(No Model.)

2 Sheets—Sheet 1.

C. W. MOESSNER.

ELECTRIC BATTERY FOR MEDICAL PURPOSES.

No. 598,948. Patented Feb. 15, 1898.

Fig. 1.

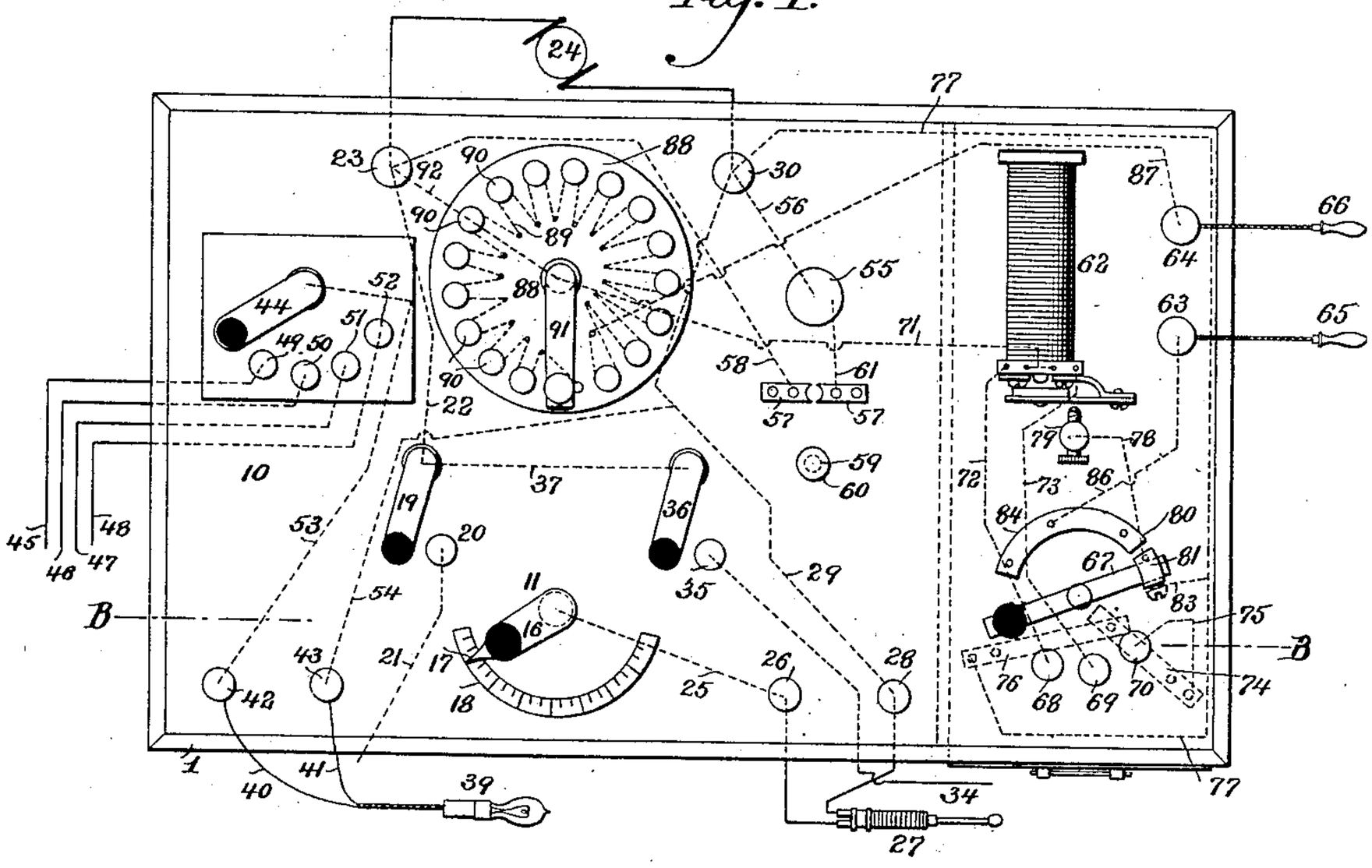
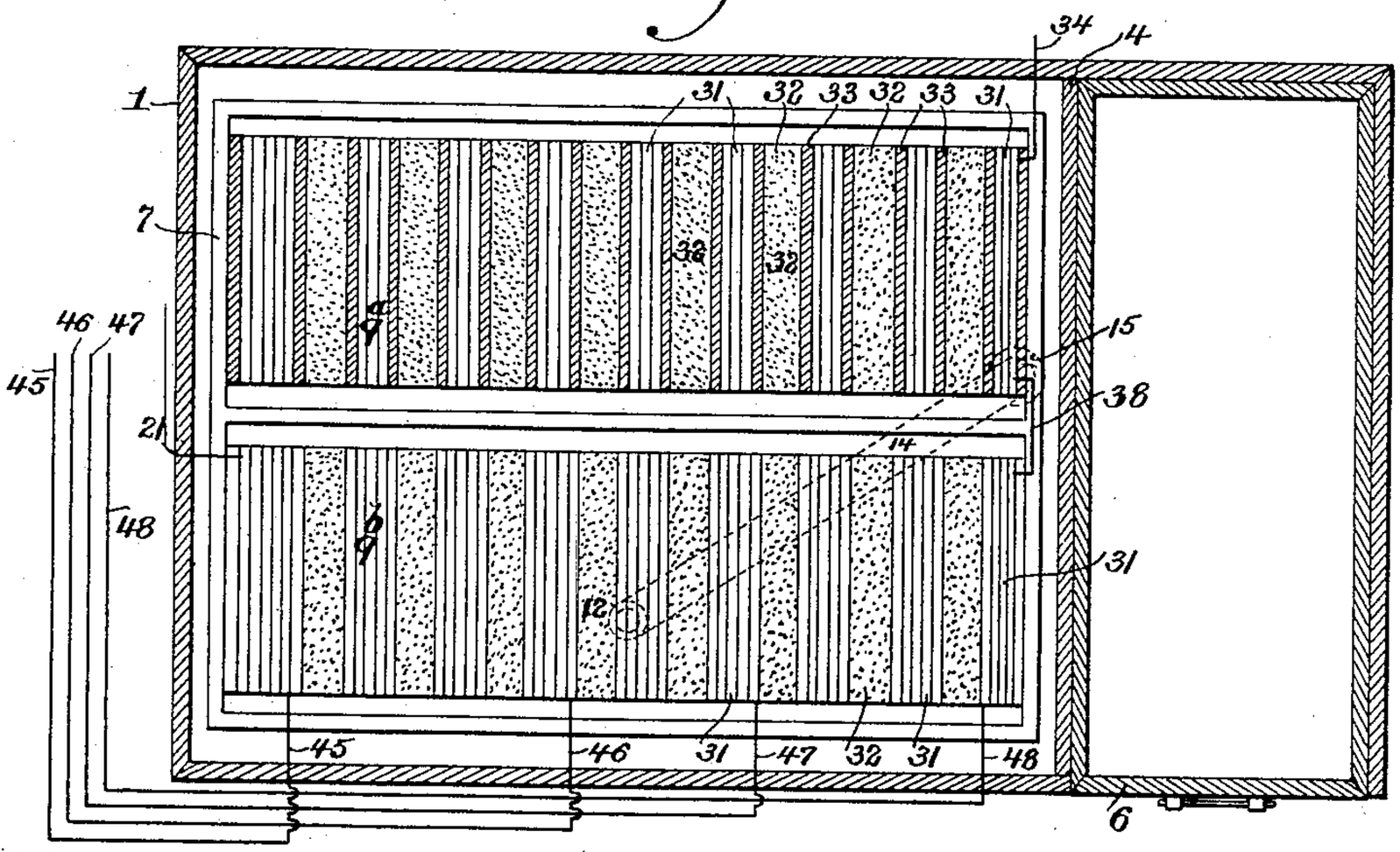


