(No Model.)

J. H. WALTER.

SECONDARY BATTERY ELEMENT.

No. 453,950. Patented June 9, 1891.

Fig. 1.

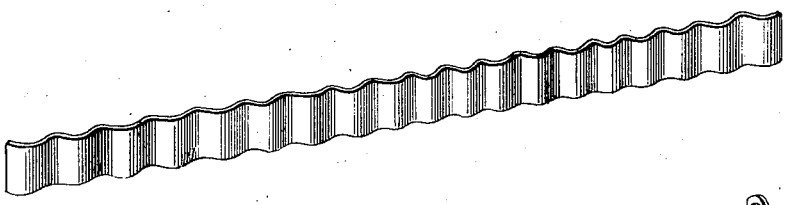


Fig. 3.

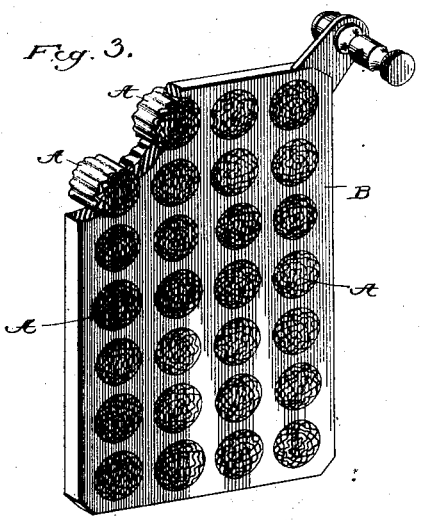
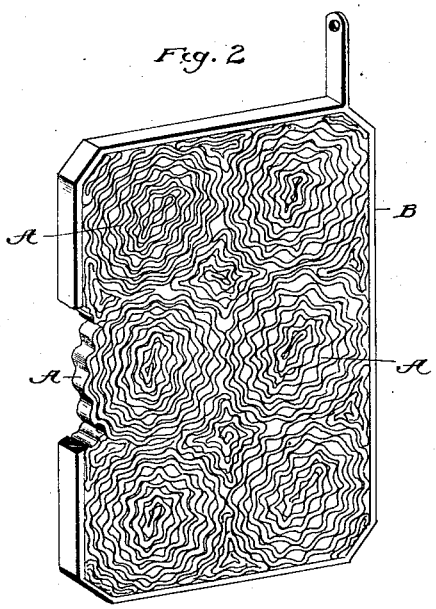


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN H. WALTER, OF WASHINGTON, DISTRICT OF COLUMBIA.

SECONDARY-BATTERY ELEMENT.

SPECIFICATION forming part of Letters Patent No. 453,950, dated June 9, 1891.

Application filed August 19, 1890. Serial No. 362,429. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. WALTER, of Washington, in the District of Columbia, have invented certain Improvements in Battery Elements, of which the following is a specification.

The aim of my invention is to produce a cheap and durable element having a large surface in proportion to its weight and adapted to receive and securely retain the active material; and to this end it consists in an element composed of a metallic ribbon or strip corrugated transversely and wound or bent upon itself in such manner as to present its edges outermost. I propose to use lead, aluminum, or other suitable metal and reduce the same by rolling or otherwise to the form of a thin tape or ribbon of a width of half an inch, more or less. This ribbon I crimp or corrugate in any manner which will give it a rough or irregular surface. I take one or more of these long strips and coil or fold the same upon itself in any manner which will produce a plate or body. The successive layers or convolutions or the series of pieces may be united or bound together by an encircling frame or in any other suitable manner which will give rigidity to the structure. The edges of the strip or strips form the two faces of the structure, and the corrugations in the strips produce cells or interstices extending through the same from one face to the other and well adapted to receive and retain active material, if the battery is of the class in which such material is applied in the form of a paste or powder.

In the accompanying drawings, Figure 1 is a perspective view of a strip such as I employ in the construction of my battery elements. Figs. 2 and 3 are perspective views showing my elements in different but equivalent forms, a portion being broken away in each case to show the details of construction.

Referring to the drawings, in Fig. 2, A A represent a series of coils, each composed of one or more strips such as shown in Fig. 1. These coils are assembled and pressed closely together in a common plane and secured within an encircling frame B of lead, aluminum, or other appropriate metal or other material. The coils may be soldered, riveted, or otherwise secured to each other and to the frame. The details of these connections are not essential. Any arrangement which will firmly unite the parts and keep them in the required relations will answer.

In Fig. 3, A represents coils composed of corrugated strips seated and secured in a sustaining-frame B', consisting simply of a plate of aluminum, lead, or the like having holes formed therethrough to admit the coils.

It is to be understood that my invention is not limited to a structure in which the element is composed of a series of bent or wound transversely-corrugated tapes, but also includes a structure in which the element is composed of a single bent or coiled tape, and that the same may be supported in a frame or otherwise sustained to adapt it for the purpose set forth.

In practice I find that the strip may be formed and pressed together in such manner as to give the structure great rigidity and a very great exposed surface in proportion to its size and weight, the cells or interstices extending through the element from side and adapted to receive and retain the red lead or other active material. If the battery is of the type in which the active material is not applied, but the metallic lead reduced, the extensive surface is equally advantageous. In this class of batteries the frame may be aluminium and the strip alone of lead.

I am aware that prior to the date of my invention battery elements had been constructed in whole or in part of aluminium, and I do not claim therefore the employment of aluminium in a battery element except as it may be applied in the specific forms herein described.

Having thus described my invention, what I claim is—

1. In a battery element, a transversely-corrugated metal tape wound or bent upon itself in such manner as to present its edges outermost.

2. In a battery element, the combination, with a sustaining-frame, of a series of trans-

versely-corrugated metal tapes, each wound spirally into a body with their edges outermost and sustained within the frame in such manner as to produce conjointly a flat body having openings therethrough from side to side.

In testimony whereof I hereunto set my hand, this 18th day of August, 1890, in the presence of two attesting witnesses.

JOHN H. WALTER.

Witnesses:
W. R. KENNEDY,
W. W. MORTIMER.