March 25, 1924. 1,487,728

H. DE OLANETA

DRY CELL

Filed March 24, 1920

Fig. 1.

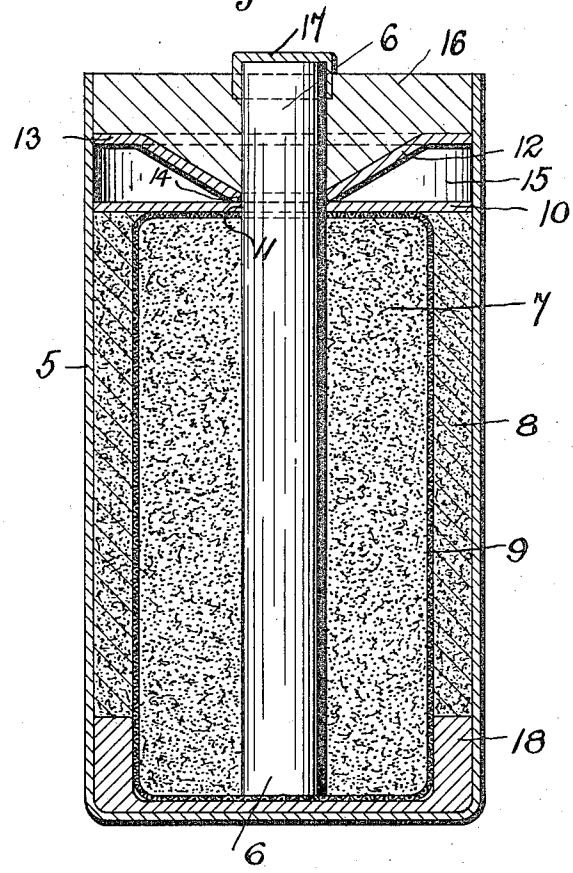


Fig. 2.

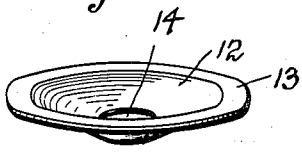


Fig. 3.

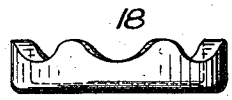
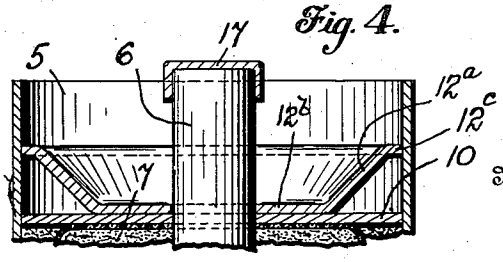


Fig. 4.



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By

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UNITED STATES PATENT OFFICE.

HAROLD DE OLANETA, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO WINCHESTER REPEATING ARMS COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DRY CELL.

Application filed March 24, 1920. Serial No. 368,324.

To all whom it may concern:

Be it known that I, HAROLD DE OLANETA, a citizen of the United States, residing in New Haven, New Haven County, Connecticut, have invented certain new and useful Improvements in Dry Cells, of which the following is a full, clear, and exact description.

This invention relates to dry cells, and is particularly applicable to dry cells of the pocket or miniature type such as commonly employed in connection with pocket flashlights, although the invention is not necessarily limited in this respect.

The invention pertains more especially to the structure of the top or upper portion of the cell, where the cell is of that type wherein a gas chamber for receiving the gases evolved in the cell by thermal or electrochemical action is located above the depolarizing cartridge and paste and beneath the usual seal of pitch, which is poured into the upper end portion of the zinc cup so as to set therein around the carbon electrode.

One of the primary objects of the present invention is to provide a dry cell having an improved form of gas chamber.

Another object of the invention is to provide a cell of very simple and cheap construction, which, although embodying a small number of parts, provides in a convenient and effective manner for the accommodation and disposal of the gases generated.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing,

Fig. 1 is an enlarged vertical central section of a miniature dry cell, embodying my improvements;

Fig. 2 is a detail perspective view of the upper cupped washer;

Fig. 3 is a detail elevation of the cupped bottom disk; and

Fig. 4 is a fragmentary sectional view of a somewhat modified form of cell.

