(No Model.)

M. H. GROSS.

ELECTRICAL INDUCTION APPARATUS.

No. 361,587. Patented Apr. 19, 1887.

Fig. 1.

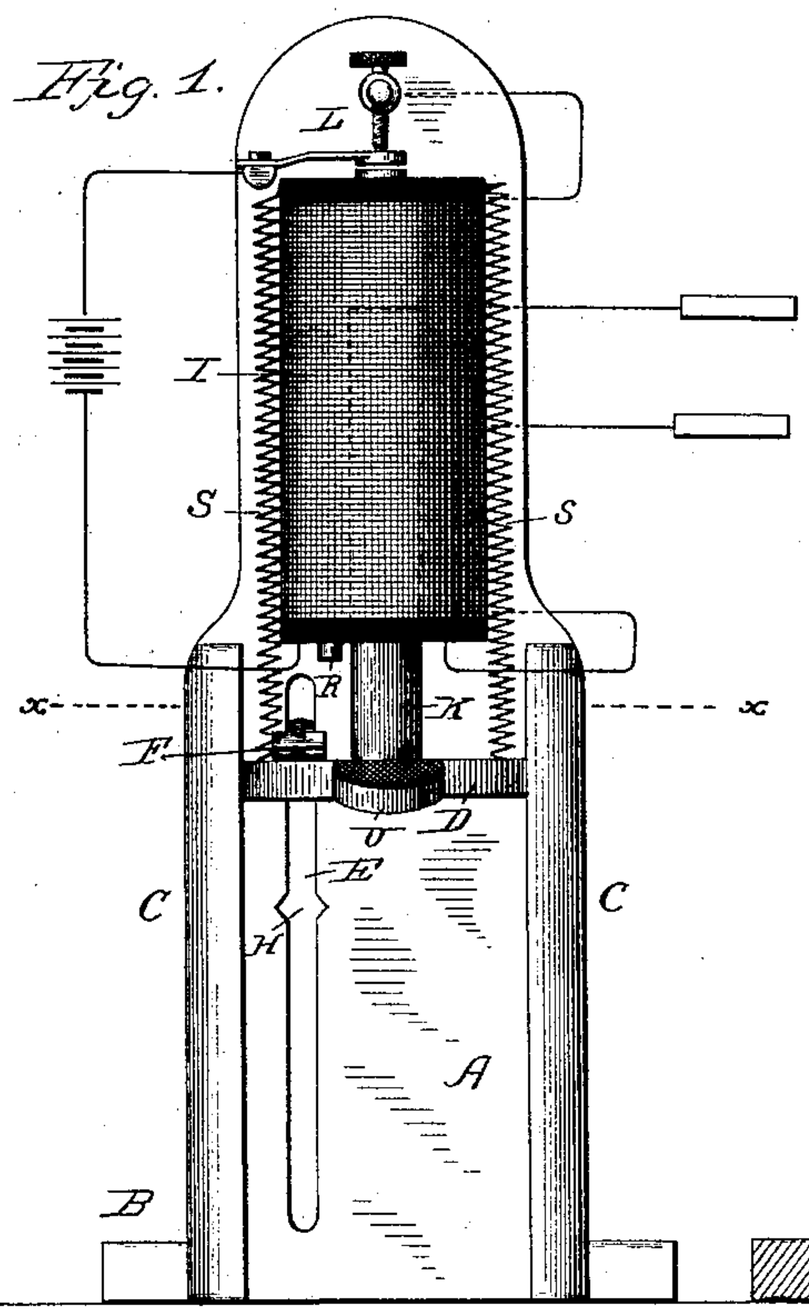


Fig. 2.

