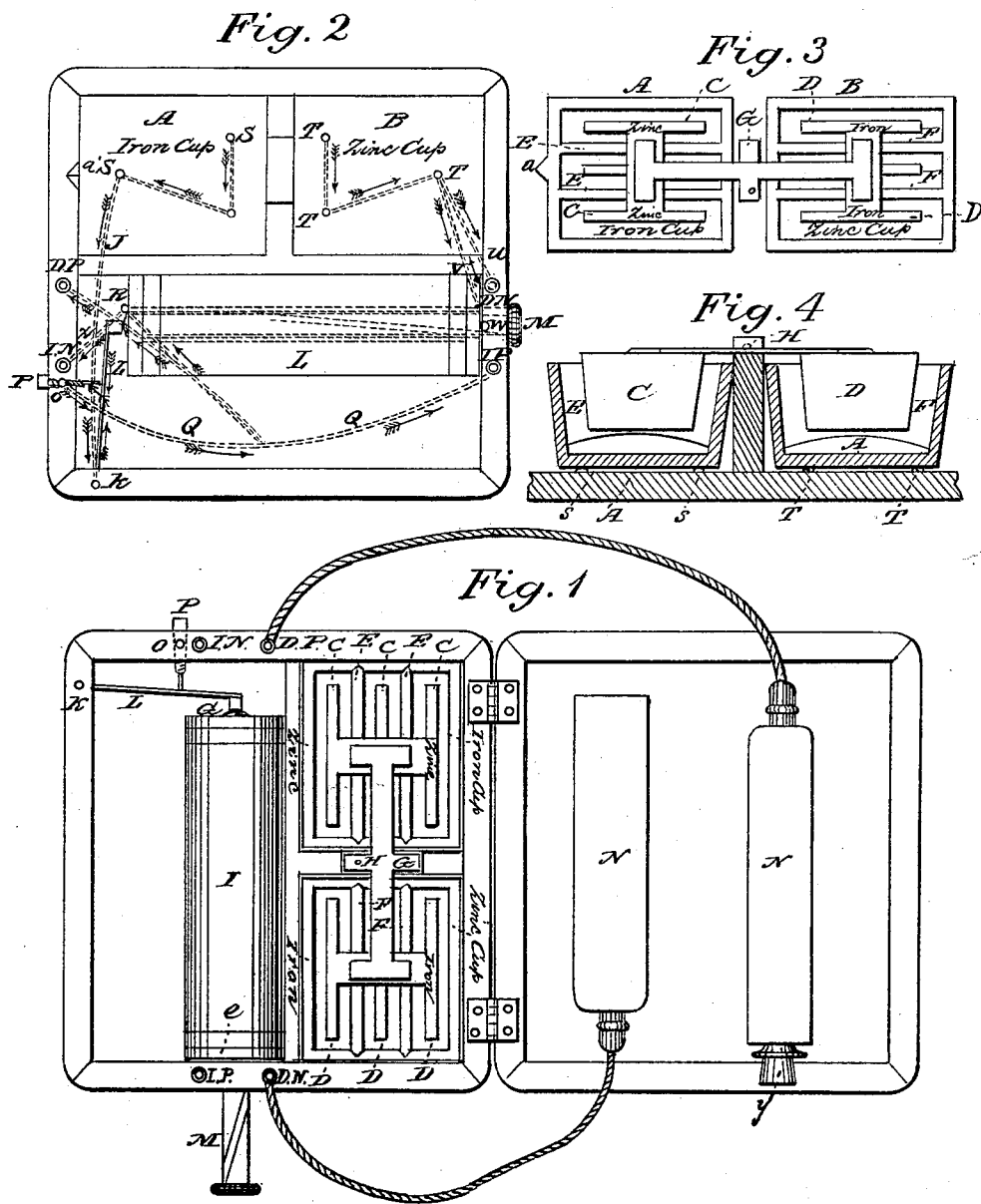


C. REITZ.

Electro-Magnetic Machine.

No. 107,626.

Patented Sept. 20, 1870.



Witnesses:

Q. F. Mayhew
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Inventor:

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United States Patent Office.

CHARLES REITZ, OF INDIANAPOLIS, INDIANA.

Letters Patent No. 107,626, dated September 20, 1870.

IMPROVEMENT IN ELECTRO-MAGNETIC APPARATUS FOR MEDICAL USE.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, CHARLES REITZ, of Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Electro-Magnetic Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable skilled artisans to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon making part of this specification.

This invention relates to construction and arrangement of the battery, and its permanent connections with the coil of electro-magnetic apparatus, with a view to render it sufficiently portable to be carried in the pocket, and to be used by persons inexperienced in and ignorant of its operation.

Figure 1 is a top or plan view of the apparatus, showing the arrangement of the battery and coil in a suitable case, in which space is also provided in which to store the cords and handles connecting with the poles, and a phial for containing sulphate of mercury, or other analogous dry acid, for exciting the battery.

Figure 2 is a plan view of the apparatus, showing, in red lines, the arrangement of the wires beneath the bottom, forming permanent connections of the battery with the coil.

Figure 3 is a top or plan view of the battery.

Figure 4 is a vertical transverse section of the same.

A is the iron cup or trough, and

B, the zinc cup of the battery.

The iron cup A is furnished with a projection, *a*, which fits into a corresponding recess, *a'*, in the case, to prevent it by accident being set into the place of the zinc cup, the projection *a* preventing it from going down low enough to rest upon the studs T T T in the compartment of the zinc cup, if, by accident, it should be placed in that compartment. It will be readily understood, of course, that various devices may be employed to effect the same purpose.

