(No Model.)

2 Sheets—Sheet 1.

J. A. CABOT.

ELECTRO MEDICAL APPARATUS.

No. 501,558. Patented July 18, 1893.

FIG. 1.

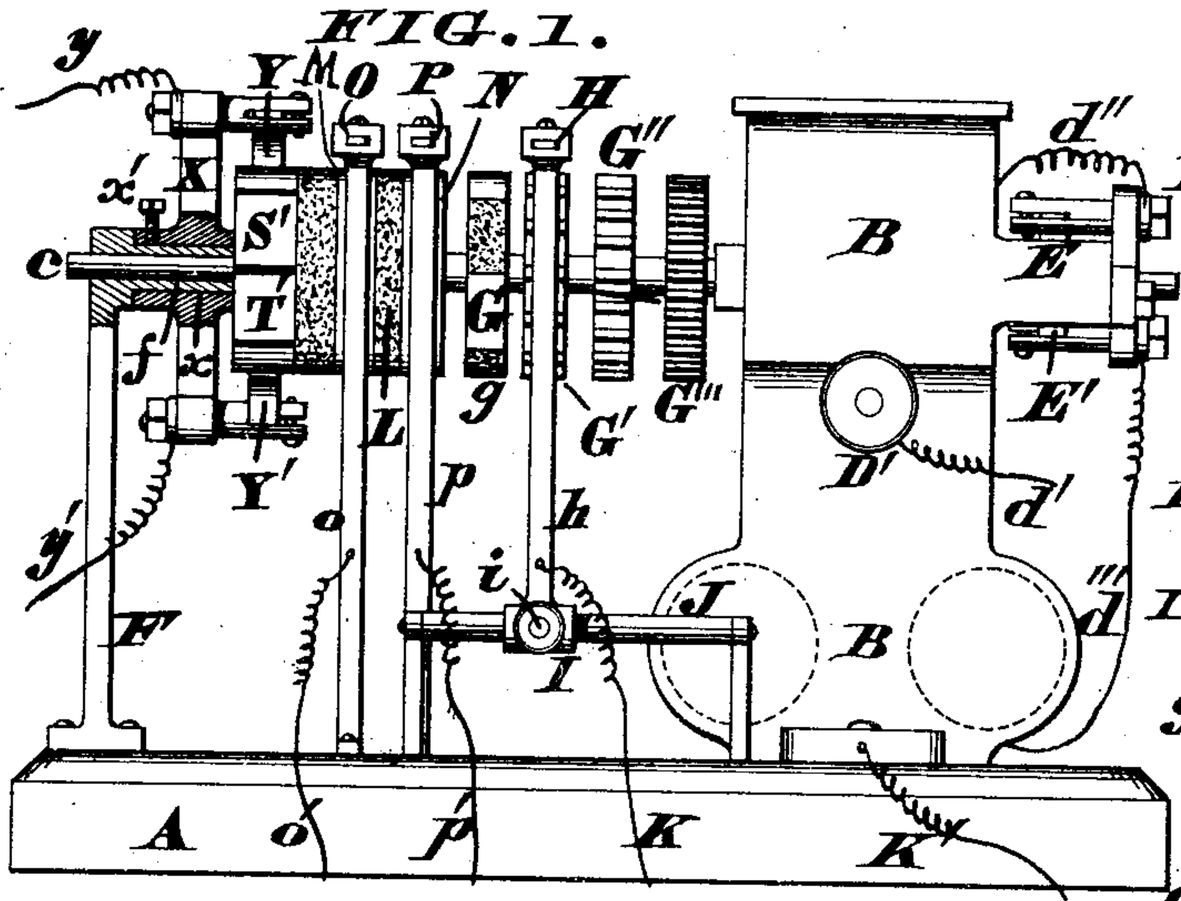


FIG. 2.

