L. DRESCHER.

Electro-Magnetic Machine.

No. 221,291. Patented Nov. 4, 1879.

Figure 1.

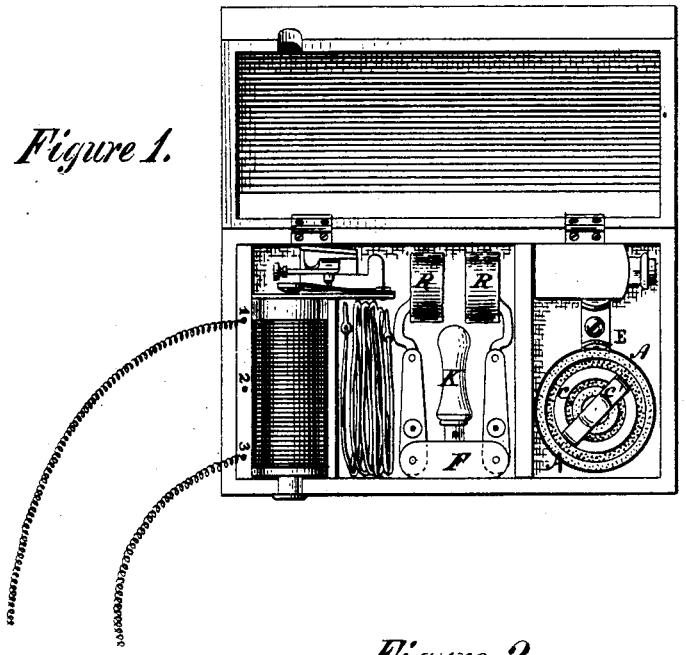


Figure 2.

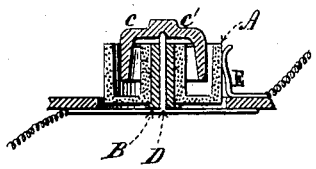


Figure 3.

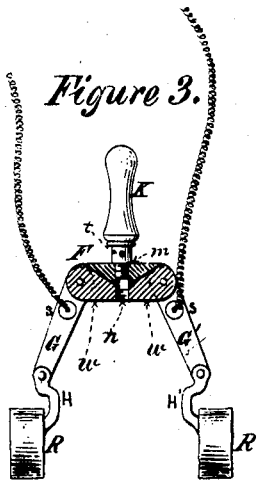
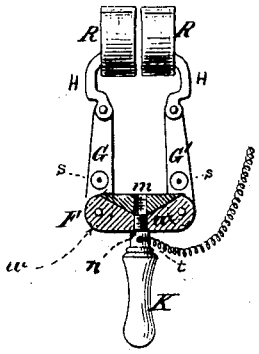


Figure 4.



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UNITED STATES PATENT OFFICE.

LUIS DRESCHER, OF WHITE PLAINS, NEW YORK.

IMPROVEMENT IN ELECTRO-MAGNETIC MACHINES.

Specification forming part of Letters Patent No. **221,291**, dated November 4, 1879; application filed March 12, 1879.

To all whom it may concern:

Be it known that I, LUIS DRESCHER, of White Plains, in the county of Westchester and State of New York, have invented a new and useful Improvement in Electro-Galvanic Apparatus, of which the following is a specification.

The invention relates to apparatus for the production and therapeutical application of an electric current.

It consists, first, in the construction of a galvanic-battery cell made of prepared carbon, to serve as its electro-negative element, in an annular form to encircle a central insulated column for the support of its electro-positive element, the object of this part of my invention being to produce at a reduced cost a more efficient and compact cell for portable electric apparatus than any now in use.

It consists, secondly, in the use of a roller or revolving surface as an electrode in applying the current to the human body; and also in the combination of a pair of properly-insulated jointed roller-electrodes, with a single handle to facilitate a consentaneous local application of the opposite poles of the battery for therapeutical purposes.

In the accompanying drawings, Figure 1 is a top view of a portable electro-magnetic machine fitted with my improved annular battery-cell and roller-electrode; Fig. 2, a central transverse section of the annular battery-cell complete; and Figs. 3 and 4, elevations of my improved bipolar roller-electrode.

The improved battery-cup A is composed of coke, artificially prepared in like manner as is the Bunsen carbon commonly employed for use as the negative element in the cells of galvanic batteries. It is made of an annular form, as shown in Fig. 2, either by carving a suitable block of Bunsen carbon, or, preferably, by molding the carbon into proper form during the process of its manufacture. It is rendered impervious, so as to retain the oxidating liquid of the galvanic cell either by soaking it in paraffine or by resort to any other of the processes for waterproofing porous materials which do not involve the use of chemicals that would impair the electro-motoric power of the carbon, or neutralize the oxidating-liquid of the cell. The sides of the cup may be polygonal instead of cylindrical. This annular polygonal or cylindrical carbon cup A is secured in place for use within a suitable case by means of a pillar, B, arranged to project through the central opening in the cup, and which affords likewise proper support for an annular, polygonal, or cylindrical plate of zinc, *c*, constituting the positive element of the cell.

