

(No Model.)

N. M. POWELL.
GALVANIC BATTERY.

No. 490,231.

Patented Jan. 17, 1893.

Fig. 1.

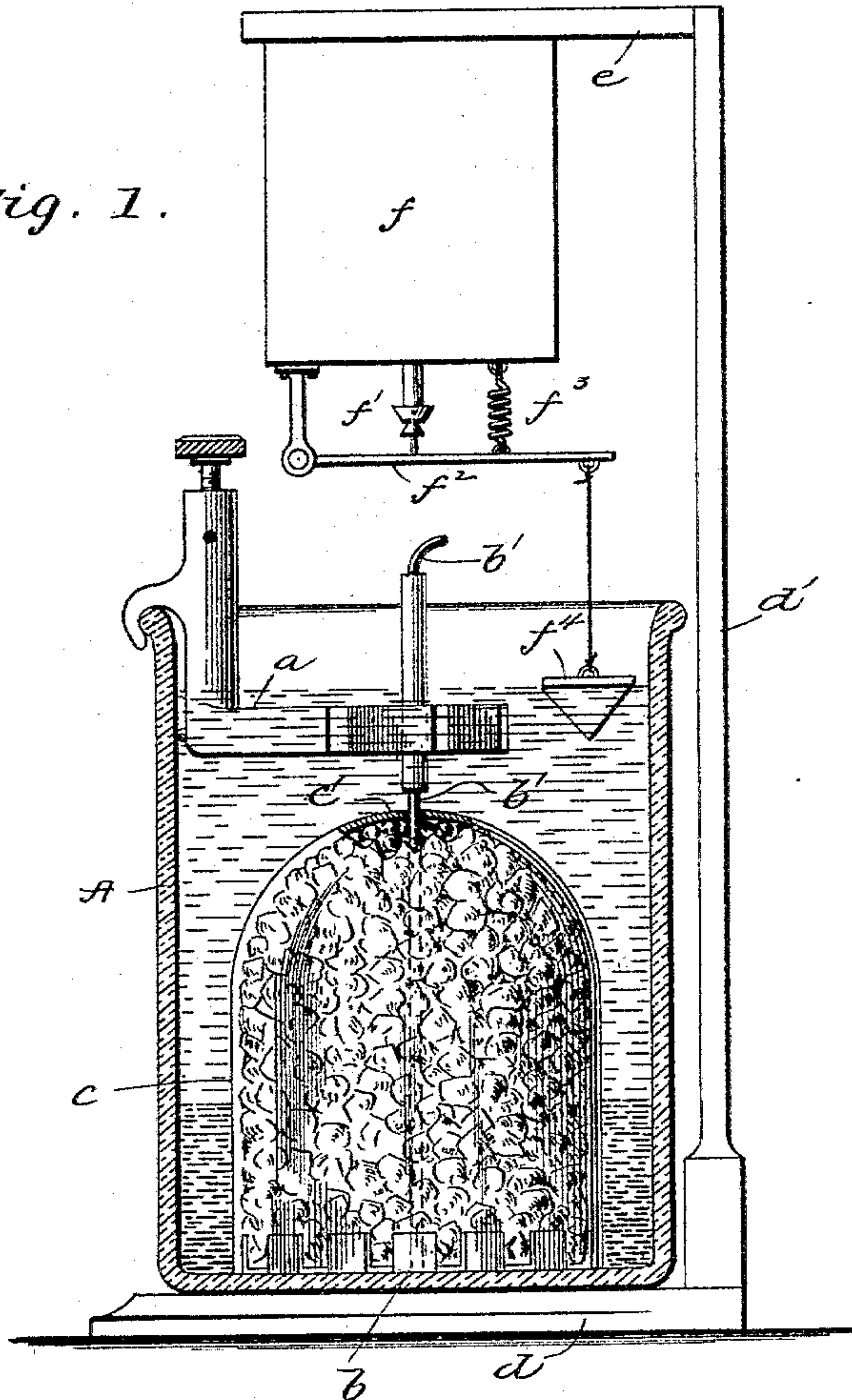


Fig. 2.

