

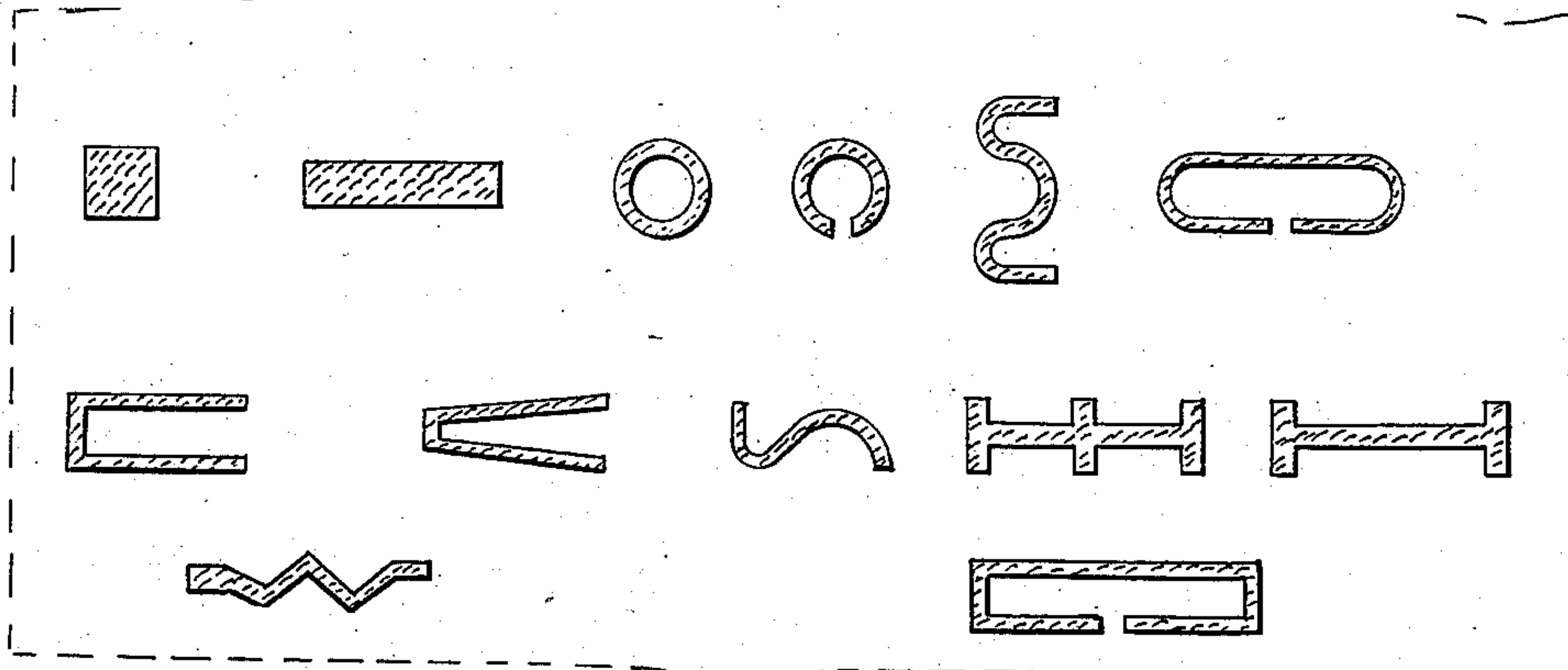
