Feb. 23, 1954 B. R. FIELD 2,670,396

VENTING AND PRESSURE RELEASE ARRANGEMENT OF ELECTRIC ACCUMULATORS

Filed July 30, 1951 2 Sheets-Sheet 1

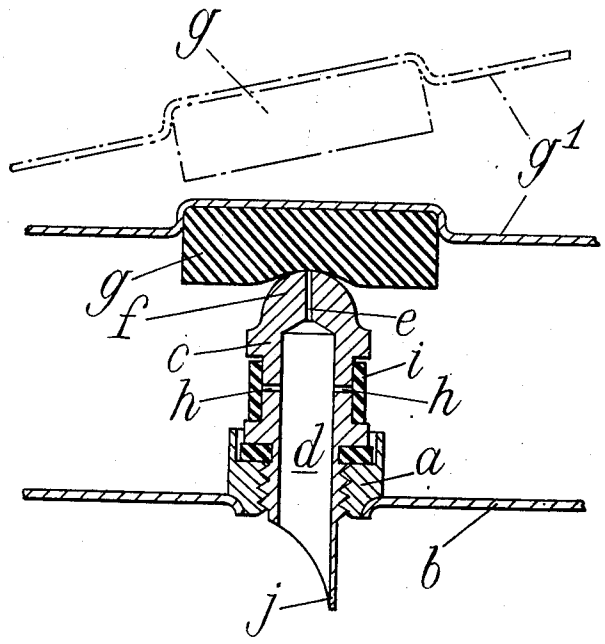


Fig. 1.

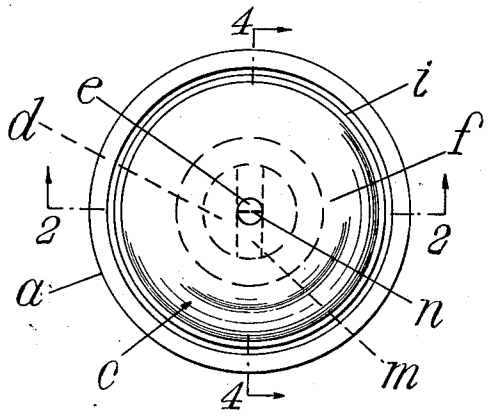


Fig. 3.

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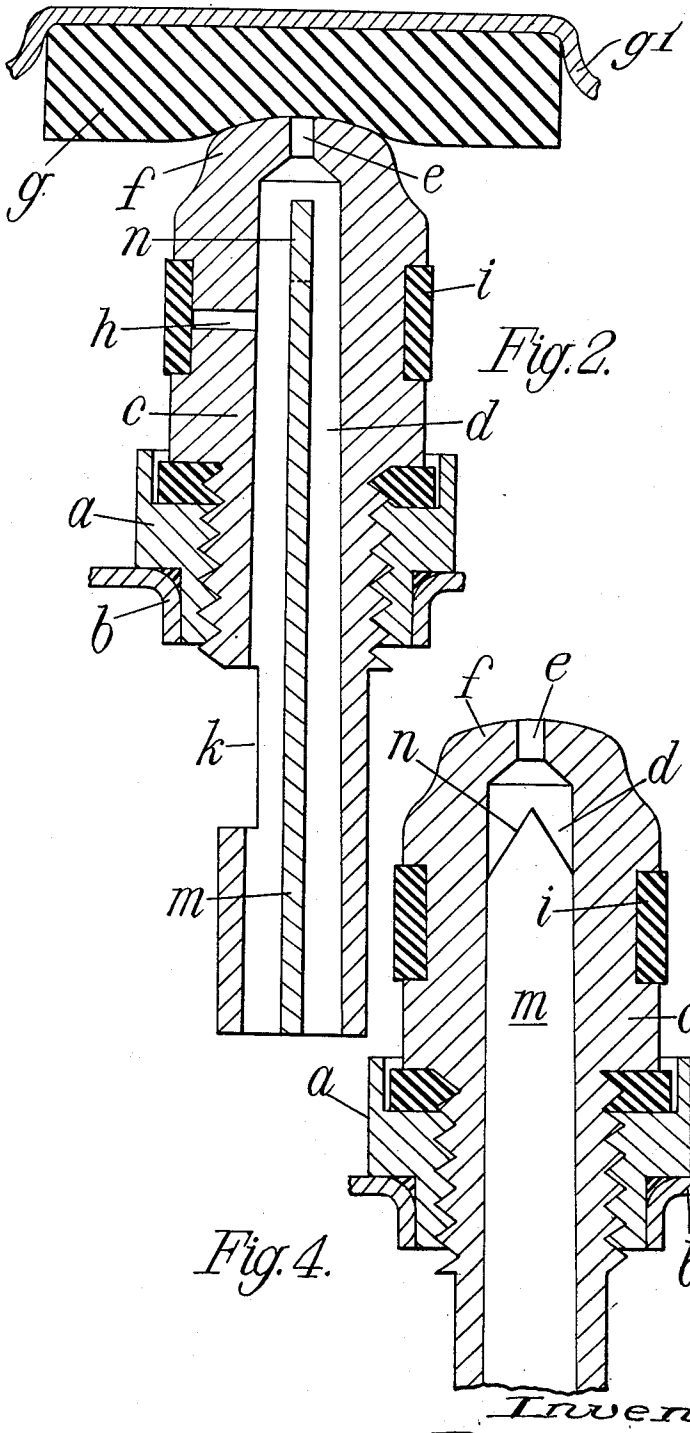


Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE

2,670,396

VENTING AND PRESSURE RELEASE ARRANGEMENT OF ELECTRIC ACCUMULATORS

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Application July 30, 1951, Serial No. 239,314

Claims priority, application Great Britain August 10, 1950

2 Claims. (Cl. 136—178)

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This invention relates to the venting and pressure release arrangements of electric accumulators particularly of the alkaline type.

