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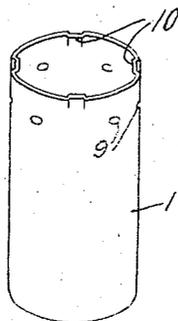
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1,908,194

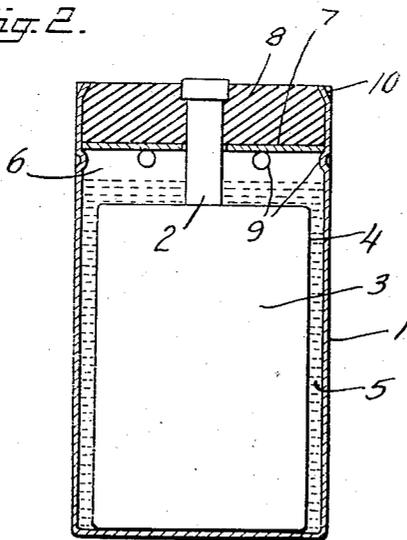
DRY CELL

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*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE

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## DRY CELL

Application filed March 21, 1928. Serial No. 263,274.

This invention relates to improvements in dry cells and methods of making them.

In the manufacture of dry cells it has been proposed to insert a washer of substantially the same diameter as the inner diameter of the zinc cup over the cathode core slightly spaced from the top of the core to form an expansion space for gases formed during the discharge of the cell. A fusible seal is placed over this washer and the upper edge of the cup then crimped.

In some instances the frictional resistance between the washer and the wall of the can is depended on to hold the washer in its proper place. This requires the use of washers and cans of exact dimensions, with the cans perfectly round. In actual practice, difficulties are encountered due to the washers slipping down too far in the cans or tilting too much to one side thereby making an uneven seal. Where the washers are inserted by hand this condition is aggravated by careless workmanship.

In a prior application of Howard D. Hodge (deceased), Serial No. 123,237, Apparatus for assembling galvanic cells (now Patent No. 1,669,054 granted May 8, 1928), there is described and claimed a machine by means of which the various components of a dry cell are inserted in a can as it is automatically fed past a number of stations. When the Hodge machine is employed in the assembling of cells, defects due to careless workmanship in the placing of the washers is avoided and such defective insertion is entirely due to defective washers and cans. Furthermore, when the upper edge of the can is crimped, it apparently causes a slight bulge or distortion of the can at about the washer level and the washers then drop to the top of the core.

It has been proposed to overcome these difficulties by crimping or spinning a continuous shoulder at a slight distance below the top of the can on which the washer is adapted to rest. Such spinning or crimping of a continuous shoulder cannot be readily accomplished in a battery assembling machine, and, therefore, adds an extra step to

the manufacturing operation and adds to the cost of the cell.

In my present invention, I indent the can a slight distance beneath the top preferably at circumferentially spaced intervals and then crimp the upper edge of the can, preferably by spot crimping and in staggered vertical arrangement with the indentation.

In the drawing, I have shown a battery can and cell constructed in accordance with my invention.

Fig. 1 is a perspective view of the cup, and,

Fig. 2 is a vertical, sectional view of the completed cell.

A dry cell constructed in accordance with my invention is shown in cross section in Fig. 2. It consists of a can 1 containing a depolarizing cathode core consisting of a central carbon rod 2 about which is uniformly tamped a depolarizing mix 3 of carbon or graphite and a depolarizer such as manganese dioxide, conducting salts and water. The cathode core may be naked or may be surrounded by a bibulous envelope 4 of cheesecloth, tissue paper or hardened dip such as is described in United States Patent, No. 1,316,597 and may be insulated at the bottom by folding under the bibulous envelope. A suitable gelatinous or pasty electrolyte 5 separates the core from the can. This electrolyte may be that described in United States Patent, No. 1,292,764 and may be compounded as described in United States Patent, No. 1,370,056. An expansion space 6 is provided above the top of the core and a water-proofed washer 7 is arranged over this expansion space to support a wax or pitch seal 8. As shown, the washer rests upon a series of circumferentially spaced indentations 9 arranged in substantially the same horizontal plane and adapted to limit the downward movement of the washer to retain it suitably spaced from the top of the core. The upper edge of the can is provided with spaced crimped portions 10 which may be arranged staggered with respect to the indentations 9 and these crimped portions prevent the seal from being blown from the cell by an accumulation of gases in the expansion space.

The indentations and crimping of the can

may be performed by any suitable apparatus, such as the apparatus described and claimed in the copending application of Robert A. Lorig, filed March 21st, 1928, Serial No. 5 263,232 (now Patent No. 1,766,661, granted June 24, 1930).

By forming spaced indentations, in lieu of a continuous shoulder, the operation may thus be accomplished on a battery assembling 10 machine of the Hodge or Lorig type and the crimps in the upper edge of the can may likewise be formed as a step in the assemblage of the cell without necessitating a separate later operation as is necessary when the can is 15 crimped continuously around its upper edge.

I claim:

In a dry cell, a zinc cup having a plurality of horizontally arranged, circumferentially spaced indentations at a slight distance from 20 the top of the cup and having its upper edge crimped at spaced intervals, the crimped portions of the upper edge being staggered with respect to the indentations.

In testimony whereof I affix my signature. 25  
GEORGE STONE.

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