

C. F. MARSH.  
ELECTROTHERAPEUTIC APPARATUS.  
APPLICATION FILED DEC. 3, 1903.

4 SHEETS—SHEET 1.

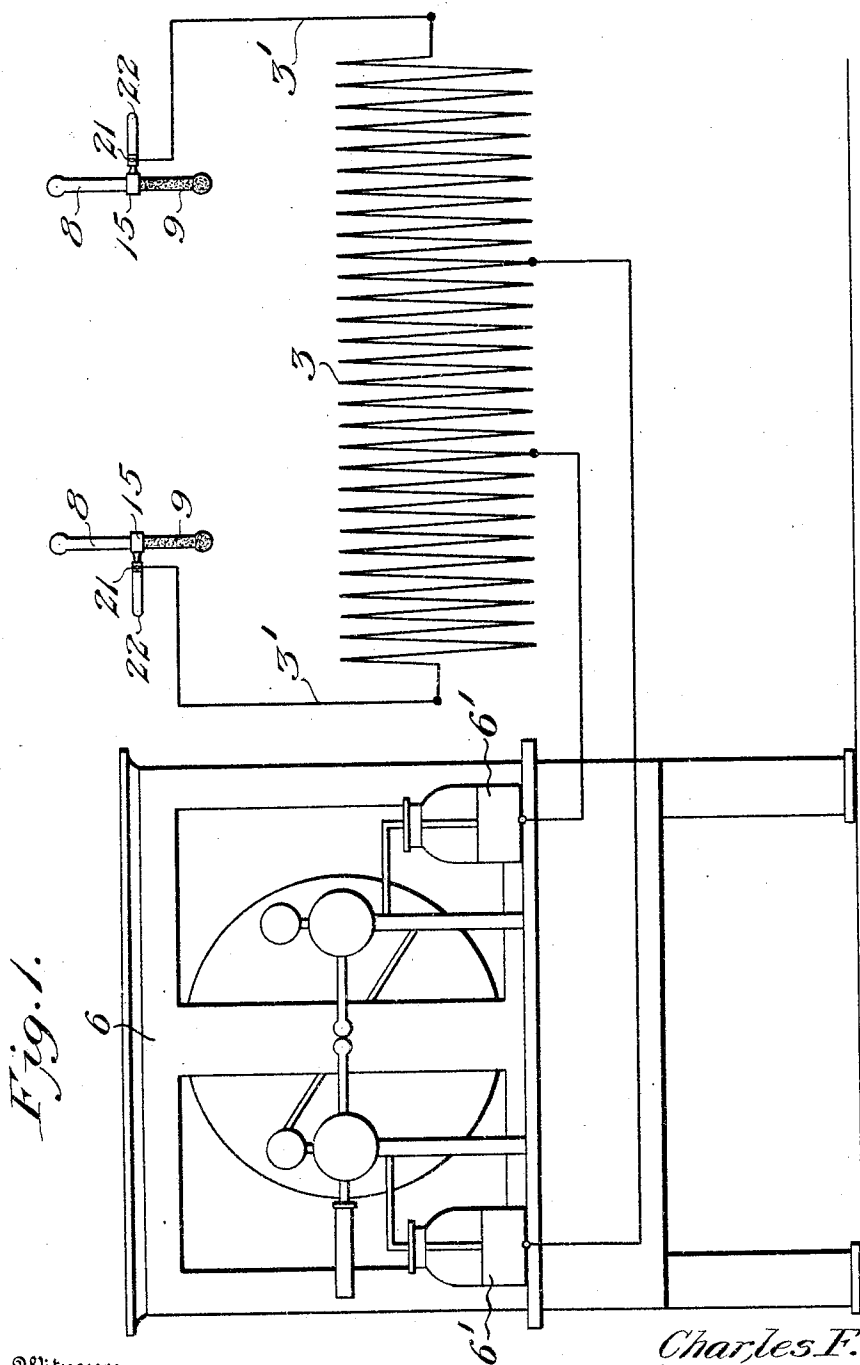


Fig. 1.

Witnesses

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C. C. Hines.

