585,795

UNITED STATES PATENT OFFICE.

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ELECTROTHERAPEUTIC APPARATUS.

Application filed November 22, 1922. Serial No. 602,664.

This invention relates to improvements in electro-therapeutic apparatus for treating the human body with the aid of electricity which can be derived from any existing electric supply mains such as an electric light or power circuit.

The object of the present invention is to improve the effect of the electric current applied by the electrodes to the human body. This is accomplished by connecting one or more solid bodies consisting of preferably mineral substances producing the effect of so called electric semi-conductors, which as shown in the British specifications 144,761 and 146,747 may consist of slate, agate, marble, burnt clay, or the like, in the circuit of the electrodes. The substances named above have the property not to conduct directly electricity of low voltage, but to have the effect of high resistances in high voltage circuits and always to let flow off electrical charges. The electrodes themselves, or one of them, may consist of such semi-conductors. The wires by which the apparatus is connected to the electric supply circuit may terminate in ordinary terminals such as the plug of a plug switch adapted to be inserted in the plug sockets of an electric light installation or the like.

The invention is illustrated in the drawing. Fig. 1 is a diagrammatic illustration of one form of the novel apparatus. Fig. 2 shows an apparatus in which the electrodes are connected to a hollow plug which contains the semi-conductors and is provided with pins adapted to be inserted in a wall socket of a plug switch. Fig. 3 is a modification in which the electrodes are connected to a screw plug containing the semi-conductors. Fig. 4 is an apparatus in which one semi-conductor is mounted in the plug and another semi-conductor forms one of the electrodes. Fig. 5 shows another modification in which both electrodes are formed of a semi-conductor.

In Fig. 1 of the drawing 1 represents a part of human body to which electricity is applied by electrodes 2 and 3. The electricity is taken from an electric light circuit, for example by inserting the pins 7 of a plug 6 into the socket of a plug switch. The wires each lead from a pin 7 through a semi-conductor 4 to one of the electrodes 2 and 3 respectively. The semi-conductors 4, which may consist of a plate of wood, marble or any other aforementioned sub-

stance, are interposed between metal plates 5, 5.

Fig. 2 shows a simple practical form of the apparatus. This apparatus consists of two electrodes suitable for application to the human body, electric conductors in the form of a flexible cord 8, and a plug 6 provided with terminals in the shape of pins 7 adapted to be inserted in the sockets of a plug switch. The body of the plug is constructed in a form of a casing closed at one end by a removable cover 9. Arranged in the casing are two marble plates 4 provided at two opposite sides with contacting metal plates 5 and fixed to the walls of the casing by means of screws 10. The external plates 5 are connected by wires or conductors 11 to the pins 7 while the internal plates are connected to the two conductors 75 of the flexible cord 8.

In Fig. 3 the device for connecting the apparatus to the electric supply circuit has the shape of an Edison screw plug, similar to the screw plug of an electric glow lamp. In the interior of the body consisting of a screw portion 12 and a hollow base 13 of insulation, the two semi-conductors 4 are arranged, one of which extends lengthwise while the other extends transversely in the screw plug. The semi-conductor that extends lengthwise is connected at one end to the top contact 14 of the threaded body 12, while the other end is connected to one of the conductors in the flexible cord 8 leading 90 to the electrodes 2. The semi-conductor that extends transversely in the screw plug is connected at one end to a metal strip 15 leading to the metal screw 12, while the other end is connected to the second conductor in the flexible cord 8.

In the apparatus shown in Fig. 4 only one semi-conductor 20 is used, this semi-conductor forming one of the electrodes. A piece of metal sheet 21 is attached to the rear surface of the electrode 20 and this plate and the other electrode 25 are connected through flexible conductors 8 to a plug 6 with terminals 26, 26'. The person to be treated being connected directly to one pole of the electric supply, the same is preferably located on an insulating plate, chair or the like.

