

(No Model.)

J. S. MUIR.
THERAPEUTIC ELECTRODE.

No. 568,095.

Patented Sept. 22, 1896.

Fig. 2.

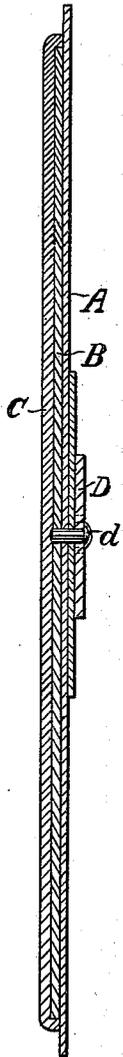
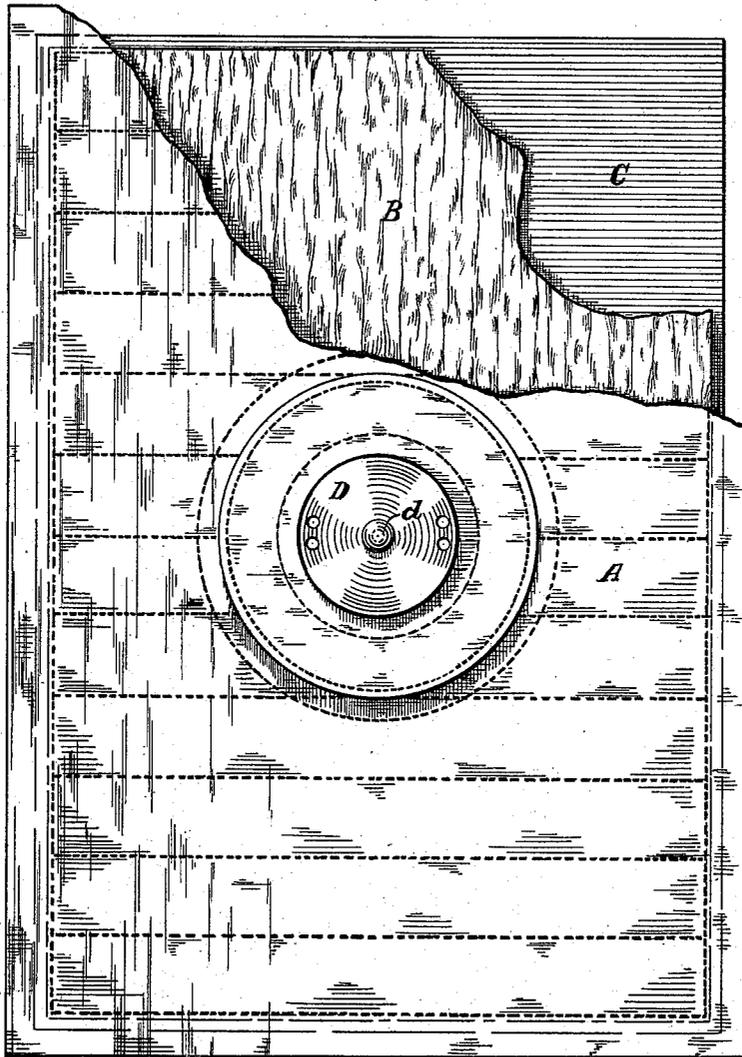


Fig. 1.



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UNITED STATES PATENT OFFICE.

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THERAPEUTIC ELECTRODE.

SPECIFICATION forming part of Letters Patent No. 568,095, dated September 22, 1896.

Application filed April 17, 1896. Serial No. 587,911. (No model.)

To all whom it may concern:

Be it known that I, JOHN SEVERN MUIR, a citizen of the United States, residing at Stockton, county of San Joaquin, State of California, have invented an Improvement in Therapeutic Electrodes; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of electrodes used in the administration of electricity for therapeutic purposes; and my invention consists, essentially, in an electrode composed of a backing of leather, cloth, or any other suitable material which is a non-conductor of electricity. To the face surface of this backing is attached by stitching or cementation a flexible sheet of metallic or semimetallic electroconducting material, and on the face surface of this sheet of metallic or semimetallic substance is spread a pliable compound containing as part of its composition an electroconducting substance.

My invention also consists in the novel construction and combination of the parts of the electrode which I shall hereinafter fully describe.

The general object of my invention is to provide a durable and perfect therapeutic electrode which is adapted to be readily applied to any portion of the body, fitting it perfectly throughout its entire surface and so constructed that it can be used dry, avoiding the necessity of moistening or wetting it, said electrode being adapted to distribute the electric current equally and smoothly over that portion of the body to which it is applied, and, on account of this even distribution of the current, permitting the use of much larger currents than by other forms of electrodes.