Fig. 2.



Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

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ELECTRIC BATTERY FOR MEDICAL PURPOSES.

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Fig. 3.

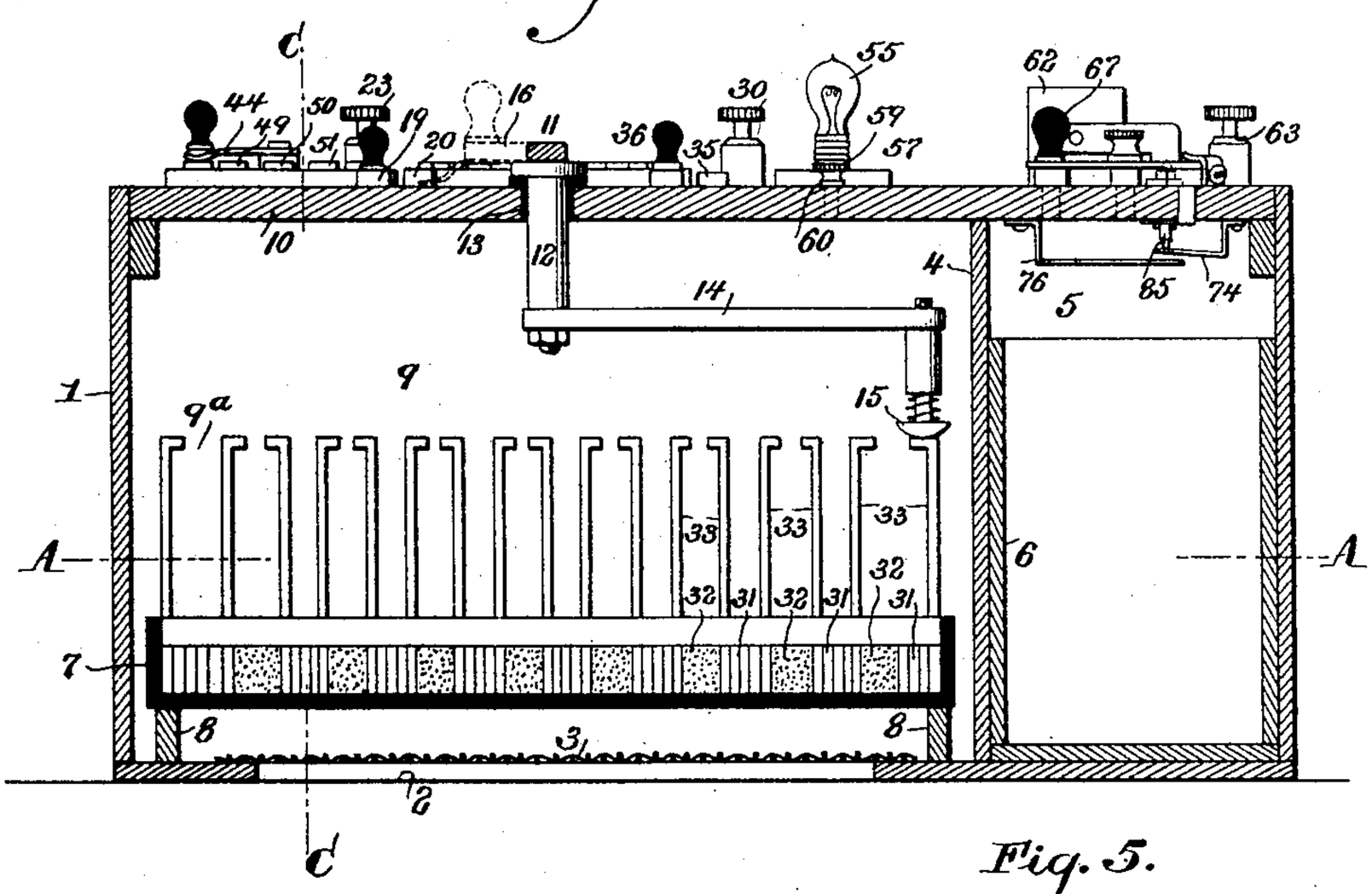


Fig. 4.

