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COMBINATION COVER AND VENTING CAP FOR STORAGE BATTERIES

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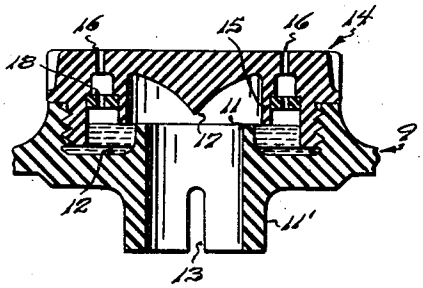


Fig. 3.

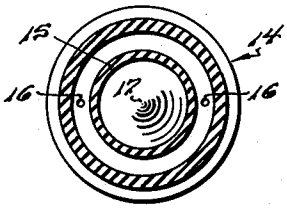


Fig. 2.

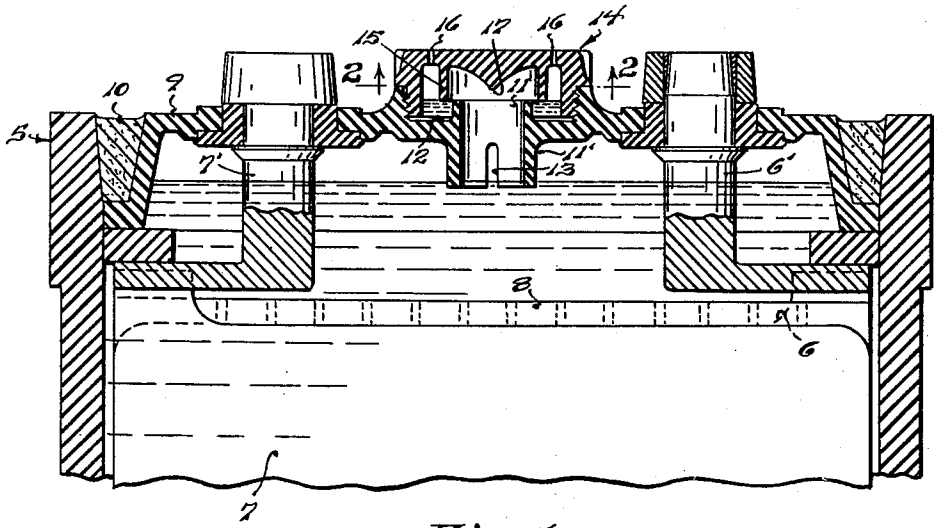


Fig. 1.

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COMBINATION COVER AND VENTING CAP FOR STORAGE BATTERIES

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2 Claims. (Cl. 136—179)

This invention relates to storage battery vents and particularly to trap-flow vents of the character illustrated and described in pending application of Albert C. Macbeth and Hugh Swartz for Letters Patent of the United States filed January 18, 1938, Ser. No. 185,484. It may be here stated, in connection with said pending disclosure, that the same indicates a two-piece cap arranged to fit the vent opening from a battery cell, one of the two pieces providing a gas duct and a sump in surrounding relation thereto and the other piece providing a chamber divided by an annular partition into a central condensation pocket lying above the gas duct and an outer air pocket above the sump and vented to the atmosphere, the dividing partition extending into the sump and in the manner of a sewer trap preventing free travel of gases between the inner condensation and the outer air pocket.

The principal object of the present invention is to engineer a trap-flow vent of the character described into a battery assembly in a manner to eliminate the necessity of forming the trap wholly within the cap, such object being aimed toward simplifying construction, facilitating installation, and generally more efficiently adapting the principle of a sewer trap to the work of venting a battery.

A further object of the invention is to perfect the trap itself and with these ends in view the invention consists in the novel construction, the adaptation and the combination of parts hereinafter described and claimed.

In the drawing:

Figure 1 is a fragmentary transverse vertical section taken through the central cell of a three-cell storage battery to represent a cover and venting cap embodying the present invention.

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1; and

Fig. 3 is an enlarged fragmentary transverse vertical section illustrating a modification of the cover and cap shown in the preceding views.

