(No Model.) 2 Sheets—Sheet 1.

J. A. BARRETT.

INDUCTION COIL APPARATUS.

No. 414,626. Patented Nov. 5, 1889.

Fig. 1.

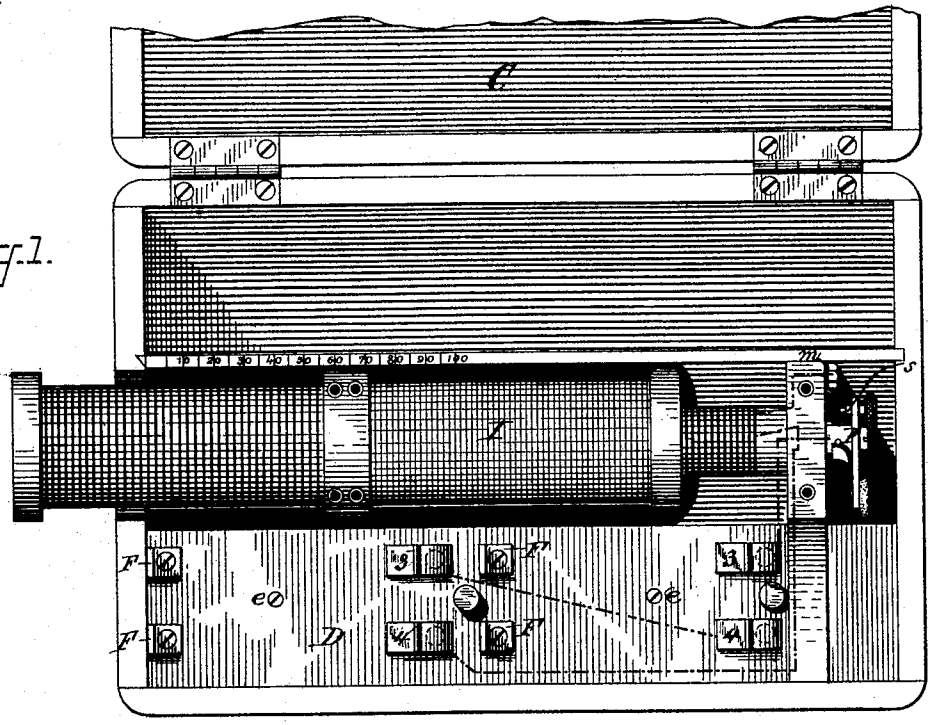


Fig. 2.

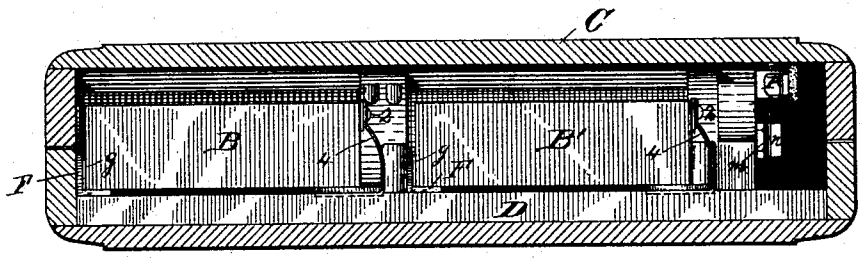
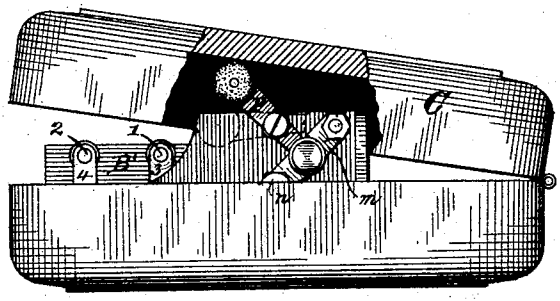


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

J. A. BARRETT.

INDUCTION COIL APPARATUS.

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Fig. 4.

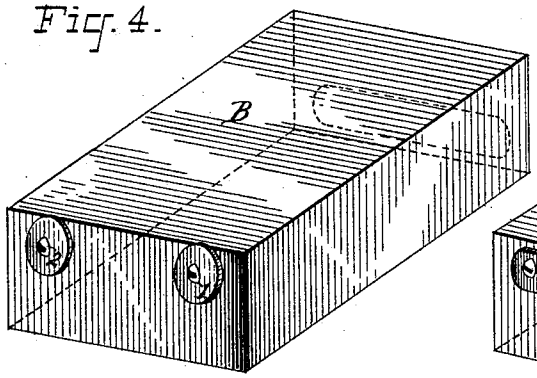


Fig. 5.