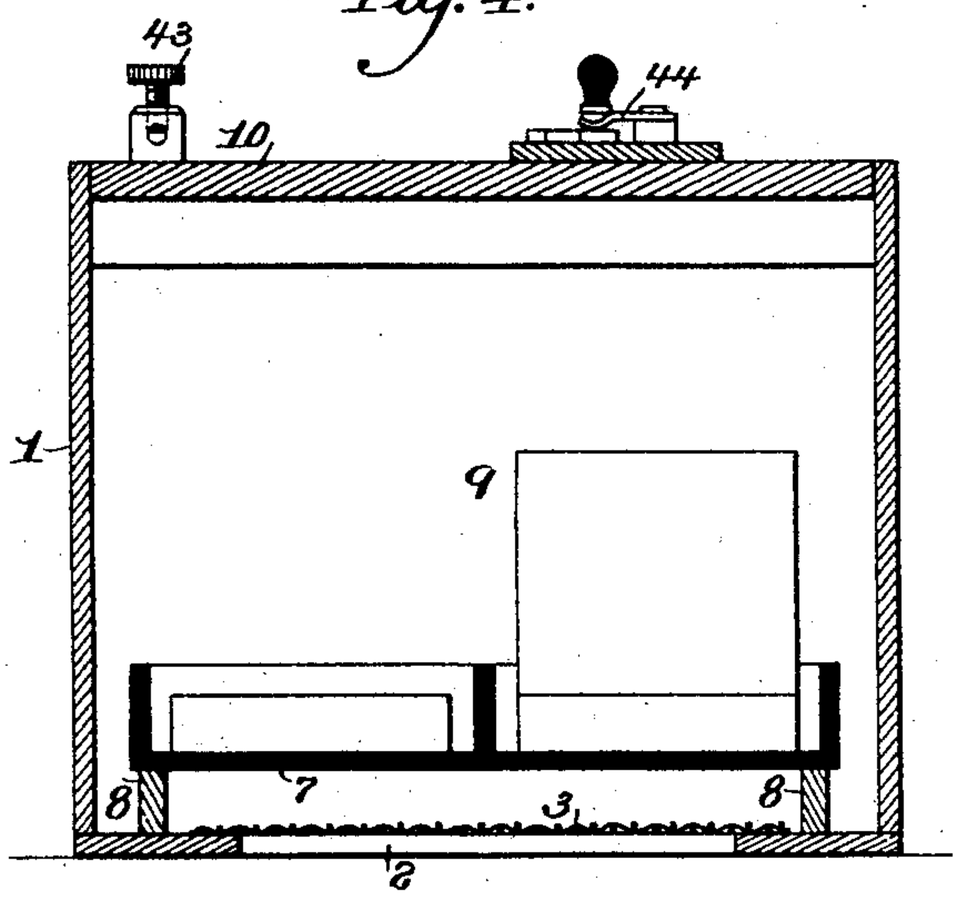


Fig. 5.

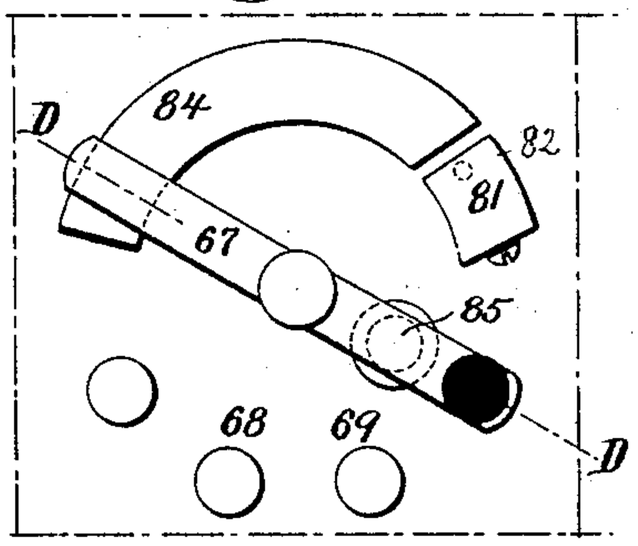


Fig. 6.

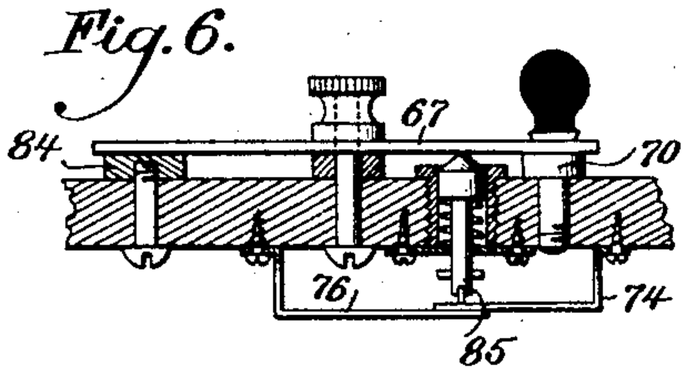
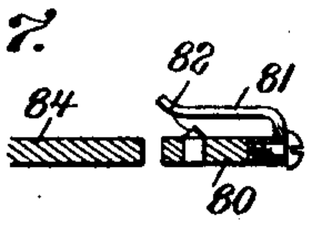


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

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ELECTRIC BATTERY FOR MEDICAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 598,948, dated February 15, 1898.

Application filed June 2, 1896. Serial No. 594,005. (No model.)

To all whom it may concern:

Be it known that I, CARL W. MOESSNER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Electric Batteries, of which the following is a specification.

My invention relates to electric batteries for medical and other purposes; and it consists of the improvements which are hereinafter described and claimed and are illustrated in the accompanying drawings.

It is one of the objects of my invention to embody within a single box or case the various electrical appliances which are usually required in the practice of medicine and surgery and to arrange the same compactly and conveniently for operation.

It is also an object of my invention to provide a medical battery with a rheostat or current-controlling device by which the currents supplied to an instrument, such as a cautery-knife, may be regulated with great nicety and precision.

A part of my improvements relate to the construction of this rheostat and to the combination of the same with switches whereby the currents may be regulated and controlled.

It is also an object of my invention to provide a medical battery with a small movable electric lamp which may be taken in the hand of the surgeon or attendant and used to illuminate parts of the patient to be inspected or operated upon, and part of my improvements relate to the employment of a switch in connection therewith and to devices for regulating the current passing through the lamp, so that the intensity of the light may be regulated to suit the character of the work to be done.

It is also an object of my invention to provide a battery with an illuminating-lamp, so that the physician or surgeon may always be supplied with local illumination.

It is a further object of my invention to provide a faradic apparatus with a triple switch by which primary, secondary, or galvanic currents may be supplied; and my improvements in this behalf relate both to the construction and arrangement of the switch and to the circuits embraced therein.

