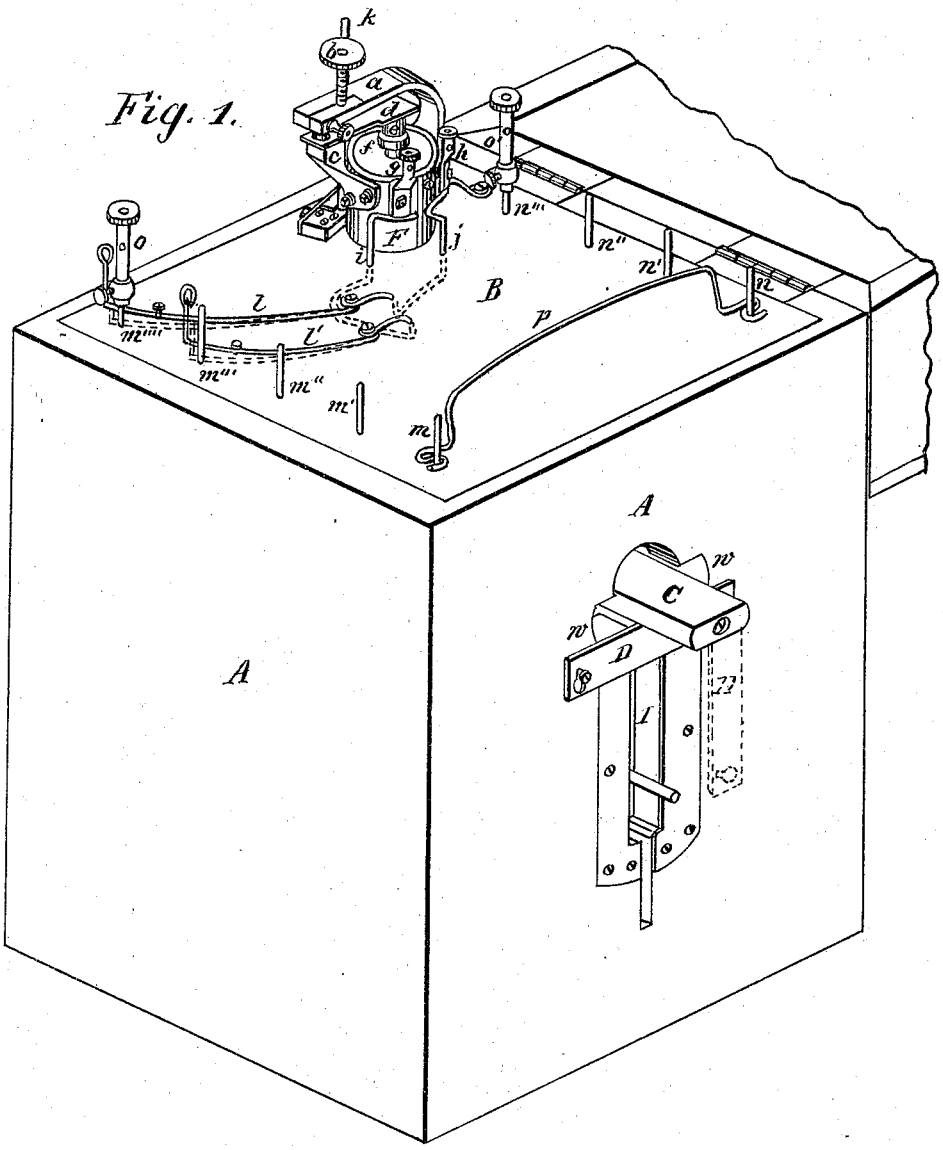
2 Sheets—Sheet 1.

J. KIDDER.

ELECTRICAL APPARATUS.

No. 182,203. Patented Sept. 12, 1876.

Fig. 1.



Witnesses
B. F. Warner
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Inventor
Jerome Kidder & Co

2 Sheets—Sheet 2.

J. KIDDER.

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Fig. 2.

