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SECONDARY STORAGE BATTERY.
APPLICATION FILED MAR. 29, 1912.

1,043,535.

Patented Nov. 5, 1912.

Fig. 1.

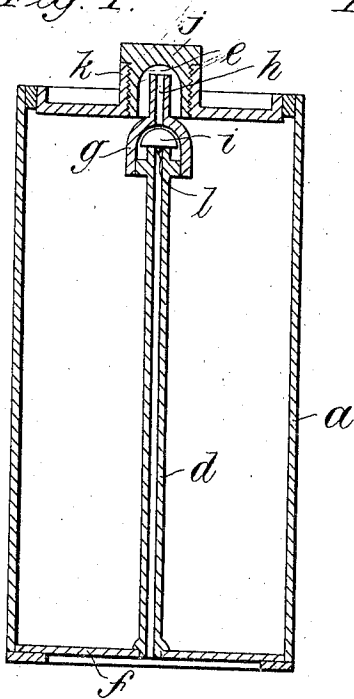


Fig. 2.

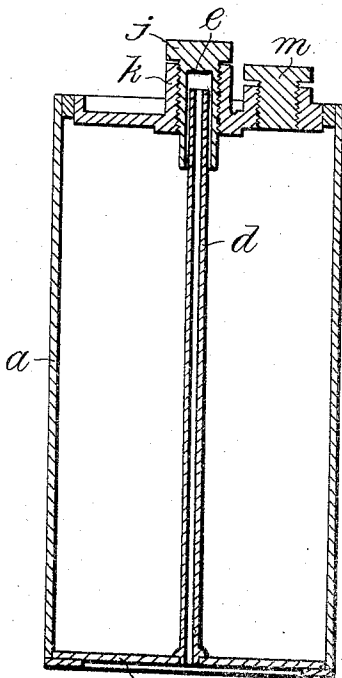
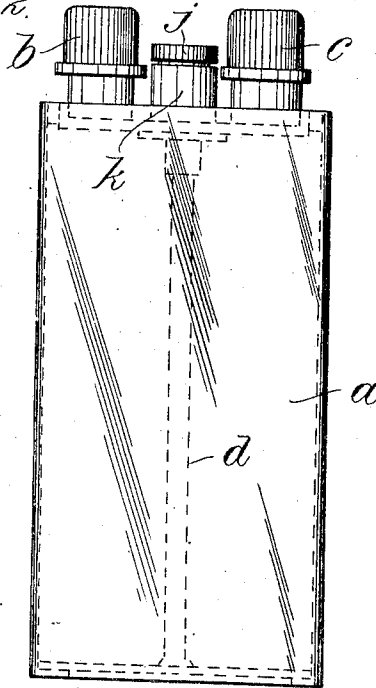
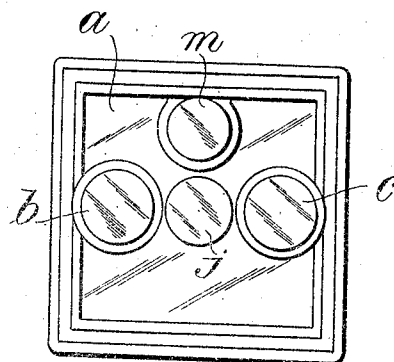


Fig. 4.

Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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SECONDARY STORAGE BATTERY.

1,043,535.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed March 29, 1912. Serial No. 687,136.

To all whom it may concern:

Be it known that I, ORLANDO OLDHAM, a subject of His Majesty the King of England, residing at Hyde Road, Denton, near Manchester, in the county of Lancaster, Kingdom of England, have invented a certain new and useful Improvement in Secondary Storage Batteries, of which the following is a specification.

This invention relates to improvements in secondary storage batteries of the kind having a chamber and a tube arranged within the cell so as to allow a free escape of gas and at the same time prevent the escape of liquid in any position of the cell. In certain arrangements of this kind the gas discharge tube is carried down to a vent chamber formed beneath the cell with a tube or passage coming up to the level of the top of the cell. In all these arrangements however the gas exit is at the top of the cell so that the creeping of the liquid therefrom speedily results in the corrosion of the terminals.