My invention also includes various combinations of features and constructions of parts which are hereinafter described and claimed.

Figure 1 is a plan view of an electric battery embodying my invention. Fig. 2 is a horizontal sectional view of the same on the line A A of Fig. 3. Fig. 3 is a longitudinal vertical sectional view on the line B B of Fig. 1. Fig. 4 is a transverse vertical sectional view on the line C C of Fig. 3. Fig. 5 is a plan view of the switch for controlling the current to the handles. Fig. 6 is a vertical sectional view of the same on the line D D of Fig. 5, and Fig. 7 is a vertical sectional view of part of the switch on the line E E of Fig. 5.

The box and main current-controlling devices.—1 is the box or frame of the battery, of suitable shape and size. It is preferably formed with an opening 2 in the bottom to admit air to the interior, and this opening may be covered by a screen 3, of gauze wire or equivalent material. For convenience I prefer to divide the box 1 by a partition 4, forming a compartment 5 at one end, adapted to contain a drawer 6.

Within the box 1 is a supporting frame or box 7, preferably of asbestos, and elevated on supports 8 8 slightly above the base of the box 1. This interior support or frame 7 carries a rheostat 9, which is preferably of peculiar construction.

10 is the top of the box, on which is located a collector 11, adapted to move over the contacts of the rheostat 9. As shown, this collector consists of a stud 12, journaled in an insulated bushing 13 on the top 10 and provided on its lower end with an arm 14, carrying a spring-contact 15, and upon its upper end with an operating-arm 16. A pointer 17 on the arms 16 moves over a scale 18 on the box and indicates the extent of movement of the collector and the strength of the current which passes through the rheostat 9.

19 is a switch on the top of the box adapted to make electrical contact with the contact-piece 20, which is in electrical connection with the rheostat 9 through the wire 21. The switch 19 is electrically connected with the source of electric energy. As shown, it is connected by a conductor 22 with a binding-post 23 in the rear of the box, adapted to be connected with one pole of the source of energy 24. When the switch 19 is thrown upon the contact 20, the circuit is completed from the source of energy to the rheostat 9, from

which it is taken by the collector 11. The collector 11 is connected by a conductor 25 with a binding-post 26, from which the current may be supplied to a suitable translating device, such as the cautery-knife 27.

The return-wire from the device 27 is connected with the binding-post 28, which is in turn connected by the conductor 29 with the binding-post 30 in the rear of the box, and this binding-post 30 is adapted to be connected with the opposite pole of the source of energy 24.

The circuit from the source of energy 24 is completed through the conductor 22, switch 19, contact 20, conductor 21, rheostat 9, collector 11, and conductor 25 to the knife 27 and back through the conductor 29 to the opposite pole of the source of energy 24.

By the movement of the collector 11 over the contacts of the rheostat 9 the resistance may be varied and the strength of the current through the knife or other device 27 regulated.

I shall now describe my preferred construction of the rheostat 9. This consists of alternately-disposed metallic members 31 and blocks 32, of material having a high resistance, with suitably-disposed contacts 33. The members 31 are preferably composed of a number of iron strips laid side by side, but strips of aluminium, Krupp gun-metal, tin, nickel, German silver, or lead may be used in lieu thereof or may be used either alone or in combination with one another or with the iron strips. The blocks 32 are preferably formed of a composition of matter consisting of black-lead or tin suboxid or equivalent material and kaolin or other suitable binding material mixed with sufficient water to form a paste and dried. Sugar of lead, antimony, and bismuth in proper quantities may also be added. I have found the following formulæ productive of excellent results:

(*a*) Eight parts in bulk of either black-lead, black-tin suboxid, or graphite, eight parts sugar of lead, twelve parts kaolin, four parts antimony, four parts bismuth.

(*b*) Eight parts of black-lead or black-tin suboxid, eight parts sugar of lead, twelve parts kaolin, eight parts graphite, ("Rising Sun Stove Polish.")

For the contacts 33 I prefer to use copper strips. The contacts may be arranged either between the members 31 and 32 or between each pair of members. They are so disposed that the contact-piece 15 of the collector 11 will make contact with them as it is moved.

I prefer to form the rheostat 9 of two sections 9^a 9^b, only one of which, however, is provided with contacts 33. As shown, the section 9^b, which is unprovided with contacts 33, is connected with the contact 20 of the switch 19, while the section 9^a, which contains the contacts 33, is connected by a conductor 34 with a contact 35, adapted to make contact with a switch 36, connected by a conductor 37 with the binding-post 23 either directly or through the switch 19, as shown, Fig. 1. The sections 9^a and 9^b are connected by a conductor 38, Fig. 2.

