G. LAUDER.

Galvanic Battery.

No. 208,614. Patented Oct. 1, 1878.

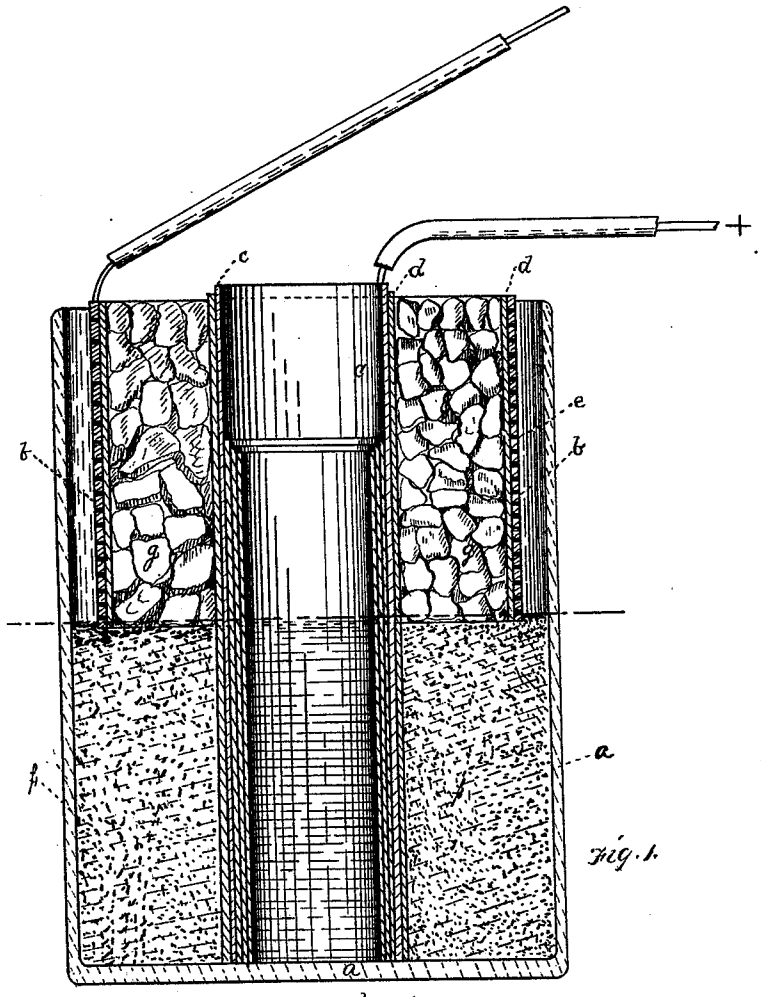


Fig. 1.

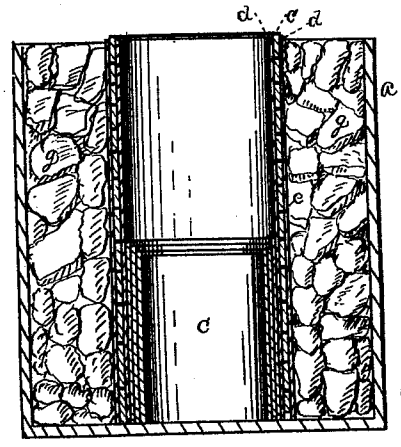


Fig. 2.

WITNESSES:

R. C. Wrenshall

J. K. Smith

INVENTOR

George Lauder

by Bakewell & Kerr

ATTORNEYS

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE LAUDER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN GALVANIC BATTERIES.

Specification forming part of Letters Patent No. **208,614**, dated October 1, 1878; application filed December 14, 1877.

To all whom it may concern:

Be it known that I, GEORGE LAUDER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Galvanic Batteries; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a vertical sectional view of a cell embodying my invention in the preferred form, and Fig. 2 is a similar view of a modification.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of cells for galvanic batteries, and also to the material employed therefor; and consists, first, in employing, as an exciting element, any metallic sulphuret capable of being oxidized by air or moisture, or air and moisture—as, for instance, the sulphuret of iron or iron pyrites; secondly, in the use of perforated plates to allow access of air, or air and moisture, to the exciting element; thirdly, in the employment of two plates, P and N, of similar metal, with an exciting element capable of oxidation by air or moisture, or air and moisture; fourthly, in covering the plates of the cell with fibrous or like material adapted to raise the water by capillary or like action.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

This cell consists, essentially, of an outer jar, two or more plates of similar or dissimilar metal, and the exciting element. For the exciting element I employ iron pyrites or any of the sulphurets of metals oxidizable in the air, or in air and water. When dissimilar metals are used for the plates I prefer copper and zinc; but when the same metal is used for both plates copper is preferred.

