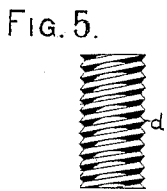
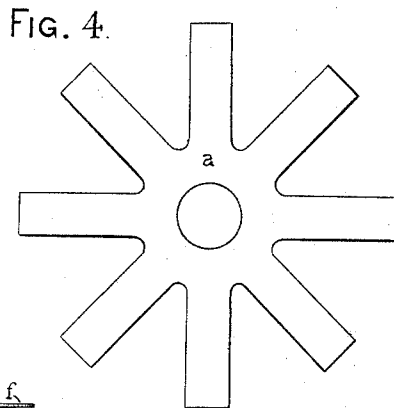
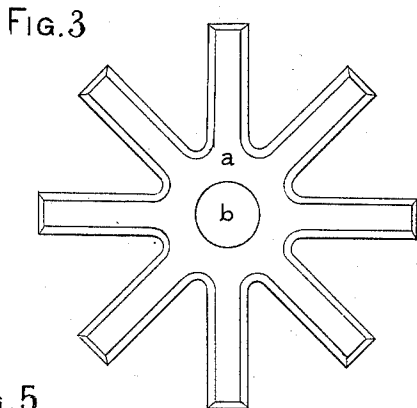
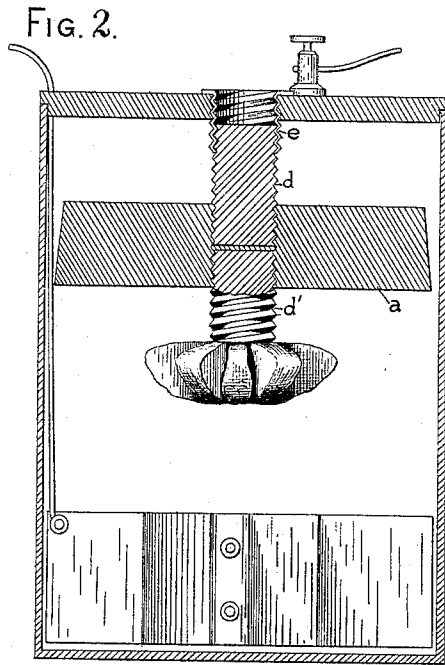
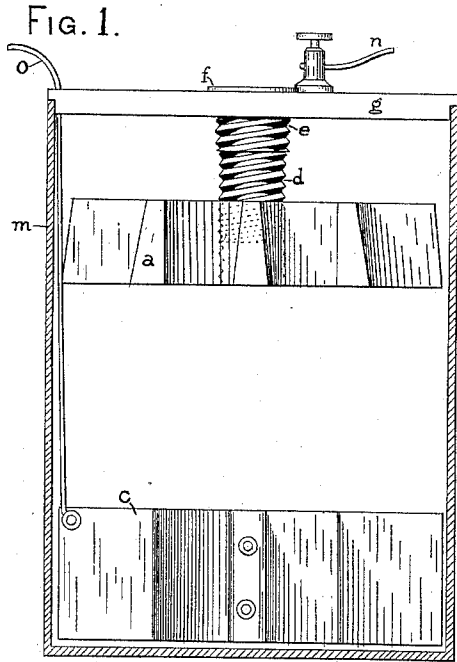


(No Model.)

T. T. ECKERT.  
GALVANIC BATTERY.

No. 482,425.

Patented Sept. 13, 1892.



WITNESSES.  
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# UNITED STATES PATENT OFFICE.

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## GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 482,425, dated September 13, 1892.

Application filed May 16, 1892. Serial No. 433,117. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS T. ECKERT, a citizen of the United States of America, residing in the city, county, and State of New York, have made a new and useful Improvement in Galvanic Batteries, of which the following is a specification.