When the switch 19 is turned to close the circuit through the wire 21, the current passes through the section 9^b before entering the section 9^a, from which it is taken off by the collector 11; but as the collector 11 is moved over the contacts of the section 9^a the full resistance of the section 9^b is at all times opposed to the current. If, however, the switch 36 be closed and the switch 19 is left open, the current will pass through the conductor 34 directly to the section 9^a. When the switch 36 is closed, therefore, the maximum current may be utilized, and this may be reduced to the extent of the resistance of the section 9^a; but when the switch 19 is closed the maximum available current is the current reduced by the section 9^b, which may be further reduced by the operation of the collector on the section 9^a. Supposing a maximum current of one hundred volts to be used and that each section 9^a 9^b would reduce that current one-half, with the switch 36 closed a current ranging from one hundred to fifty volts could be supplied to the knife or device 27, and with the switch 19 closed a current ranging from fifty volts to zero could be supplied. By thus dividing the rheostat into sections and employing the two switches 19 and 36 I am enabled to arrange the rheostat and collector more compactly and to dispense with the use of a large number of contacts 33.

The small movable lamp and its connections.—39 is a small incandescent lamp having a flexible connection by conductors 40 41 with binding-posts 42 43 on the box. The lamp 39 may be taken in the hand of the physician or assistant and used for lighting up parts to be operated upon or examined. While this lamp may be supplied with current directly through the binding-posts 23 30, I prefer to employ a diminished current and a switch 44, through which the intensity of the current may be regulated.

45, 46, 47, and 48 are a series of conductors connected with different portions of the rheostat 9—*e. g.*, with the section 9^b—and leading to a series of contacts 49, 50, 51, and 52, any one of which may be brought into electrical contact with the switch 44. The switch 44 is connected with the binding-post 42 by a conductor 53, and a return-conductor 54 leads from the binding-post 43 to the post 30. It is shown as connecting with the conductor 29.

The current from the supply-wire 21 passes through a section of the rheostat 9 and thence through one of the conductors 45, &c., and contacts 49, &c., to the switch 44, and from there to the lamp 39. By the regulation of the switch 44 a greater or less extent of the rheostat 9 will be thrown into circuit, and consequently the current supplied to the lamp 39 may be regulated.

The lamp for lighting the battery.—To light up the battery I employ a lamp 55, having a

return connection 56 with the binding-post 30 and a supply connection 61 with a switch 57. The switch 57 is connected by a conductor 58 with the binding-post 23.

59 is a pin adapted, when inserted in a recess in the switch 57, to close the circuit through it and thus complete the circuit through the lamp 55.

The box top or frame 10 may be provided with a socket 60 to receive the key 59 when it is not in use to close the switch 57.

The faradic apparatus and triple switch therefor.—This part of my invention relates to a faradic apparatus provided with a switch by which primary, secondary, or galvanic currents may be supplied through the handles.

62 is the induction-coil of the faradic apparatus.

63 64 are the binding-posts with which the handles 65 66 are connected.

67 is the switch by which the currents are controlled.

68, 69, and 70 are respectively the primary, secondary, and galvanic contacts of the switch.

The primary wire of the coil 62 is connected with one of the binding-posts, as 23, by a conductor 71, and with the primary contact 68 by a conductor 72. The secondary coil is connected with the secondary contact 69 by a conductor 73, and the galvanic contact 70 is connected with one member 74 of a spring-contact by a conductor 75. The other member 76 of the spring-contact is connected by a conductor 77 with the binding-post 30.

78 is a conductor connecting the interrupter-screw 79 with a contact-piece 80.

81 is a spring-piece insulated from the body of the contact 80, but normally making contact with the face thereof, as through a pin 82. The switch-lever 67 is adapted when thrown into the extreme position shown in Fig. 1 to enter between the spring 81 and the contact 80, thus breaking the contact between the two. One face of the switch-lever is insulated so that electrical connection is broken.

83 is a conductor connecting the spring piece 81 with the binding-post 30, as through the conductor 77.

84 is a contact-strip over which the end of the switch-lever 67 moves and with which it is in electrical contact.

86 is a conductor between the strip 84 and the binding-post 63 of the handle 65.

85 is a spring-pin located over the ends of the spring-contacts 74 and 76 and adapted when depressed to press them together so as to close the circuit.

87 is a conductor between the binding-post 64 of the handle 66 and the binding-post 23.