Referring to the accompanying drawings, Figure 1 is a view of my electrode, successive portions being broken away to show underlying parts. Fig. 2 is a section of same.

The electrode is composed of a backing A, which may be of leather or cloth or any other suitable and flexible material and a non-conductor of electricity. To the face of this backing is secured, as by stitching or other fastening, a sheet B of electroconducting material of a flexible character. This may be a thin sheet of metallic foil or any metallic sheet, or a partly-metallic sheet, such,

for example, as tinsel-cloth, which latter is the preferred material, as it is pliable, and at the same time its metal threads will act as a sufficient conductor and distributor of the current over the entire electrode. Upon this sheet of conducting material B is placed a pliable layer C of suitable electroconducting properties. This layer may be a single substance, but preferably a composition which in practice I prefer to make somewhat similar to the composition known as "hekto-graph" material. In order that this may be understood, I will state, for example, that in practice I use for making this material, say forty parts of gelatin, which is softened in a small quantity of hot water, to which is added, while still hot, say one hundred parts of glycerin, which holds the gelatin in solution. In order to render this substance electroconducting, I add to it, while still hot and in a plastic or semifluid condition, any material in finely-divided quantities which is an electroconductor, such, for example, as plumbago or pulverized carbon, or any metallic substance in a fine state of division. This is incorporated into the composition and renders the whole layer C electroconducting and acts as a distributor for the current over the entire surface. When using plumbago for this purpose, I will state, for example, that I use about one ounce of the plumbago to a pound of the composition. Bronze powder may be used in this connection, if desired. This composition is applied to the sheet B while the composition is hot and plastic, the best way of applying it being to form a frame around the edges of the backing to constitute a mold and then pour the composition into the mold, so that it will set upon the sheet B.

D is the contact-plate for the wires on the backing A, said plate having a contact-pin *d*, which extends through the backing and forms contact with the electro conducting materials on the face thereof.

A therapeutic electrode thus formed is very pliable and is adapted to be easily adjusted to all parts of the body and to fit thereto throughout its entire surface, so that there is no one point of greater contact than another, thereby avoiding too strong a current at any one point. It is, moreover, uniform in the distribution of the current throughout the en-

tire surface. To this result the electroconducting-sheet B contributes, in that the current is fully distributed throughout the electrode, but said sheet alone would not form as perfect a contact of the pad as is necessary, especially where tinsel-cloth is used, so that the pliable composition C obviates this difficulty by giving a perfectly smooth surface to form the contact, and at the same time said composition, by virtue of its soft and plastic character and its contained moisture, will permit the use of much larger currents being passed through the skin and tissues than if the sheet B alone were used.

The electrode is not only convenient of application, but is permanent and durable and is easily handled. It has a constant and non-varying resistance, and there is no danger of irritating the skin in spots or patches on account of the even diffusion and distribution of the current.

Another great advantage of this electrode is that it may be used dry, as there is no necessity for wetting it, as is done with the ordinary electrodes.

I do not confine myself to the use in the composition of the layer C of any particular material as an electroconductor, for in addition to those mentioned I may mix with the gelatin a saline solution of suitable material, such as chlorid of sodium or epsom salts, to accomplish a similar result.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a therapeutic electrode, the combination of a flexible backing of non-conducting material, a flexible sheet of electroconducting material upon the face of said backing, and a layer of pliable substance or composi-

tion of electroconducting character upon the face of the electroconducting-sheet.

2. In a therapeutic electrode, the combination of a flexible backing of non-conducting material, a flexible sheet of tinsel-cloth upon its face, and a layer of pliable substance or composition of electroconducting character, upon the face of the tinsel-cloth.

3. In a therapeutic electrode, the combination of a flexible backing of non-conducting material, a flexible sheet of electroconducting material upon the face of the backing, and a pliable layer of a composition consisting of gelatin and glycerin in which is incorporated a suitable electroconducting material, said layer being upon the face of the electroconducting-sheet.

4. In a therapeutic electrode, the combination of a flexible backing of non-conducting material, a flexible sheet of tinsel-cloth secured upon the face thereof, and a flexible layer of a composition consisting of gelatin and glycerin in which is incorporated a suitable electroconducting material, said layer being upon the face of the tinsel-cloth.

5. In a therapeutic electrode, the combination of a flexible backing of non-conducting material, a flexible sheet of tinsel-cloth secured upon the face thereof and a flexible layer of a composition consisting of gelatin and glycerin in which is incorporated plumbago, said layer being upon the face of the tinsel-cloth.

In witness whereof I have hereunto set my hand.

JOHN SEVERN MUIR.

Witnesses:

JNO. C. REED,
T. W. HUMMEL.