The object of the invention is to renew the zinc or that electrode of the battery which is the more rapidly eaten away by adding fresh parts to those which have been so far consumed as to be incapable of maintaining an efficient action of the cell. To this end I propose to add zinc plates one at a time, the fresh plate in each instance being placed above the others, and this I accomplish by employing zinc plates, which are fastened together by short screws of the same material, and which are equally adapted to be inserted into a cross-bar or other support resting upon the upper edges of the cell. A single zinc when fresh is of itself sufficient to form the positive electrode of the cell, and when thus employed it will be suspended from the lower end of a zinc screw, whose upper end will be screwed into the supporting cross-bar. When, however, the zinc has been partially consumed, the suspending-screw will be removed from the support and a new zinc placed upon its upper end, and at the same time a second screw will be inserted in the cross-bar to support the composite electrode thus formed, and in like manner one zinc after another may be applied as those already in use become partially consumed.

In the drawings, Figure 1 represents in a battery a side view of a fresh zinc which of itself constitutes the positive element of a cell, together with a cross-bar and screw-support. Fig. 2 is a cross-section of a fresh zinc, a side view of a zinc which is partially consumed, and two zinc screws, one for fastening the zincs together and the other for suspending them from the cross-bar above the cell. Fig. 3 is a top view of one of my zinc plates, showing its upper surface and beveled edges, while Fig. 4 shows its lower surface. Fig. 5 is one of the zinc screws which is adapted either to join neighboring plates or to suspend the electrode from a cross-bar or other support above the cell. Fig. 6 is a screw-thimble having an upper flange, it being

adapted to be seated in the supporting cross-bar, as shown in Figs. 1 and 2.

Referring to the drawings, *a* represents a zinc plate or skeleton, which is provided with a screw-perforation and radially-projecting arms, the upper surfaces being of less area than the lower, while *d* is a zinc screw, which is adapted either to join two zincs together by inserting each end a little less than half-way into the screw-openings of neighboring zincs or to suspend the electrode in the cell by inserting its lower end into the uppermost plate and its upper end into a thimble *e*, having a supporting-flange *f*, which is in turn screwed through the cross-bar *g*.

As shown in Figs. 1 and 2 of the drawings, *m* is an ordinary battery-jar; *c*, the copper electrode; *o*, a wire connected therewith, and *n* a wire leading to the zinc electrode. Ordinarily not more than two plates at a time need be used in making the zinc electrode, though obviously the element may include a larger number and be prolonged to any desired length by a simple alternation of plates and screws.

In applying and renewing the zinc electrode in a battery-cell the plate *a* first used has the lower end of a screw *d* turned into its axial aperture, while its upper end is screwed into the supporting-thimble *e*. When, however, the first zinc is so far consumed that it is no longer sufficient to support the battery, the upper end of the screw is removed from the thimble *e* and in turn screwed about half-way into the aperture of a new zinc from the lower side, while a new screw is inserted into the second plate from above, the upper end of the new screw *d* being then screwed into the thimble *e*. In like manner after the second zinc is partly consumed the second male screw will be unscrewed from the thimble *e* and in turn inserted into a third zinc from the lower side, while a third screw will be inserted into the upper opening of a third zinc and its upper end screwed into the supporting-thimble *e*, and in the same manner one zinc after another indefinitely may be applied to the battery.

The employment of an alternation of zinc screws and disks according to my plan is especially advantageous in that such arrange-

ment permits a vertical adjustment of the zinc plates with reference to each other and with reference to the support at the top of the cell, thus permitting the zinc plates to be more widely separated or to be brought more closely together or to be raised and lowered in the battery liquid.

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

1. In a galvanic battery, a zinc electrode formed of zinc plates having screw-perforations and separate zinc screws alternately arranged, as and for the purpose described.

2. In a galvanic battery, a zinc electrode formed of zinc plates having screw-perforations and separate zinc screws alternately ar-

ranged and applied and a cross-bar to which the electrode is suspended by one of said screws.

3. In a galvanic battery, a zinc electrode formed of perforated zinc plates and separate zinc pins or screws, said pins or screws being employed to fasten adjoining plates together and to suspend the composite electrode from a cross-bar or other support above the cell.

4. In a galvanic battery, a perforated zinc plate and a separate pin or screw of the same material, substantially as described.

THOS. T. ECKERT.

Witnesses:

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WM. ARNOUX.