Nov. 22, 1927. 1,650,319

A. J. BRIGGS

SEAL FOR GALVANIC CELLS

Filed May 7, 1924

Fig. 1.

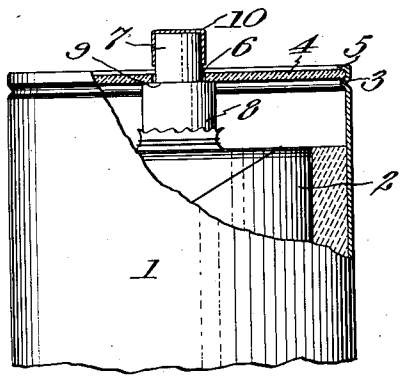


Fig. 2.

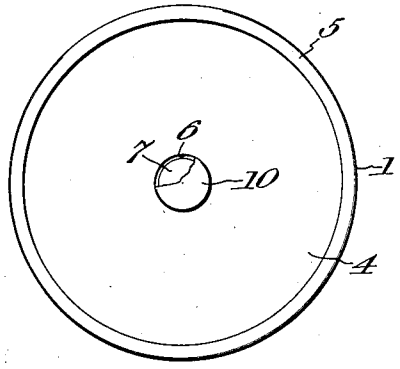
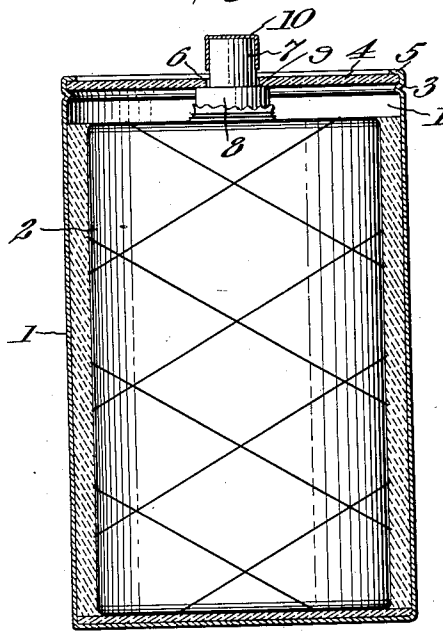


Fig. 4.



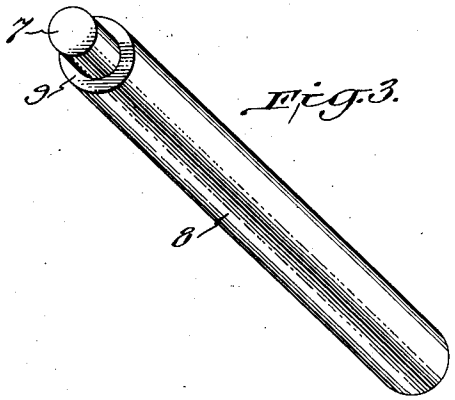


Fig. 3.

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UNITED STATES PATENT OFFICE.

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SEAL FOR GALVANIC CELLS.

Application filed May 7, 1924. Serial No. 711,730.

This invention relates to sealing means for primary galvanic cells, especially dry cells of the Le Clanché type. A particular object of the invention is to provide a seal capable of substantially preventing access of air to the cell but permitting escape of gases generated in it. Further objects are to simplify and reduce the cost of sealing dry cells, to provide a strong, relatively infrangible seal adapted to reinforce the end of the cell, and to secure other advantages, as more fully described hereinafter.

Reference is to be made to the accompanying drawing, illustrating preferred embodiments of the invention.

Fig. 1 is a partial vertical section through a cell comprising the improved seal;

Fig. 2 is a top plan view of the cell;

Fig. 3 is a perspective view of the cathode; and

Fig. 4 is a vertical section through a cell having a bobbin of length greater than normal.

In Figs. 1 to 3 of the drawings, reference numeral 1 denotes a zinc container electrode in which a depolarizing bobbin 2 is enclosed. The container is spun inwardly to form an annular seat 3 for a sealing disc 4. This is best made of relatively stiff waterproofed cardboard, bonded fiber, or the like. Any insulating material will serve which has the essential qualities of strength and some degree of flexibility. The rim 5 of the container is bent to overlie the disc and hold it firmly in position. This method of securing a sealing disc is old in the dry cell art and does not in itself form a part of the present invention. Any suitable marginal retaining means may be adopted.