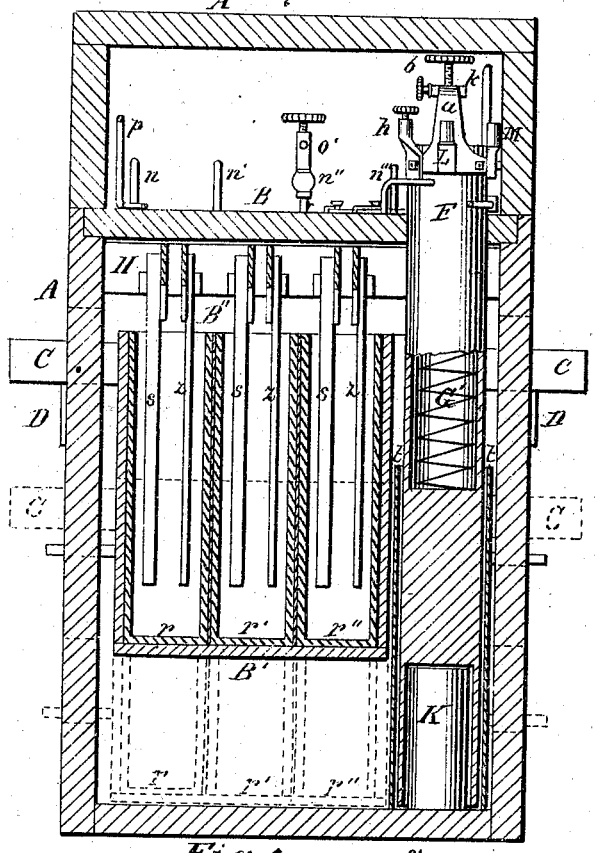


Fig. 3.

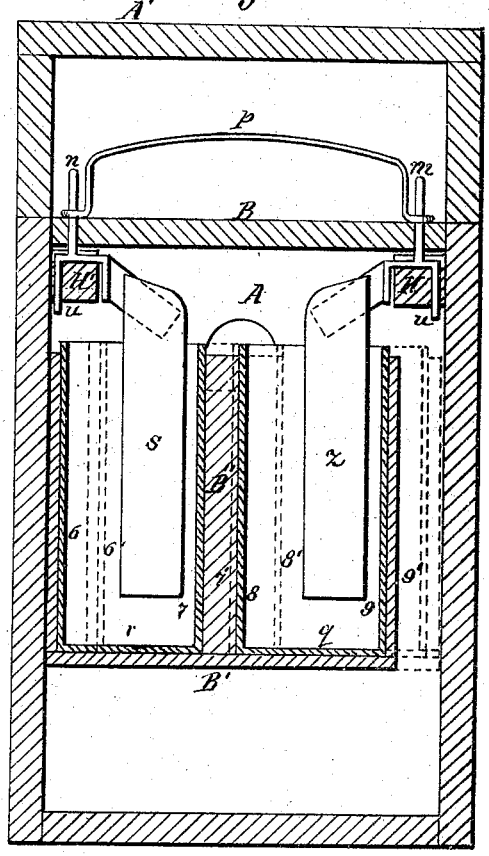


Fig. 4.

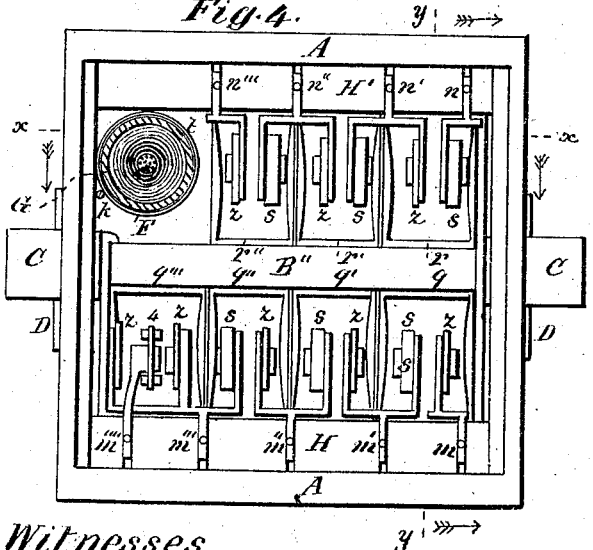


Fig. 5.

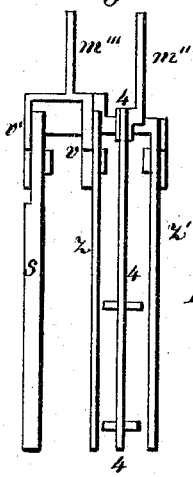


Fig. 6.

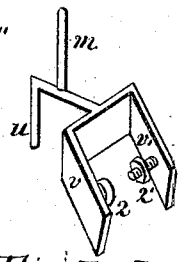
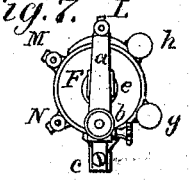


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

JEROME KIDDER, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRICAL APPARATUS.

Specification forming part of Letters Patent No. **182,203**, dated September 12, 1876; application filed May 9, 1874.

To all whom it may concern:

Be it known that I, JEROME KIDDER, M. D., of New York, N. Y., have invented Electrical Apparatus, of which the following is a specification:

My invention consists in the combination of a series of battery elements, a portion of which, as one or two, or thereabout, in a short series, differ in character from the rest by sustaining their power better on a metallically-closed circuit, the combined series arranged for use not on a metallic circuit, but through the human body, with appropriate connections to use any consecutive number of the series of cells, and the one or two, or thereabout, which sustain their power better on a metallic circuit, arranged to operate an induction coil or coils, with devices for closing these distinctively in the circuit of the coil.

