Oct. 3, 1950 F. A. KELLER 2,524,668

DRY CELL

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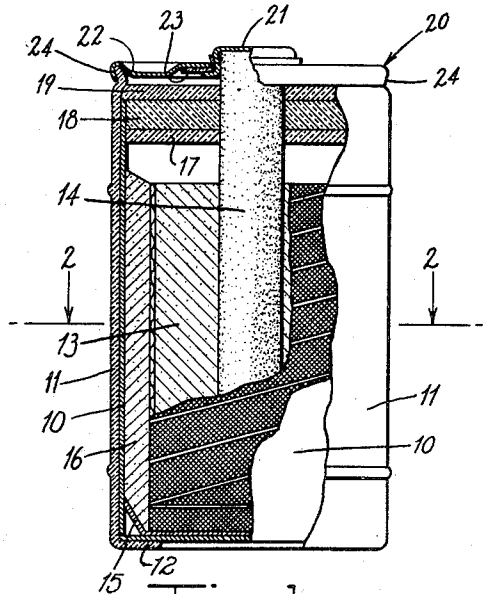


Fig. 1.

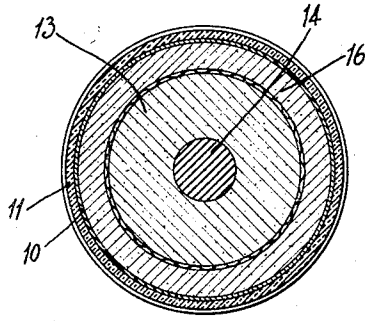


Fig. 2.

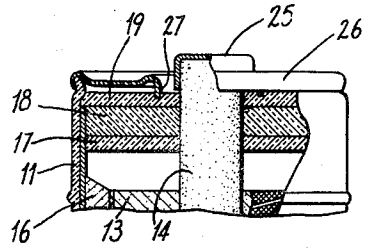


Fig. 3.

INVENTOR.

Frederick A. Keller

BY

Kenyon & Kenyon

ATTORNEYS

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DRY CELL

Frederick A. Keller, East Paterson, N. J., assignor to Bright Star Battery Company, Clifton, N. J., a corporation of New Jersey

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2 Claims. (Cl. 136—133)

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This invention relates to dry cells of the type commonly known as flashlight batteries.

An object of this invention is a highly efficient dry cell in which the possibility of leakage of electrolyte is reduced to a minimum.

Other objects, novel features and advantages of this invention will become apparent from the following specification and accompanying drawings, wherein:

Fig. 1 is an elevation partly broken away of a dry cell embodying the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1, and

Fig. 3 is a fragmentary view similar to Fig. 1 illustrating a modification.

A zinc anode cup 10 is contained in a snugly fitting plastic material shell 11 having at one end an inwardly extending integral annular flange 12 on which rests the bottom of the cup 10. Preferred plastic materials are ethyl cellulose or cellulose acetate-butyrate thermoplastic molding compound known as Tenite II. Many other plastics such as phenolic plastics known as Bakelite or the like may be used instead. Within the cup 10 is contained a bobbin 13 centrally of which is arranged a carbon rod electrode 14. The bobbin 13 is centralized in the cup 10 by a bottom washer 15 and is surrounded with the usual electrolyte 16 extending up to the top of the bobbin.

A paper disk 17 snugly fits the electrode 14 and extends to the inner surface of the cup 10, the disk being spaced from the top of the bobbin 13 to provide an air chamber. Above the disk 17 is provided a sealing compound layer 18 and a second paper disk 19 mounted on the electrode 14 in contact with the upper surface of the sealing compound layer 18 engages the rim of the cup 10.

The shell 11 is closed by a cover 20 consisting of a brass cap 21 receiving the upper end of the electrode 14 and a steel annulus 22 mechanically attached to the cap 21 with a collar 23 of suitable plastic insulating material interposed between the cap and the annulus. The periphery of the annulus 22 is spun onto the rim of the shell 11 as indicated at 24 to form a mechanical liquid-tight seal therewith and the washer 19 insulates the cover from the cup.

Escape of electrolyte from the battery is effectively prevented by the combination paper disk and pitch seal, together with the mechanical seal between the cover 20 and the shell 11. The usual paper wrapper of a flashlight battery is replaced by the plastic shell 11 and the battery has the advantage of being equipped with a metal cover. The cover preferably is composed of two

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sections so as to provide a brass terminal without requiring that the whole cover be made of brass. However, it is to be understood that the invention contemplates a one-piece metal cover as well as the two-piece cover illustrated.

In the modification of Fig. 3, the rod electrode 14 is capped by a flangeless terminal 25 and a metal annulus 26 has its periphery spun onto the rim of the shell 11 to form a mechanical liquid-tight seal therewith. The inner edge of the annulus 26 is offset as at 27 for engagement with the washer 19. The annulus 26 is supported by the shell 11 in such a manner that the offset edge 27 is pressed tightly against the washer 19 by the resiliency of the annulus, thereby forming a seal between the inner edge of the annulus 26 and the washer 19.

I claim:

1. A leak resistant battery construction comprising a plastic material shell open at one end and having an inwardly extending integral annular flange at its other end defining an opening in said other end, a metal cup anode resting on said flange and having its bottom exposed through said opening in said other end of said shell to facilitate direct electrical contact with the said bottom of said metal cup anode, a bobbin within said cup containing a central rod electrode, an insulating disk snugly fitting said central rod electrode, a sealing compound layer in said cup anode overlying said disk, a second disk of insulating material surrounding said rod electrode and overlying said layer of sealing compound, a cap receiving the upper end of the rod electrode and having an annular flange, a metallic cover having an opening through which said cap projects, the edge of said cover defining said opening overlying said annular flange of said cap, and a collar of insulating material interposed between the cover and said cap and lying on the annular flange of the latter to insulate the cap from the cover and to provide a seal, said cover having its outer periphery crimped tightly over the rim of the plastic material shell at its first-named end to secure it to said shell and to form a mechanical seal therewith.

2. A leak resistant battery construction comprising a plastic material shell open at one end and having an inwardly extending integral annular flange at its other end defining an opening in said other end, a metal cup anode resting on said flange and having its bottom exposed through said opening in said other end of said shell to facilitate direct electrical contact with the said bottom of said metal cup anode, a bobbin

within said cup containing a central rod electrode, an insulating disk snugly fitting said central rod electrode and extending to the inner surface of said cup anode, a sealing compound layer in said cup anode overlying said disk, a second disk of insulating material surrounding said rod electrode and overlying said layer of sealing compound and resting on the rim of said cup anode, a cap receiving the upper end of the rod electrode, a metallic cover having an opening through which said cap projects, the inner edge of said cover defining said opening being offset and pressed tightly against said second disk to provide a seal between the inner edge of said cover and said disk, and said cover having its outer periphery crimped tightly over the rim of the plastic material shell at its first-named end to secure it to said shell and to form a mechanical seal therewith.

FREDERICK A. KELLER.

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