The numeral 5 designates the battery case, 6 and 7 the positive and negative plates with their related poles 6' and 7', 8 the separators, and 9 the cover which is affixed by sealing compound 10 to the case. Excepting the cover 9, all of these parts are or may be of well known construction.

Characterizing the cover is the vent thereof which provides a central tube 11 surrounded by an annular basin 12, the tube extending a short distance above the floor of the basin and within the battery depending to a point defining the filling level of the cell. This depending portion 11' of the tube is formed at diametrically opposite sides with vertical slots 13 for the escape of gases into the tube.

The basin 12, about its perimeter, provides internal threads to receive a chambered cap 14 carrying a concentrically disposed neck 15 operating to partition the chamber into an inner gas pocket lying above the tube 12 and an outer air pocket vented, as at 16, to the atmosphere. In diameter the neck 15 is slightly larger than the tube 11 and terminates at or very slightly below the upper limits of the tube, thus presenting what constitutes a liquid "skin" rather than a deep-water seal through which to pass the gases rising from the battery acid, a feature which is particularly desirable in that it permits the gases to be easily bubbled through the trap to maintain a low rather than a high pressure condition within the cell.

We form the ceiling of the gas pocket in the shape, somewhat, of an inverted cone, this conical reduction head with its centrally disposed drip cusp 17 promoting condensation. The cap may also be provided with a vented splash ring frictionally fitting the walls of the air pocket in a position immediately above the level of the liquid within the collecting basin, such ring, denoted by 18 (Fig. 3), being in the form of a condensing baffle to serve the added office of impeding evaporation of the liquid in the basin.

It will be readily seen that the operator, when filling the battery cell with water, simultaneously supplies water to the collecting basin up to the overflow level defined by the upper limits of the tube 11, the subsequent introduction of the caps forming the liquid-seal trap. While moisture collecting on the walls of the gas pocket acts to automatically develop this seal, it is desirable that the seal be produced in the manner described in order that minor volumes of acid gases will not escape in the interval necessary to obtain a natural formation of the trap.

It is our intention that the hereto annexed claims be given a breadth in their interpretation commensurate with the state of the advance in the art.

What we claim, is:

1. In combination with the cell of a storage battery, a cover therefor marginally defining the approximate areal dimensions of the cell and normally fixed by sealing compound to the latter, said cover being formed with a venting duct and, in surrounding relation to the exhaust end thereof, having a recessed liquid-collecting basin characterized in that its floor lies below the exhaust

rim of the duct and its perimeter is internally threaded, both the duct and the basin being produced as integral parts of the cover, and a cap for said duct and basin fitting the threads of the basin and providing, intermediate its center and its basin-fitting threads, an annular partition operating to form inner and outer pockets of which the inner pocket is of a diameter exceeding the diameter of the duct, said partition in the assembled position of the cap depending into the basin to a point at which its lower edge lies below the plane occupied by the exhaust rim of the duct whereby, in the presence of liquid within the basin at a level overflowing into the duct, to form a liquid-seal trap between the inner and outer pockets of the cap, said outer pocket of the cap being vented to the atmosphere for exhausting moisture-freed gases passing into said outer pocket from the inner pocket of the cap.

2. In combination with the cell of a storage battery, a cover for the cell marginally defining the approximate areal dimensions of the cell and normally fixed by sealing compound to the latter, said cover being provided with an upwardly projecting cell-venting duct and, in surrounding relation to the exhaust end thereof, having a recessed liquid-collecting basin characterized in that its floor lies below the exhaust rim of the duct, both the duct and basin being produced as integral parts of the cover, and a cap for said duct and basin detachably supported by the cell cover and formed with a skirt of a diameter less than the outer limits of the basin but larger than the diameter of the duct and of a length such that the same extends, in the assembled position of the cap, into the basin to a point at which its lower edge lies below the plane occupied by the exhaust rim of the duct to thereby form, in the presence of liquid within the basin at a level overflowing into the duct, a liquid-seal trap between the space which lies interiorly and the space which lies exteriorly of said skirt, said space exteriorly of the skirt being open to the atmosphere for exhausting moisture-freed gases passing into said exterior space from the space interiorly of the skirt.

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