The object of the invention is to provide an improved device constituting a gassing valve or breather which also incorporates a safety valve and means for facilitating draining back to the body of electrolyte in the cell of any electrolyte which may be in the device after inversion of the accumulator or during service.

The invention consists in a venting and pressure release device for an electric accumulator comprising a body adapted to be fitted into the top of the accumulator, a relatively large bore orifice extending through said body from its lower to adjacent to its upper end, a small bore orifice extending from the top of said large bore orifice to the end of said body, at least one radial orifice in the body extending from said large bore orifice to the exterior of the body, and an elastic band on the exterior of said body to yieldingly close said orifice.

The invention further comprises the improved venting and pressure release device having the lower end of its body shaped to a quill tongue formation for the purpose specified.

The invention further comprises the improved venting and pressure release device having its body where it extends into the accumulator gapped at one side, with a partition dividing the large bore orifice through the body into two parts, with the said gap in one part, the partition terminating short of the top end of the large bore orifice, the arrangement facilitating the return of electrolyte to the cell from the device after the cell has been inverted.

Referring to the accompanying explanatory drawings:

Figure 1 is a sectional view of one form of the improved venting and pressure release device of an electric accumulator according to the invention.

Figure 2 is a sectional view on the line 2—2 of Figure 3 of a modified form of the venting and pressure release device.

Figure 3 is a plan view of the device shown in Figure 2, the sealing or closing member being removed.

Figure 4 is a sectional view on the line 4—4 of Figure 3.

In Figure 1, the device is screwed into a bush *a* secured in the top *b* of the accumulator. The device comprises a body *c* which has a relatively large bore orifice *d* therein which terminates in a small hole *e* in the top dome shaped end *f* of the

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body. The hole *e* is adapted to be closed by a pad *g*, which may be made of indiarubber, secured to the lid g^1 of the accumulator, such lid being closed and having the pad *g* firmly sealing the hole *e*, when the accumulator is in service. Orifices *h* radiate from the relatively large bore orifice *d* and a rubber or like band *i* located in a peripheral recess in the body *c* serves to close the outer ends of said orifices *h*. If, however, a sufficient pressure is developed in the accumulator whilst it is being charged, due to the orifice *e* being blocked from any cause or being left sealed inadvertently, then the band *i* will yield sufficiently to permit gas escape from the device. The radial orifices *h* thus form in conjunction with the rubber band *i*, a safety venting means.

The bottom end of the device is made of a quill tongue shaped formation as shown at *j* to facilitate the concentration of the liquid dropping from the device at the point of the quill and its ready return to the body of electrolyte in the accumulator.

In the construction of device shown in Figures 2, 3 and 4, which generally resembles that in Figure 1 in respect of the large bore orifice *d*, the small bore hole *e*, the radial orifice *h* and the rubber or like elastic band *i*, the body *c* is cut away at one side where the body extends into the accumulator so as to provide a hole or gap *k* at that side and a division wall or partition *m* extends up the orifice *d* to a point towards the top of the orifice where the partition has a pointed end *n*, the hole or gap *k* coming to one side of the partition. It will be seen that with this arrangement, the effective length of the portion of the orifice *d* at one side of the partition *m* is greater than the effective length at the other side where the hole or gap *k* is situated. If therefore an accumulator cell fitted with my improved device is inverted, with the lid g^1 closed, the orifice *d* and hole will fill with liquid. When the cell is returned to its upright position, the two columns of liquid at the opposite sides of the partition are out of balance, which results in the longer column syphoning or drawing the shorter column out of the device. This facilitates rapid clearing of the device of any electrolyte which may accumulate therein if the cell is inverted before charging.

With my improvement which provides a free straight passage for venting during charging, there is little likelihood of electrolyte accumulating in such passage during charging, and so splashing of the cell top is obviated. The cell can be sealed off in service because of the safety re-

lease provided should a pressure accumulate in the cell. Further I ensure rapid evacuation of liquid from the device after the cell has been inverted.

What I claim is:

1. A venting and pressure release device for an electric accumulator, comprising a body adapted to be fitted into the top of the accumulator and to extend beneath the top and having a gap at one side of the part which so extends, a relatively large bore orifice extending through said body from its lower to adjacent to its upper end, a small bore orifice extending from the top of said large bore orifice to the end of said body, at least one radial orifice in the body extending from said large bore orifice to the exterior of the body, an elastic band on the exterior of said body to yieldingly close said radial orifice, and a partition located in the large bore orifice, extending from its lower end to a point short of its top end and dividing said orifice longitudinally into two parts, the said gap being at one side of the partition.

2. A venting and pressure release device for an electric accumulator comprising a body adapted to be fitted into the top of the accumulator, a relatively large bore orifice extending through said body from its lower to adjacent to its upper

end, a small bore orifice extending from the top of said large bore orifice to the end of said body, at least one radial orifice in the body extending from said large bore orifice to the exterior of the body, an elastic band on the exterior of said body to yieldingly close said orifice, and an accumulator lid adapted when closed to bear directly on the top of the body and close the small bore orifice therein.

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