R. N. CHAMBERLAIN.

SEPARATOR.

APPLICATION FILED JUNE 20, 1914.

1,185,058. Patented May 30, 1916.

Fig: 1

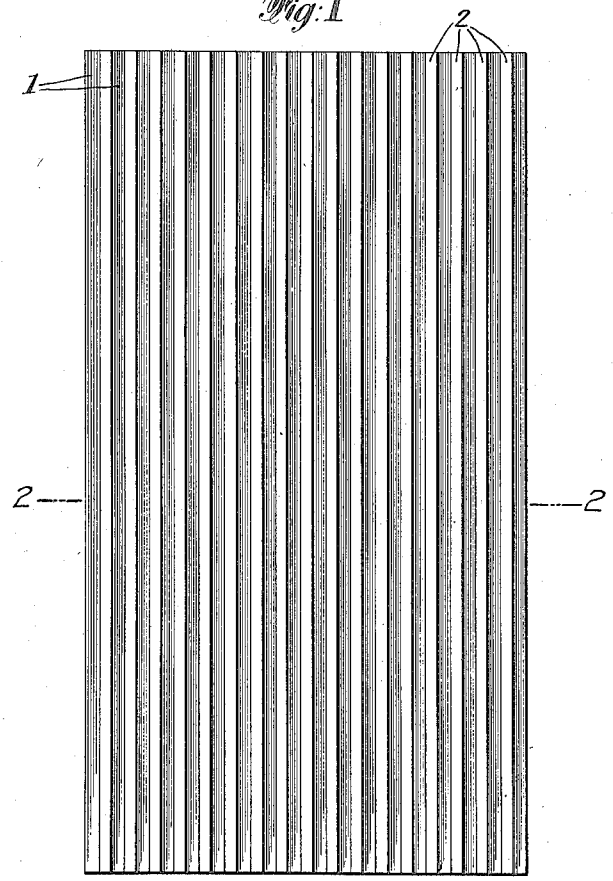
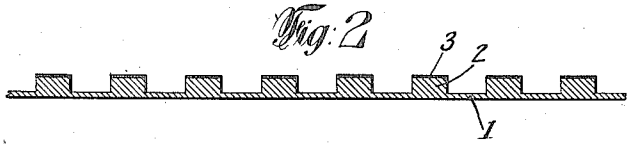


Fig: 2



Witnesses:
Weston A. Burgess.
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Inventor,
Rufus N. Chamberlain.
By his Attorneys,
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UNITED STATES PATENT OFFICE.

RUFUS N. CHAMBERLAIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO GOULD STORAGE BATTERY COMPANY, A CORPORATION OF NEW YORK.

SEPARATOR.

1,185,058. Specification of Letters Patent. Patented May 30, 1916.

Application filed June 20, 1914. Serial No. 846,244.

To all whom it may concern:

Be it known that I, RUFUS N. CHAMBERLAIN, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Separators, of which the following is a specification.

My invention relates to separators for storage batteries, and has for its object a wood separator so treated or constructed as to increase the life of the separator, and the efficiency of the battery in which it is used, and also the provision of a separator which will perform the function now performed by the usual wood separator and the perforated rubber sheet combined.

It has been found that the life of wood separators is prolonged by the use of some material between the wood and the surface of the positive plates. The usual practice is to place a perforated rubber sheet between the separator and the positives, but this practice, while it has the advantage of prolonging the life of the separator, has the disadvantage of reducing the voltage of the battery, particularly on rapid discharge, and the further disadvantage in a substantial increase in the cost of the battery. The reason why the rubber sheet increases the life of the separator is probably because when the wood is placed in direct contact with the positive plate, the oxygen liberated from the plate attacks the wood while in nascent condition, and being more active at that time causes a comparatively rapid disintegration of the wood; while when the rubber sheet is used the wood is a sufficient distance away from the surface of the positive to escape the action of the oxygen while in nascent condition.

My invention consists in taking the ordinary wood separator and preferably vulcanizing rubber on the outer portion of the ribs although the rubber may be placed thereon in other ways. When the rubber is vulcanized in place it probably penetrates the wood for a substantial distance and when vulcanized is firmly and intimately attached to the wood.

By the use of my invention the principal advantages of the rubber sheet are secured and the disadvantages avoided, because the wood which would otherwise come in direct contact with the positive is protected by the rubber or other suitable material placed upon the ribs, and at the same time the article is produced at a considerably lower cost.

