April 5, 1927. 1,623,719

H. DE OLANETA

DRY CELL

Filed Aug. 18, 1920

Fig. 1.

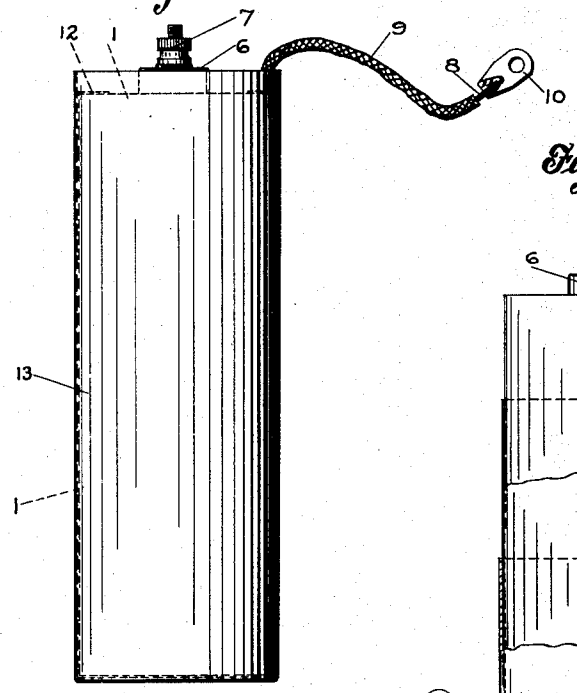



Fig. 4.

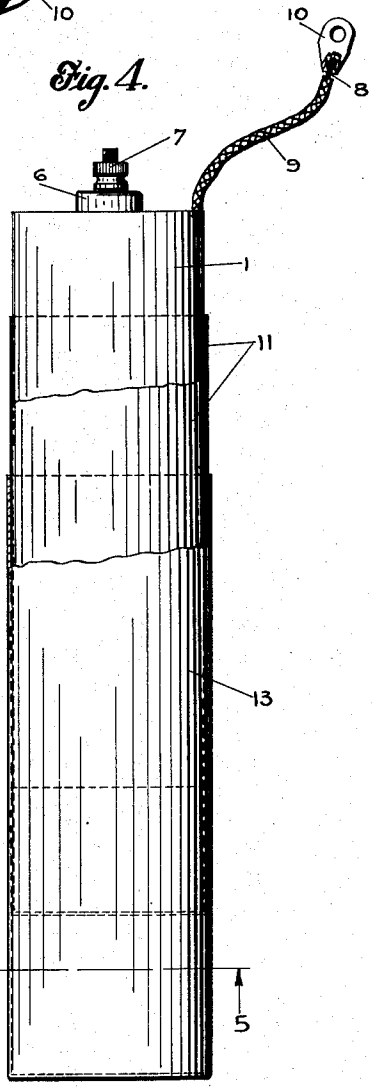



Fig. 5.

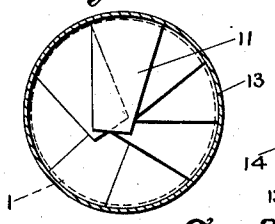



Fig. 2.

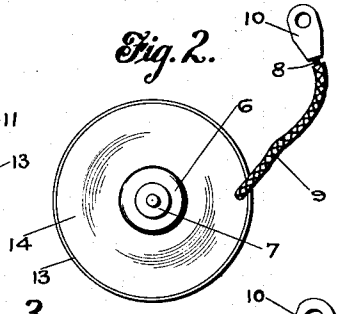
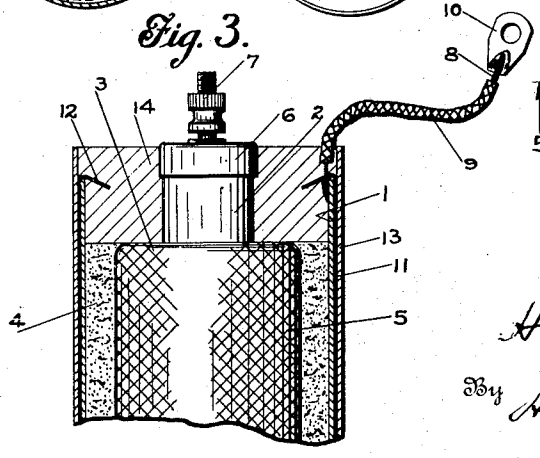



Fig. 3.