By

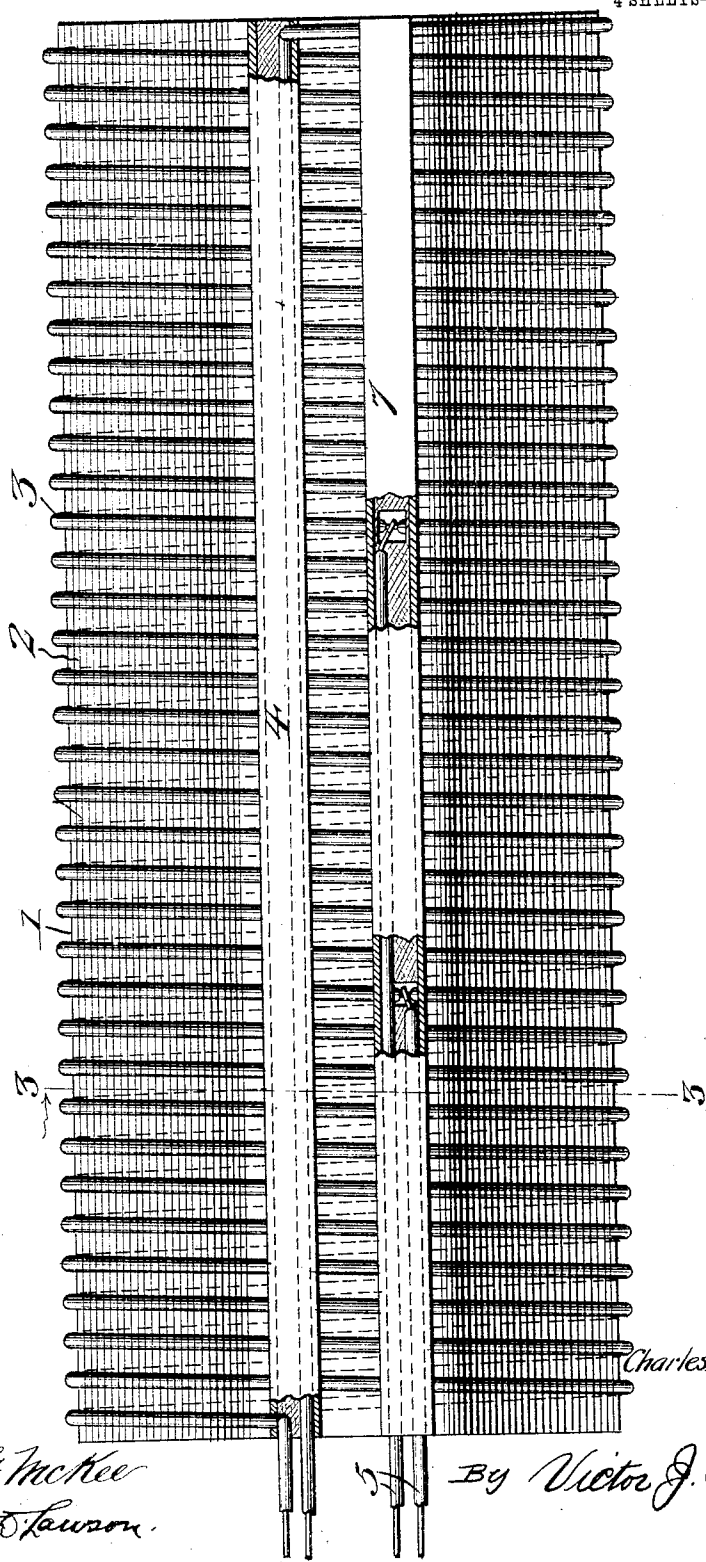
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4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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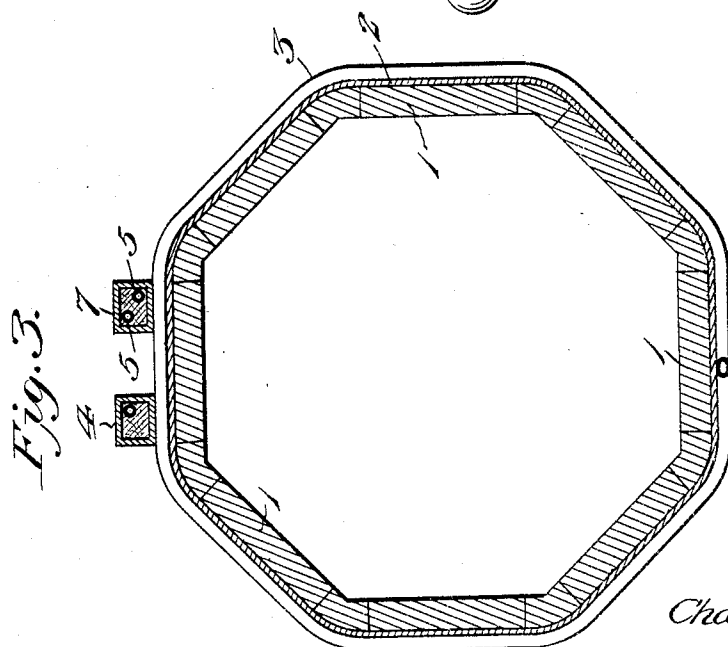
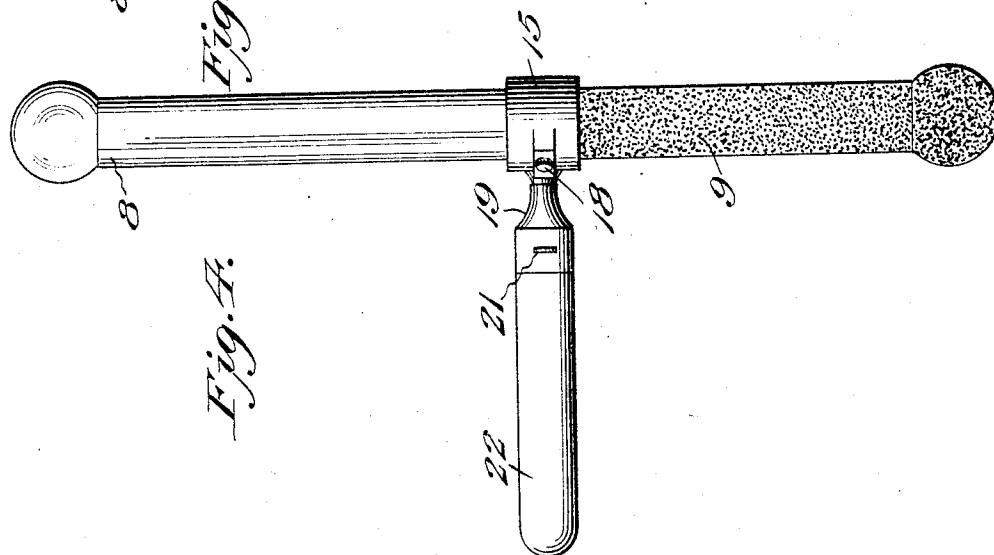
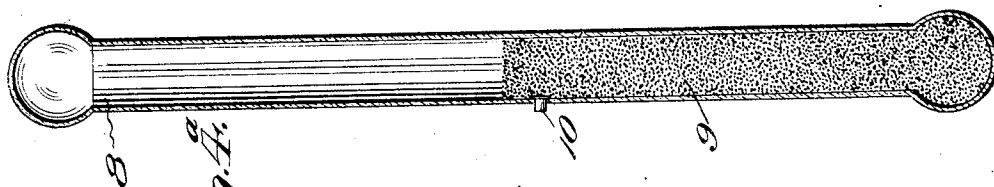
No. 789,040.