In carrying the invention into practice, the zinc cup 5, carbon electrode 6, depolarizing cartridge 7, and paste 8 can be of the usual or any preferred kind. Customarily the depolarizing cartridge 7 consists of a mixture of higher oxid of manganese, carbon, and a suitable electrolytic salt or salts. The paste 8 may, for example, consist of flour, water, chlorid of mercury and a suitable electrolytic salt or salts. The depolarizing cartridge and the paste may both contain solutions of ammonium chlorid and zinc chlorid, as is the usual practice, or a different practice may be adopted in this respect, as the particular composition of the cartridge and paste is not an essential feature of the invention. Preferably the depolarizing cartridge 7 is encased in a porous bag or envelope 9 of cheese cloth or the like, although this is not essential so far as my present invention is concerned.

The paste 8 preferably extends over the outer cylindrical surface of the cartridge and is interposed between the same and the opposing inner surface of the side wall of the zinc cup. Preferably the top of the paste is about level with the top of the cartridge. Pressed closely against the upper surface of the cartridge is a fairly stiff washer 10 of paraffin-coated paper having a central opening 11, whereby it is fitted over the electrode 6. The outer edge of the washer 10 engages the inner surface of the cup, and the lower surface of the washer, adjacent its periphery, forms a stop for the paste 8 and prevents the same from rising to any appreciable degree above the top of the cartridge, or from being otherwise displaced.

On top of the washer 10 is a second washer, or disk, 12, of paraffin-coated paper, preferably similar in character to the washer 10, but of somewhat different shape. This washer 12 is in the form of a cup and by preference the same is provided at the periphery with a lateral flange, as shown, although this is not essential in all cases. In Fig. 1, the lateral flange is shown at 13. The washer 12 is provided with a central opening 14, whereby it is fitted about the electrode 6. The cup of the washer faces upwardly and its lower central part may make contact or approximate contact with the central portion of the lower washer 10, as shown, so as to provide between the two washers a gas space 15. The greater part of this gas space, as will be noted, is located at the peripheral portion of the cell. In an inward and radial direction the height of the gas space progressively decreases, owing to the cupping of the upper washer and the

convergence of the upper and lower walls of the gas space or chamber.

By cupping the central part of the upper washer and setting it in the upper part of the zinc cup in the manner shown, the flange 13 of the cupped washer is spaced upwardly to a considerable extent from the flat washer 10, so as to provide an ample space at the periphery of the cell for the accommodation of gas evolved by heat, or by electrochemical action in the operation of the cell. The uppermost washer, therefore, may be said to be provided with an integral spacing element formed by the downwardly extending central bulged portion or its equivalent. Other arrangements may be adopted giving the same general result, but the forms shown in the drawing are preferred, owing to the fact that they enable the electrode 6 to be gripped by the sealing material 16 over a surface of considerable area, so as to hold said electrode tightly in place.

The assembly of the cell is a very simple matter. After the carbon pencil, depolarizing cartridge, paste and washer 10 have been inserted into the cup the washer 12 is placed in the upper end of the cup with its central opening fitting over the carbon electrode. The middle part of the washer 12 rests on the washer 10 and provides the gas space 15 below the washer 12, and a space above said washer 12 for the accommodation of the sealing material 16, such as pitch. The pitch 16, or the like, is poured into the top of the cup onto the washer 12 while the pitch is hot, and is then permitted to cool and set. Owing to the form of the washer 12, the sealing material is enabled to make contact with and grip the carbon electrode 6 approximately from the top surface of the washer 10 to a point approximately at the level of the upper edge of the cup. The upper end of the carbon electrode is provided with the usual contact cap 17, which is placed on the electrode before the top of the cell is sealed.

