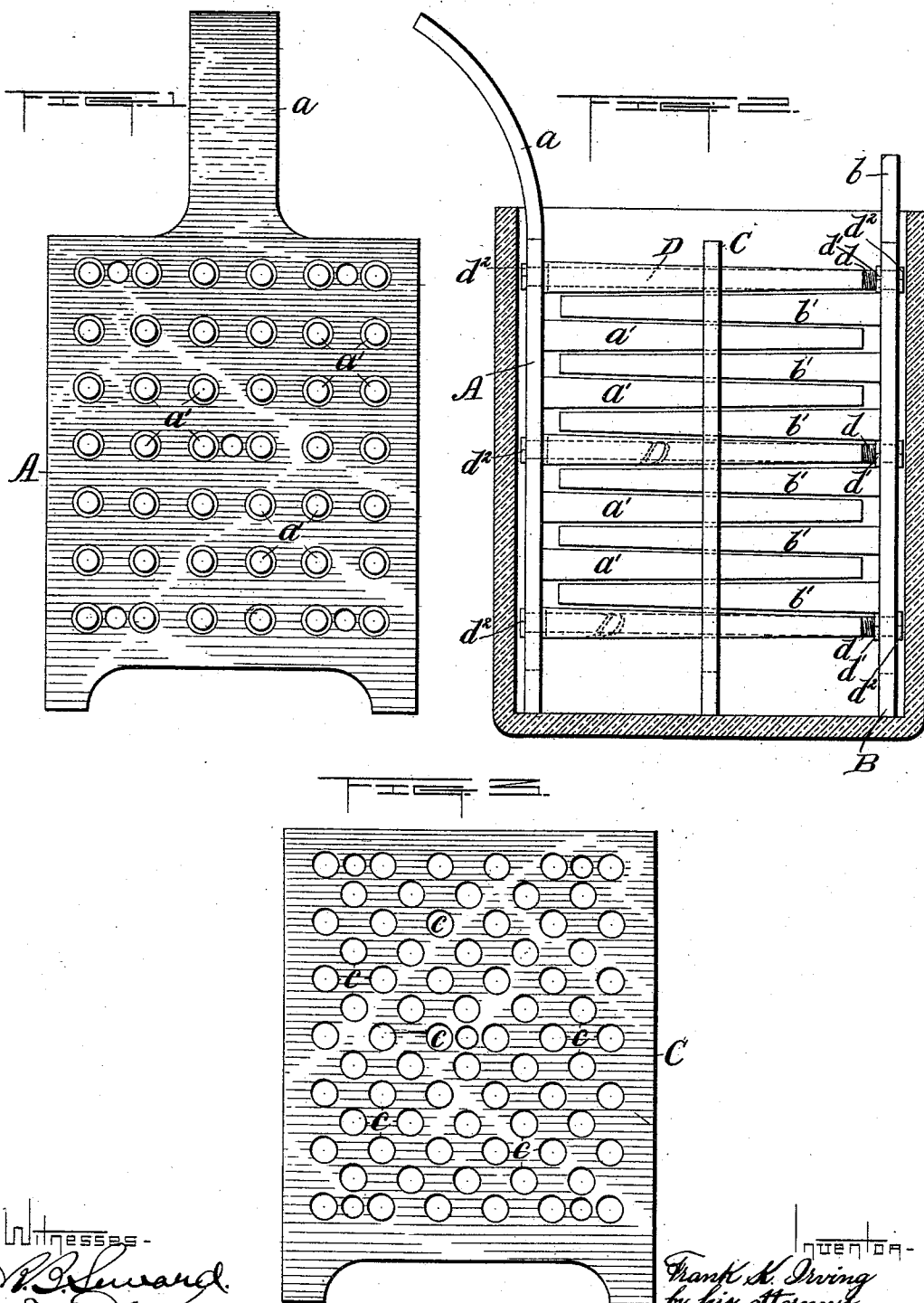


(No Model.)

F. K. IRVING.
GALVANIC BATTERY.

No. 496,658.

Patented May 2, 1893.



Witnesses -
B. B. Leonard
D. B. Secker

INVENTOR -
Frank K. Irving
by his attorneys,
Brown & Leonard

UNITED STATES PATENT OFFICE.

