J. KIDDER.

INDUCTION COIL.

No. 52,054. Patented Jan. 16, 1866.

Fig. 1.

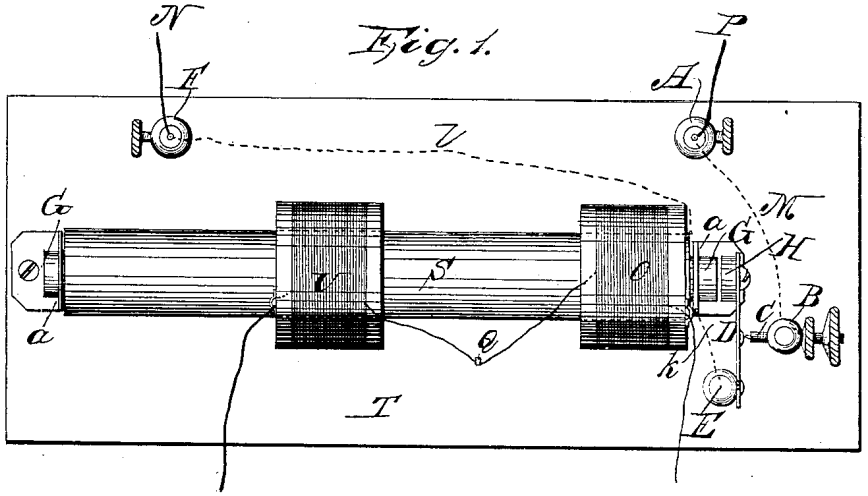


Fig. 2.

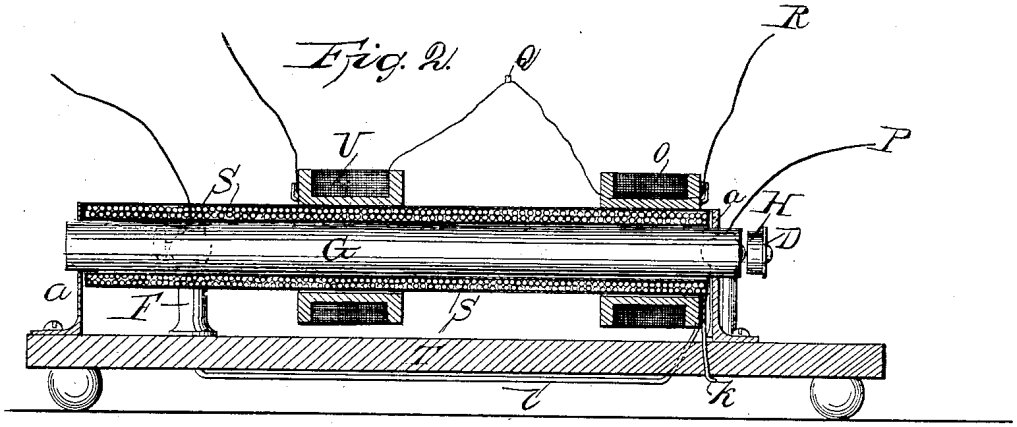
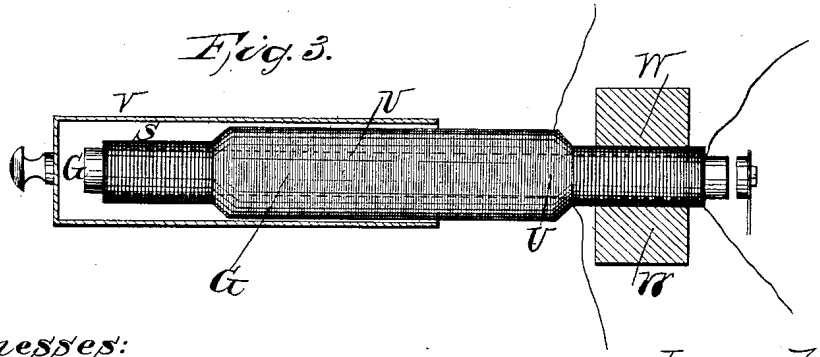


Fig. 3.



Witnesses:
L. Holmes Jr
G. W. Reed

Inventor:
Dr Jerome Kidder

UNITED STATES PATENT OFFICE.

DR. JEROME KIDDER, OF NEW YORK, N. Y.

IMPROVEMENT IN INDUCTION-COILS.

Specification forming part of Letters Patent No. **52,054**, dated January 16, 1866.