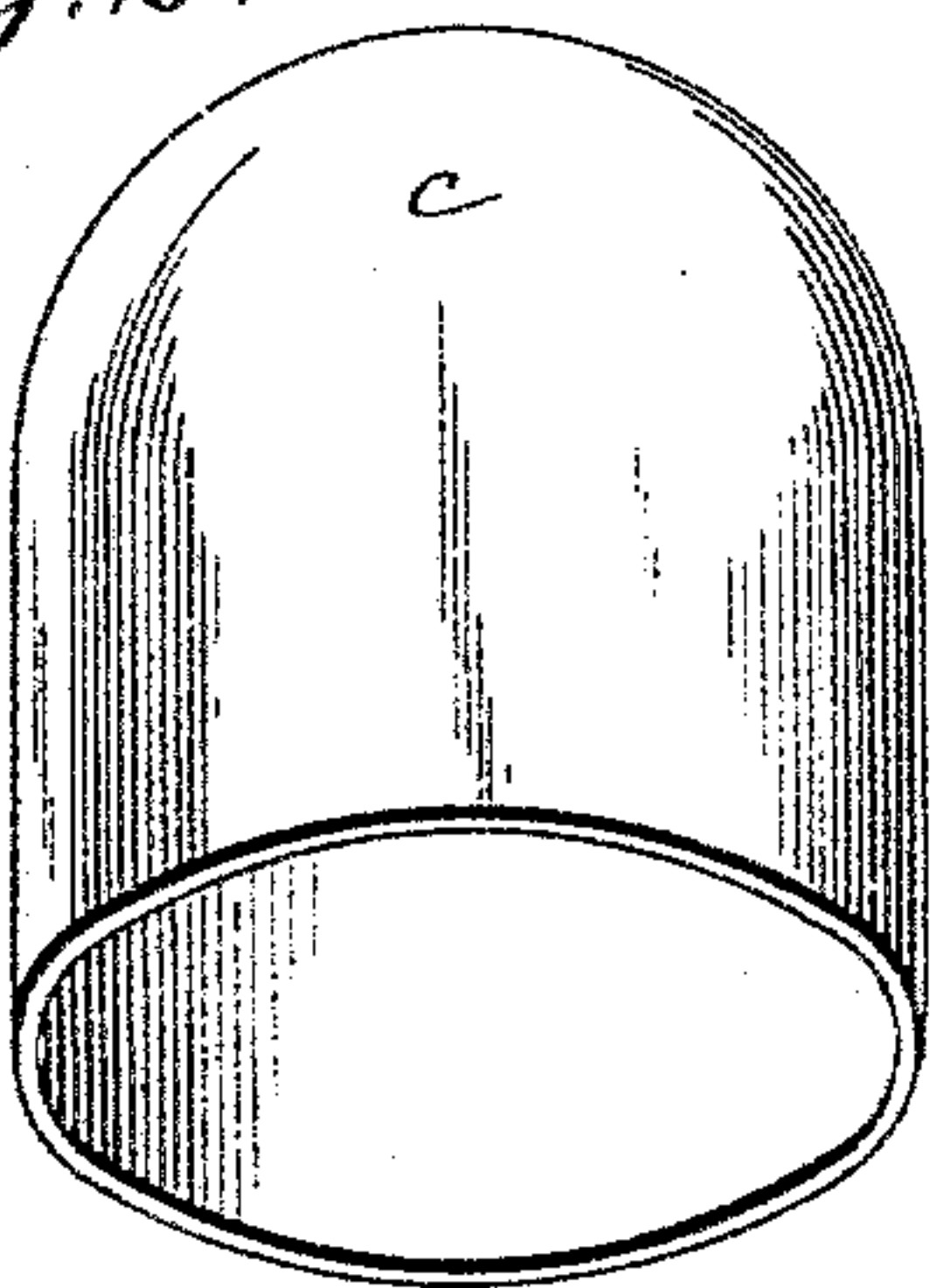
