April 2, 1957 H. M. B. RECOPÉ DE TILLY BLARU 2,787,650

DEVICE FOR PRIMING ELECTRIC BATTERIES

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FIG. 1

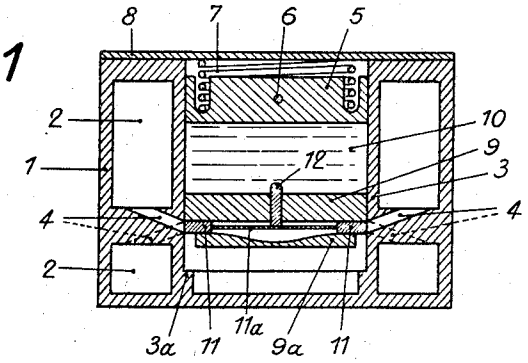


FIG. 2

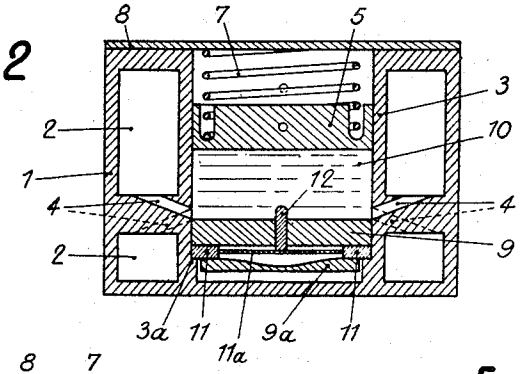


FIG. 3

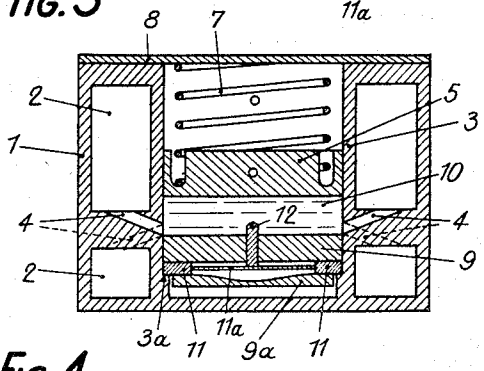


FIG. 5

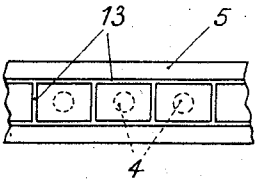


FIG. 4

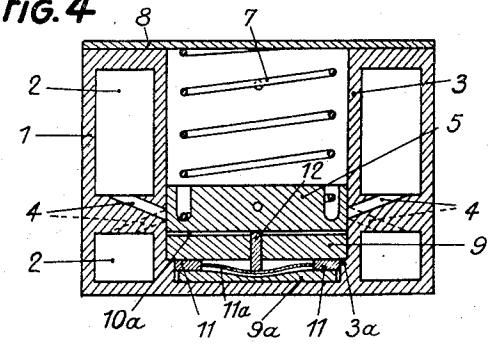
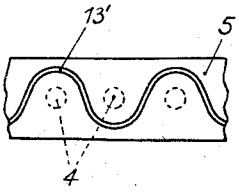


FIG. 6



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DEVICE FOR PRIMING ELECTRIC BATTERIES

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4 Claims. (Cl. 136—90)

The present invention relates to a device for priming electric batteries having a plurality of cells. This device has for its object to feed the required quantities of priming liquid into the cells of the battery and to ensure thereafter an effective sealing of said elements with respect to each other.

With these objects in view, the device according to the invention comprises a cylindrical liquid reservoir having its peripheral wall formed with ports located in a plane perpendicular to the axis of said reservoir, inlet ducts leading from said ports to the cells of the battery, two pistons slidingly engaged in said reservoir end enclosing between themselves the liquid contained in said reservoir, resilient means acting upon the first of said pistons, and disengageable locking means locking said first piston near one end of said reservoir, against the action of said resilient means, while the second of said pistons is placed in front of said ports so as to obturate the same. Upon disengagement of said locking means, said first piston urged by said resilient means advances in said reservoir and exerts a pressure upon said liquid whereby said second piston is displaced and uncovers said ports, whereafter said first piston forces said liquid through said ports into said cells and finally places itself in front of said ports so as to cover the same.

According to an embodiment, to which the invention is however not limited, said second piston is provided with arresting means which arrest the displacement of said second piston as soon as it has uncovered said ports, and with releasing means for releasing said arresting means, said releasing means being adapted to be actuated by said first piston when it approaches said second piston, so that the latter is enabled to continue its displacement and to allow said first piston to place itself in front of said ports.

Other features of the invention will become apparent from the following specification and from the appended drawing which represents by way of example an embodiment of the invention.

Fig. 1 is an axial section of a battery provided with a priming device according to the invention, said device being locked in its initial position.

Fig. 2 is a corresponding section showing the priming device shortly after the beginning of its operation.

Fig. 3 is another corresponding section showing the priming device in an intermediate position.

Fig. 4 is still another corresponding section showing the priming device at the end of its working stroke.

Figs. 5 and 6 represent details of the device.