The movable parts of the battery, D being the iron, and C the zinc, are also so arranged that their transposition would be readily detected, as, unless the hole in the cross-piece G is in proper position to receive the pin H in the partition separating the two cups, the movable parts of the battery will not go down into place.

In order to make the apparatus within the smallest practicable space, and the battery to evolve the required strength of electrical current, I divide the cups by partitions E and F, as shown, the partitions in each cup being of the same metal as the cup in which they are placed; and also make the movable parts of the battery with leaves, C D, corresponding to the spaces formed by the partitions, thus exposing a very extended surface of metal to the action of the acid,

the strength of the electrical current being in proportion to the surface of metal exposed to the action of the acid.

The red lines in fig. 2 show the arrangement of the wires connecting the battery A B with the coil I. These connections are so constructed and arranged as to be permanent, and are at all times in readiness to conduct the electricity evolved by the battery to the coil whenever the acid is placed in the cups and the movable parts of the battery are put in place.

The electricity is conveyed from the battery to the coil as follows, to wit: From the iron cup A to the points S S S; thence along the wire J to the post K, connected with the vibrating armature L; thence along the vibrating armature to the post O, connecting with the set-screw P; and from thence along the wire Q both to the pole marked I P, (indirect positive,) and to the pole marked D P, (direct positive,) also to the end R of the large wire of the coil I. From the zinc cup B it is taken up by the studs or points T T T, from whence it is conveyed along the wire U to the pole marked D N, (direct negative,) and also along the wire V to the end W of the large wire of the coil I. One end of the fine wire that is wrapped on the outside, and forms part of the coil I, is soldered to the end W of the large wire, and leads thence by X to the pole I N, (indirect negative,) and the other end to the end *w* of the large wire.

It will be readily understood by those skilled in electro-magnetic apparatus that the movements of the electrical currents in this apparatus do not differ materially from that of others, and that the poles may be readily changed by making different connections of the wires leading from the battery to the coil I; hence no claim is made to anything more, in this respect, than to the arrangement of the connections in this particular device as a matter of convenient and economical construction, the claim being more especially confined to the construction and arrangement of the permanent connection of the battery through the points S S S and T T T, either under the cups A B or at their sides, as may be found most convenient, and being at all times in readiness to convey the electrical current from the battery to the coil, without requiring skill or knowledge on the part of the operator to make the connections, as in other apparatus.

The use of a dry acid in connection with the battery and other parts of the apparatus, constructed as herein described, is also a matter of great convenience as well as cleanliness. When required to be put in operation, the movable parts C D of the battery are to be taken out, and about four of the small copper spoons accompanying the apparatus full of the dry acid, contained in the phial Y, is put into each cup A B, and is then made fluid by the addition of a small

quantity, say about two large tea-spoonfuls, of water. The movable parts C D are then put in place, when the evolution of the electrical current commences, the quantity of which is in ratio to the depth of the acid contained in the cups A B.

For a strong current, the handles N N' are connected with the poles marked I P and I N, (indirect positive and indirect negative, respectively,) and for a weaker current, with the poles marked D P and D N, (direct positive and direct negative, respectively.) At any time during the action of the battery a violent shock may be produced by depressing either end C or D of the movable part of the battery deeper into the acid. The vibrations of the armature L, alternately breaking the current and connecting it with great rapidity, induces a smooth current, which is very desirable, in being less disagreeable to the patient when applied to the treatment of disease.

M is a regulating-bar, made in the usual manner, and inserted in the interior of the coil I, which is also made in the usual manner, except that the inner coil, of large wire, is wound upon a hollow shaft or spool of wood, of which e are the heads, all turned in one piece. The shaft is lined on the inside with sheet-iron, and in the end next to the armature a cylinder of soft iron is permanently fixed. The cylinder of soft iron is shown in dotted lines at g, in fig. 2.

The partitions E and F of the cups A and B do not extend entirely to the bottom of the cups, but space is left for the acid to flow freely beneath them, as shown in fig. 4.

The battery is easily cleaned by taking out the movable parts C D, and taking out and emptying the cups A B, which then require no washing or other cleansing. Care should be taken, however, to keep the bottoms of the cups clean, especially where they come in contact with the studs S and T.

The advantages of this apparatus over those of ordinary construction consist—

First, in its compactness and portability.

Second, in avoiding the use of fluid acids and their attendant dangers and disagreeable odor.

Third, the completeness of the apparatus within itself, requiring nothing outside of it to set it in operation but a small quantity of water.

Fourth, the strength of current, for all required purposes, produced by a small and compact apparatus.

Fifth, evenness of current, effected by the more rapid movements of the vibrating armature.

Sixth, simplicity of construction, operation, and use, on account of the arrangement and permanent connections of the battery and the coil.

Seventh, avoiding the possibility of changing the poles by unskilled persons.

Eighth, susceptibility to produce violent shocks by simply immersing either of the movable parts C or D deeper into the acid.

Having thus fully described my invention,

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

1. The arrangement of the cross-piece G and pin H in a galvanic-battery, in the manner and for the purpose substantially as specified.

2. The arrangement herein shown and described of the iron cup A, zinc cup B, removable leaves C and D, constructed respectively of iron and zinc, as described, together with the iron and zinc partitions E and F, when the several parts are constructed substantially as and for the purpose specified.

CHARLES REITZ.

Witnesses:

O. F. MAYHEW,
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