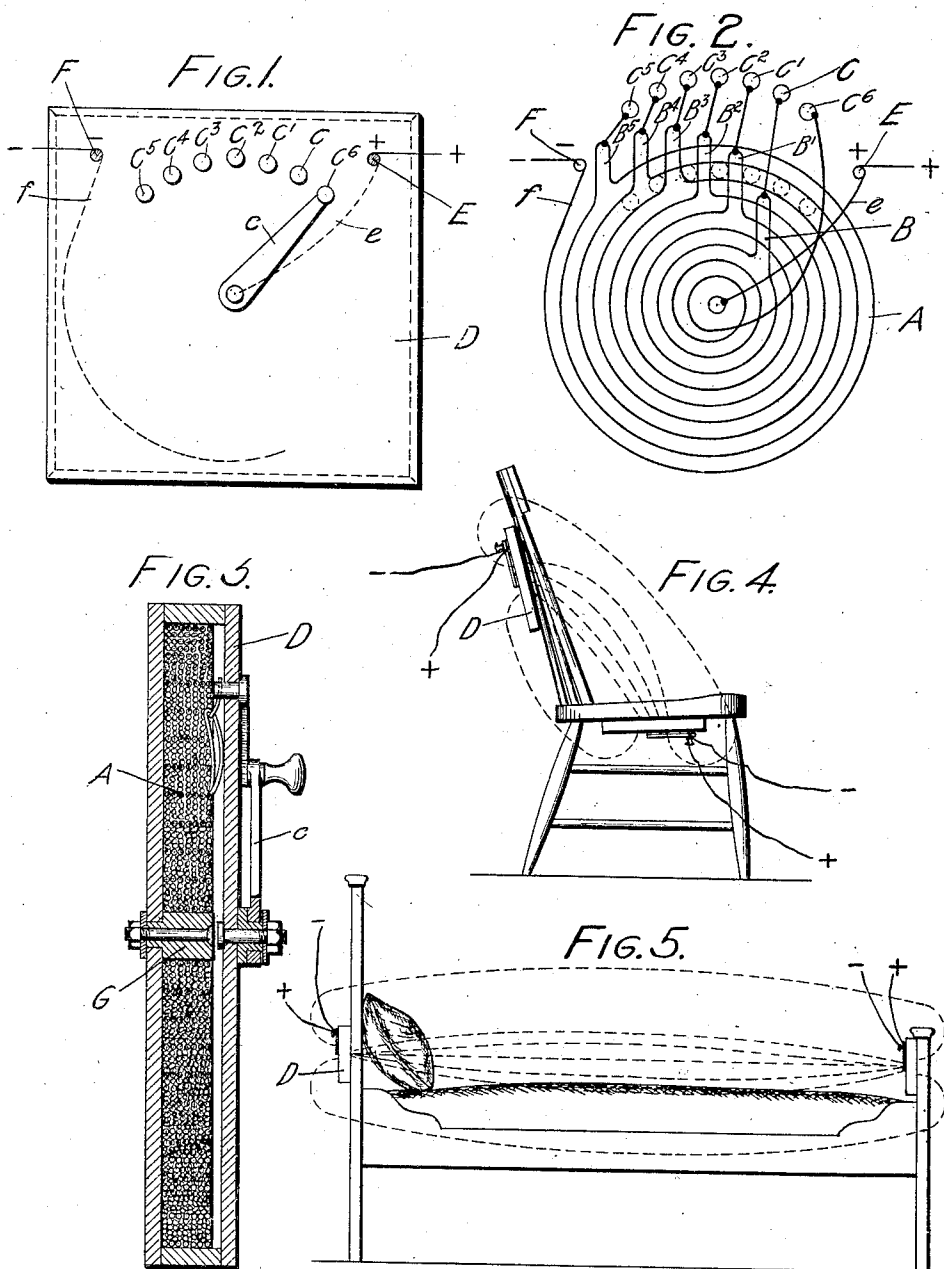


No. 849,653

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E. BACHELET.
ELECTROMAGNETIC APPARATUS.

APPLICATION FILED AUG. 10, 1904.



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EMILE BACHELET, OF TACOMA, WASHINGTON.

ELECTROMAGNETIC APPARATUS.

No. 849,653.

Specification of Letters Patent.

Patented April 9, 1907.

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To all whom it may concern:

Be it known that I, EMILE BACHELET, of Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Electromagnetic Apparatus; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improved electromagnetic apparatus especially designed for creating vibrating or pulsating magnetic fields and particularly adapted for use in therapeutics for the treatment of all diseases of the nervous system and to reestablish the normal condition of the organs, being particularly useful in diseases where muscles or nerves have become stiffened, strained, or distorted and also useful in restoring the blood to a healthy normal condition. The apparatus may also be used for other purposes in the art where magnetism or magnetic fields have been found useful—such, for example, as purifying or clarifying liquids, stimulating animal and vegetable growths, and in refining and aging liquors, &c. I do not, therefore, wish to restrict my invention to therapeutic purposes.

The invention also includes a novel construction of an electromagnet whereby I obtain a large magnetic field with a solenoid or magnet of large diameter, but very short length, and which magnet is so constructed that more or less of its coils may be cut out, so as to render the strength of the magnetic field easily controllable.

I will now describe the invention with reference to the accompanying drawings, which illustrate a practical form of the apparatus, and refer to the claims for summaries of those features of the invention for which protection is desired.

In the drawings, Figure 1 is a front view of the preferred form of the apparatus incased. Fig. 2 is a view showing the coil or solenoid-magnet of the preferred form. Fig. 3 is a longitudinal section through Fig. 1. Fig. 4 is a detail view showing one application of the apparatus. Fig. 5 is another view showing another mode of using the apparatus.