In the drawing, *a* indicates a receptacle of suitable material, preferably glass or earthenware. *b c* indicate the plates, which are, in the present instance, copper and zinc, respectively, but may be of any other two dissimilar metals adapted to form a positive and negative; or the two plates *b c* may be of the same metal—as, for instance, both copper or both zinc. *d d* represent plate-coverings of felt, blotting-paper, or other fibrous material adapted to supply moisture to the exciting element and to the plates by the capillary action. These coverings should be applied to the surfaces of the plates which come in contact with each other or with the exciting element, but may be applied on both surfaces, if desired. One or more of the plates of the battery should be perforated or slotted, as at *e*, or in other suitable manner, to facilitate the access of air to the body of the exciting element.

In practice I have found that a somewhat different arrangement of the elements is desirable in a constant battery, as for electro-plating, where quantity and uniformity are required, and a battery for open circuits, where intensity is preferred. For the former (shown in Fig. 1) I obtain good results by rolling a sheet of zinc, *c*, of, say, eight inches by thirty-six inches, into a cylinder of suitable size, inclosing it in a sheath or covering of felt or blotting-paper, *d*, arranging it centrally in a jar and packing it around, to a depth of about four to six inches, with coke-dust *f* or other absorbent of like nature. I next take a perforated copper plate and form therefrom a cylinder, or otherwise produce a perforated or slotted copper cylinder, which may vary from six to twelve inches in diameter, and should be about six inches long. This I cover upon its inner surface with a layer of felt or blotting-paper, *d*, as in the case of the zinc. The copper cylinder is then arranged within the jar, resting upon the absorbent packing *f* and concentric with the zinc-cylinder. The space between the two metals is filled with iron pyrites *g* or other oxidizable sulphuret of a metal, and water is added in sufficient quantity to touch the bottom of the copper plate.

For an open circuit the cell modified in arrangement, as shown in Fig. 2, has been found best adapted. In this case the perforated or slotted copper cylinder is usually some three or four inches in diameter, sufficiently long to extend to the bottom of the jar, and is covered on both surfaces with the felt or blotting-paper. The zinc is arranged within the copper cylinder, and preferably in contact with the fibrous cover thereof, the space between the copper cylinder and the jar is filled

in with the metallic sulphuret, and water is added to the height of the zinc. If desired, both plates may be perforated or slotted, though I have not found any advantages therefrom.

The advantages of my invention are that an effective, equable, inexpensive, odorless, and clean cell is obtained thereby.

I am aware that a thermopile has been constructed wherein a central cylinder or fire-chamber has been surrounded by an isolated metallic trough for containing water, an intervening space between the fire and water chambers being packed with galena, the difference between the temperature caused by the fire in the inner chamber and the evaporation of the water in the trough outside causing a current to flow through the galena into the conductor used to join the two cylinders; and also that it has been proposed to substitute nickel and its copper compounds, selenium, tellurium, or sulphate of copper for the galena, and do not herein claim such subject-matter.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As an exciting element in a galvanic cell, a metallic sulphuret oxidizable by air and moisture, substantially as specified.

2. In a galvanic cell whose exciting element is a metallic sulphuret, a perforated plate, substantially as and for the purpose specified.

3. A galvanic cell composed of two or more plates of either similar or dissimilar metals and a metallic sulphuret or similar oxidizable exciting element, substantially as and for the purpose specified.

4. The combination, in a galvanic cell, of two or more plates of metal, an oxidizable exciting element, and a cover or coverings of fibrous material interposed between the plates and the exciting element, substantially as and for the purpose specified.

In testimony whereof I, the said GEORGE LAUDER, have hereunto set my hand.

GEORGE LAUDER.

Witnesses:
JAMES I. KAY,
F. W. RITTER, Jr.