A further distinct advantage secured by my invention is that the rubber placed upon the ribs strengthens them so that a mechanically stronger separator is secured, and it also insures that the acid channels will be properly maintained throughout the life of the separator.

A separator embodying my invention is shown in the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows a side elevation; and Fig. 2 shows a section on the line 2—2 of Fig. 1.

By reference to the drawings, it will be seen that the separator comprises a sheet 1 of wood, having ribs 2 preferably formed integrally therewith. On the outer portion of each rib is a layer of somewhat relatively hard acid-resistant material 3, such as rubber. This rubber may be applied to the ribs in any suitable manner, preferably by vulcanizing, or it may be formed separately and otherwise secured in position.

From the foregoing it will be seen that the rubber or other material will insure that the channels for the electrolyte are maintained and a free circulation along the face of the plate thereby secured. At the same time the rubber will protect the ribs of the separator which has been treated preferably by the process set forth in my application, Serial No. 790,653, filed on the 19th day of September, 1914. When treated by that process, the separator has substantially all of its natural composition and structure, such as porosity, and contains all of its natural constituents, the fiber being coated throughout by a suitable inert material to retard the action of the electrolyte upon the constituents of the wood, and when treated as set forth herein, the rubber protects the surface of the ribs, whereby the length of life and usefulness of the separator are greatly increased.

While I have specifically mentioned rubber as the material for protecting the surface of the ribs, it is understood that any material, which is relatively harder than

wood, and has the necessary acid-resistant qualities, will be equally satisfactory for the purpose specified.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A wood separator for storage batteries having ribs at intervals on one surface thereof, only said ribs having their outer portions protected by rubber.

2. A wood separator for storage batteries having ribs thereon, only said ribs having a layer of rubber vulcanized thereon.

3. A separator for storage batteries comprising a sheet of wood with ribs thereon and having a coating of rubber on the ribs only.

4. A separator for storage batteries comprising a sheet of wood having its natural porosity and constituents and its pores lined with an acid-resistant material and having ribs thereon with only their outer portions protected by a layer of rubber vulcanized *in situ*.

5. A porous separator for storage battery plates having ribs thereon and having an acid-resistant material on the ribs only.

6. A porous separator for storage battery plates having ribs thereon and having the face only of the ribs covered with an acid-resistant material.

7. A porous separator for storage battery plates having ribs thereon and having the outer surface of the ribs covered with and the pores of the ribs only filled with an acid-resistant material.

8. A porous separator for storage battery plates having ribs thereon and having the pores in the outer surface of the ribs only filled with an acid-resistant material.

9. A separator for storage battery plates having thin porous portions of natural structure and thicker portions having their outer surface rendered acid-resistant.

10. A separator for storage battery plates having thin porous portions of natural structure and thicker portions adapted to bear against said plates, the surface of said thicker portions being rendered acid-resistant.

11. A separator for storage battery plates having thin porous portions of natural structure and thicker portions adapted to bear against said plates, the surface of said thicker portions being rendered acid-resistant by filling the pores with an acid-resistant material.

12. A separator for storage battery plates having thin porous portions of natural structure and thicker portions adapted to bear against said plates, the surface of said thicker portions being rendered acid-resistant by filling the pores thereof with rubber and vulcanizing it.

13. A separator for storage battery plates having thin porous portions of natural structure and thicker portions adapted to bear against said plates, the surface of said thicker portions being rendered acid-resistant by filling the pores of the thicker portions with rubber and vulcanizing it *in situ*.

14. A separator for storage battery plates having thin porous portions of natural structure and thicker portions, said thicker portions having only their faces protected by acid-resistant material.

15. A separator for storage battery plates having thin porous portions and thicker portions, said thicker portions only having a thin strip of acid-resistant material thereon.

16. A separator for storage battery plates having only a portion of its surface adapted to contact with the positive plates, and an acid-resistant material between the contact surface and the positive plates only, the space between the other parts of the separator and the positive plates being effectively unobstructed.

17. A wood separator for storage batteries having its natural porosity and constituents, a portion only thereof being protected by an acid-resistant material.

18. A wood separator for storage batteries having its natural porosity and constituents and provided with strips of an acid-resistant material covering only a portion thereof.

19. A wood separator for storage batteries having its natural porosity and constituents and having thereon strips of rubber covering only a portion of the surface of said separator.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

RUFUS N. CHAMBERLAIN.

Witnesses:

NEWTON A. BURGESS,

EDWIN SEGER.