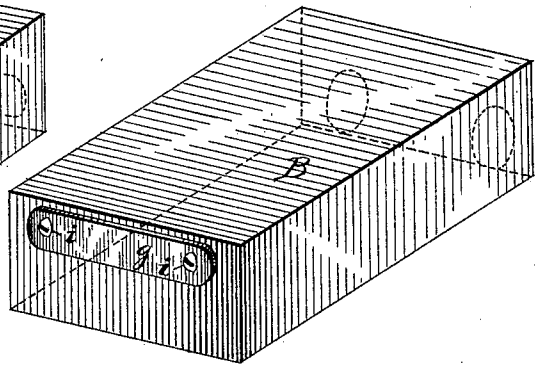
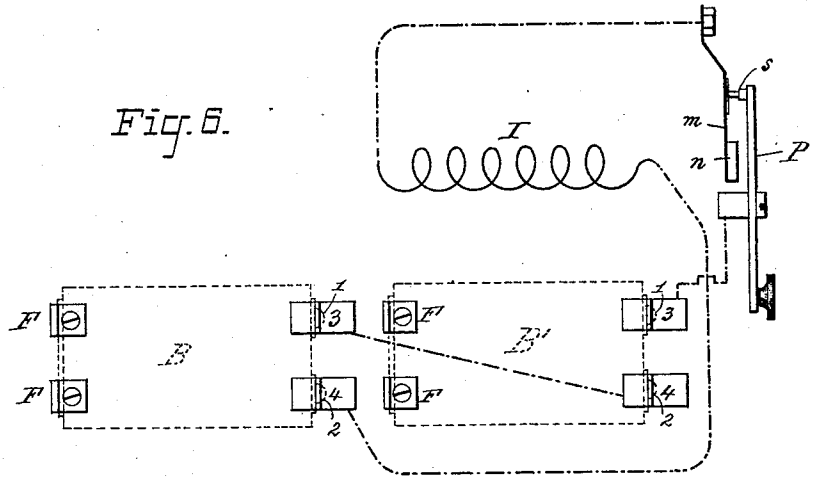


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN A. BARRETT, OF BROOKLYN, NEW YORK.

INDUCTION-COIL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 414,626, dated November 5, 1889.

Application filed February 8, 1888. Serial No. 263,355. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. BARRETT, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improved Induction-Coil Apparatus, of which the following is a specification.

My invention relates principally to the battery and the means for making connection therewith and holding the same in place upon a suitable support.

My invention relates, also, to a means for disconnecting the battery automatically to prevent the same from wasting or running down through failure to turn the switch in the connections to the induction-coil or other apparatus after use of the latter.

My invention consists, first, in the combination, with the terminals of a removable battery, of fixed contacts with which the terminals of the battery are adapted to make connection when the battery is in place, and a circuit-closing strap upon the battery adapted to complete the connection between the fixed contacts independently of the battery terminals, when the position of the battery with relation to said fixed contacts is suitably changed.

My invention consists, also, in the combination, with the battery having suitable permanent terminals supported thereon and respectively joined to its positive and negative plates, of two conducting-pieces insulated from one another and forming a means for holding the battery to its place, while at the same time making electrical connection with the battery-terminals.

My invention consists, further, in the combination, with the battery and induction-coil contained in a suitable case, of a spring-supported armature for the coil and a pivoted lever, both in the primary circuit and arranged in position for the pivoted lever to be struck by the cover of the case in the act of closing the same, and thereby thrown from operative to inoperative and open-circuit position.

My invention consists, also, in certain special combinations of devices, which will be more particularly specified in the claims.

In the accompanying drawings, Figure 1 is a plan of an apparatus embodying my invention, the cover being thrown back. Fig. 2 is a front elevation of the same, the case being shown in section. Fig. 3 is an end view of the apparatus, showing the pivoted lever and the cover of the box in position where the cover is about to operate on the lever for throwing it into inoperative position and opening the circuit. Figs. 4 and 5 are perspective views of the battery in reversed and inverted positions. Fig. 6 is a diagram of the circuits.

I indicates an induction-coil of a type frequently used in medical apparatus, and B B′ electric-generator cells of any suitable construction—such as galvanic batteries—designed for use with the induction-coil in the ordinary way.

The parts are inclosed in a suitable case, with a cover C, as indicated.

In order to thoroughly protect the connecting-wires of the apparatus from damage or displacement, while at the same time permitting them to be readily got at whenever desired for repairs, I mount the apparatus on a supplemental removable board or base D, which rests in the bottom of the case, and is secured in place by screws *e* or other device, as shown, and run the electric wires in grooves in the under side of the removable base-board D, as shown by dotted lines in Fig. 1.