When the switch is thrown in the position shown in Fig. 1 with the insulated end of the switch between the contacts 80 and 81, the circuit is broken and no current passes. If the switch is turned until its rear end is in contact with the primary contact 68 and its outer end is in contact with the strip 84, the circuit for primary currents is completed through the handles 65 66. The circuit will then be completed from the post 30 through the conductor 77 and branch 83, spring 81, contact 80, conductor 78, and interrupter 79 to the coil 62, and from the primary wire thereof through the wire 72 to the contact 68, whence it will pass through the switch 67, strip 84, and wire 86 to the binding-post 63 and handle 65. The other handle 66 is connected with the binding-post 23 through the conductor 87 and the rheostat 88, or directly, if the rheostat is not used.

If the switch is turned into position so that its ends make contact with the strip 84 and the contact 69, the circuit is completed for secondary currents. The circuit passes from the binding-post 30 to the coil 62, as before, and thence through the wire 73 from the secondary wire of the coil to the contact 69, whence it continues as before. The circuit from the post 23 is the same as that described for primary currents. When the switch is turned so that its ends are in contact with the strip 84 and the contact 70, the pin 85 is depressed by the switch 67, and the spring-pieces 74 76 are brought in contact. The circuit is then completed for galvanic currents. From the post 30 the circuit extends through the wire 77 to the spring 76, thence to the spring 74 and wire 75 to the contact 70, and from there through the switch 67, strip 84, and wire 86 to the binding-post 63 and handle 65, and from the handle 66 back to the post 23, through the wire 87 and rheostat 88.

For controlling the currents from the binding-posts 23 and 30 to the faradic apparatus I prefer to interpose in the circuit a current-controlling device or rheostat 88. This may be of any suitable character for reducing the currents from the source of supply. I have shown, and I prefer to use, however, a rheostat consisting of a resisting conducting-cord 89, provided with a series of contact-pins 90 and a switch 91, which is in electrical connection with the binding-post 23 through a conductor 92. The end of the resisting conducting-cord 89 is connected with the wire 87, which leads to the binding-post 64. The current passes through the conductor 92 to the switch 91, and thence through so much of the resisting conductor 89 as is in circuit to the wire 87, or vice versa.

While I have shown the various devices combined in a single medical battery adapted for the various uses demanded of such an apparatus, it is apparent that they may be used separately and that the details of construction which have been shown may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a medical battery, the rheostat for controlling the electric currents composed of a series of alternately-arranged metallic and composition members, the metallic members

being each composed of a series of metallic strips, and provided with contacts, and a movable switch adapted to be moved over the contacts.

2. In a medical battery, the rheostat for controlling the electric currents composed of a series of alternately-arranged metallic and composition members, the latter being formed of black-lead, or equivalent material, and kaolin, and provided with contacts, and a movable switch adapted to be moved over the contacts.

3. In a medical battery, the rheostat for controlling the electric currents, composed of a series of alternately-arranged metallic and composition members, the latter being formed of black-lead, or equivalent material, kaolin and sugar of lead, and provided with contacts, and a movable switch adapted to be moved over the contacts.

4. In a medical battery, the combination of a rheostat divided into sections, conductors connecting said sections with the source of electrical supply, a collector for throwing a greater or less portion of said rheostat into circuit, switches independent of the collector for throwing either one or more of said sections of the rheostat into circuit, and supply-conductors from said rheostat for taking the current therefrom.

5. In a medical battery, the combination of a rheostat divided into sections, independent supply-conductors leading to each of said sections, switches for independently controlling the current through each of said supply-conductors, whereby the direct supply of current to either of said sections may be cut off and a collector for taking the current from the rheostat.

6. In a medical battery, the combination of a rheostat divided into two sections, one of which is provided with contacts, an electrical connection between said sections, a current-collector adapted to take current from the section provided with contacts, supply-conductors leading independently to each of said sections, and independent switches in each of said supply-conductors.

7. In a medical battery, the combination of a rheostat composed of two independent sections 9^a and 9^b, one of said sections, as 9^a, being provided with a series of contact-pieces, an electrical connection between said sections, a current-collector adapted to make contact with the series of contacts of the section 9^a, the supply-conductors 34 and 21 leading to the sections 9^a and 9^b respectively, and the switches 36 and 19 for controlling the supply through said conductors 34 and 21 respectively.

8. In a medical battery, the combination of a cautery-knife 27, and a movable electrical lamp 39, with binding-posts in the battery adapted to be placed in circuit with a source of electrical energy, electrical conductors between the binding-posts and the cautery-knife 27 and lamp 39 respectively, a rheostat in circuit with the cautery-knife and lamp, for controlling the current passing through them, and independent controlling devices for controlling the current through the rheostat to the cautery-knife and lamp respectively.

9. In a medical battery, the combination of a suitable box provided with binding-posts or contacts adapted to be put in circuit with a source of electrical energy, a stationary lamp 55 in circuit with said binding-posts or contacts, a movable lamp 39 also in circuit with said binding-posts or contacts, and a controlling device for controlling the current through said lamp 39.

