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VALVES FOR ELECTRIC STORAGE BATTERIES

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Fig. 1

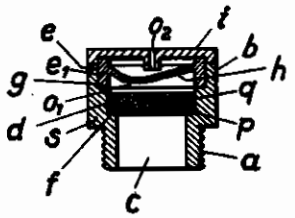


Fig. 2

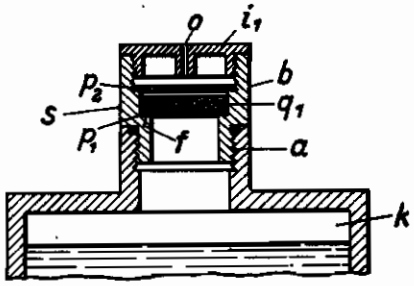


Fig. 3

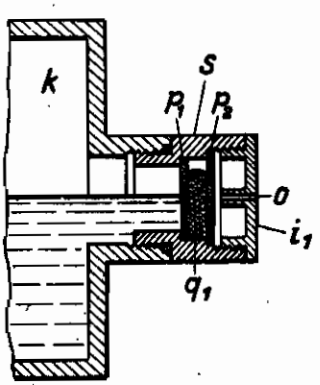
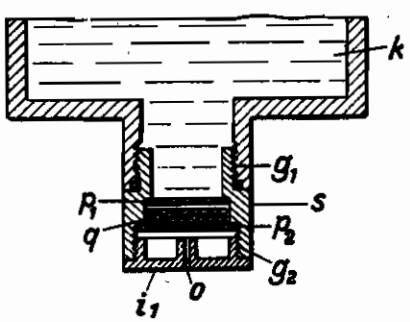


Fig. 4



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ALIEN PROPERTY CUSTODIAN

VALVES FOR ELECTRIC STORAGE BATTERIES

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My invention relates to improvements in valves for electric storage batteries, particularly alkaline storage batteries, and more particularly in valves of the type which are based on the use of a plate having minute pores and a layer of mercury placed thereon. As is known in the art, plates of sufficiently fine porosity, such for example as glass frits in which the pores have a width of from 5 to 15μ, can be used as mercury check valves with pressures of about 1,5 atmospheres. However, heretofore the use of such valves in electric storage batteries was not possible, because the mercury is affected by vapors containing oxygen of sulphuric acid, and because the glass frits which heretofore were universely used in such valves were not sufficiently stable as against the strong lye of alkaline storage batteries. Further, frits now in use are readily wetted by sulphuric acid as well as by potash lye, whereby the gas pressure at which the wetted frits permit the passage of the gas is increased to a multiple of that of dry frits so that an objectionable gas pressure can be developed in the cells.

The object of the improvements is to provide a valve in which the above-named objections are obviated, and with this object in view my invention consists in providing a valve for electric storage batteries and more particularly for alkaline storage batteries, in which the plates of fine porosity consist of a frit of a substance, preferably artificial resin, which has humidity repelling property, and which therefore is not wetted, the said frits being preferably made from polystyrol and polymetacrylic acid ester. Further, a body of fine porosity may be made from a material which is capable of being wetted or of being affected by the vapors, in which however the surface and the walls of the pores have a coating of humidity repellent and stable material.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawing, in which the same letters of reference have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1 is a sectional elevation of the valve,

Fig. 2 is a sectional elevation illustrating a modification, the figure showing the valve as mounted on a cell, and

Figs. 3 and 4 are sectional elevations of the valve shown in Fig. 2 and illustrating the cell and valve in tilted positions.

In Fig. 1 I have illustrated a valve which is suitable for use in normal alkali cells, the object of the valve being to prevent the access of obnoxious carbonic acid to the cells.

As shown in the said figure the valve comprises a tubular bady s having an externally screw-threaded portion a of smaller diameter and a portion b of larger diameter. Internally the body s comprises three chambers c, d and e of different diameters whereby shoulders f and g are formed. Within the chamber d and on the shoulder f there is a porous plate p which provides a support for a layer q of mercury. The porous plate consists of the materials referred to above, that is either a frit of high porosity of a material which has humidity repelling property, and which is not affected by the vapors rising from the cell, or of a material which may or may not be humidity repellent or proof against the action of the said vapors, in which however the surface and the walls of the pores have a coating of humidity repellent and stable material. Preferred substances are the aforesaid substances artificial resin such as polystyrol and polymetacrylic acid ester. Above the layer q of mercury an annular body e formed with a partition h having a vent o_1 is fitted within the chamber e, and the said annular body is covered by a cap i having a vent o_2.

In Figs. 2 to 4 I have shown a modification of the valve which may be used in any upright or tilted positions of the cell. The valve body s has been shown fixed to a cell k. Its construction is substantially the same as that of the body shown in Fig. 1 and the same letters of reference have been used to indicate corresponding parts. The body of mercury q_1 is confined, between a lower plate p_1 mounted on the shoulder f, and an upper plate p_2 of similar material and of high porosity the plate p_2 being slightly spaced from the body q_1 of mercury. The valve body is closed by a screw cap i_1 having a vent o. By thus providing the cap i_1 which may be readily removed, access can be had to the plates p_1 and p_2 and the body of mercury q_1 for cleaning the plates or replacing the same by new plates.

Fig. 3 shows the cell turned sidewise into horizontal position. The volume of the body q_1 of mercury is such that a slight passage is left above the body of mercury and through the portions of the plates p_1 and p_2 located above the same. In Fig. 4 I have shown the cell in a position turned upside down, in which position the plate p_1 prevents the liquid electrolyte from leaking from the cell.

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