(No Model.)

C. WIRT.

ELECTRIC BATTERY.

No. 345,756. Patented July 20, 1886.

Fig. 1.

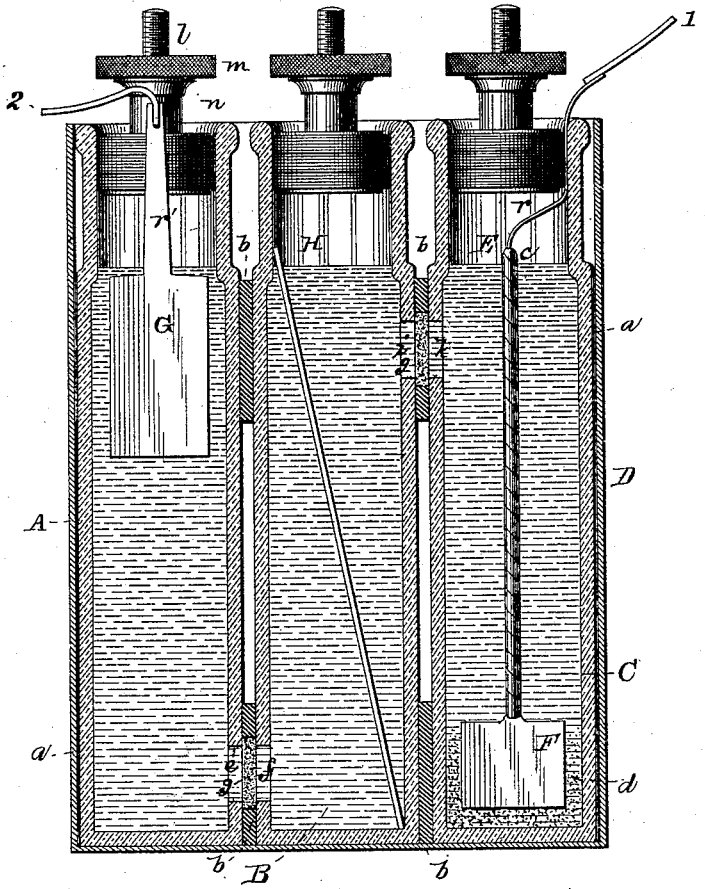
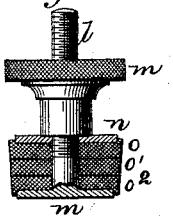


Fig. 2.



Witnesses

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CHARLES WIRT, OF CHICAGO, ILLINOIS.

ELECTRIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 345,756, dated July 20, 1886.

Application filed October 2, 1885. Serial No. 178,854. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WIRT, of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Batteries, of which the following is a specification.

The object of my invention is to produce a reliable standard battery for testing purposes.

The main feature of my invention is the use of an idle plate placed in a compartment situated intermediately between two compartments, each of which contains one of the active plates of the battery, which plate takes up the copper deposit and leaves the active zinc plate bright and unchanged.

The battery with which I prefer to employ the invention is preferably a Daniell battery, and there is therefore a copper plate in one compartment with crystals of sulphate of copper, as usual, and a zinc plate in another, while the idle zinc plate is in a compartment between the two, and all the compartments are filled with sulphate-of-zinc solution. The copper plate and crystals are placed at or near the bottom of their compartment and the zinc plate near the top of its compartment, and the connection from the copper-compartment to the intermediate compartment is near the top, while that from the intermediate compartment to the zinc-compartment is near the bottom. Thus the internal circuit of the battery comprises the whole length of all three compartments and is one of very high resistance, whereby the plates and liquids are very little effected when the battery is in action, and its electro-motive force remains the same for a very long time.

My invention consists, further, in certain novel features of construction of the battery, as hereinafter described and claimed.

In the annexed drawings, Figure 1 is a vertical section of a battery embodying my invention, and Fig. 2 a view, partly in section and partly in elevation, of one of the moisture-tight stoppers employed by me.