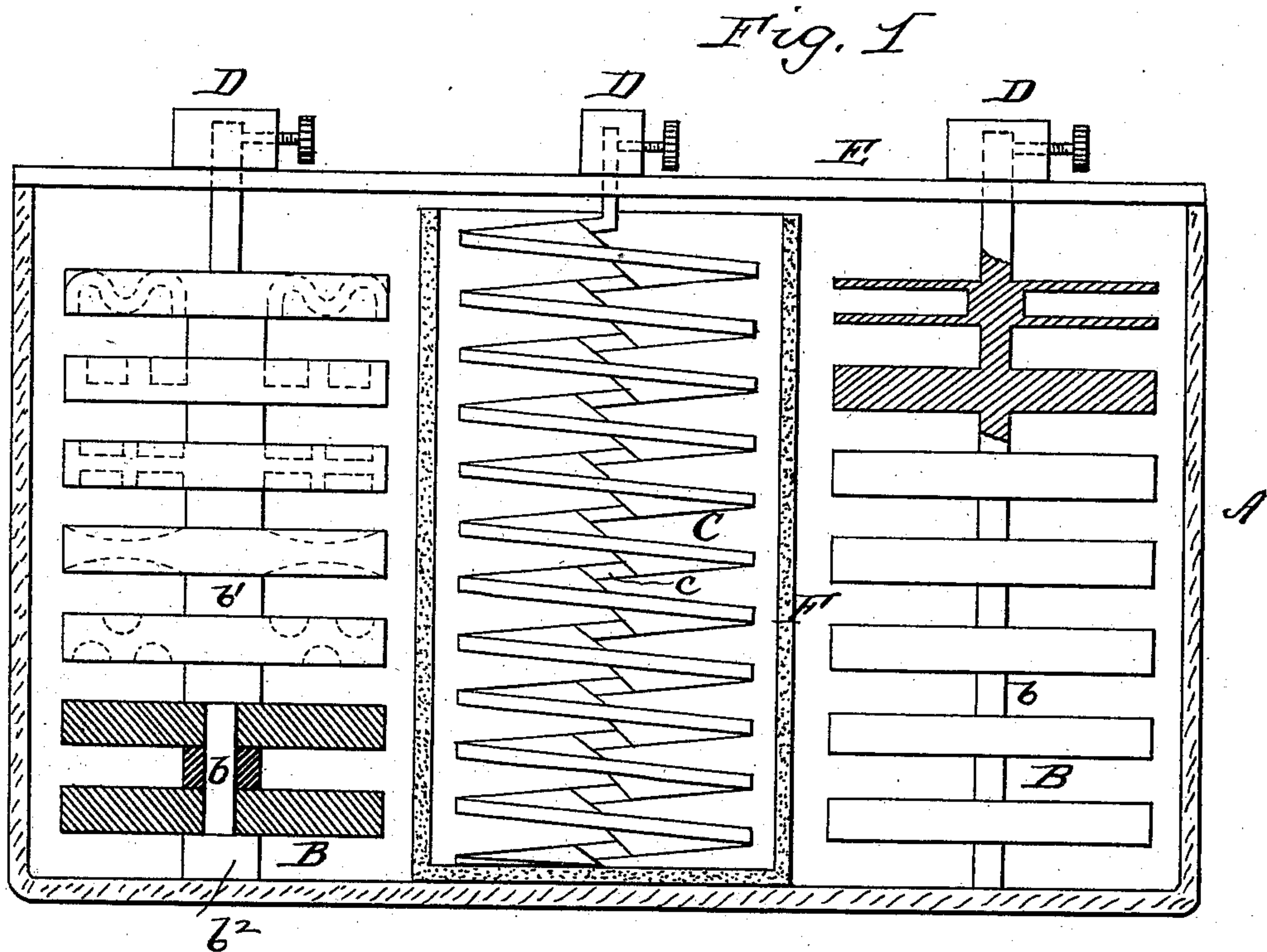
(No Model.)

