

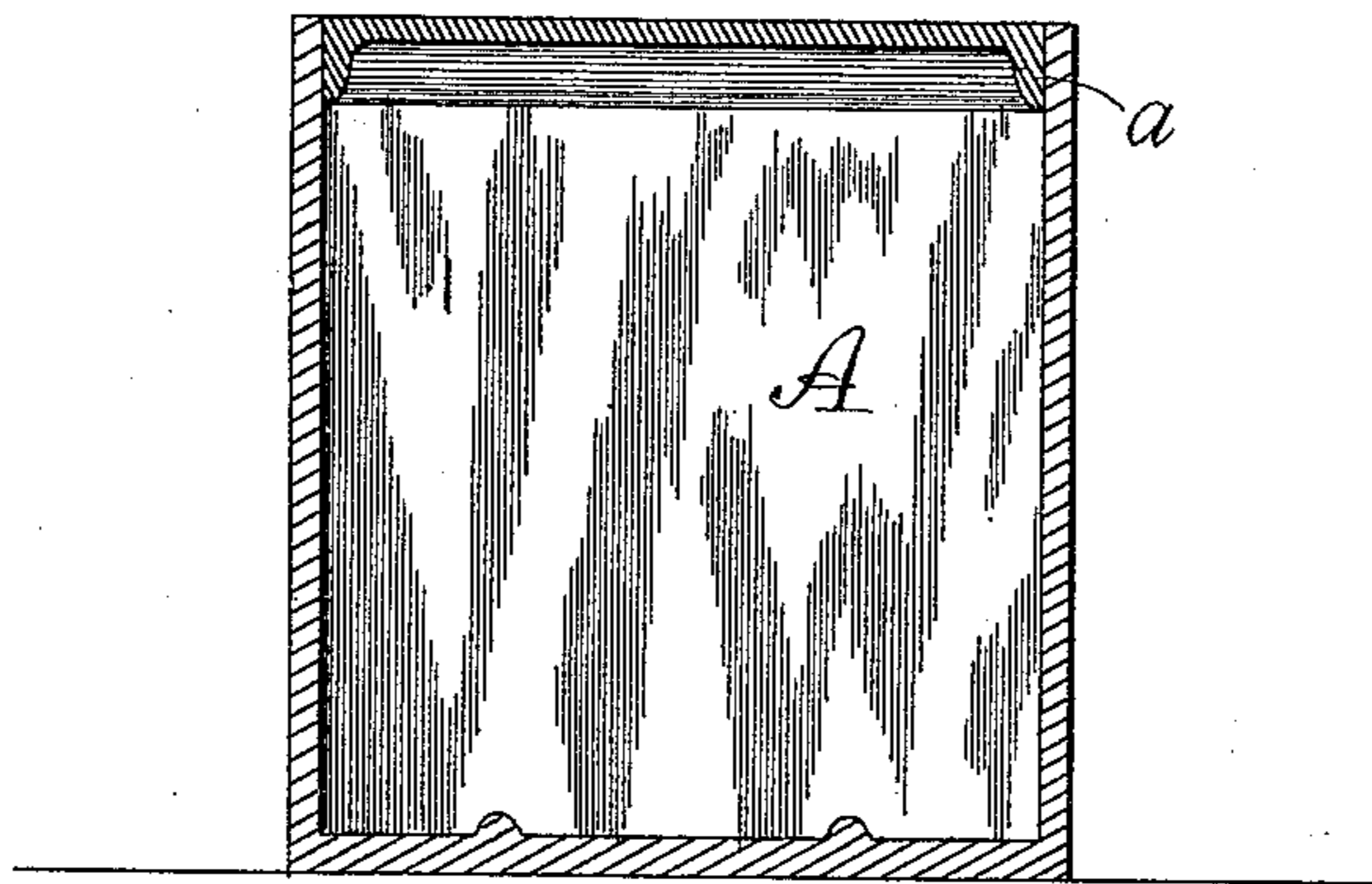
(No Model.)

F. W. HUESTIS.  
RECEPTACLE FOR SECONDARY BATTERIES.

No. 411,124.

Patented Sept. 17, 1889.

*Fig. 1.*



*Fig. 2.*

*Witnesses.*

*Richard H. Lodge*  
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*by H. E. Lodge Atty.*

# UNITED STATES PATENT OFFICE.

FRED. W. HUESTIS, OF NEWTON, MASSACHUSETTS.

