

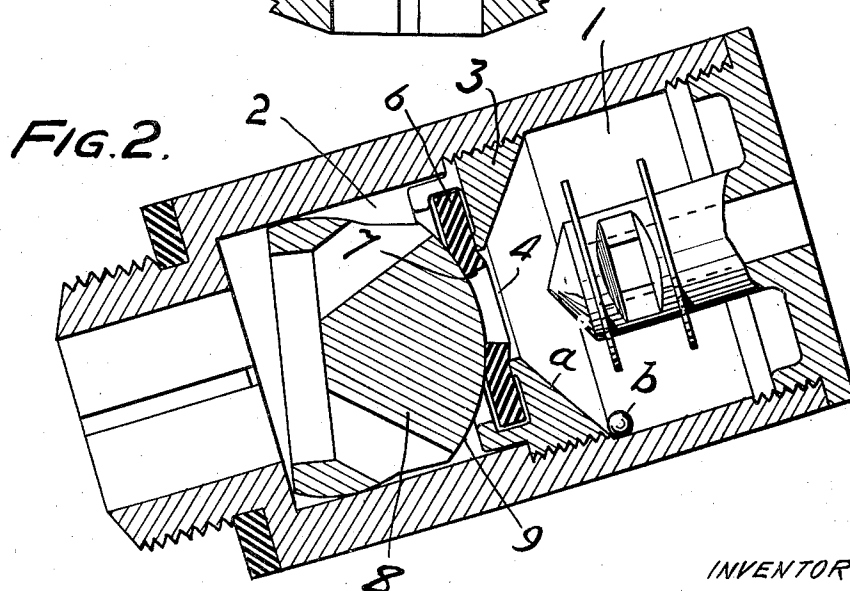
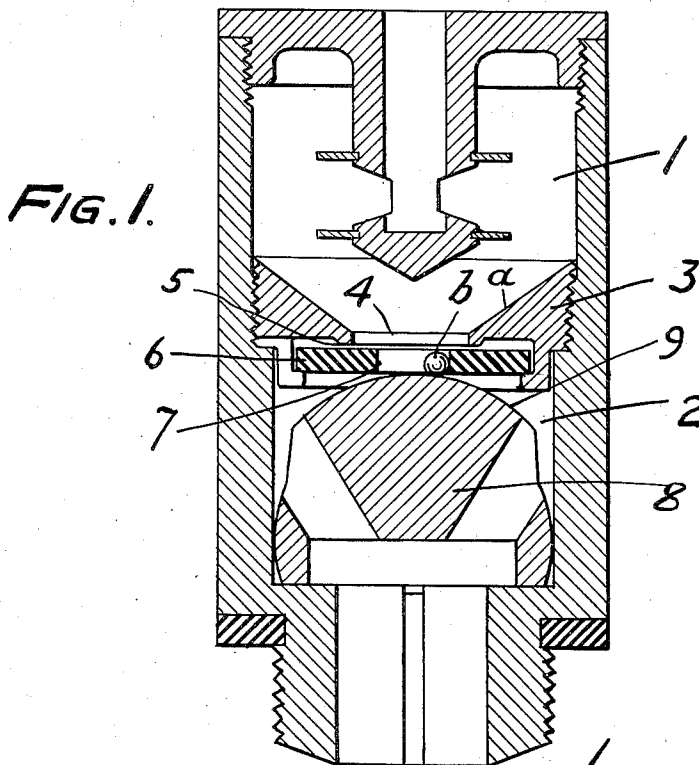
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NONSPILL VENT PLUG

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WITNESS:

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NONSPILL VENT PLUG

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3 Claims. (Cl. 251—147)

The principal object of the present invention is to facilitate the drainage of liquid which may collect above the valve back against the flow of gas escaping from the cell through the opening that is controlled by the valve.

The invention consists in the provision of a ball adapted when the vent plug is in upright position and the valve is open to roll into the opening through which the gas escapes and serve as a means for inducing back flow of liquid against the escaping gas pressure.