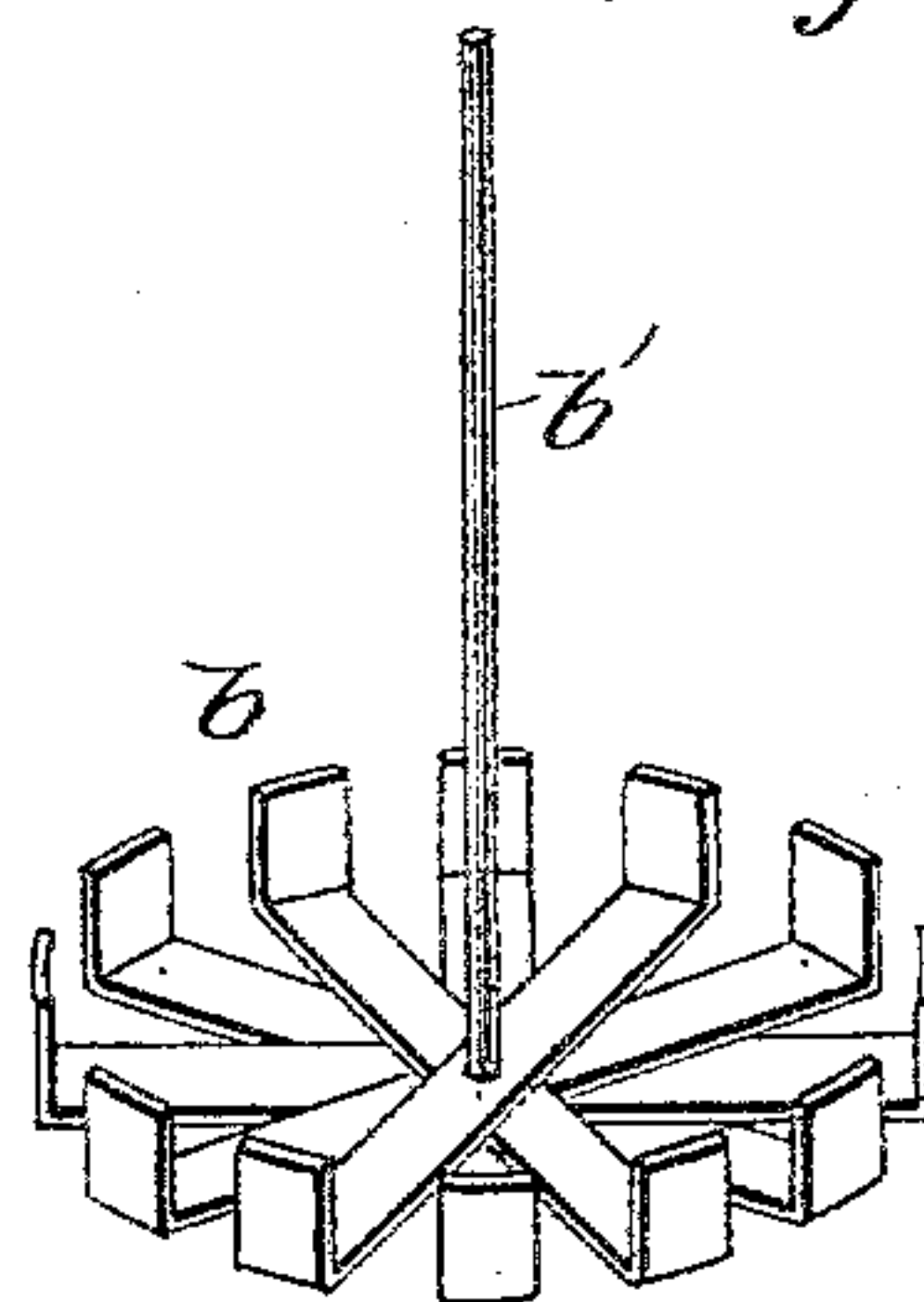