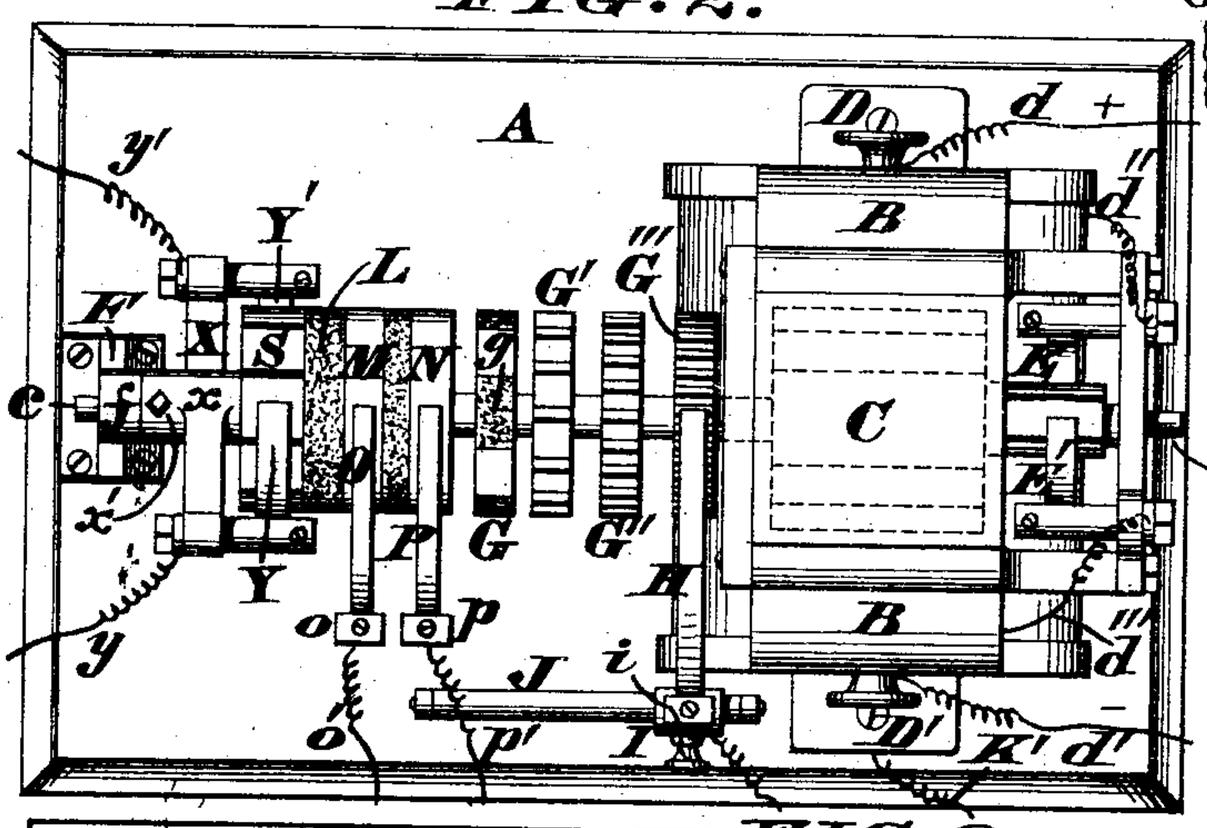


FIG. 3.

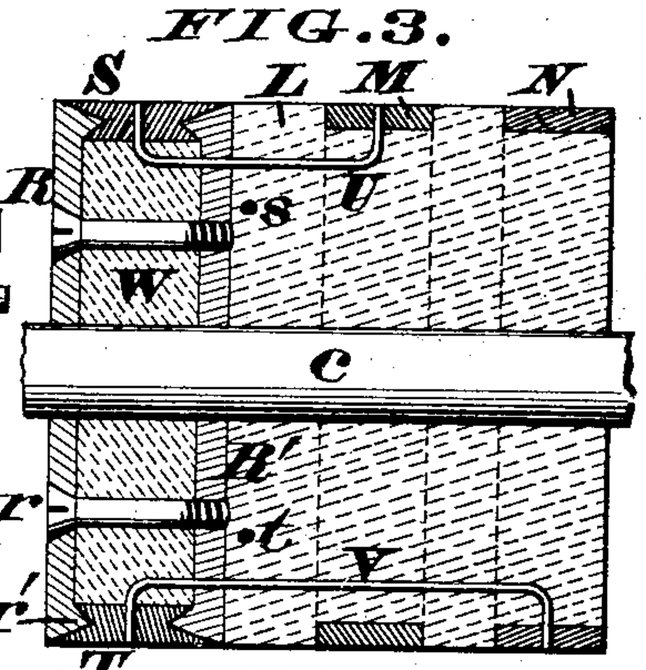


FIG. 4.