The generator-cell B consists of a suitable case or box, including the galvanic battery, the electrodes of which are connected to terminal buttons or studs 1 2 on the outside of the cell, and adapted to impinge on the fixed spring-contacts 3 4 when the battery is put in place. I have shown in the present instance two like pairs of contacts 3 4 and two cells B B′. One of the contacts 3 of one pair is connected by a wire under board D to the contact 4 of the other set, the design being that when both cells are in place with their terminals bearing on the springs 3 4 said cells shall be in series with one another.

In order that there may be no possibility of making the connection with the poles of the two cells opposed to one another, I locate the studs 1 2 of said cells above the central line of the cell, so that if by any chance the cell should be placed upon its base in an inverted position no connection would be made with the spring-contacts 3 4. It is obvious that if

the terminal studs were placed at the center, the contacts 3 4, being also made of suitable height to correspond with the height of the terminal studs 1 2 when the battery is in place, electric connection could be formed with either the positive or the negative terminal of the battery in connection with contacts 3; but by arranging the studs 1 2 asymmetrically or to one side of the median line any possibility of accidentally making connection in this manner is avoided. The contacts 3 4 operate in conjunction with clips F F, also mounted on the base-board D to hold the generator-cells in place in an obvious manner. Mounted also on the generator-cell is a circuit-closing strap or plate *g*, arranged below the median line, so that when the position of the battery with relation to the contacts 3 4 is properly changed said strap will make connection simultaneously with the contacts 3 4, thus completing a circuit from one to the other independently of the battery elements of the cell to which said plate or strip is attached. The object of this provision is to permit either one of the cells to be used independently of the other, which object is accomplished by simply inverting the cell in its clips or holding devices and at the same time shifting it end for end. Thus, for instance, if the right-hand cell be turned over end for end, the connection will be formed directly by the strip *g* across the contacts 3 4 for said cell, the circuit thus being completed for the cell which has not been disturbed, leaving the latter to work by itself. The studs or screw-heads *i*, projecting from the strip *g*, are adapted to engage in perforations in the clips or springs so as to hold the cell firmly in place. Connection from one contact 4 of one pair is made in the ordinary manner to the primary of the induction-coil I, as indicated in Figs. 1 and 6, and thence to the vibrating spring or rheotome *m*, carrying the armature *n*, which is operated upon by the core of the induction-coil. The spring-contact 3 of the other pair is connected to the hub of a pivoted lever P, which carries the contact *s*, against which the rheotome vibrates. The lever P is pivoted in such position that when its handle is thrown upward its other end carries the contact *s* forcibly against the rheotome, thus closing the primary circuit and aiding the starting of the vibratory movement.

When the apparatus is out of use, the lever P is turned to break the circuit of the battery. When it is desired to put the apparatus into operation, the lever is moved to bring the contact *s* against the rheotome, which thereupon begins to vibrate and to make and break the circuit for the primary of the induction-coil, the initial contact being obviously made with a wiping movement.

It frequently happens that through negligence or forgetfulness the switch is left in position to keep the circuit of the battery closed, which latter soon becomes exhausted and worthless. To prevent this, I propose to arrange the lever P in the circuit of the battery in suitable relation to the cover of the apparatus, so that when the cover is brought down it will strike the lever and turn the same in a direction to break the circuit of the battery automatically, the lever having one end arranged in position to be struck by the cover, so that the latter will throw said lever into the position indicated in dotted lines in Fig. 3, which is the position where the contact-stud *s* will be out of connection with the spring-rheotome.

What I claim as my invention is—

1. A generator or battery-cell having on one end or face the usual terminals adapted for connection to an external circuit, and on the other end or face a conducting bar or stop whose ends span the same distance as said terminals and correspond with them in geometrical position, whereby in one position the cell can be actively included in an external circuit, and in another position can be open-circuited, while preserving the external circuit unbroken.

2. The combination, with the generator-cell, of fixed contacts with which the poles or terminals of the cell make connection when the cell is in place upon its support, and a circuit-closing strip or piece *g* for completing a circuit around the cell when the position of said cell with relation to said contacts is suitably changed.

3. The combination, with the generator-cell having suitable terminals 1 2 upon its surface, of the contacts 3 4, insulated from one another and forming a means for holding the cell in place upon its support, while at the same time forming the connection from said cell to its external circuit.

4. The combination, with the generator-cell removable from its support, of terminals 1 2, placed asymmetrically, or to one side of the median line, as and for the purpose described.

5. The combination, with a battery and induction-coil inclosed in a suitable box or case, of a circuit closing and breaking pivoted lever adapted in one position to be placed in operative relation to the rheotome of said coil, and in the other position adapted to open the circuit, and arranged in suitable relation to the cover of the case or box, as described, so as to be struck by said cover when the case is closed, and be thereby moved from operative to inoperative position.

Signed at New York, in the county of New York and State of New York, this 10th day of January, A. D. 1888.

JOHN A. BARRETT.

Witnesses:
WM. H. CAPEL,
HUGO KOELKER.