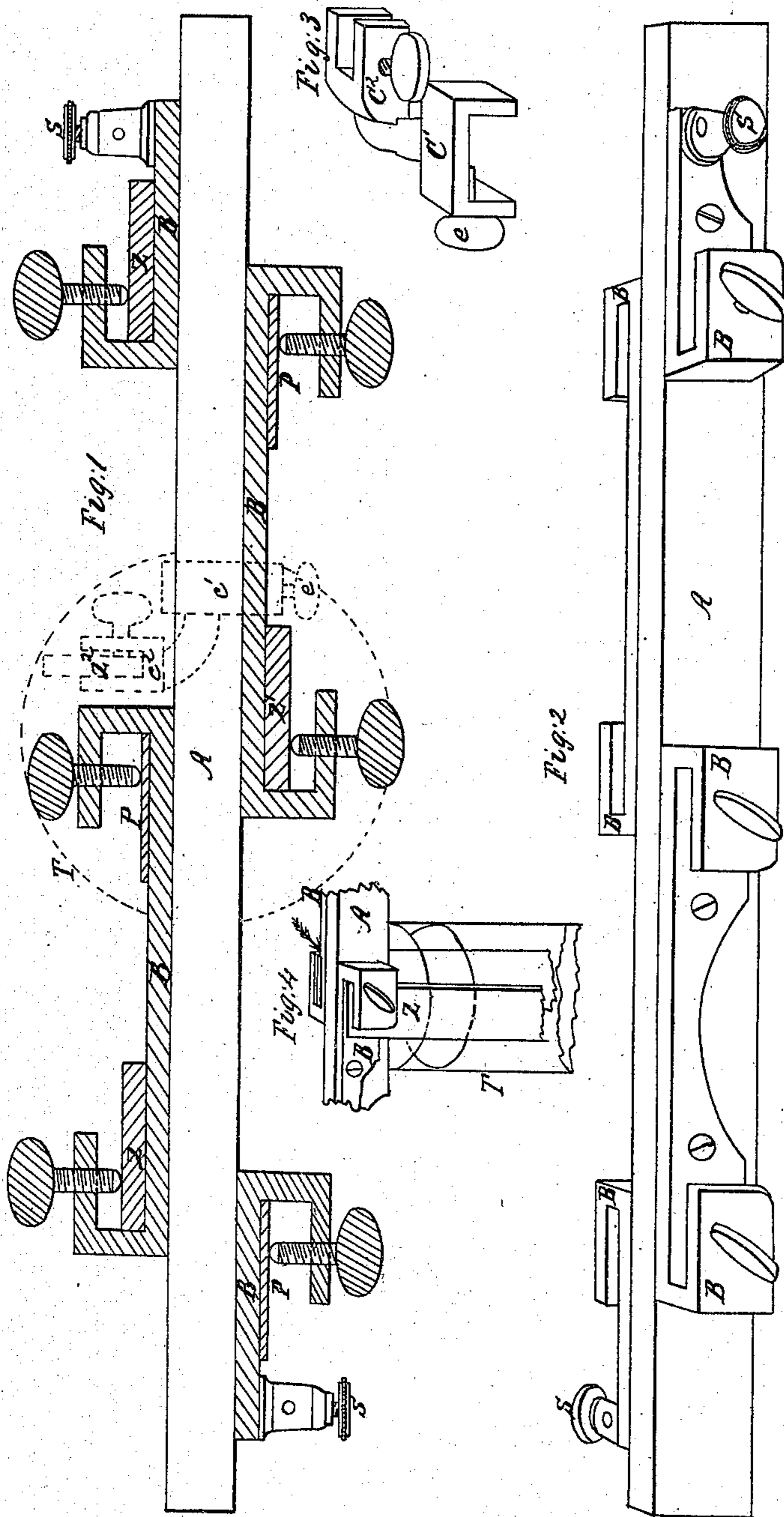


C. T. CHESTER.  
GALVANIC BATTERY.

No. 12,855.

Patented May 15, 1855.



# UNITED STATES PATENT OFFICE.

CHARLES T. CHESTER, OF NEW YORK, N. Y.

## IMPROVEMENT IN CONNECTING-CLAMPS FOR THE PLATES OF GALVANIC BATTERIES.

Specification forming part of Letters Patent No. 12,855, dated May 15, 1855.

*To all whom it may concern:*

Be it known that I, CHARLES T. CHESTER, of the city, county, and State of New York, have invented a new and useful Improvement in Insulating the Plates of Galvanic-Batteries; and I do hereby declare the following to be a full description of the same.