The pillar B is made of hard rubber or other insulating material, to insulate the zinc plate from the carbon cup, and itself incloses and is supported by a central metallic rod or wire, D, projecting from a metallic plate or strip fixed in the bottom of the case, and to which the positive wire of the electric circuit is connected. The transverse bar *c'* of the annular zinc plate *c* is provided with a central platina point, arranged to fit upon the upper end of the rod D, or into a socket formed thereon, whereby connection is established between the positive pole of the battery and said annular plate *c*, the connection of the negative pole with the carbon cup, forming the negative element of the cell, being produced by means of a metallic spring, E, arranged to bear lightly against the cup, as shown in Figs. 1 and 2.

The therapeutical application of the electric current, produced by the immersion of the insulated zinc plate *c* into bisulphide of mercury or other suitable oxidating-liquid contained in the carbon cup A, is facilitated in this my improved apparatus by means of a bipolar electrode, illustrated fully in Figs. 3 and 4.

F is the central plate of the electrode. This plate is made of hard rubber or other insulating material.

G G′ are metallic arms, hinged to said plate and thereby insulated the one from the other. H H′ are shorter bent arms, hinged to the extremities of the arms G G′, and which carry rollers R R, covered with felt or other suitable absorbent material to retain moisture.

K is the handle of the electrode. It may be screwed for use into either edge of the central plate, F, between the arms G G′. The threaded aperture *m* for its reception upon the one side is formed wholly in the insulating material constituting the body of the plate, as shown in Fig. 3, so that when the handle K is inserted therein the arms remain insulated there-

from and from each other. The threaded aperture *n* on the opposite edge is made to cut the edges of metallic plates *w w*, inserted in the central plate, F, and which extend, respectively, to the pivot-bearings of the two arms G G′, so that when the metallic screw of the handle is inserted into the aperture *n* a continuous metallic connection is established thereby between the two arms G G′ as well as with the handle K.

Sockets *s s* are formed in the arms G G′, to receive and hold the respective battery-wires, and an independent socket, *t*, is provided in the metallic screw-tip of the handle.

When the battery cell or cells are properly charged, and the one arm, G, of the bipolar electrode is connected with the positive pole of the battery and the other arm, G′, with its negative pole by connecting-wires, as shown in Fig. 3, the electric current may be applied locally to the spinal column and to other parts of the body with singular efficacy by simply passing the rollers R R, properly moistened, over the affected part.

The revolution of the rollers prevents all irritation, such as results from the friction of ordinary electrodes, and the combination and arrangement of the two electrodes with a single handle, so that they may be applied with the hand, not only insures equal and uniform pressure, but greatly facilitates the methods and processes of beneficial application.

The double joints of the instrument permit a ready adjustment of its arms and rollers for various and special applications.

The bipolar electrode, Fig. 3, is convertible at pleasure into a single or unipolar-roller electrode by screwing the handle into the socket *n*, as shown in Fig. 4, and securing the appropriate connecting-wire from the battery in the socket *t* of the handle, whereupon a connection will be established by this wire between the corresponding pole of the battery and both rollers.

The novel concentric arrangement of an annular zinc plate, *c*, within an annular battery-cup made of carbon, so as to dispense with an extra plate for the electro-negative element of the cell, not only reduces the cost of the complete cell, but renders it exceedingly compact, so that it presents more active working-surface within the same space than any form of cell now in use.

The suspension of the removable plate *c* upon a central pivot, so that it may be readily revolved in the cup, increases the practical efficiency of the cell, for by its revolution the oxidating solution is readily agitated to neutralize polarization, and to overcome any inertness in the cell which may be due to differences of specific gravity in the solution.

Although I prefer the use of a single annular plate, *c*, as the removable element of my cell, I contemplate as an equivalent therefor the use of two or more plates depending from transverse arms supported to revolve horizontally upon and about the central pillar, B.

The positive and negative rheomotive elements of my improved cell may be reversed without departing from my invention by using an electro-negative substance, as carbon, for the central plate, *c*, and an electro-positive substance for the cup or its lining.

I claim as my invention—

1. The combination, in an electro-galvanic cell, of a rheomotoric plate constituting one of its elements, with a central pivotal support insulated from the cell-cup, and upon and about which the plate may be revolved, substantially as and for the purpose herein set forth.

2. The combination, with a central insulating and connecting plate and handle, of two separate and insulated arms jointed to said connecting-plate, and adapted for connection with the respective poles of an electric battery to constitute a bipolar electrode for therapeutical purposes, substantially as is herein set forth.

3. A portable electrode terminating with a roller or rollers, and adapted for therapeutical purposes, substantially as herein set forth.

LUIS DRESCHER.

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