Now the object of the present invention is to provide an improved and more simple arrangement in which also the gas outlet opening is at the lower portion of the cell away from the terminals which will thus remain clean and electrically good.

The invention is illustrated in, and hereinafter described with reference to the accompanying drawings in which:—

Figure 1 is a sectional side elevation of a single cell accumulator; Fig. 2 is a side elevation; Fig. 3 is a plan; and Fig. 4 is a sectional view of a slightly modified form of construction.

In carrying out the present invention I construct each cell or case *a* of celluloid or other suitable material as heretofore and I arrange the electrical terminals *b* and *c* on the top of the case. The gas escapes from the bottom of the cell by means of a small tube *d* which leads from a chamber *e* at the top and extends down between the plates to the bottom of the chamber *f*. Thus the gas can not injure or corrode the terminals as at present. The upper end of the tube *d* may as in Figs. 1 and 2 be inclosed by an inner dome shaped cover *g*. This cover has a gas exit hole *h* in its top and incloses also a semi-spherical or a ball-shaped valve *i* which when the cell is turned sidewise or upside down covers the said gas exit hole *h*. A cover cap *j* of ebonite or other suitable material is provided and recessed to form the

chamber *e* and this screws or otherwise engages with an outer cylindrical or tubular well *k* attached to the top of the case around the valve dome. The gas passes from the top of the cell *a* into the said chamber *e*, through the hole *h* in the inner dome *g*, past the valve *i* and down the exit tube *d*. A slit *l* is made across the top of the tube to allow the gas to pass the valve when as normally, it rests on the top of the said exit tube.

In the slightly modified arrangement shown in Fig. 4, the tube *d* terminates at its upper end directly below the cap *j* in the chamber *e* and it is arranged as an easy fit in the bore or recess of the said cap, so that gas can pass up between the tube *d* and the sides of the cap to the chamber *e* and down the tube *d* to the bottom of the case.

In each form of the invention splashing of the electrolyte will not cause it to reach the normally upper end of the tube, since the relation of such end of the tube to the walls of the chamber in the cap into which said end of the tube enters is such that the space between the tube and the walls of the chamber will prevent any amount of liquid passing therethrough, although gases may find easy passage therethrough. The tube where entering the chamber in the cap may, therefore, be defined as in splash-resistant relation to the walls of the chamber.

A false bottom can be readily made in the case containing the cell if desired to enable the condensation moisture to be conducted away.

When the accumulator cell is in its vertical position my invention provides a very free exit for the escape of the gas, as the said exit is in the top of the cell where the gas accumulates, while should it be turned over or inverted the exit is closed and the electrolyte cannot escape. Further when charging there is no necessity to remove the filling cap *m*, as the exit is perfectly clear.

The invention is applicable to batteries for miners' lamps, submarines, and generally to all classes of secondary storage batteries.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A secondary storage battery comprising a cell having a cover member, a gas collecting chamber in the cover member extending above the same, and a tube having an exit opening in the bottom of the cell and extending to and into the collecting chamber

and accessible to gases formed within the cell.

2. A secondary storage battery comprising a cell provided with a cover member, a dome or collecting chamber on the cover member and opening to the interior of the cell, and an upright tube having its upper end entering the collecting chamber in gas-free, splash-resistant relation to the walls thereof, and terminating in an exit opening in the bottom of the cell.

3. A secondary storage battery comprising a cell, a recessed cap screwing into the top of the said cell and forming a dome or chamber in the top thereof and a tube adapted to enter the dome or chamber in the cap and conduct away the gas collected

therein to an exit opening at the bottom of the cell for the purpose described.

4. A secondary storage battery comprising a cell, a recessed cap screwing into the top of the said cell and forming a dome or chamber in the top thereof, a tube extending from the said dome to an exit opening at the bottom of the cell for conducting away the collected gas and a gravity controlled valve in connection with said tube for preventing the escape of liquid.

In testimony whereof I have hereunto set my hand this 15th day of March 1912.

ORLANDO OLDHAM.

Witnesses:

HARRY HOLT,
JAMES HAMMOND.