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# UNITED STATES PATENT OFFICE.

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## DRY CELL.

Application filed August 18, 1920. Serial No. 404,381.

This invention relates to galvanic cells and more particularly to that type of the same known as dry cells.

In dry cells of the type now found on the market, it is usual for the zinc cup which forms one pole, or electrode of the cell, to contain the exciting paste, and the depolarizing cartridge which has embedded therein the carbon pencil which forms the second pole of the cell. This carbon pencil is usually provided at the top with a metallic contact member. It is apparent that if such a cell is used in a damp place or in a position where it is exposed to rain or to water which may be splashed thereon, as for instance when used in a motor boat or the like, a film of water is apt to gather on the top of the cell surrounding the metallic contact member and extending out to the zinc cup which forms the other pole of the cell. The cell will in this manner be short-circuited, which, it will be plain, will rob the cell of its power and shorten its life. This invention relates to the provision of a cell in which these defects will have been overcome.

One object of this invention is to provide a water-proof cell.

A second object of this invention is to provide a cell which is not subject to short-circuiting in the manner described.

A further object of the invention is to provide a cell of the type described with a container which will be insulated from the zinc cup of the cell.

With these and other objects in view, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is an elevational view of a dry cell which embodies my invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is an enlarged sectional view of the upper portion of the cell.

Fig. 4 is a view showing the cell proper, the case of insulating material and the container in extended positions.

Fig. 5 is a sectional view on line 5—5 of Fig. 4 looking in the direction of the arrows.

The dry cell to which my invention is applied may be made in any of the usual methods and constructed in any of the usual forms. In the drawings, I have shown a usual form of such cell consisting of the zinc cup 1, which contains the carbon pencil 2, which in turn is embedded in a depolarizing cartridge 3, contained in the cup and surrounded by the paste 4. The cartridge 3 is usually contained in a bag of cheese cloth or the like 5, which lies between the cartridge and the paste 4. The paste 4, as shown, surrounds the cartridge 3 and lies between it and the zinc cup 1. The carbon pencil 2 is provided at its upper end with a metallic cap 6, upon which is soldered or secured in any desired manner a contact member 7. It is usual to provide a cell of this kind with a seal, at the top, of wax or pitch material, or a seal in the form of a preformed plug of some insulating material, which will prevent the loss of the contents of the cup and will also serve to insulate the metallic cap from the cup. The preferred embodiment of the invention shown in the drawings, however, is not provided with such a seal, which is separate from the seal of the outside container, which is to be hereinafter described. This, however, is not an essential feature of the invention, and if desired, the usual seal of the zinc cup may be provided.

To the zinc cup 1 is soldered or secured in any desired manner a contact wire 8, which is insulated by a covering 9, and provided at its outer end with a contact member 10. The cell with this contact wire applied is then slipped into a casing or covering of paraffined paper or other insulating material 11, which is in the shape of a cylindrical can and is provided with a bottom of the same material, so that the zinc cup of the cell will be completely covered by the paper and will be completely insulated by it from any object with which it might come in contact. In the form shown, the bottom of this paper casing is formed by folding over the lower edge of the cylindrical casing, as shown in Fig. 5. This bottom may, of course, be provided in any other desired manner. As shown in Fig. 3, the top edge 12 of the paper casing is extended and bent over the top of the zinc cup just enough so that the top edge of the cup will be covered by the paper.

The cell with its paper covering is then slipped into an outer container 13, which is in the form of a cylindrical can of any suitable metallic material, which it is seen will be entirely insulated from the zinc cup by

the paper covering. It is not, of course, essential that the outside container 13 be made of metal, as it may be made of any desired material which can be formed into the desired shape and which is economical to manufacture. It is moreover not essential that the casing 11 be made of paper for it may be made of any proper material which will insulate the zinc cup from the container 13. A seal of wax or of a pitch substance 14 or the like is now poured into the top of the outer container, and as shown in Fig. 3, will act as a seal for the cell and will extend up to the top of the container 13.