10. In a medical battery, the combination of an induction-coil, an electrical circuit including said coil, independent conductors leading from the primary and secondary wires of said induction-coil respectively, a switch for throwing either said primary or secondary conductors into circuit, contacts or binding-posts in circuit with said switch adapted to be placed in circuit with faradic handles or current-consuming devices, and an independent circuit, excluding the induction-coil and embracing the switch and binding-posts for the faradic handles, whereby either primary, secondary or galvanic currents may be supplied through a single pair of handles by the manipulation of a single switch.

11. In a medical battery, the combination of an induction-coil, an electrical circuit including said coil, independent conductors leading from the primary and secondary wires of said induction-coil respectively, a switch for throwing either said primary or secondary conductors into circuit, contacts or binding-posts in circuit with said switch adapted to be placed in circuit with faradic handles or current-consuming devices, an independent circuit, excluding the induction-coil and embracing the switch and binding-posts for the faradic handles, whereby either primary, secondary or galvanic currents may be supplied through a single pair of handles by the manipulation of a single switch, and a rheostat embraced in the general circuit for controlling the current passing therethrough.

12. In a medical battery, the combination of an induction-coil, an electrical conductor connecting the same with a source of supply or outlet, a series of contacts, a conductor between one of said contacts and the primary wire of the induction-coil, a conductor between another of said contacts and the secondary wire of the induction-coil, an electrical connection between the third of said contacts and a source of supply or outlet embracing a normally open switch, binding-posts or contacts adapted to be connected with faradic handles or current-consuming devices, a contact-strip in electrical connection with one of said binding-posts or handles, a switch-lever adapted to connect any one of said contacts with the contact-strip, and devices controlled by the switch-lever for closing the nor-

mally open switch in the circuit of the third contact, whereby primary, secondary or galvanic currents may be supplied to the faradic handles or current-consuming devices.

13. In a medical battery, the combination with the contacts or binding-posts 63, 64 adapted to be connected with faradic handles or current-consuming devices, the normally open switch composed of the members 74, 76 in circuit with a source of supply or outlet, the switch-lever 67, an electrical circuit between the switch-lever and one of the binding-posts or contacts of the faradic, a conductor between the other binding-post or contact and a source of electrical supply or outlet, a contact in electric circuit with one of the members 74, 76, and devices controlled by the switch-lever 67 for closing the switch members 74, 76 and thereby completing the circuit through the switch-lever 67.

14. In a medical battery, the combination of the induction-coil connected with a source of electrical supply or outlet, the switch-contacts 68, 69, the conductors 72 and 73 between the primary and secondary wires of the induction-coil and the contacts 68 and 69 respectively, the contact-piece 84, the switch-lever 67 adapted to place either of the contacts 68, 69, in electrical connection with the piece 84, the interrupter 79 of the induction-coil in circuit with the source of electric energy, and the contacts or binding-posts 63, 64 in circuit with the contact-piece 84.

15. In a medical battery, the combination of the induction-coil connected with a source of electrical supply or outlet, the switch-contacts 68, 69, the conductors 72 and 73 between the primary and secondary wires of the induction-coil and the contacts 68 and 69 respectively, the contact-piece 84, the switch-lever 67 adapted to place either of the contacts 68, 69, in electrical connection with the piece 84, the interrupter 79 of the induction-coil in circuit with the source of electric energy, and the contacts or binding-posts 63, 64 in circuit with the contact-piece 84, and the normally closed switch 80, 81 in the circuit between the source of supply and the interrupter.

16. In a medical battery, the combination of the induction-coil connected with a source of electrical supply or outlet, the switch-contacts 68, 69, the conductors 72 and 73 between the primary and secondary wires of the induction-coil and the contacts 68 and 69 respectively, the contact-piece 84, the switch-lever 67 adapted to place either of the contacts 68, 69, in electrical connection with the piece 84, the interrupter 79 of the induction-coil in circuit with the source of electric energy, and the contacts or binding-posts 63, 64 in circuit with the contact-piece 84, the normally open switch 74, 76 in circuit with the source of electrical energy, the contact 70 in circuit with the switch 74, 76, and devices controlled by the lever 67 to close the switch 74, 76 when the lever is thrown to make connection between the contact 70 and the piece 84.

17. In a medical battery, a faradic apparatus embracing a triple switch in electrical circuit with the primary, and secondary wires of the induction-coil respectively and also directly with the source of electrical energy, whereby either primary, secondary or galvanic currents may be passed through said circuit by the manipulation of said triple switch.

In testimony of which invention I have hereunto set my hand.

CARL W. MOESSNER.

Witnesses:
R. M. KELLY,
WM. L. ELAUS.