The novelty of the present seal lies chiefly in the provision of the central perforation 6 receiving the end 7 of carbon rod 8. As shown, the end 7 is of less diameter than the body of the rod 8, and the disc 4 is supported centrally by the annular shoulder 9 thus formed upon the rod. Any other suitable means of supporting the disc may be adopted. The diameter of perforation 6 is slightly greater than that of end 7, and the surface of the disc is somewhat below metal cap 10, which is preferably affixed to the rod after the seal is in place.

It will be clear that the disc 4 may be elevated at the center by gaseous pressure developed in the cell, and that the gases may be vented about the end 7 of the carbon rod. Since the disc normally rests upon the shoulder 9, there is little diffusion of air between the cell and the atmosphere. Drying out is therefore substantially prevented. In order to insure a positive seating of the disc and to hold the bobbin in position, it is desirable to form the annular seat 3 slightly lower than the shoulder 9 on the carbon electrode. This causes the disc to exert a continuous downward pressure upon the shoulder.

The carbon rod may be formed by extrusion, molding, or any other suitable method. The reduced end of the rod should be machined to a diameter lying between rather close limits, so as to insure a proper fit in the central perforation of the disc. The body of the rod may of course vary considerably, so long as an adequate seating shoulder remains.

The machining of the end of the rod is further desirable because it ensures an accurate fit and good contact with the brass cap. This is important in all cases, but especially where a number of cells are connected in series, as in "B" batteries. A single defective contact may result in wholly or partially destroying the effectiveness of the battery.

If desired, the end of the carbon rod may be treated to prevent creepage of electrolyte. Impregnation with paraffin, coating with asphalt paint, or the like, are satisfactory.

Since the improved seal permits gases to escape, it is unnecessary to provide a large gas space. Further, the seal is relatively thin as compared with the ordinary seals of thermoplastic substances. The space thus saved may serve to receive exuded paste and it is therefore feasible to use a longer bobbin than in cells having a thick seal. Important advantages are obtained in this way. Even small increase in the bobbin length, in cells having normal external dimensions, results in material extension of service life. In Fig. 4 a cell with elongated bobbin is illustrated. The space 11 is adequate to receive paste which may be forced upward on heavy service.

The improved seal eliminates the troubles characteristic of the thermoplastic seals, such as chipping, breaking, and failure to make an air-tight junction with the cell wall and carbon rod. Also, the automatic valve action of the present seal, relieving gaseous

pressure in the cell, is an important improvement over rigid preformed seals provided with gas chambers, as heretofore proposed.

The invention is not limited to the specific type of cell and seal construction illustrated. Various modifications may be made within the scope of the appended claims.

I claim:

1. A galvanic cell comprising a container, a sealing member adjacent to one end of the container, means rigidly holding the margin of the sealing member, a seat, and an interior portion of said member normally resting on said seat but adapted to be displaced therefrom to permit escape of gases generated in the cell.

2. A dry cell comprising a zinc cup, a carbon rod electrode therein, an insulating disc secured at its margin in the open end of the cup and having a perforation to receive the end of the carbon rod, means on the rod forming a seat normally occupied by the central portion of the disc, said portion having sufficient flexibility to permit discharge of gases under pressure in the cell.

3. The invention according to claim 2, in which the carbon rod is provided with an integral shoulder to form the seat for the disc.

4. A dry cell comprising a zinc cup, a carbon rod electrode therein, provided with an integral shoulder, an insulating disc secured at its margin in an annular grooved portion of the cup adjacent the upper end thereof and having a perforation to receive the end of the carbon rod, the central portion of said disc normally seating on the shoulder portion of the carbon rod and having sufficient flexibility to permit discharge of gases under pressure in the cell.

5. In a dry cell, a carbon rod electrode having near one end a reduced portion forming a shoulder, a flexible closure for the cell adapted normally to rest upon the said shoulder to seal the cell but adapted to be displaced therefrom to permit escape of gases generated in the cell.

6. A dry cell comprising a zinc cup, a seal of thin sheet material in the open end of the cup and displaceable from its sealing position by internal pressure to permit escape of generated gases, a paste receiving chamber in the space normally occupied by the usual thermoplastic seal, and a relatively elongated mix bobbin having its upper termination at the lower margin of said space.

In testimony whereof, I affix my signature.

ARTHUR J. BRIGGS.