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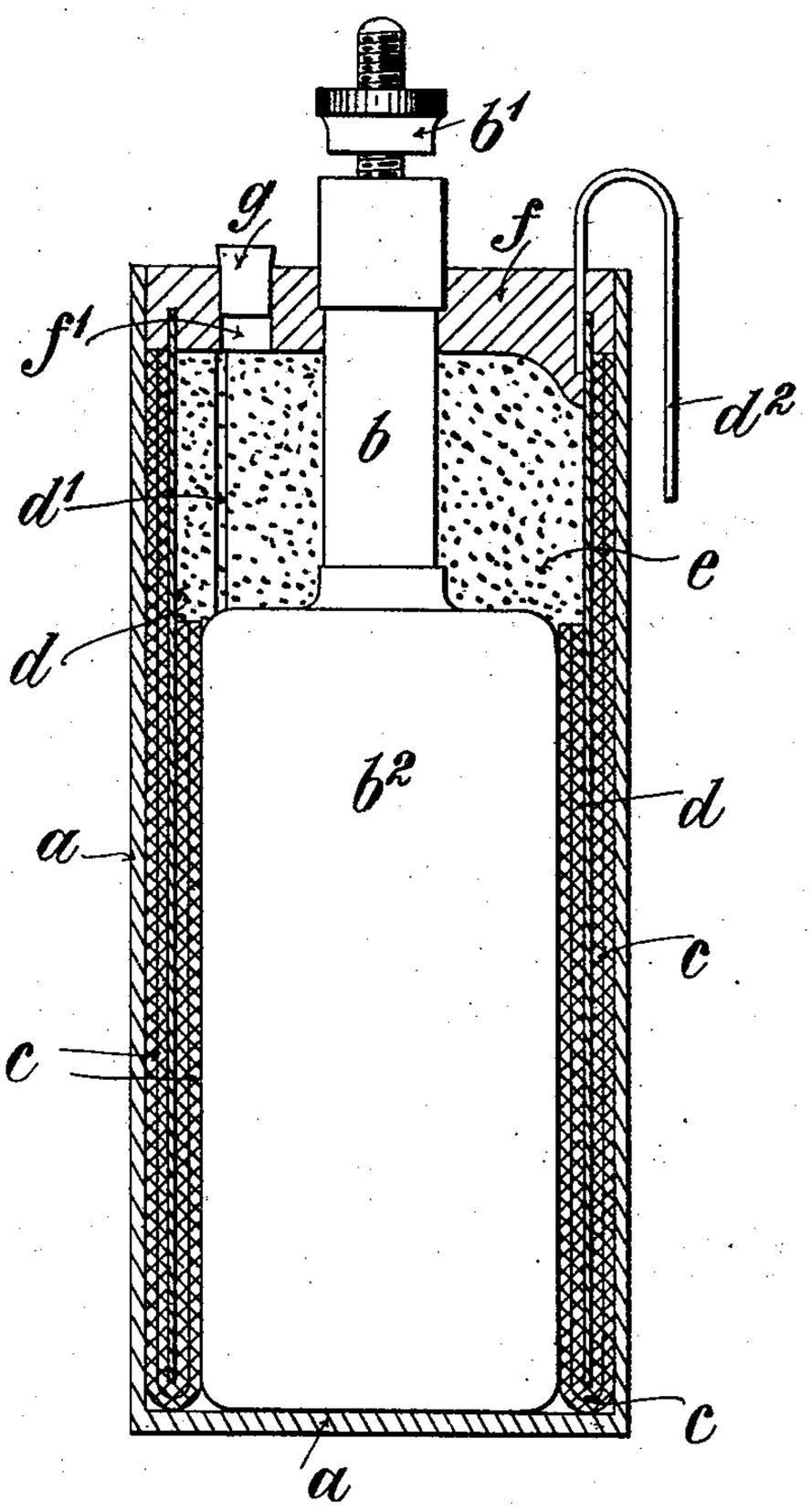
W. STRICKLAND.

GALVANIC CELL.

APPLICATION FILED JULY 23, 1903.

NO MODEL.



WITNESSES:

Sy. V. Symes.

Hedley J. Harrop.

INVENTOR.

William Strickland.

Per Robert B. Phillips.

Attorney.

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UNITED STATES PATENT OFFICE.

WILLIAM STRICKLAND, OF BRIGHTON, ENGLAND.

GALVANIC CELL.

SPECIFICATION forming part of Letters Patent No. 742,365, dated October 27, 1903.

Application filed July 23, 1903. Serial No. 166,708. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STRICKLAND, a subject of the King of Great Britain and Ireland, residing at the County Hotel, New Steyne, Brighton, in the county of Sussex, England, have invented a certain new and useful Improvement in Galvanic Cells, (for which I have applied for Letters Patent in Great Britain, No. 16,706, dated July 28, 1902,) of which the following is a full, clear, and complete specification.