PATENTED MAY 2, 1905.

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ELECTROTHERAPEUTIC APPARATUS.

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4 SHEETS—SHEET 3.



Witnesses

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4 SHEETS—SHEET 4.

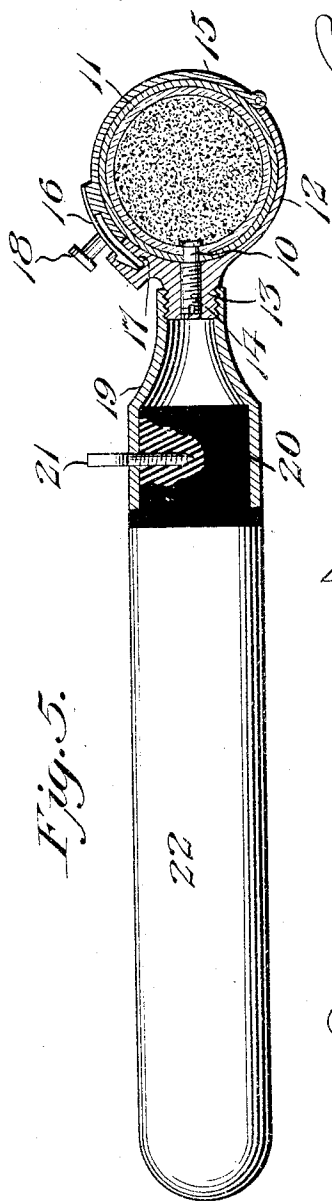


Fig. 5.