## RECEPTACLE FOR SECONDARY BATTERIES.

SPECIFICATION forming part of Letters Patent No. 411,124, dated September 17, 1889.

Application filed March 5, 1889. Serial No. 301,831. (No specimens.)

*To all whom it may concern:*

Be it known that I, FRED. W. HUESTIS, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Receptacles for Secondary Batteries; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to the manufacture of vessels or receptacles for holding the cells of secondary batteries, as also the acid liquid in which said cells are immersed.

The object of this invention is to produce a material from which said receptacles are to be made possessing several important features and consequent advantages over and above those now in general use. First, said material is a much better insulator; secondly, it is entirely acid-proof; thirdly, when compounded and made into sheets it always remains flexible. As it is likewise very tough, the vessel is not liable to fracture.

The drawings accompanying this specification represent in Figure 1 a central vertical section of a receptacle formed of material embodying my invention. Fig. 2 represents the spring-cover, as hereinafter described.

To produce a receptacle for secondary batteries above premised—one which shall be a good insulator, acid-proof, and moreover one in which the walls are flexible and not easily broken or cracked—I propose to employ as a base the material commercially known as “balata,” or a vegetable gum procured from the tree *Sapota mulleri*. This material possesses characteristics peculiarly adapted for receptacles for secondary batteries. It is an excellent insulator, never becomes hard, and consequently, as it is very tenacious, not liable to break or crack. I do not propose to use this material in a pure state, but prefer to compound it with other cheaper materials, employing the balata as a base. These other ingredients must be acid-proof; and by preference I use asbestos,

ground slate, soapstone, or other analogous substances, which are to be added in suitable quantities, as may be deemed desirable. I do not wish to be limited to any specific proportions, as such may be varied. The resultant mixture or compound is to be vulcanized, preferably with sulphur, and formed in sheets, which are cut to the required size, placed in a mold, and subsequently heated and pressed, in order to unite the several pieces, thereby forming an integral homogeneous receptacle A. In this manner I secure a vessel which will retain a higher percentage of a charge, since it is a much better insulator than a receptacle made of ordinary hard rubber. The latter contains a certain amount of carbon, produced by the charring of the ingredients mixed with the rubber and during the process of vulcanizing; hence, as carbon is a good conductor, leakage occurs, which difficulty is avoided by the material I employ.

A further advantage in the use of balata with an acid-proof substance is that the mixture never becomes hard as compared with hard rubber. It always remains flexible, and as it is very tenacious incidental shocks, blows, or falls will not injure or break the sheets which compose the walls of the receptacle.

Gutta-percha, a substance very analogous to balata, may also be employed as a base and compounded with acid-proof materials—such as asbestos, ground slate, and like substances—to produce a mixture very well adapted to make receptacles for secondary batteries, and such may be considered a substantial equivalent.

It is a matter of much importance to have the receptacle tightly sealed to prevent the escape or accidental overflow of the acid-liquid contents of the battery; hence I have adopted a cover, as shown in Fig. 2. This cover is made of the same ingredients as the receptacle proper; but since said compound is elastic I mold the cover with a lip *a*, which extends continuously about the under side and projects normally beyond the perimeter of the upper outer surface of said cover; hence when the cover is inserted in the receptacle and said lip is compressed its elasticity causes

it to hug the sides of the vessel tightly, and effectually prevents the escape of any acid liquid, and likewise serves to retain the cover within the receptacle.

5 What I desire to claim is—

1. As a new article of manufacture, a receptacle for secondary batteries, composed of balata as a base, combined with acid-proof material, as asbestos, in suitable quantities,  
10 substantially as and for purposes specified.

2. As a new article of manufacture, a receptacle for secondary batteries, consisting of balata and acid-proof material, as asbestos, ground slate, or analogous substances, mixed  
15 in suitable proportions and subsequently vulcanized, substantially as described.

3. As a new article of manufacture, a vessel for secondary batteries, composed of integrally-united homogeneous flexible sheets of acid-proof material, consisting of balata and  
20 asbestos, soapstone, or analogous substances, compounded in suitable quantities, as herein stated and set forth.

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

FRED. W. HUESTIS.

Witnesses:

H. E. LODGE,  
RICHARD W. LODGE.