The apparatus consists, essentially, of a solenoid-magnet A, composed wholly of wire, and preferably wound in one continuous length. In a good practical form of this apparatus the said solenoid may be about five-

eighths of an inch long or thick by eight inches in diameter, with an internal opening of about one-inch diameter. The solenoid is wound on a suitable mandrel not necessarily having any spool. After a certain length of the wire has been wound on the mandrel a loop B is formed in the wire, this loop projecting out of the plane of the solenoid and forming a means for connecting this division of the solenoid to a suitable contact-point C on the box. Any number of such sections may be thus formed without breaking the wire, each section being indicated by a loop. The solenoid shown has six such sections, whose loops B B' B'', &c., are respectively connected to the contacts C C' C'', &c., which contacts are arranged on the casing D, within which the solenoid is secured. Said casing is preferably of wood, but may be of any other suitable material, and the contacts C C' C'', &c., are attached thereto. A switch-arm *c* is pivoted on the casing and is electrically connected by a wire *e* to a binding-post E on the casing. Similarly, one terminal of the solenoid A is attached by a wire *f* to the other binding-post F on the box, the other terminal of the coil being attached to the last contact-point C⁵ of the series. By bringing the arm *c* in contact with the terminal C⁵ the whole solenoid will be thrown into circuit, and by shifting this arm *c* onto any of the other contacts more or less of the coil can be cut out. Thus in a simple manner the strength of the magnet can be easily controlled.

The binding-posts F and E may be connected in an alternating circuit, preferably of high frequency, so that the magnet is energized and deenergized with great rapidity. This results in a succession of magnetic impulses or waves being projected into space, as is well known. Where an alternating current is not obtainable, the binding-posts may be connected in circuit with a continuous current of electricity, in which case, however, a rotary transformer or Ruhmkorff coil and interrupter should be interposed in the circuit, so as to obtain a vibration or alternation of the current through the solenoid.

The solenoid is secured in the casing in suitable manner. A convenient way is to center it around a plug G, screwed to the box. If desired, this plug G may be of iron or other suitable metal to form a core for the solenoid, which will increase its intensity. My invention, however, includes the solenoid with or without a core.

As shown in Fig. 4, one of the devices is attached to the back of a chair, and the lines of force radiating from the magnet will be applied to the spinal column of any one sitting in the chair. A like apparatus may be arranged under the chair, if desired, or any other convenient position adjacent to the subject being treated, but not necessarily in contact therewith. The apparatus establishes a vibratory magnetic field, and the effect upon the system when applied to a human being is to produce a gentle warmth and stimulate natural functions of the organs. The apparatus may be used safely for hours at a time, and I have found that the best results are obtained by a moderate current and continued use of the apparatus, and it can be most advantageously employed by attaching it to the bed or couch in which the subject sleeps. In Fig. 5 I have indicated the apparatus attached to a bed for this purpose, and in this instance I have shown it as attached to the headboard of the bed, and at the foot of the bed I attach a device for prolonging the magnetic lines of force, which may be either a secondary coil, as described in my Patent No. 743,372 of November 2, 1903, or a connecting primary coil, as described in my Patent No. 743,373 of November 2, 1903. I do not, however, in the present application claim specifically the use of means for prolonging these lines of force.

My improved electromagnetic therapeutic apparatus projects or discharges magnetic waves with great rapidity and is used by being brought into close proximity with the subject or material to be subjected to its action. As before stated, I do not limit my invention to use for medical purposes only, as it may be used to facilitate or control the crystallization, fermentation, or precipitation of substances.

The solenoid is of course made of wires having an insulating covering, so as to prevent short-circuiting, and it can be wound for low-tension and low-frequency currents or for high-tension and high-frequency currents, as may be required, and can be used, as stated, either with or without a core or with a permanently-magnetized core, if desired.

One of the most valuable features of the present invention is its extreme simplicity. It can be used by inexperienced persons with absolute safety. It does not require the attention of a skilled operator. It can be attached to any article of furniture or suspended or located at any place adjacent to

the patient or object to be treated and does not in any manner interfere with the movements of the patient.

While I have given the specific dimensions of a practical form of coil, I do not consider my invention restricted or limited as to size or dimensions in length, breadth, thickness, or diameter of coil.

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

1. A solenoid consisting of a concentric series of coils formed from a continuous wire, the wire being connected at intervals to different contact-points; in combination with a non-conducting casing entirely inclosing the solenoid, contact-points on the casing connected to the coils, and means to engage said points and cut more or less of the solenoid into or out of circuit.

2. A solenoid for electromagnetic apparatus of large external diameter and small internal diameter and short length, formed of a continuous wire, said wire having one terminal at the core and being looped at intervals to divide the solenoid into sections, and means for connecting one end of the wire to one terminal conductor; with a non-conducting casing entirely inclosing the solenoid, a series of contact-points on the casing respectively connected to the loops, and a lever connected with the core-terminal of the wire and adapted to engage any contact-point whereby more or less of the solenoid can be thrown into circuit.

3. The combination of the insulated casing, the binding-posts thereon, contact-points intermediate the binding-posts, and connected to one terminal through the magnet-coil, and a switch-lever adapted to contact with said contact-points, and an electrical connection between said switch-lever and the other of said binding-posts; with an electromagnet entirely inclosed within said casing and having looped wires at intervals respectively connected to the several contact-points, and one terminal of said magnet being connected to the other binding-post, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses:

EMILE BACHIELET.

In presence of—

SIEGFRIED P. SAHM.

A. J. GUTSLIN.