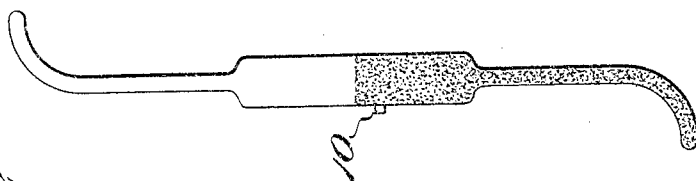


Fig. 8.

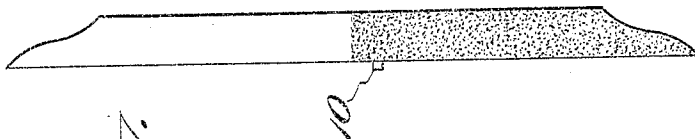


Fig. 7.



Fig. 6.

Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES FRANKLIN MARSH, OF PENSACOLA, FLORIDA.

## ELECTROTHERAPEUTIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 789,040, dated May 2, 1905.

Application filed December 3, 1903. Serial No. 183,643.

*To all whom it may concern:*

Be it known that I, CHARLES FRANKLIN MARSH, a citizen of the United States, residing at Pensacola, in the county of Escambia and State of Florida, have invented new and useful Improvements in Electrotherapeutic Apparatus, of which the following is a specification.

My invention relates to the art of electrotherapy; and its object is to provide an apparatus of a simple and effective nature for producing a current of such high frequency and potentiality and such low amperage as to render it extremely valuable for therapeutic purposes, the current being rich in penetrative force.

Another object is to provide the apparatus with electrodes of novel construction whereby an increased quantity of ultra-violet rays is produced, together with a ray more potent than the ultra-violet and less injurious to tissues than the X ray, this new ray being between the ultra-violet and the X rays.

A further object is to provide handles of novel construction connected to the electrodes.

With the above and other objects in view the invention consists in the novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatical view of the apparatus constituting my invention. Fig. 2 is a plan view of the resonator, a portion thereof being broken away. Fig. 3 is a section on line 3 3, Fig. 2. Fig. 4 is a side elevation of one of the electrodes of the apparatus. Fig. 4<sup>a</sup> is a longitudinal section through the electrode. Fig. 5 is a transverse section through the electrode and showing the handle-fastening means in section, and Figs. 6, 7, and 8 are elevations of modified forms of electrodes.

Referring to the figures by numerals of reference, 1 is a preferably octagonal frame forming the body of the resonator, and this frame has a covering 2, of felt, asbestos, or other soft material. A wire 3 is coiled about the frame from end to end thereof, and the terminals of the wire are embedded in a casing

4, extending longitudinally of the frame 1. Two conductors 5 are connected to the coiled wire 3 at points equidistant from each other and from the ends of the coil. These conductors are electrically connected to the source 6 55 of electricity and are likewise embedded for portions of their lengths in a casing 7, extending longitudinally of the frame 1.

The ends of the wire coil are each connected to an electrode 8 of novel construction. This 60 electrode is formed of a tube of glass or other vitreous material, and one half thereof is filled with powdered carbon 9, while the remaining portion has an interior vacuum. A conductor 10 extends through one side of the tube and 65 contacts with the carbon, and this conductor also projects through a felt or other soft covering 11, arranged about the central portion of the electrode. A metal yoke 12 partly incloses the covered portion of the electrode, 70 and this yoke has a screw-threaded stem 13, in which is located an adjustable contact-screw 14, adapted to bear against the conductor 10. A curved strap 15 is hinged to one end of the yoke 12, and the other end thereof abuts against 75 the opposite end of the yoke and has a spring-catch 16 extending therefrom. This catch is adapted to project into and engage the wall of a recess 17, formed in the adjoining end of yoke 12, and a button 18 is located on the 80 catch, whereby it can be easily depressed to unlock the straps and release the electrode. Stem 13 is detachably fitted in one end of a sleeve 19, of conducting material, and this sleeve is secured on an insulating-plug 20 by 85 means of a screw 21, pin, or other suitable device. Plug 20 is arranged at one end of a handle 22, and, if desired, the plug and handle can be formed integral. One of the terminals 3' of wire 3 is secured to the screw 21 of each 90 electrode.