As shown in Fig. 3, the zinc cup, the case of insulating material and the container are all formed to fit each other snugly, so that there will be no looseness or play between the same and so that the pitch seal will not flow down between them. As shown in this figure, the seal will flow down upon the turned edge 12 of the case of insulating material and will hold it in the position shown. It will be apparent that as shown in Fig. 2, the contact members 7 and 10 will be the only exposed poles of the cell, the zinc cup having been entirely insulated from the atmosphere and from the surrounding container.

It will be apparent that a cell enclosed in a container in this manner will not be subject to short-circuiting by the two poles being connected by a film or body of water as previously described, and for this reason such a cell is particularly adapted for use in an automobile where it might be exposed to rain, or in a motor boat where there is danger of water splashing on or covering the same. Moreover, it is also desirable for use in a damp place where a film of water is likely to form on the top of the cell and connect the zinc cup with the carbon pencil or the contact member thereon.

The zinc cup may, as stated, be covered with any suitable material to insulate it from the outer container, and such a result might be achieved in various ways, such as coating the cup with a paint of asphaltum or similar material. The contact wire 8 may be soldered or secured to make an electrical connection with the zinc cup 1 in any desired way.

In some modifications of this invention it will be necessary to use but one container to surround the zinc cup of the cell. This will be the case when the zinc cup will be covered with a coat of asphaltum paint or like material, or when the outside container is itself made of an insulating material, and the cell, including the zinc cup, may be slipped therein and sealed as shown and described above. In the latter construction, the outer container may be made of hard rubber or of other insulating material, and it will be apparent that a water-proof cell would be formed, which would be very similar to the one described, wherein the outer container is made of conducting material and is separted from the zinc cup by an insulating material.

While I have shown and described a preferred embodiment of my invention, it will be understood that I do not intend to be limited to the exact details shown, as various changes and modifications might be made in the parts shown which will lie within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. In combination, a dry cell including a containing cup of conducting material, and an outer container in which the cell is enclosed, said containers being completely insulated from each other by a cylindrical wrapper of non-conducting material, the lower end of said wrapper being folded over the bottom of the cup to completely cover the same, and the upper end thereof being folded inwardly over the upper edge of the cup, and means to seal the cup and the container and hold the insulating wrapper in place.

2. In combination, a dry cell including a containing cup of conducting material, an outer container, and an intermediate casing between said cup and outer container, said intermediate casing being formed of insulating material and having its upper and lower ends folded over the upper and lower edges of the dry cell cup, and a seal for the cup and container, the upper folded edge of the casing being embedded in said seal.

3. In combination, a dry cell including a containing cup of conducting material, a cylindrical casing of insulating material embracing said cup and having its lower end folded over the bottom of the cup to completely cover the same, and its upper edge turned inwardly over the upper edge of the cup, an outer cup-shaped container in which the cell is placed, the wall of said container extending upwardly above the wall of the cup, and a seal for the cell placed directly upon the contents thereof and filling the upper portion of the cup and also filling the container above said cup, the upper folded edge of the insulating casing being imbedded in said seal so as to be held in place.

4. In combination, a dry cell including a containing cup of conducting material, a cylindrical casing of insulating material embracing said cup and having its lower end folded over the bottom of the cup to completely cover the same, and its upper edge turned inwardly over the upper edge of the cup, an outer cup-shaped container in which the cell is placed, the wall of said container extending upwardly above the wall of the cup, and a seal for the cell placed directly

upon the contents thereof and filling the upper portion of the cup and also filling the container above said cup, the upper folded edge of the insulating casing being imbedded in said seal so as to be held in place, and an insulated conductor secured to the cup leading outwardly through said seal and imbedded therein.

5. A dry cell comprising a pair of open mouthed, cup shaped containers of conducting material one disposed within the other, a cup shaped casing of insulating material, between said containers, the inner container containing dry cell elements, including an exciting paste, depolarizing material and electrode pencil, said insulating casing having its wall, at the upper portion thereof, turned over the upper edge of the inner container, and a sealing substance filling said inner container above the level of the paste, also filling the unoccupied space in the outer container and holding the folded edge of the insulating casing in position.

In witness whereof, I have hereunto set my hand on this 31 day of July, 1920.

HAROLD DE OLANETA.