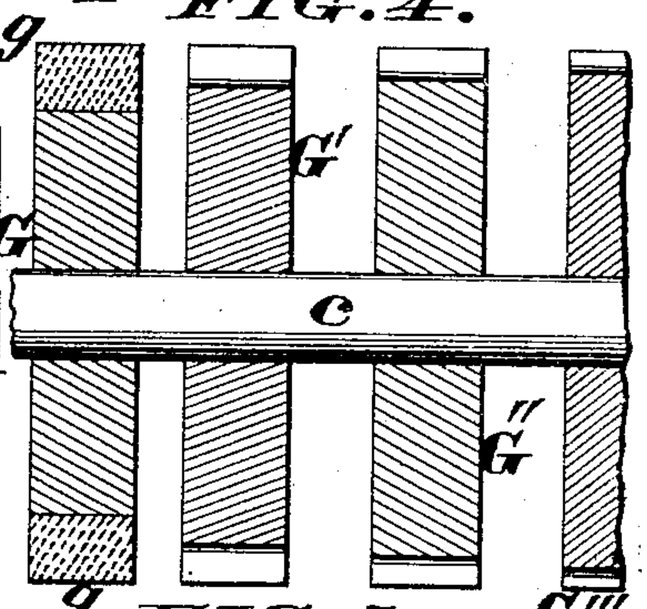


FIG. 5.

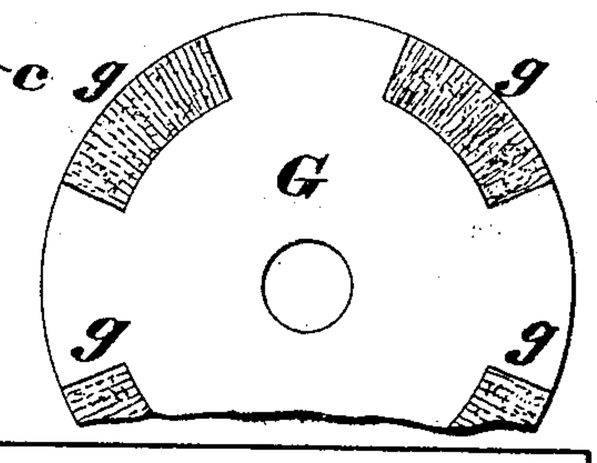
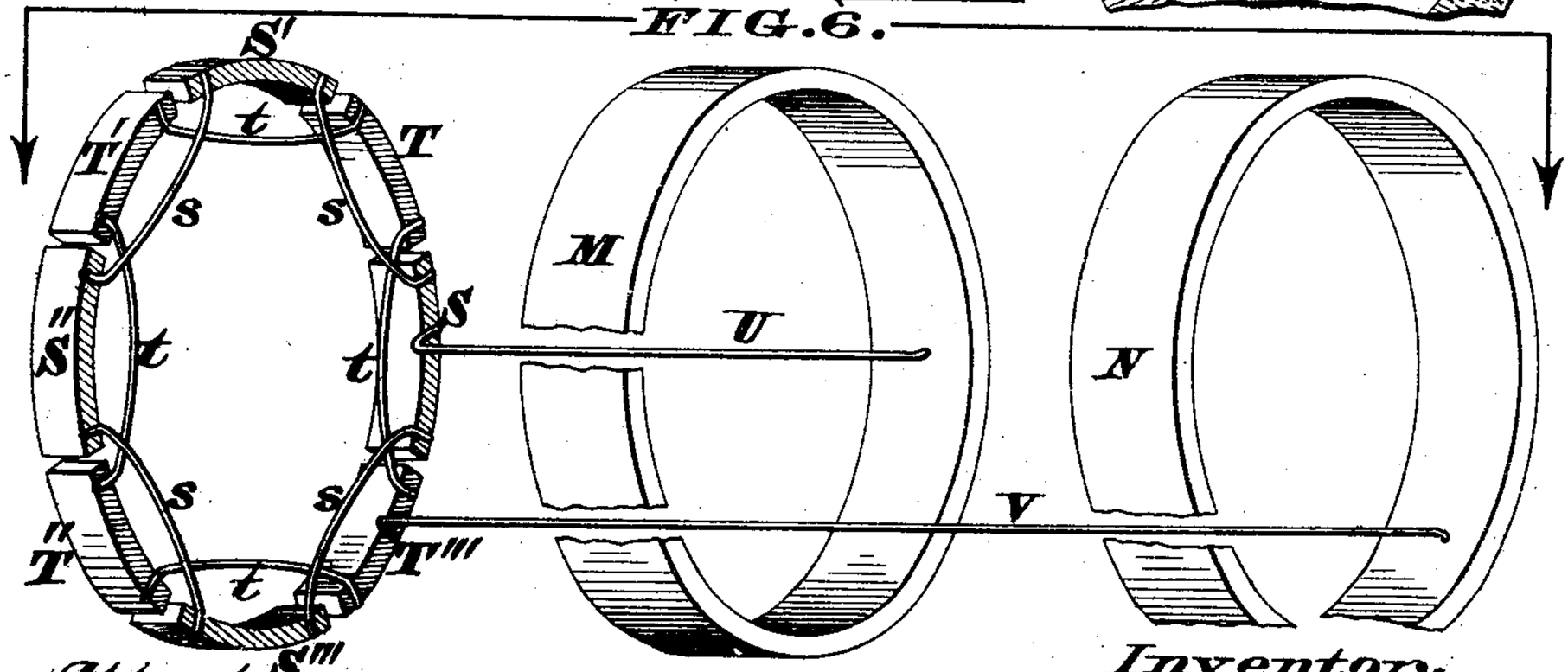