My invention also consists in rendering the cells movable in their relation to the elements, in such a manner as to displace a portion or all of the fluid between the elements in the cells and substitute other portions of the fluid which have been less acted upon, substantially in the manner herein specified.

My invention also consists of a metal holder, provided with a hook for its own support and arms for the support of the elements on projections, which are a part of those arms, and also provided with a projection for communicating with the conductors.

My invention also consists in supporting the induction coil or coils by fixing them in a tube of non-conducting or of metallic material, in combination with another tube, surrounding the outside, which latter is always of metal, adjustable for modifying the power of the induced currents.

Further, my invention consists in the combination of a tube supporting an induction coil or coils, over which is an adjustable metallic tube for modifying the power of the induced currents, and an automatic interrupter of the primary circuit, as herein set forth.

And, also, my invention consists in the combination of electrical coils of as many as three different lengths and thicknesses of wire, supported by a tube, over which is an adjustable metallic tube, to modify the power of the induced currents, and an automatic circuit-breaker, as herein set forth.

Referring to the drawings, Figure 1 is a perspective view. Fig. 2 is a cross-section on line *x x* of Fig. 4. Fig. 3 is a cross-section on line *y y* of Fig. 4. Fig. 4 is a top view with the top inside cover removed, and shows a cross-section of the coils in the tube. Fig. 5 is a detached view of the elements of one cell, with an adjoined element of another cell. Fig. 6 represents one of the metallic holders which support the elements. Fig. 7 is a top view of the metallic parts, joined to the tube *t*, Fig. 1, containing the coils.

A′, Figs. 2 and 3, represents the lid, and A the box itself, containing the operating devices. B represents the inside cover, having perforations through which pass the poles of the several galvanic elements. B′, Figs. 2 and 3, is the inner box, containing the cells of fluid.

B″, Fig. 4, is a thick partition dividing the row of cells, and affording at each end the fastenings of the arms C C, Figs. 1, 2, and 4, which project through the slots I on opposite sides of the box, and serve to raise and lower the inner box of cells. In the raised position they are supported by the bars D D, Figs. 1 and 2, pivoted at one end and hooked at the other end.

The slot I, Fig. 1, is widened at its upper end at *w w* to admit of a lateral movement of the arms C C. Also, the arms C C may have any other appropriate form for substantially the same purpose, and may be rested on rollers or pivoted standards to facilitate their movement, which changes the fluid between the elements of the battery.

H H, Figs. 3 and 4, are bars, of non-conducting material, fastened to the front and rear sides of the box A, a little below the lid, and on these bars rests the inside cover. They are perforated to receive the prongs *u* of the metal holder shown in Fig. 6, which holder has a projection, *m*, for connecting with a conductor.

v v′, Fig. 6, show the flat arms of the metal holder, provided with screws 2 and 2′ on their inner sides, and forming a part of the same, for holding the elements of the battery. One of these holders supports, on one of its

arms, the element—as zinc— of one cell, and on its other arm the element—as carbon—of the adjoining cell.

Fig. 5 shows an extension of metal joined to *v* for supporting an additional zinc plate, *z'*, so as to have two zinc plates in one cell to obtain a larger surface; and 4 4 4 represent a plate of platina or platinized silver, or other platinized metal used as one of the elements of this same cell. The poles of this element thus formed are seen at *m''''* and *m'''*, Figs. 1, 4, and 5. The elements of the other cells are zinc and carbon, but may be of other materials which give a comparatively high intensity. The zinc plates are severally represented by *z* and the carbon plates by *s*. They are attached to the extensions (arms) *v v'* by the screws with nuts 2 and 2'.

F, Figs. 1, 2, and 4, is the tube, in which is fixed a series of coils for developing the induced currents. This tube is of non-conducting material, but may consist of metal, having a longitudinal opening at one side, so as not to close the circuit. F, Fig. 2, represents this tube with the lower part cut away to show the location of the coils, and the cylinder K fastened to the box, over which this tube passes to be held in place. This tube F may be supported horizontally, or in any position, by fixing it at one end, or by fixing it in any manner that will admit of the adjustability of the metallic tube *t*, which passes over (outside) and around the tube F.

l, Fig. 1, is a spring-wire, connecting with the wire *j* in communication with the metallic part *h*. *l'* is a spring-wire, connected with the wire *i* in communication with the metallic part *g*.