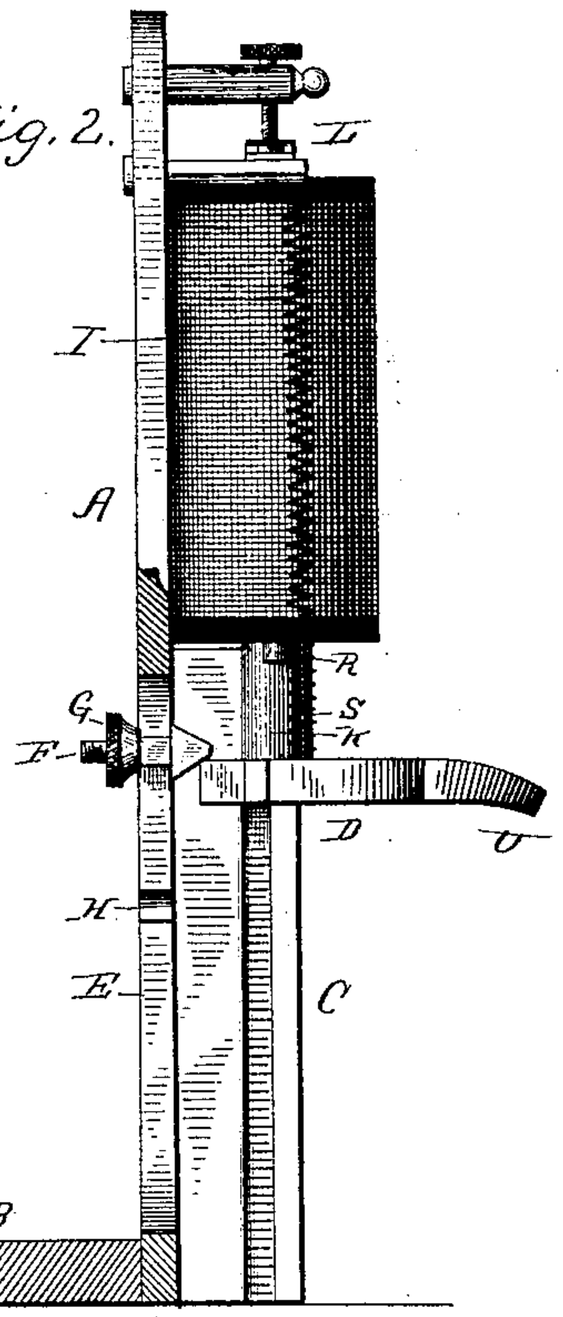


Fig. 3.

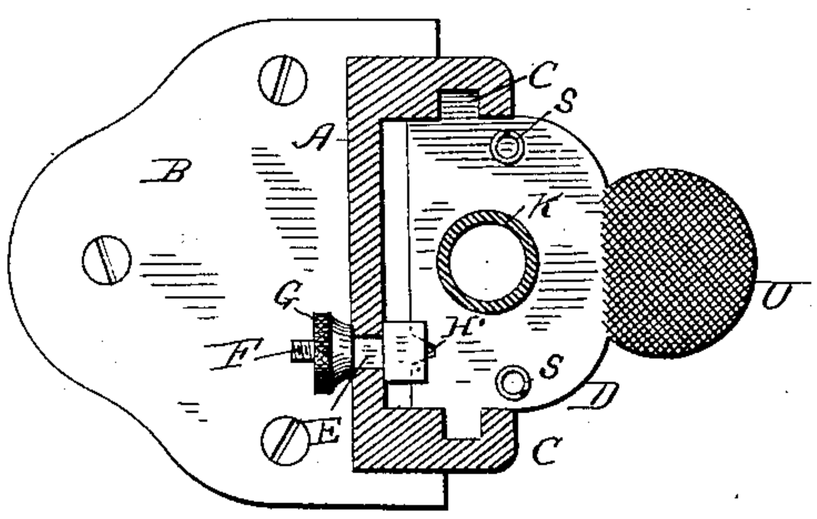


Fig. 4.

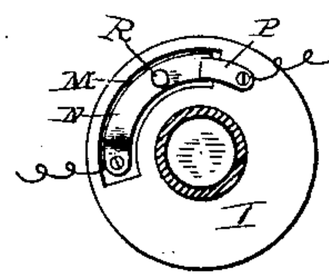
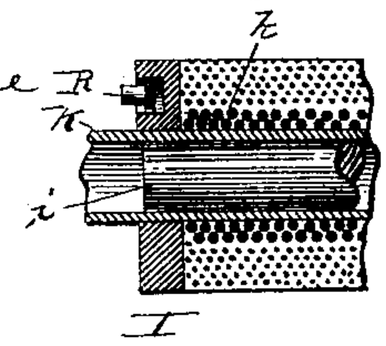


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRICAL INDUCTION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 361,587, dated April 19, 1887.

Application filed July 21, 1886. Serial No. 208,603. (No model.)

To all whom it may concern:

Be it known that I, MILTON H. GROSS, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Induction Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain improvements in electric induction apparatus for surgical and dental purposes; and it has for its objects to provide an induction-coil so arranged in connection with suitable mechanism that the induced current applied to the patient may be conveniently and quickly modified as to its intensity and held at any desired tension, or the operation of the device instantly stopped, when required, so as to relieve the patient when required, and to automatically cut off the primary current when the device is put out of use, as more fully hereinafter specified. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of my improved apparatus; Fig. 2, a longitudinal vertical sectional view thereof. Fig. 3 is a cross-sectional view on the line *x x* of Fig. 1; Figs. 4 and 5, detail views of the automatic circuit-breaker.