The cartridge 7 is centered in the bottom of the zinc cup by means of a suitable centering disk 18, shown in detail in Fig. 3. A preferred form of such disk is claimed in my application Serial No. 379,515.

In the modification illustrated in Fig. 4, the cupped washer 12^a is of somewhat different shape from that first described, having a relatively large central bottom portion 12^b resting on the washer 10, and a narrow peripheral flange 12^c.

In the claims, where I refer to a "pitch seal" it will be understood, of course, that I use this term in a generic sense; and it will be evident that, in its broader aspects, the invention is not limited to the use of a cupped or dished paper or similar washer in combination with a seal of resinous or bituminous material. In a broad sense the washer or disk constitutes a closure member for the cup, having as an integral part thereof a spacing member or projection (preferably annular, as shown) adapted to be supported on the cartridge in such a manner as to present a suitable gas chamber. While, also, it is preferred to locate the cupped or dished washer above the flat washer, a reversal of the parts would be within the scope of the invention, and in certain cases the flat washer 10 may be omitted.

Various other modifications will suggest themselves to those skilled in the art, and the same may be adopted without departure from the scope of my invention, as defined in the claims.

What I claim is:

1. In a dry cell having a cup and a pitch seal, an upwardly facing cup shaped washer supporting the seal and presenting a gas space beneath the washer at the peripheral portion of the cup.

2. In a dry cell, a cup, a carbon pencil therein, a cartridge of depolarizing material surrounding and adhering to the pencil, a body of paste interposed between the cartridge and the side wall of the cup, and closure means for the cup. including a disklike member having integral means located in proximity to the carbon pencil for supporting said member from beneath from the top of the cartridge, but with the peripheral portion of said disklike member located some distance above the top surface of the cartridge so as to create a gas chamber bounded by the cup wall.

3. In a dry cell, a cup, an electrode therein, a paste interposed between the electrode and the side wall of the cup, and a closure for the cup comprising a member having a central downwardly projecting spacing extension creating a gas chamber bounded by said extension and the cup wall.

4. In a dry cell, a cup, a central electrode therein, a depolarizing body surrounding the electrode, a paste between the depolarizing body and the side wall of the cup, and a thin seal-supporting member for closing the upper end of the cup, perforated to fit about the upper end of the central electrode and having a central downwardly bulged portion supported on top of the cartridge, whereby a peripheral gas chamber is created.

5. In a dry cell, a perforated top closure member adapted to surround the carbon electrode and having an approximately centrally located annular spacing projection extending downwardly therefrom.

6. In a dry cell, a cup, a carbon pencil therein, a cartridge surrounding the carbon pencil, a body of paste interposed between the cartridge and the side wall of the cup, a closure for the cup including an upwardly facing cupped disk supported from the top of the cartridge and having

its outer portion substantially above the top of the cartridge whereby a gas chamber is created.

7. In a dry cell, a cup, a pencil centrally located therein, a body of depolarizing material surrounding the pencil, a body of paste interposed between the depolarizing material and the side wall of the cup, a washer of yielding material set over the pencil on top of and lying against the cartridge, and means for closing the upper end of the cup, including a disklike member having downwardly projecting integral means located in close proximity to the pencil for supporting said member from the cartridge on top of said washer with the main part of said disklike member some distance above the washer, said disklike member formed as an upwardly facing cup.

8. In a dry cell, a perforated closure member adapted to embrace the carbon electrode, the body of said member being displaced to occupy an inclined position at its inner portion to support the peripheral portion of the closure member in spaced relation to the contents of the cell.

9. In a dry cell, a sheet metal cup, a cartridge therein of less height than the cup, having an upwardly projecting pencil, a body of paste interposed between the cartridge and the side wall of the cup and extending approximately to the top of the cartridge, a yielding washer resting on the cartridge and paste, and a closure body in the mouth of the cup spaced at its peripheral portion above the washer to provide a peripheral gas space bounded by the cup wall.

In witness whereof, I have hereunto set my hand on the 22d day of March, 1920.

HAROLD DE OLANETA.