In the modification shown in Fig. 5 both electrodes consist of semi-conductors 20, 20'', to whose rear surfaces plates are attached which are connected through flexible

conductors 8 to a plug 6. One of the semi-conductors 20" may preferably be concave or slightly curved inwards at the surface that is to be applied to the body in the manner shown in Fig. 4 at the electrode 20. The other semi-conductor 20' is ball-shaped to make it easily to be held in the hand. The plates 21 may be attached to the semi-conductors by means of water-glass if the 10 semi-conductors consist of stone-like material. The bare semi-conductors may be applied to the body or they may be coated with a covering 31 of leather or cloth as shown on the electrode 20" in Fig. 5, which 15 enables the electrodes to be moistened.

The apparatus has a peculiar effect. If the plug is connected to an alternating current supply and the electrodes are applied in a dry state to the body the person treated 20 will experience a sensation similar to that produced by vibration massage, particularly if his body is rubbed by the electrode being moved to and fro or in circles. If 25 the electrodes are moistened the pricking sensation will be more intense. These effects will remain the same if the one electrode is grasped by the patient while the operator holds the other electrode in his one hand and carries out the therapeutic touch 30 by stroking the part of the body to be treated with the other hand. At all events the semi-conductor or conductors connected in series with the human body seem to have the effect partly like the dielectricum of a 35 condenser partly like a high resistance in combination with a high contact resistance but a relatively good interior conductivity all these properties producing the singular effect on the body.

40 Either a semi-conductor electrode or a metallic electrode may be used according to the effect that is to be produced. The effect will also be different according as an electrode with a small or large contacting surface is employed.

An important point to be considered in connecting the apparatus is that the patient 50 must not be directly connected to a terminal of the current supply. This could happen in an arrangement according to Fig. 4 if the person to be treated would not be located in insulated manner and the metal electrode 25 were connected through the plug 6 with a lead of the alternating current supply that is not connected to earth. To avoid 55 this the plug may be provided with pins 26, 26' of different diameters which can only be introduced into a plug socket in the right manner. An undesirable connection of this 60 kind can be avoided without employing plug pins and sockets of special kinds by connecting a semi-conductor resistance in the manner shown in Fig. 1 in the wire leading to the metal electrode 25 or by only using

apparatus of the kind shown in Figs. 2 or 65 3, or by using a semi-conductor electrode in the place of the metal electrode 25, which semi-conductor electrode may be of the kind shown in Fig. 6.

It will be understood, of course, that all 70 the forms of apparatus shown are merely embodiments of my invention, which forms may be varied considerably without departing from the spirit of the invention.

I claim:—

1. Electro-therapeutic apparatus adapted to be connected to a low frequency alternating current supply, comprising electrodes adapted for application to the body of the person to be treated, one of these electrodes 80 consisting of mineral substance classed as a semi-conductor, and electric connections between the electrodes and the current supply forming with the body an electric circuit. 85

2. Electro-therapeutic apparatus adapted to be connected to a low frequency alternating current supply, comprising electrodes consisting of mineral substances classed as a semi-conductor and adapted for application to the body of the person to be treated, and electric connections between the electrodes and the current supply forming with the body an electric circuit. 90

3. Electro-therapeutic apparatus adapted 95 to be connected to a plug socket of a low frequency alternating current supply, comprising a plug with terminals adapted to be inserted into the said socket, electrodes for application to the body of the person 100 to be treated, one of said electrodes consisting of a mineral substance classed as a semi-conductor, and conductors connected to said electrodes and said plug.

4. Electro-therapeutic apparatus adapted 105 to be connected to a plug socket of a low frequency alternating current supply, comprising a plug with terminals adapted to be inserted into said socket, a ball-shaped electrode consisting of a mineral substance 110 classed as a semi-conductor, and conductors connecting said plug and said electrode.

5. Electro-therapeutic apparatus adapted to be connected to a low frequency alternating current supply, comprising an electrode 115 consisting of a solid body of mineral substance classed as a semi-conductor effect, a metallic part connected to said body, a flexible conductor fixed to said metallic part and to said current supply, a cover of a 120 material adapted to keep a fluid arranged at the outer side of the mineral body, another electrode adapted to be applied to the person to be treated, and a conductor connecting said electrode to the other pole of 125 said current supply.

In testimony whereof I affix my signature.
MAX SPETER.