FIG. 6.



Attest.
Harry Dyer
Lillie Eldridge.

Inventor:
John A. Cabot.
by James H. Layman.
Atty.

(No Model.)

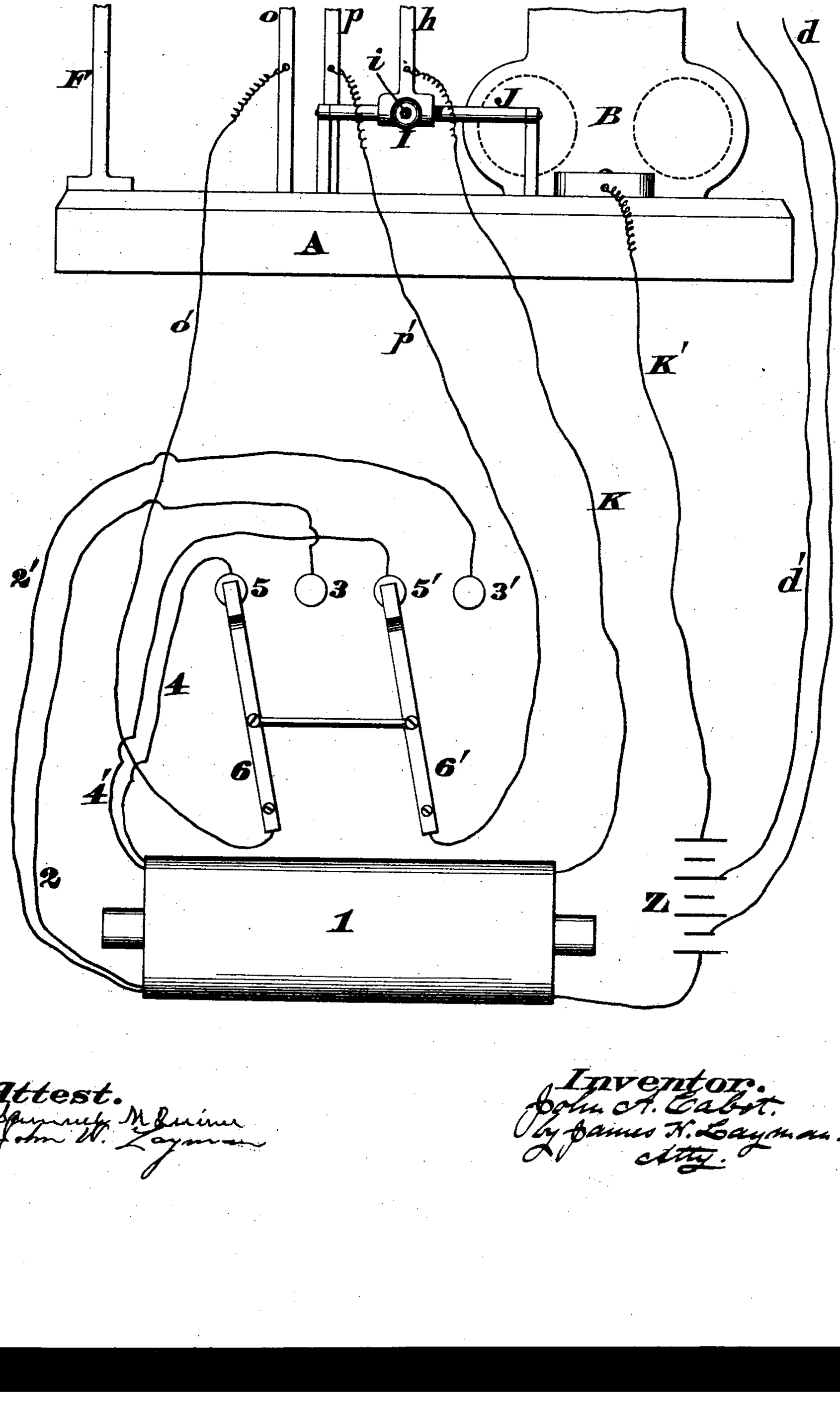
2 Sheets—Sheet 2.