The invention also consists in the improvements to be presently described and finally claimed.

In the following description reference will be made to the accompanying drawing forming part hereof and in which—

Figure 1 is a central sectional view of a vent plug having provisions embodying features of the invention; and

Figure 2 is a similar view of the same shown in tilted position.

Referring to the drawing, the vent plug is provided with two chambers 1 and 2 of which one, 1, communicates with the atmosphere and of which the other, 2, communicates with the interior of the storage battery cell. A partition 3 is arranged between these chambers and it is provided with a central valve port 4 and a valve seat 5. 6 is a flexible valve arranged to cooperate with the valve seat 5 and it is provided with a central opening 7. A gravity operated body 8 having a spherical surface 9 is arranged in the chamber 2 and it clears the valve 2 and the opening 7 therein when the plug is in upright position and it closes the valve and the opening when the plug is tilted as in Figure 2. The foregoing is a description of one type of nonspill vent plug to which the present invention is applicable.

A description will now be given of the invention and of the manner in which it cooperates with the described nonspill vent plug to improve the operation of the same. There is a conically dished surface *a* extending between the valve seat 5 and the wall of the chamber 1 and it is provided on the face of the partition 3 which confronts the chamber 1. *b* is a ball adapted to roll on the dished conical surface *a* and to occupy a position in the port 7 of the valve and on the spherical surface of the body 8 and in contact with both when the plug is upright to facilitate return of liquid to the cell against the pressure of gas escaping from the cell. This is shown in Figure 1. When the nonspill vent plug is in the position shown in Figure 2 the ball *b* is free to

roll out of the way of the valve 6 and to the top of the dished surface and the wall of the chamber 1.

It has been said that the function of the ball *b* which may be of lead is to facilitate draining back liquid which may have collected in the chamber 1 against the flow of gas escaping from the cell through the opening 7. The theory of the action of the lead ball is not entirely clear. However, as a matter of fact it hastens the draining back of any liquid in the upper chamber when the cell has been restored to the upright position and gas is escaping. One theory is that the ball provides capillary spaces between its surface and the adjacent surfaces with which it is in contact, and such spaces provide a continuous capillary path down through the opening 7 on one side while gas is escaping through the other side.

The diameter of the ball 6 is greater than the maximum distance between the lower periphery of the wall of the opening 7 and the surface 9, to prevent the ball from escaping between the two.

It will be obvious that modifications may be made in details of construction and arrangement without departing from the spirit of the invention which is not limited to such matters or otherwise than the appended claims may require.

I claim:

1. In a nonspill vent plug having two internal chambers respectively communicating with the atmosphere and with the interior of a storage battery cell, a partition between said chambers having a central valve port and valve seat, a flexible valve arranged to cooperate with the seat and having a central opening through it, a gravity operated body having a spherical surface and arranged in the chamber that communicates with the cell and clearing the valve and opening therein when the plug is upright and closing the valve and the opening when the plug is tilted, the combination therewith of a conically dished surface extending between the valve seat and the chamber wall and provided on the face of the partition confronting the chamber communicating with the atmosphere, and a ball adapted to roll on said conical surface and to occupy a position in the opening in the valve and on the spherical surface of the body and in contact with each when the plug is upright to facilitate return of liquid to the cell against the pressure of gas escaping from the cell.

2. In a nonspill vent plug the combination of a

centrally perforated partition having a dished conical surface, a valve having a perforation, a tiltable body having a spherical surface cooperating with the valve, and a ball arranged for cooperation with the wall of the perforation in the valve and the spherical surface and the dished surface.

3. In a nonspill vent plug the combination of a partition including a member having a central

perforation, a movable body having a surface adapted to close the perforation and movable into and out of closing position, and a ball arranged for cooperation with the wall of the perforation and the closing surface and of diameter greater than the maximum distance between the lower periphery of the bounding wall of said perforation and said surface.

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