k, Fig. 1, is a rod, fastened to, and used to raise, the metallic tube *t*, Fig. 2, over the tube F containing the coils, which tube *t* is to reduce the currents of the coils by its own circuit. *p*, Figs. 1 and 3, is a wire connecting the front row with the back row of elements. *o* and *o'*, Fig. 1, are screw-cups, for connection with the conductors, and are arranged to be attached to any of the poles of the several elements. 6 7 and 8 9, Fig. 3, show the position of the two rows of cells in their relation to the elements *s* and *z* when the arms C C, Fig. 4, are moved backward; and 6' 7' and 8' 9', Fig. 3, show their relative position when the arms are moved forward. F, Fig. 4, shows a cross-section of the tube, and a view of the contained coils G. These coils are designed to be of three different sizes and lengths of suitably-insulated wire. The inner coil is the thickest wire, and is used in the battery-circuit. The second coil is of longer and finer wire, and the third or outer coil is of a still longer and finer wire. In the center of the coils is shown an end view of the electro-magnet, consisting of iron wires. G', Fig. 2, is intended to show, not the coils themselves, but their location in the tube F.

Describing the metallic parts joined to the upper portion of the tube F, *a*, Figs. 1 and 7, is an arm, supporting the platinum-pointed screw *b*, which touches a platinum disk on the spring *d*, which has at one end the iron hammer *e*, and is fastened at the other end to the metallic part *c*. The first end of the inner coil of wires joins with the metallic part *g*, and the other end with *c*. The first end of the second coil joins with *c*, and the last end with M, Fig. 7. The first end of the third coil joins with M, and the last end with N. *a*, L, and *h*, Fig. 7, are all metallic parts connected together. *g* and *h* are the poles to connect with the cell. L and *c* are the poles of the first coil, *c* and M of the second coil, and M and N the poles of the third coil.

It will be seen that by using other two of these poles, the first two coils, or the last two, or all three can be used in combination.

To use the battery, the zincs are to be amalgamated. The cells *r r' r'' q q' q''* are supplied with the well-known battery solution—bichromate of potash, sulphuric acid, and water—but the cell *q'''* is supplied with the well-known battery solution, sulphuric acid and water. The lid B is replaced, the wire *p* connected with *m* and *n*, Fig. 3, and the cells raised, so as to immerse the elements.

By varied adjustments of the wire *p* and the screw-cups *o* and *o'*, Fig. 1, any consecutive number of the cells can be brought into the circuit—that is, the wire *p*, Figs. 1 and 3, can be readily removed from contact with the poles *m* and *n* and placed so as to connect with any two poles opposite each other in the rows of elements.

It will be seen that the screw-cups *o o'*, Fig. 1, can be placed on different poles, so as to leave out of the circuit one or more battery elements at the end of the rows; and it will also be seen that the wire *p*, Figs. 1 and 3, can be so placed as to leave out of the circuit one or more battery elements at the beginning of the rows, so that in using only a few elements it is not necessary in every case to use any same elements over and over. The elements represented by the poles *m''''* and *m'''*, though not having as high intensity as the others, (not yielding a current of as high intensity as the others,) nevertheless have a high conducting power to transmit the intensity of the other elements. The elements of the cell *q'''*, used with one or more of the adjoining elements, give a ratio of quantity and intensity different from that of any other like number of these elements. Also, when the power becomes reduced by using, the cells can be moved by the arms C C, as heretofore explained, thus displacing from between the elements the more used portion of the fluid and substituting a portion less used, thus sustaining the power while it is being used.

To operate the coils, the elements of one cell serve well, and the special elements of the cell *q'''* retain their power much longer than the others in a metallically-closed circuit.

It is, therefore, preferable to use the elements of the cell q''' to operate the coil, to avoid the inconvenience of frequently replenishing the fluid of a cell or cells. The spring-wires l and l', when brought in contact, respectively, with the poles m'''' and m''', the current passes from m'''', along the wire l, Fig. 1, to the wire j, and to the part h and a, and down the screw b to the spring d; thence to c; thence through the inner coil of coarse wire, and out at g; thence through the wire i and the wire l', to the other pole m''' of the battery.

The interruptions of the primary current which vary the magnetism of the iron core to cause the induced currents, is effected by the magnet f, Fig. 1, attracting the hammer e in the usual manner.

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

1. The combination into one organization of battery elements of different qualities, an induction coil or coils, and the wire p, operating substantially as set forth.

2. The horizontally-elongated slots w w, in combination with the arms C C and the bars D D, substantially as and for the purpose set forth.

3. The metallic device v v' m n 2 2′, operative for holding both the positive and the negative battery plates or elements, substantially as and for the purpose set forth.

4. The tube F, in combination with a coil or coils, and with the metallic tube t, substantially as and for the purpose described.

5. The combination of the tubes F and t, an induction coil or coils, the screw b, and the armature d, as set forth.

6. The combination of the tubes F and t, electrical helices of three different lengths and thicknesses of wire, the screw b, and the spring or armature d, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEROME KIDDER, M. D.

Witnesses:

T. L. TALCOTT,

B. F. WARNER.