J. A. CABOT.

ELECTRO MEDICAL APPARATUS.

No. 501,558. Patented July 18, 1893.

FIG. 7.



Attest.
Samuel H. Laymon
John W. Laymon

Inventor.
John A. Cabot.
by James N. Laymon.
Atty.

UNITED STATES PATENT OFFICE.

JOHN A. CABOT, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO FRANK H. KIRCHNER, OF SAME PLACE.

ELECTRO-MEDICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 501,558, dated July 18, 1893.

Application filed August 24, 1892. Serial No. 444,008. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. CABOT, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Electro-Medical Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

My invention comprises an electro-magnetic machine that has been designed more especially for medical and surgical purposes, the machine being constructed in such a manner as to convert a continuous current into a "Faradic current," and then to collect the latter thereby producing an unbroken current at the commutator of the apparatus, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a side elevation of an electro-magnetic machine embodying my improvements. Fig. 2 is a plan of the same. Fig. 3 is an enlarged axial section of the commutator and its accessories. Fig. 4 is a similar section of a series of toothed wheels that constitute the circuit-breakers of the primary current. Fig. 5 is a side elevation of a portion of the first one of said wheels. Fig. 6 is a perspective view of the three principal parts of the commutator separated some distance from each other to render the construction more apparent, the annular segments of said commutator being sectioned. Fig. 7 shows the preferred arrangement of wires for connecting the machine to a battery and induction-coil.

A represents the base of my machine, and B is a metallic frame secured thereon, which frame carries any approved form of motor, as indicated by the dotted lines C, in Fig. 2, said frame being further provided with a pair of binding posts D, D′, to which are attached wires *d*, *d′*, leading to the opposite poles of any battery capable of running said motor, the battery being indicated at Z in Fig. 7.

d″, *d‴*, are other wires communicating with brushes E, E′.

As thus described, the machine differs in no respect from many well-known forms of electric apparatus, and requires no further explanation.

Rigidly secured to motor C is a longitudinal shaft *c*, one end of which is journaled in a cylindrical bearing *f*, of a standard F, projecting vertically from the base A. Fastened upon this shaft are four metallic wheels or disks G, G′, G″, G‴, of equal diameter, and so arranged as to make and break the primary current. The first wheel G has a series of non-conducting fillings *g*, inserted in its periphery, as more clearly seen in Fig. 5, four of these fillings being sufficient for most purposes. Consequently, the periphery of said wheel is divided into eight equal parts, but the invention is not limited in this respect, as any even number of fillings may be used according to the special requirements of the machine. The second wheel G′, is devoid of fillings and has, simply, a toothed periphery. The third wheel G″ has a greater number of teeth than the wheel G′, and the fourth wheel G‴, has the greatest number of teeth. Adapted to bear upon the periphery of either of these wheels, is a brush H, secured to a holder *h*, projecting vertically from a slide I that can be shifted along a bar J, and retained in any desired place by a set-screw *i*. K is a wire connecting this brush-holder *h*, with a primary-circuit coil, which coil is connected to the battery, and the latter is connected to the frame A, by another wire K′. Shaft *c*, also carries a non-conducting cylinder L, surrounded by a pair of contact-rings M, N, separated a slight distance from each other, and provided, respectively, with brushes O, P, mounted upon fixed holders *o*, *p*, from which latter wires *o′* *p′*, conduct low tension and high-tension currents, respectively, from an induction coil 1. Furthermore, this shaft *c* carries a pair of non-conducting disks R, R′, united together by screws *r*, the opposing faces of said disks being provided, near their margins, with annular flanges *r′* adapted to enter grooves in the edges of a number of metallic pieces forming the commutator proper. Now, as there are eight divisions of the wheel G, so there must be a similar number of pieces in the commutator, as clearly shown at S, S′, S″, S‴, T, T′, T″, T‴, in Fig. 6. These pieces are annular segments, separated a suitable distance to afford a positive "break" between them, the segments S, S′, S″, S‴, being so

united by wires *s*, as to form one complete metallic-circuit, while the other pieces T, T′, T″, T‴, are connected by wires *t* to make another complete metallic-circuit.