A, B, and C are three glass bottles, preferably of square form. They are attached together by wrappings of any suitable material, *a a*, and also have rubber cushions *b b* placed between them and cemented to the glass. The bottles may, if desired, be held in a suitable case, D. All the bottles are nearly filled with the standard solution E of zinc sulphate.

F is the copper plate resting on the bottom of bottle C and having a wire, *c*, wrapped with insulating material, extending up from it to the top of the liquid.

G is the active zinc plate suspended in the liquid near the top of A.

H is the idle plate, preferably a zinc plate, placed loosely in the bottle B. Crystals of copper sulphate *d* are also placed in the bottle C.

Near the bottom of bottle A is an opening, *e*, and near the bottom of bottle B is a corresponding opening, *f*. An opening is also formed through the rubber *b*, so that there is a communication between the two bottles at this point. Porous material *g* is placed in the opening, preferably asbestus. A similar communication is made between B and C, near the tops thereof, at *i k*, also provided with asbestus *g*. Each bottle is provided with a stopper, which consists of a screw-threaded stem, *l*, having at one end a thumb-nut, *m*, and carrying at the other a metal disk, *m'*.

Placed loose upon the stem *l* are a metal disk, *n*, and three soft-rubber disks, *o o' o²*. The upper disk, *o*, has an upward flange which encircles the metal disk *n*. When the rubber stopper thus formed is inserted in the neck of the bottle, the thumb-screw is screwed down tightly against disk *n*, the soft rubber is forced out laterally against the neck of the bottle and hermetically closes the same. To withdraw the stopper it is necessary to unscrew the thumb-nut a certain distance, which loosens the stopper so it can be pulled out. A flat metal strip, *r*, is soldered to the end of wire *c*, (or this wire itself may be flattened,) and passes out through the neck of the bottle, its shape being such that it does not interfere with the stopper. A metal strip, *r*, of the same character extends from zinc plate G in the same way. The external circuit-wires, 1 2, are connected with these projecting strips in any desired manner.

It will be understood that when the battery is in operation the internal circuit is from the copper plate to the top of its bottle, thence through the middle bottle to the bottom of the zinc-bottle and then to the zinc plate. This is

a circuit of high resistance, and the idle plate intercepts the copper, which would otherwise be deposited on the active zinc plate and impair its surface. It is evident that to increase the internal resistance there may be more than one intermediate compartment, the different compartments opening into each other alternately at top and bottom. Each of said compartments may contain its own idle plate.

What I claim is—

1. In a battery, the combination of three compartments connected together, the outer ones each containing an active plate, and the middle one an idle plate, substantially as set forth.

2. In a battery, the combination of three compartments, the outer ones each containing an active plate, and one being connected with the middle compartment at or near the bottom, the other at or near the top, substantially as set forth.

3. In a battery, the combination of compartments, one having an active plate near its bottom, the other one near its top, and a communication from the upper part of the former to the lower part of the latter, substantially as set forth.

4. In a battery, the combination of the three compartments, the outer ones each containing an active plate, and the middle one containing an idle plate, one of the outer compartments being connected with the middle one at or near the top, and the other connected at or near the bottom, substantially as set forth.

5. In a battery, the combination of the three compartments, each of the outer ones containing an active plate, one plate being at or near the bottom and the other at or near the top of its compartment, communications from the upper part of the former and the lower part of the latter to the middle compartment, said middle compartment having an idle plate, substantially as set forth.

6. The combination, with a battery cell or bottle, of an elastic stopper having rigid plates above and below the same, and means for forcing said plates together upon said elastic stopper, substantially as set forth.

7. The combination, with a battery cell or bottle, of the stopper consisting of a stem, one or more rubber disks loose on said stem, a rigid disk carried by said stem on one side of said rubber disks, and a loose disk and thumb-nut on the other side, substantially as set forth.

8. The combination, with a battery cell or bottle and a flexible stopper therefor, of the flat metal strip extending between the stopper and the neck of the bottle, substantially as set forth.

9. In a battery, the combination of the three compartments arranged substantially as described, and provided with porous diaphragms in the openings between the compartments, substantially as set forth.

This specification signed and witnessed this 21st day of September, 1885.

CHARLES WIRT.

Witnesses:
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