The nature of my invention consists in the use and combination of brass clamps with insulated wooden supports, so that the plates immersed in the exciting fluid are insulated from each other, local action in the battery prevented, and the plates can be removed, cleaned, and replaced, or their size increased or diminished without interrupting the action of the battery.

To describe my invention more particularly I will refer to the accompanying drawings, forming a part of this schedule, the same letters of reference wherever they occur referring to the same parts.

Figure 1 represents a longitudinal section of the insulating rod and clamps. Fig. 2 is a perspective view of the same. Fig. 3 represents one form of clamps used during the operation of changing plates in the battery. Fig. 4 is a section of the insulating rod and clamp relative to its position with the tumbler.

Letter A is a piece of highly-insulated wood having secured to it at opposite sides clamps B B, for holding the zinc and platenized plates Z and P in their respective positions in the exciting-fluid contained in the tumbler T. (See dotted outline, Fig. 1.)

Letters s s are binding-screws for forming connections by wire from one series of cups to another.

Letter C' and C<sup>2</sup> represent one form of clamp used to insert a duplicate plate in the battery fluid while the other is removed. Thus, C' is placed over and upon the insulating-rod A and clamp B, and held in that position by means of the binding-screw e, while the clean or auxiliary zinc plate Z<sup>2</sup> is screwed into the clamp C<sup>2</sup>, so as to dip into the same acid which Z' dips. Z' is then removed, cleaned, and replaced, and the battery-current will not have been disturbed.

The dotted outline in Fig. 1 represents the relation of these parts.

To charge my batteries I make a solution of one part sulphuric acid added to nine parts of water, which is placed in tumblers of nearly two quarts capacity, to act upon the plate of zinc and platina or platenized metal. The size of these plates are seven inches long and of proportionate width, according to quantity of electricity desired for use. The plates are such as those generally used in galvanic batteries.

The insulating wooden rod A may be made of any extent required. For the batteries I use I combine with it clamps for five cups or cells, and also combine with it clamps so arranged as to hold two zincs, one on each side of the platenized plate. When the clamps are so arranged it supercedes the use of the auxiliary clamp, Fig. 3, in changing plates.

For telegraphic purposes (for which this mode of combining and insulating the plates is of great value) I prefer using the single and auxiliary clamp, Fig. 3.

I insulate the upper parts of my platenized plates, except where connection is formed by the binding-screw, by baking with copal varnish, thus cutting off in a great measure the effect of capillary action, which causes the acid solution, (especially after being partly mixed with sulphate of zinc,) to creep up the plate and attack the brass clamps and wood-work; but I do not consider that the insulation by varnish, however carefully performed, would entirely prevent local action produced by the effect of capillary attraction, especially when the battery has been in long or careless use; but I rely especially upon the construction of my brass clamps, which, however varied in form and design, always embrace the battery-plates in a metallic chamber, cutting them off from contact with the wood-work, and thus, when the battery is neglected or used very severely, zinc salts may accumulate in almost any quantity about the tops of the plates and yet the salt and moisture shall all be confined in the metallic cell, and the wood-work remain dry and insulated.

The other insulating devices that I have described or shall describe are valuable auxiliaries against local action and against external injury, such as the spilling water or acid upon the battery itself or on the shelves which sup-

port it; but as a guard against the tendency of the battery to create local action within itself by its non-operation, and as a natural effect of its continued use, I rely mainly upon the metallic chamber form of the plate-supporting clamps.

The wooden insulating-rod A is insulated by means of varnishes, which is forced into its pores by the pneumatic apparatus or other suitable means.

My tumblers on the lower part are coated with Faraday's electrophorous. By this means I cut off intercommunication between the surfaces of the glass cells. The advantages derived from these arrangements are the prevention of local action in the individual cells and cross-tire between different cells, the ability to take down and clean the battery without interrupting the flow of the current, and the power it gives the operator of arranging with the greatest dispatch the quantity of electricity desired. I have had this arrangement of battery in use five months without being taken down or interrupting the current of electricity, the zincs being substituted by means of the

auxiliary clamp and brushed once a week, and sufficient acid added to supply evaporation.

Having now described my invention and its operation, I will state what I claim and desire to secure by Letters Patent of the United States—

The arrangement herein described for fastening and connecting the battery-plates, viz: clamps of brass or such other metal as will alike answer the purpose of the arrangement attached to the insulating-bar of wood commonly used in Smee's battery in such manner that the battery plates clamped to them shall be separate from the wooden bar and the solution be prevented from finding its way by capillary attraction to the wood, and which shall by their form allow of an easy removal and replacement of each separate plate without the disturbance of any other part of the battery arrangement, as hereinabove set forth.

CHARLES T. CHESTER.

Witnesses:

J. M. BALDWIN,  
WOODBIDGE HUDSON.