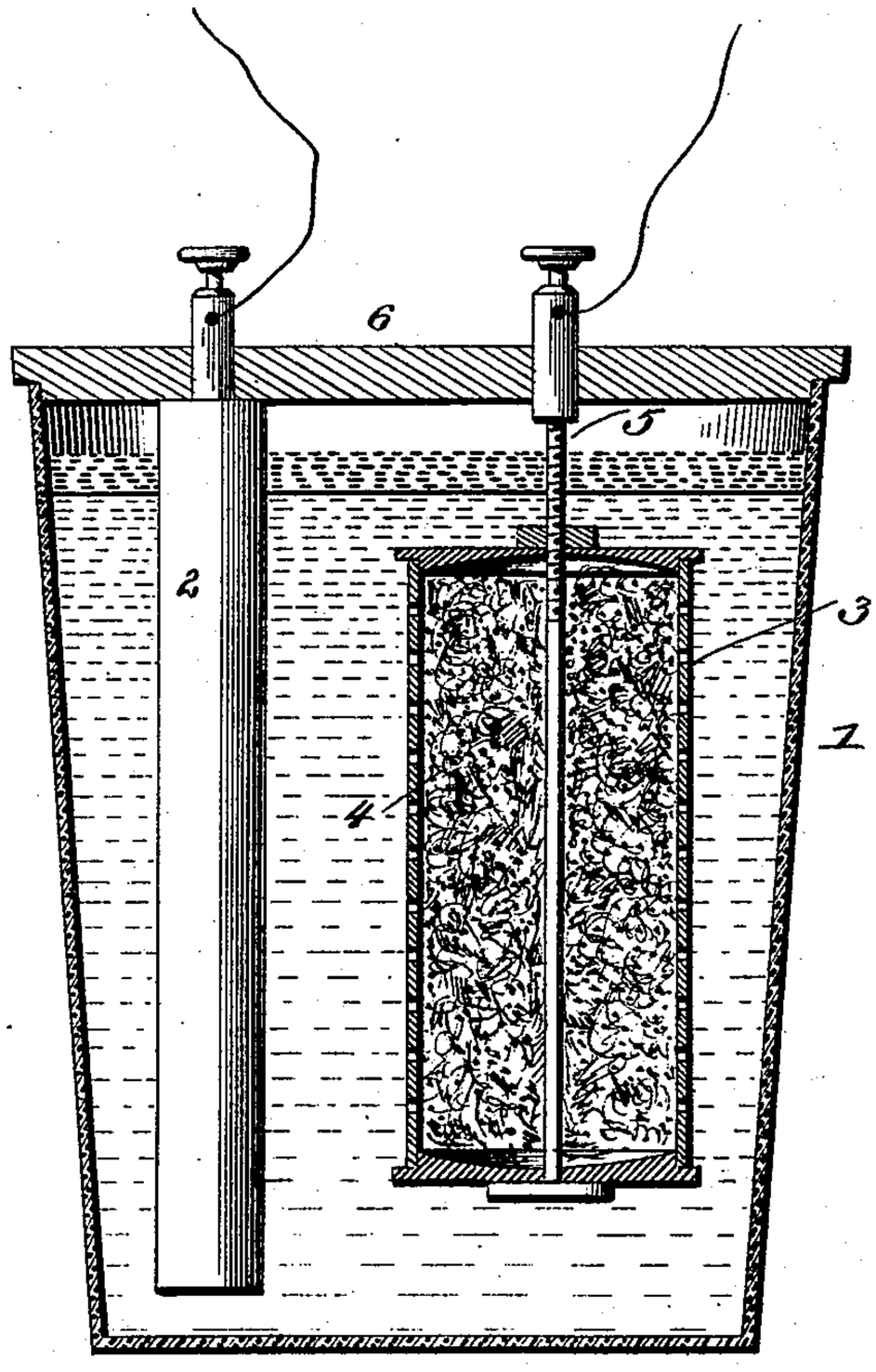
(No Model.)

R. O'TOOLE.

PRIMARY BATTERY.

No. 533,078. Patented Jan. 29, 1895.



Witnesses
John Dennis
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UNITED STATES PATENT OFFICE.

RICHARD O'TOOLE, OF MECHANICSTOWN, ASSIGNOR OF ONE-HALF TO GEORGE W. SMITH, OF BALTIMORE, MARYLAND.

PRIMARY BATTERY.

SPECIFICATION forming part of Letters Patent No. 533,078, dated January 29, 1895.

Application filed August 3, 1893. Serial No. 482,315. (No model.)

To all whom it may concern:

Be it known that I, RICHARD O'TOOLE, a citizen of the United States, and a resident of Mechanicstown, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Primary Batteries, of which the following is a specification.

My invention relates to a primary battery employing an oxide of copper inclosed in a perforated vessel and immersed in a solution of caustic potash or caustic soda. The metal used is zinc.

In the drawing the figure represents my battery.

1 is a jar containing caustic potash or caustic soda.

2 is a zinc.

3 is a perforated jar made of any suitable material preferably of iron wire gauze and containing oxide of copper, which is marked 4. The perforated jar may be held in position closed or not as desired. In the drawing I have shown the jar as closed and the cover and jar held in position in the battery by means of a rod 5.

6 is a yoke or cover to the battery jar by which the zinc and the perforated jar are held in position.

A battery constructed in this way will give a constant current for a long period without deterioration. I have found it desirable to cover the top of the caustic potash or soda solution in the jar with an oil suitable to prevent the chemical from crawling up the side of the cell.

The action of the elements as far as I have been able to determine the same is as follows, but I do not propose to limit or bind myself by this description of the chemical action which may not be correct. A battery constructed of the black oxide of zinc or caustic potash or caustic soda and water will give forth a constant current when the circuit is closed. The water will be decomposed, the oxygen forming with the zinc an oxide of zinc which in turn combines with the potash to form a soluble double salt of zinc and potash which dissolves as rapidly as it is formed. The hydrogen liberated by the decomposition of the water reduces the copper oxide to metallic copper. The cover of oil which is placed on the top of the cell serves the purpose of preventing the absorption by the contents of the cell of carbon dioxide from the air, which would destroy the efficiency of the battery.

When the cell has become exhausted the particles of metallic copper will remain in a pure state in the perforated jar. These may be removed and roasted so as to restore them to the condition of black oxide when they may be used again indefinitely. The cell is an economical one for this reason.

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

In a primary battery, such as one containing oxide of copper as depolarizing material, caustic soda or caustic potash in solution and zinc, the combination of a perforated jar, containing the depolarizing material, fitted with a cover at top and bottom, and a suspensory rod passing through the top and bottom and secured to a cover or bridge across the jar, substantially as described.

Signed at Baltimore city, in the State of Maryland, this 24th day of July, A. D. 1893.

RICHARD O'TOOLE.

Witnesses:

JOHN L. HEEB,

R. MOREHEAD.