J. F. McLAUGHLIN.

GALVANIC BATTERY.

No. 375,559.

Patented Dec. 27, 1887.



WITNESSES:

Wm. St. Lawrence
M. W. Walker

Fig. 2.

INVENTOR

James F. McLaughlin

By J. Van Stavoren

ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 375,559, dated December 27, 1887.

Application filed May 5, 1886. Serial No. 201,212. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Voltaic or Battery Cells, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to voltaic or primary-battery cells, particularly to the elements used therein; and it has for its object to secure the greatest possible superficial surface or area for the elements without increasing their size or bulk, so as to provide for the generation of either the greatest quantity or intensity of electric current possible with given sizes or bulk of elements.

My invention accordingly consists of the combination, construction, and arrangement of parts, as hereinafter described and claimed, comprising a battery or voltaic cell having one element of zinc in the form of a spiral and another of carbon in the form of disks or plates, separated from one another to provide spaces between succeeding plates or a pile of disks or plates one above the other, with intervals between them.

In the drawings, Figure 1 represents a longitudinal section of a battery-cell embodying my improvements, and Fig. 2 represents sections of various forms of bars for the spirally-coiled element.

A indicates the main box or cell; B B, one or a set of similar elements, and C the other element, which elements may be used with any suitable exciting liquid or solution. These elements B and C may be of any of the well-known or other suitable materials; but for the sake of clearness I will designate the elements B as being made of carbon, and the element C of zinc or other suitable metal. To obtain the greatest possible superficial area or surface of elements for the action of the exciting-fluid without materially increasing their bulk, I prefer to make the zinc or metal element C from a ribbon or plate which is coiled on its edge to produce an edge-coiled spiral, as indicated, which spiral is coiled from a rolled, drawn, cast, or other bar, of any suitable or desired form in cross-section, having a central

or mandrel opening, *c*, as more plainly indicated in Fig. 2 of the drawings—that is to say, the bar in cross-section may be square, rectangular, tubular, slotted tubular, U or double-U shape, or otherwise made irregular, and grooved, as compatible with desired results to be obtained—and each coil of the spiral is separated from its neighboring coil, so as to leave a clear space or open interval between them, or, in other words, the pitch of the spiral is such that its coils do not contact.

The carbonelement B is preferably in the form of a pile or a number of disks or plates having spaces or intervals between them, which are preferably produced by separating the plates from each other, as indicated. These plates may be round, square, or of any other suitable shape, and have any desired form in cross-section, as indicated by full and dotted lines, Fig. 1—that is to say, the sides and faces of the disks are provided with grooves or recesses of any desired configuration—so as to vastly increase the superficial area of the disks. These plates are preferably strung or fitted upon a central rod or shaft of carbon, *b*, with interposed collars *b'*, made either separate from or integral with the plates, the shaft having a fixed bottom collar, *b²*, for maintaining the plates and collars in position at all times thereon. If desired, however, the rod *b* and the collars may be made integral, as shown to the right in Fig. 1.

The elements B or their rods *b* are preferably attached to a binding-post, D, secured to a lid or cover, E, as is also the upper end of the zinc element, as shown; but as the cover E is not essential, said binding-posts may be otherwise disposed of, as desired.

The metal element C may be inclosed in a porous cup, F, or it and the remaining element may be disposed of or arranged relatively to one another, as desired, as I do not limit myself to any particular disposition of the elements, nor to the number of each of the elements, nor to the number of similar elements.

The elements may be vertically, horizontally, or otherwise arranged, as desired.

The coils of the spiral may have either a regular or an irregular pitch, or may be otherwise arranged, as desired, and they may be

coiled upon a square, round, or other suitable form of mandrel.

The spirally-coiled element C and the plate element B provide, it is evident, a greatly-in-
5 creased extent of superficial area or surface for the exciting fluid or solution without change of bulk of the elements, and therefore a greater quantity of current is generated, and by suitably coupling the battery-cells an in-
10 crease in intensity as well as in quantity is obtained.

When the plates of element B are separable from one another, each or a number of the plates, when mutilated, broken, or otherwise
15 impaired, can readily be removed and replaced by others without necessitating the throwing away of the whole element when some of its parts are still fit for use.

I am aware that battery elements have been heretofore constructed comprising a series of 2c independent plates with apertures or perforations vertically therethrough, and therefore such an arrangement I do not claim; but

What I do claim is—

In a primary electric battery, a battery-ele- 25 ment comprising a vertical plate carrying a series of independent disks, each disk being horizontally grooved or recessed on its surface, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in 30 presence of two witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

S. J. VAN STAVOREN,
CHAS. F. VAN HORN.