The electrodes are used in the ordinary manner, and different forms may be employed for the treatment of different portions of the body. I have shown some modified forms in 95 Figs. 6, 7, and 8, but all forms inclose vacuums and contain powdered carbon. As hereinbefore stated, by the use of this particular form of electrode a ray is produced which is of the utmost value in therapeutic treatment, 100

this ray being less injurious to the tissues than X-rays and more potent than the ultra-violet rays. By connecting the source of electricity to the resonator at points equidistant from the ends thereof and from each other and attaching the electrodes to the terminals of the resonator the polarity is broken, thereby making the resultant current of high frequency and potentiality and low amperage, rich penetrative force, and exceedingly rich in ultra-violet rays. The source of electricity referred to is a static machine or its equivalent for producing a non-continuous or alternating current. As the current passes from the accumulators or condensers (Leyden jars) 6' through the connections and to the coil at points removed from the ends of the resonator the tendency is to pass in either direction on the coil, thereby producing waves and counterwaves, which results in instability in polarity, rapid interruptions in attractions and repulsions in anodal and cathodal rays, and immense frequency.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto; as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus fully described my invention, what I claim as new is—

1. In an electrotherapeutic apparatus, a static machine, a resonator, conductors between the accumulators of said machine and opposite sides of the center of the resonator-coil and electrodes connected to the terminals of the coil.

2. A resonator; a source of alternating current, conductors connecting the same with the coil of the resonator at points equidistant from each other and from the ends of the coil, vacuum-electrodes containing a resistance material, and electrical connections between the resistance material in the electrodes and the respective terminals of the coil.

3. In an electrotherapeutic apparatus, a source of electric current, a coil, conductors from said source to opposite sides of the center of the coil, and treatment-electrodes connected to the terminals of the coil.

4. A resonator having a source of electricity connected to the coil thereof at points equidistant from the ends of the coil and from each other, and electrodes electrically connected to the terminals of the coil.

5. A resonator having a source of electricity connected to the coil thereof at points equidistant from the ends of the coil and from each other, carbon-containing vacuum-electrodes,

and electrical connections between the carbon in the electrodes and the respective terminals of the coil.

6. A resonator having a source of electricity connected thereto, electrodes each comprising a vacuum-tube containing carbon, the area of carbon equaling the extent of the vacuum, and electrical connections between the carbon and the resonator.

7. An electrode comprising a vacuum-tube, resistance material within said tube, and a conductor extending into the tube and contacting with such resistance material.

8. A source of electric current, a coil, conductors from said source to opposite sides of the center of the coil, and vacuum-electrodes containing resistance material connected to the terminals of the coil.

9. An electrode comprising a vacuum-tube, carbon within the tube, a handle, a yoke on the handle, and means for detachably connecting the tube to the yoke.

10. An electrode comprising a vacuum-tube, carbon within the tube, and a conductor extending into the tube and contacting with the carbon.

11. An electrode comprising a vacuum-tube, carbon within the tube at one end, a conductor extending into the tube and in contact with the carbon, a handle, a yoke thereon, a contact in the yoke, and means for securing the tube to the yoke and the contact on the conductor.

12. An electrode comprising a handle, a yoke thereon, a strap hinged to the yoke, a strap-securing device, a vitreous vacuum-tube inclosed by the yoke and strap, carbon in the tube, and a conductor whereby a circuit is established from the yoke to the carbon.

13. The combination with a handle having a sleeve at one end, and wire-attaching means engaging the sleeve; of a yoke detachably secured to the sleeve, a contact adjustably mounted therein, a strap hinged to the yoke, means for securing the strap to the yoke, a vacuum-tube inclosed by the yoke and strap, a covering interposed between the tube, yoke and strap, carbon within the tube, the area of the carbon being equal to the extent of the vacuum, and a conductor within the tube and contacting with the carbon.

14. An electrode comprising a tube having a portion of its interior filled with a resistance material, and its remaining portion *in vacuo*, said portions being of equal area.

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

CHARLES FRANKLIN MARSH.

Witnesses:

GEORGE DONVILLE,  
J. A. NEMBECK.