FRANK K. IRVING, OF BROOKLYN, ASSIGNOR TO THE FRANKLIN ELECTRIC COMPANY, OF NEW YORK, N. Y.

GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 496,658, dated May 2, 1893.

Application filed January 27, 1892. Renewed October 10, 1892. Serial No. 448,290. (No model.)

To all whom it may concern:

Be it known that I, FRANK K. IRVING, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Galvanic Batteries, of which the following is a specification.

My invention relates to an improvement in galvanic batteries with the object in view of increasing the superficial area of the plates exposed to the solution and at the same time providing plates of sufficient thickness and strength to stand the work required of them for a very long period of time.

A practical embodiment of my invention is represented in the accompanying drawings in which—

Figure 1 represents one of the plates of a couplet in side elevation, as for example the lead plate. Fig. 2 represents a pair of plates in edge elevation the plates being arranged in the position which they are intended to occupy when assembled in a cell as in operation, and Fig. 3 represents a view in detail of a separating plate shown in edge elevation in Fig. 2.

One of the plates, as for example the lead plate, is represented by A and the other, as for example the zinc plate, is represented by B. While the length, breadth and thickness may be varied as experience may dictate and will in all cases depend upon the size of the cell, the proportions which I have found desirable are as follows: A plate eight inches long or high and six and one-quarter inches wide will be made one-quarter of an inch thick and will have cast integral therewith, if it be the lead plate, at its upper end a lug *a* about four and one-half inches long and one and one-half inches wide for making connections, and if it be the zinc plate, a lug *b* one and one-half inches long and the same width as that of the lead plate.

The plate A is provided on one of its faces with horns *a'* projecting laterally therefrom. In a plate of the dimensions which I have above noted the horns will be advantageously formed one half inch in diameter at their base where they join with the plate and will have a true taper toward their opposite ends which will be made about three-eighths of an inch in diameter. The plate B is provided with

similar horns *b'* projecting from its side and adapted to enter between the horns on the plate A when the two plates are assembled for use, as clearly indicated in Fig. 2. It is intended that the spacing between the horns on the respective plates shall be such that when the plates are brought into assembled adjustment there shall be a clear space of about one-quarter of an inch between the nearest adjacent surfaces of the horns on the two plates. The horns *a'* and *b'* may be cast integral with their plates and may be held intermediate of their bases and points or free ends against any possible displacement through jarring or otherwise by means of a separating plate C of some suitable insulating material, rubber for example, provided with holes *c* adapted to receive the horns *a'* and *b'* therethrough from opposite directions, the holes being so sized as to tightly fit the horns when they have been inserted the proper distance. The separating plate C is conveniently made about one-quarter of an inch thick. The plates are further held securely in position relative to each other by means of bolts D of some suitable insulating material, rubber for example, having screw threaded ends *d* and provided with nuts *d'* for engaging the inner faces of the plates and adjusting the plates the proper distance apart and with nuts *d''* for engaging the exterior faces of the plates and holding them against separation. In practice I use five of the bolts D for each couplet or pair, two near the bottom, two near the top and one central.

I have shown the horns *a'* and *b'* circular in cross section but it is obvious that they might be formed of other shapes either oval or polygonal as may be found desirable.

The insertion of the horns on the one plate within the spaces between the horns on the opposite plate fills the entire mass of the solution with exposed surfaces, separated from each other only just sufficiently to admit of a free circulation and at the same time the plates with their horns may be made thick and durable.

What I claim is—

1. A galvanic pair or couplet comprising plates having horns emanating from their ad-

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jacent sides, the horns upon the one plate being arranged to enter the spaces between the horns upon the opposite plate, substantially as set forth.

5 2. A plate for a galvanic battery provided with horns extending laterally from one of its faces, substantially as set forth.

3. The combination with the electro positive and electro negative plates of a galvanic
10 pair or couplet, the said plates being provided

with horns projecting from their adjacent faces and over lapping one another, of a separating plate of insulating material in which the horns of the opposite plates are seated, substantially as set forth.

FRANK K. IRVING.

Witnesses:

FREDK. HAYNES,

I. B. DECKER.