Fig. 3.



WITNESSES:

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GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 490,231, dated January 17, 1893.

Application filed December 19, 1891. Serial No. 415,671. (No model.)

To all whom it may concern:

Be it known that I, NOAH M. POWELL, a citizen of the United States, residing at Galesburg, in the county of Knox and State of Illinois, have invented certain new and useful Improvements in Galvanic Batteries, of which the following is a specification.

My invention relates to galvanic batteries and has special reference to the class of battery known as the "gravity."

The object of my invention is to provide means for automatically supplying water to the cell whenever it is necessary to do so, and to provide a form of cell which may be conveniently taken apart and in which a very dense stratum of the sulphate of copper may be maintained for a considerable length of time.

The invention consists in the details of construction which will now be described with reference to the accompanying drawings, in which

Figure 1 represents a vertical section of the cell, showing other parts in side elevation; Fig. 2 is a perspective view of an inner jar used in my improved cell; and Fig. 3 is a perspective view of the copper element.

Referring to the drawings by letter, A represents the outer or containing cell of the battery.

a represents the zinc element of the battery which is preferably of the crowfoot form and suspended in the upper stratum of the solution as shown.

b represents the copper element of the battery. It consists of a number of flat strips of copper riveted together at their centers and with their ends turned up at right angles as shown in Fig. 3. To the center of the copper element is secured the end of the copper rod *b'*, forming one of the terminals of the battery.

c represents an inverted jar. It is preferably of glass or some other nonporous material, and of such diameter to leave a space of about one-half inch all around between its sides and the sides of the outer vessel. Its lower end is open and its upper end closed, except for a central perforation *c'* through which the copper connection *b'* passes. When the cell is assembled the crystals of vitriol are stored in the inverted vessel *c* with the cop-

per element on the bottom of the outer vessel and within the vessel *c*. With this construction I am enabled to store a large quantity of the vitriol crystals in the cell, which makes it unnecessary to replenish for a long period of time. Such a large quantity of vitriol also keeps the lower stratum of the solution where the copper is located well saturated with the sulphate of copper.

In assembling the cell the jar *c* is first filled with the crystals, then the copper conductor is inserted by passing the rod *b'* through the crystals and through the perforation *c'*, then by grasping the rod on the outside and pulling it down the copper element enters the mouth of the vessel and rests upon the crystals. The jar may then be inverted, the crystals being held in place by the copper, and inserted concentrically in the outer cell. The zinc is then suspended in proper position above the vessel *c*, and the battery is complete except for water, which when added, entirely submerges the inner inverted vessel. This form of battery is to be used where a weak current but long life and constancy are required; such for instance as is used for electrometers, ocean cables and tests. The internal resistance of this battery will be great but the resulting weak current which is generated by the mingling of the liquids under the edges of the inverted jar will be constant and the battery will have long life.

The cell stands upon a circular base or shelf *d*. To the edge of this base is secured a vertical rod or rods *b'*, which extends above the cell and carries a bracket or holder *e* to the under side of which is secured a water tank *f* arranged directly over the battery cell. In the bottom of the tank a valve *f'* is provided which is controlled by a pivoted lever *f²*; the valve when open allows water to flow into the cell beneath. The lever *f²* is ordinarily pulled in an upward direction to hold the valve closed, by the spring *f³*, but opposed to this spring is a weighted float *f⁴* which rests upon the surface of the solution in the cell and is connected by the cord with the lever *f²*, as shown. When the solution in the cell becomes abnormally low from evaporation or other cause, the weight of the float overcomes the spring and opens the valve which admits water into

the cell. When the solution is sufficiently replenished, the spring is allowed to close the valve. It is a compact and simple arrangement for single cells, but it is obvious that it
5 may be used for a plurality of cells.

Having thus described my invention, I claim:

1. In a galvanic battery, the combination of
10 an outer jar containing an electrode and a liquid solution, and an inner inverted jar containing an electrode, the inner jar being entirely submerged and the electrode in the outer jar located directly above the inverted jar.

2. In a galvanic battery, the combination of
15 an outer jar containing an electrode and a liquid solution, and an inner inverted jar containing an electrode, the inner jar being entirely submerged and the electrode in the outer jar located directly above the inverted jar,
20 and the electrode in the inner jar being connected with a wire leading through a perforation in the top of the inverted jar, substantially as described.

3. The combination with a battery cell of a bracket supporting the same, said bracket 25 also supporting a supplying tank for the cell and the valve and float arranged to admit the material contained in the tank into the cell for the purpose set forth.

4. The combination with a battery cell of a 30 supplying tank and a valve and float arranged to control the flow of the water contained in the tank from the tank to the cell for the purpose set forth.

In witness whereof I have hereunto signed 35 my name in the presence of two subscribing witnesses.

NOAH M. POWELL.

Witnesses:

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