The present invention relates to an improved galvanic cell; and it has for its object constructing and arranging the cell in such a manner that the excitant is not rendered active until the cell is intended to be brought into use, thereby allowing it to be kept in an inactive state for an indefinite period without deterioration, and, further, owing to its particular construction it is quite portable even when in an active state and can, moreover, be easily and readily recharged or replenished without cost by unskilled persons.

In the accompanying drawing, which illustrates by way of example one method of carrying this invention into effect, the figure is a view in side elevation of the cell, partly in section.

The receptacle *a*, adapted to contain the elements, is of varnished or japanned papier-mâché or other suitable non-conducting material and is preferably circular in form. The positive-pole electrode consists of the usual carbon rod *b*, provided with a suitable terminal *b'* and surrounded for the greater part of its length with an agglomerate b^2 of deoxidizing material, preferably consisting of binoxid of manganese and Ceylon graphite held together by a suitable agglutinating substance and covered with a thin textile fabric tightly bound with string. The agglomerate b^2 is further wrapped in one or more layers or plies *c* of a textile material, preferably cotton terry.

The negative-pole electrode *d* consists of a zinc plate bent into a cylindrical form adapted to contact with the outer layer or ply *c* surrounding the agglomerate block. The outer surface of the zinc element is also wrapped around with a similar textile material, so as to fill the space between it and the inner wall of the containing-receptacle *a*. A convenient method and the preferential one is to take a piece of the cotton terry or other material of a width approximately equal to the combined heights of the zinc element and the agglomerate block and of a length depending on the number of plies or layers required and to wrap or roll it tightly around the agglomerate block. The zinc element is then slipped on over the outer layer or ply. The free or lower part of the material then depending is turned up, so as to envelop the lower edge and outer surface of the zinc element, as shown.

In order that the excitant may have free access to the surfaces of the zinc element, the latter may be perforated or is preferably formed so that the longitudinal edges of the plate from which it is formed do not quite meet when bent into the required circular form, so as to form a space *d'*.

The annular space *e*, formed above the agglomerate block b^2 and between the carbon rod *b* and the inner wall of the zinc element *d*, is filled with the excitant in a dry granular or powdered form. The excitant is composed mainly of ammonium chlorid mixed with some inert material, such as silver sand, together with a small proportion of mercury sulfate. I have found by experiment that an excitant compounded of the following material and in or about the proportions stated give very excellent results: of ammonium chlorid, forty parts; of sodium chlorid, twenty parts; of calcium chlorid, ten parts; of mercury sulfate, five parts, and of silver sand, twenty-five parts, all by weight. This material is filled into the space *e* in a dry form, as above described, care being taken to press down the material well away from the wire d^2, forming the terminal of the zinc element *d*, where it is soldered or attached to said element. A layer *f* of bitumen pitch or other insulating material, preferably paraffin-wax, is then placed over the top of the excitant in such a way as to entirely seal the top of the cell.

A hole or vent *f'*, adapted to be closed or sealed by a stopper *g* or other convenient means, is formed through said layer *f* in order to provide means for introducing water in order to render the cell active.

The top of the agglomerate block *b* and the

upper part of the carbon rod in contact with the dry excitant are coated with paraffin-wax or other insulating material or varnish in order to obviate any possibility of local action taking place within the cell before being rendered active should the said excitant by any means become damp or moist.

It will be obvious that the excitant instead of being placed in a space formed at the top of the cell may be contained in a space at the bottom or other part thereof, although I have found in practice that the first-described method is the preferential one.

It will be seen that a galvanic cell constructed as hereinbefore described can be kept practically for an indefinite period in an inactive state without deterioration. When required to be set in action, it is only necessary to remove stopper *g* or other means employed of sealing the vent *f* and then to fill the cell through said vent with water, which percolating through the excitant will dissolve a certain quantity thereof, and the exciting solution so formed will then saturate the cotton terry or other textile material used. The vent *f* is then restoppered or sealed; but if it is desired to carry the cell about without any possibility of any liquid escaping the liquid remaining after saturation of the absorbent material is first emptied out before restoppering or sealing. The cubical contents of the space *e* for the excitant is so proportioned as to contain more material than is required for making a saturated solution for once charging the cell, so that when the cell becomes inoperative through the exciting solution becoming spent or inactive it is only necessary to refill with water to again render the cell active.

What I claim, and desire to secure by Letters Patent, is—

1. In a galvanic cell, a space formed therein to contain an excitant in a dry granular or powdered form adapted to be dissolved to set the cell in action on pouring water into the cell and means whereby the said exciting material in the event of becoming unintentionally damp is prevented from setting up local action, as set forth.

2. A galvanic cell comprising negative and positive pole electrodes, a receptacle to contain said electrodes, an absorbent material surrounding the inner and outer surfaces of the one electrode and in intimate contact with the other electrode, a space formed within the cell to contain an excitant in a dry granular or powdered form adapted to be dissolved on pouring water into the cell and to saturate said absorbent material and means whereby the said exciting material in the event of becoming unintentionally damp is prevented from setting up local action, as set forth.

WILLIAM STRICKLAND.

Witnesses:
A. MILLWARD FLACK,
HEDLEY J. HARROP.