To all whom it may concern:

Be it known that I, JEROME KIDDER, of the city, county, and State of New York, have invented a new and useful Improvement in the Method of Obtaining Induced Currents of Electricity from Magnets and Induction-Coils; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

I have made the discovery that the central or so-called neutral portion of a magnet—that part which has no attractive power—is where the strongest induced current results in using over it a helix or helices of insulated wire; and this invention consists in the practical application of such discovery—viz., in arranging the insulated wire which composes the helix or helices by which the induced current or currents are obtained, either wholly or in greater quantity, at or near that portion of the magnet, instead of, in the usual manner, evenly distributed along the whole length of the magnet, or wholly or in greater quantity near the poles thereof.

The advantages of this arrangement are, first, when I wish to obtain induction-currents from a long magnet (which resumes its unmagnetized state slower than a short one when the primary current is broken) I get a stronger induction-current on the same magnet by winding the fine wire substantially as above; second, with a given size of wire for the primary coil of a given number of layers (not convolutions) I am enabled to get strong induction-currents without so great a draft or drawing off the power of the battery and weakening the solution, because there is a longer primary wire interposed so as to exert its force on the magnet without necessitating the location of the fine wire at a farther distance from the magnet; third, it enables me to suspend a heavy helix-binding, N, in a block of wood or other manner at the end without interference from fine wire, over which latter a tube to receive within itself the induction force can be placed to weaken or cut off the current from the coil or coils.

The invention further consists in making the said helix or helices adjustable lengthwise of the magnet, for the purpose, when desired, of varying the power of the current by bringing the said helix or helices nearer to or farther from the so-called neutral portion of the magnet.

Figure 1 in the drawings is a plan or top view of an electro-magnet, having upon it two helices for obtaining induced currents, one placed in the usual position near one of the poles of the magnet and the other placed on the neutral portion of the magnet near the longitudinal center thereof, according to my invention. Fig. 2 is a longitudinal vertical section corresponding with Fig. 1.

Similar letters of reference indicate corresponding parts in both of these figures.

G is a core, composed of a bundle of iron wires, around which is wound, in two layers, a helix, S, of coarse insulated copper wire, one end, *k*, of which is connected with the metal post E, and the other end, *l*, is connected with the metal post F. The said posts are supported in the wooden base T, to which are also secured the supports *a a* of the core G and two posts, A and B. The posts A and F are connected, one with the positive and the other with the negative pole of a galvanic battery, the primary current from which passes from the positive pole of the battery through the post A, along the wire M, under the base T, to the post B, thence along the screw C in the said post, from its platinum point to the spring D of the hammer H, and through the said spring and its supporting-post E to the end *k* of the helix, of coarse insulated copper wire, through the entire length of the said helix, and out at *l*, thence through the post F to the negative pole of the battery. This battery-current magnetizes the core G.

U and O are two outer helices for obtaining induced currents of electricity. These helices are made of fine insulated copper wire, which is coiled in several layers around spools of wood placed over the helix S. The wire of the helix U begins at V and terminates in the loop Q, where the wire of the helix O commences, and the latter terminates at R.

The primary current from the battery is interrupted by the magnet G attracting the hammer H so as to draw the spring D away from the screw C, and as this opens the circuit the core G resumes its unmagnetized state, and at the same moment there is an induced current in the helices U and O, that in

the coil O, near the pole of the magnet, being very weak, but that in the coil U, over the so-called neutral portion of the magnet, being of great power. The spools are movable lengthwise upon the magnet, so that the power of the induced current in their helices may be varied, the currents being weak when they are at or near the poles of the magnet and stronger as they are moved nearer to the center of the length of the magnet, the maximum power being obtained when they are at the center of the length of the magnet and the minimum power when they are close to the poles.

The induction-coil, instead of being made movable upon the magnet, as above described, may be fixed thereon at and near the center of its length, as shown in Fig. 3, which is a central longitudinal section of the magnet. In this figure G is the core, S the coil of coarse insulated wire through which the primary current passes, and U the induction-coil. In a magnet having the induction-coil thus fixed the force of the induction-current may be varied by means of a cylindrical cap, V, of metal, fitted to slide over one end of the magnet and over the induction-coil, and to permit the application of this cylindrical cap the magnet must have a support, W, at one end only.

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

1. Arranging the fine insulated wire which composes the helix or helices used upon a magnet for obtaining an induced current or currents, either wholly or in greater quantity, at or near the center of the length of the magnet, or what is termed its "neutral portion," in combination with the arrangement of the inner or primary coil, S, and its core of soft-iron G, substantially as and for the purpose specified.

2. Making the said helix or helices adjustable upon the magnet between the poles and the so-called neutral portion thereof, for the purpose of varying the power of the induced current or currents, substantially as described.

DR. JEROME KIDDER.

Witnesses:

J. W. COOMBS,

GEO. W. REED.