U is a wire connecting the circuit S, S′, S″, S‴, *s*, with the first contact-ring M, and V is another wire that establishes communication between the circuit T T′ T″ T‴ *t*, and the second contact-ring N.

W, in Fig. 3, is a non-conducting filling that occupies all the space between the disks R, R′, and segments S, T.

X is a rocker having a hub *x*, capable of being adjusted around the cylindrical bearing *f*, and held in the most effective position by a screw *x*′. The opposite ends of this rocker carry reversely-disposed brushes Y, Y′, arranged to bear against opposite sides of the sectional commutator. *y*, *y*′, are wires leading from these brushes and having any approved form of non-conducting handles to be grasped by the surgeon or other operator.

2, 2′ are wires that conduct the high tension current from the induction coil 1 to contact points 3, 3′.

4, 4′ are other wires that lead the low tension current from said coil to the contact points 5, 5′.

6, 6′ are coupled switches having the wires *o*′, *p*′, attached to them, as shown, and capable of being shifted to make contact with either pair of points 3, 3′ or 4, 4′, as occasion may require.

When this machine is started, the motor C is driven in the usual manner at any required speed, and as the shaft *c* is attached to said motor, it is evident that all the wheels, disks, &c., carried by said shaft must revolve at the same speed. If it should be desired to make the fewest possible number of breaks in the primary current, the slide I is so shifted as to cause the brush H to bear upon the periphery of wheel G, but if a very great number of breaks is necessary, said brush must be brought in contact with the wheel G‴. A less number of breaks can be effected by applying said brush to either of the wheels G″ or G′. Consequently, the number of breaks in the low tension and high tension currents will be determined by the position of the brush H, and these broken or interrupted currents will be transmitted to the contact-rings M, N, by the brushes O, P, but as these rings are continuous, and as one of them is charged while the other is not, and vice versa, it is evident that the wires U, V, will carry a regular or constant current to the commutator S, T. This constant current is then transmitted from the commutator, through the brushes Y, Y′, to the wires *y*, *y*′, and then utilized for any appropriate medical or surgical purpose. Reference to Fig. 6 shows that the wire U, running from the ring M is attached to one of the annular segments S, and that the other segments S′, S″, S‴, are united to this first segment S, by wires *s*. Therefore, it is immaterial which one of these segments the brushes Y, Y′, come in contact with, as said segments are all included in a single metallic-circuit. The same remarks apply to the other segments T, T′, T″, T‴, as they form another metallic-circuit, complete in itself. Again, it is immaterial which one of the segments, S or T, the wires U, V, may be applied to, but in Fig. 6 these wires have been so located as not to conceal either set of wires *s*, *t*. Finally, in Fig. 3, a segment T is shown opposite another segment S, for the purpose of exposing the wires U, V, whereas, in actual practice, similar segments must be opposite each other, because the commutator consists of an equal number of parts or sections.

I claim as my invention—

1. The combination, in an electro-medical apparatus, of a motor shaft armed with a series of wheels adapted to break a primary current at different intervals, a brush and connections uniting either one of these circuit-breakers with a primary coil, a pair of insulated contact-rings having brushes and connections uniting them respectively with a low tension and high tension coil, a commutator consisting of two distinct series of insulated segments communicating with said rings, and a pair of brushes bearing against said segments, in the manner described, and for the purpose stated.

2. The combination, in an electro-medical apparatus, of a pair of insulated contact-rings M, N, and wires U, V, connecting said rings with a commutator composed of one set of segments, as S, S′, S″, S‴, connected by wires *s*, and another set of segments, as T, T′, T″, T‴, connected by wires *t*, all as herein described, and for the purpose stated.

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

JOHN A. CABOT.

Witnesses:

JAMES H. LAYMAN,

THOS. E. DOBBIE.