The letter A indicates a vertical standard having a suitable base, B, provided with apertures for screws or other fastening devices, by means of which it may be secured to the floor or other foundation. The lower part of the standard at the front is provided with guides or ways C, between which is arranged, to move vertically, a slide, D, which is grooved on opposite sides to fit the edges of the said ways. The standard is slotted vertically at its back, as indicated by the letter E, and through said slot extends a movable bolt, F, having an angular head at the front and a binding-nut, G, at the rear. The said bolt is squared just back of its head, and the said squared portion is adapted to move vertically in the slot without turning therein, so that the screw-nut may be set to bind the bolt in any desired position to adjust it and hold the slide in proper position. The slot is enlarged at H, so that when the squared portion of the bolt is brought to that point it may be turned to change the position of the head of the bolt, for the purpose more fully hereinafter explained.

The slide at one side and in line with the head of the bolt is provided with an angular groove, H′, by means of which it is enabled to pass over the head of the bolt when turned in one direction, so as to move freely past it when it is not desired to have it retained thereby.

To the upper part of the vertical standard is secured an induction-coil, I, of the usual construction, and to the slide D is secured a vertical tube, K, which is adapted to play in the space between the core *i* and the primary coil *k* of the said induction-coil. The core is stationary, and is secured at its upper end in the upper head of the induction-coil, and above it is arranged the usual vibrator, L, to automatically make and break the primary circuit in order to give the impulses in the primary coil to induce the currents in the secondary coil in the ordinary manner.

The lower head of the induction-coil is provided with a segmental recess, M, in which is arranged a segmental spring, N, which bears normally against a contact-plate, P, secured to the said head. The said spring and plate are connected, respectively, to the positive and negative elements of the primary circuit, and when in contact keep said circuit closed, so as to establish the current, but when separated open and break it, so as to stop the operation of the device. The spring is provided with a push-pin, R, with which the slide D comes in contact when fully elevated, so as to separate the parts and automatically break the circuit and put the device out of operation.

The letter S indicates two vertical springs arranged on the outside of the induction-coil and connecting with the slide D, the said springs serving to hold and return the slide and its tube to a normal position, when the same are free to move upward.

The connections of the primary coil with the vibrator are arranged as usual, and are in circuit with the circuit-breaker N P, before mentioned, and the wires from the secondary coil lead to suitable binding-posts, to which the conducting-wires to convey the induced current to the patient may be conveniently attached.

The operation of my apparatus is as follows:

The parts being properly arranged and the primary circuit connected with a suitable battery, by depressing the slide, which is provided with a suitable pedal, U, for the purpose, by means of the foot of the operator, the parts N and P come in contact and the battery-current traverses the primary coil, being automatically interrupted by the vibrator in the usual manner, inducing the currents in the secondary coil, which are conveyed to the patient by suitable wires. The intensity or tension of the induced current will depend upon the extent to which the tube or sheath K is withdrawn, and in order to hold it at any desired degree the screw-bolt may be turned so as to intercept the upward movement of the slide at any desired point and clamped in position at such point. If it is desired to have a variable current extending through the full range of the coil, the screw-bolt is so turned that the slide may be passed freely over its angular head, thus enabling the intensity to be regulated at will.

It will thus be seen that by this device the operator is enabled to control the current administered to the patient at will without the use of his hands, enabling him to give his entire attention to the patient.

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

1. The combination, with the standard having vertical ways, of the slide adapted to work between the same and provided with a pedal, the core-sheath secured to said slide, the induction-coil, and the springs whereby the slide is held and returned to normal position, substantially as specified.

2. The combination, with the induction-coil, its primary coil and connections, and the slide and core-sheath, of the circuit-breaker and push-pin, whereby the primary current is automatically cut off when the apparatus is thrown out of operation, substantially as specified.

3. The combination, with an induction-coil, of the slide carrying the core-sheath, the adjustable bolt having an angular head and adjusting-nut, the said bolt having a squared shank adapted to slide in a slot in the standard, which is enlarged at a proper point, and the slide having a groove whereby it is permitted to slide free of the head when the same is in proper position, substantially as set forth.

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

M. H. GROSS.

Witnesses:
JNO. A. METZELL,
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