The body 1 of the battery contains the cells 2 which are to be primed by feeding thereto a convenient liquid which is stored in a reservoir 3 formed by a cylindrical wall provided in the body 1. Near its lower end, the reservoir 3 has a shoulder 3*a* the purpose of which will be described later.

The inlet ducts 4 of the cells 2 open into the cylindrical reservoir 3 by ports which are located in a plane perpendicular to the axis of said reservoir.

In the reservoir 3 are slidingly engaged two tightly fitting pistons 5 and 9. The piston 5 is locked at the upper end of the reservoir 3 by a locking member, for example by a pin 6, and receives the pressure of a strong spring 7 which tends to push the piston 5 downwards. The spring 7 is tensioned between the piston 5 and the lid 8 which covers the body 1.

The piston 9 is initially placed at the level of the ports of the ducts 4, so as to cover the same. The lower portion 9*a* of the piston 9 is reduced in diameter, so as to be enabled to descend into the bottom portion of the reservoir 3, below the shoulder 3*a*. In the piston 9 are slidingly mounted two diametrally opposed bolts 11 which are connected together by a spring blade 11*a*. When the spring blade 11*a* is in its normal, straight position, as shown in Figs. 1, 2 and 3, the outer ends of the bolts 11 are in contact with the peripheral wall of the reservoir 3. At the center, the spring blade 11*a* carries a finger 12 the upper end of which protrudes above the upper surface of the piston 9. When the finger 12 is depressed, the spring blade 11*a* is bent or bowed as shown in Fig. 4, and the bolts 11 are retracted.

The device which has been described operates as follows:

The parts occupying the positions shown in Fig. 1, the space 10 between the pistons 5 and 9 is filled with liquid. A vacuum may be made in the cells 2 as well as in the other cavities of the body 1.

The piston 9 will normally remain in contact with the liquid, but said piston may be held in the position shown in Fig. 1 by any convenient means, for example by an easily disengageable latch, or by a spring placed below the piston 9; such a spring should be much weaker than the spring 7 which acts upon the piston 5.

In order to prime the battery, the pin 6 is removed. The spring 7 then forces the piston 5 downwards and the pressure thus exerted on the liquid contained in the space 10 acts upon the piston 9, whereby the latter is lowered to the position represented in Fig. 2, in which it is arrested by the bolts 11 abutting against the shoulder 3*a*. In this position, the piston 9 has uncovered the ports of the ducts 4, so that the liquid is fed into the cells 2 with a speed which is equal in all the ducts. The piston 5 continues its descent (see Fig. 3) and the cells 2 are filled with liquid.

Near the end of its downward stroke, the piston 5 depresses the finger 12 and thus causes the retraction of the bolts 11 of the piston 9, so that the latter is enabled to descend farther (see Fig. 4), while the piston 5 places itself in front of the ports of the ducts 4, so as to seal the latter. An eventual excess of liquid which may remain between the pistons 5 and 9, as indicated at 10*a* in Fig. 4, is thus displaced below the level of the ports of the ducts 4, so that said excess of liquid can not cause short-circuits between the cells 2.

In order to improve still further the separation of said ports and to avoid the formation of short-circuits through the film of liquid remaining between the periphery of the piston 5 and the cylindrical wall 3, the peripheral surface of the piston 5 may be formed with grooves 13 or 13' (Figs. 5 and 6) which are filled with a substance having a coefficient of capillarity very different from that of the priming liquid.

It will be understood that the invention is not limited to the embodiment which has been described and shown, but covers also any modifications thereof, within the scope of the appended claims.

Thus, instead of being located around the liquid reservoir, the cells may be located at the center. In this case, the inlet ducts of said cells would lead radially inwards, from an annular liquid reservoir surrounding

the cells and operated by annular pistons sliding therein.

The invention may also be applied for priming electric storage batteries.

I claim:

1. An electric battery comprising a housing provided with a plurality of cells, a liquid receiving chamber and a plurality of ports between said chamber and said cells respectively, said ports opening into said chamber intermediate the ends thereof, in combination with two pistons slidably mounted in said chamber and forming with said chamber a reservoir between said pistons, one of said pistons normally being positioned to shut-off said ports from said reservoir, resilient means in said housing and biasing the other of said pistons toward said one piston, and releasable locking means in said housing and releasably securing said other piston against the action of said resilient means and in reservoir forming spaced relation from said one piston, whereby upon release of said locking means said other piston is biased by said resilient means against the liquid in the reservoir and toward said one piston to move said one piston in said chamber and open said ports to said reservoir so that the liquid therein is forced by said other piston into said cells to activate said cells.

2. An electric battery comprising a housing provided with a plurality of cells, a liquid receiving chamber and a plurality of ports between said chamber and said cells respectively, said ports opening into said chamber intermediate the ends thereof, in combination with two pistons slidably mounted in said chamber and forming with said chamber a reservoir between said pistons, one of said pistons normally being positioned to shut-off said ports from said reservoir, resilient means in said housing and biasing the other of said pistons toward said one piston, releasable locking means in said housing and releasably securing said other piston against the action of said resilient means and in reservoir forming spaced relation from said one piston, whereby upon release of said locking means said other piston is biased by said resilient means against the liquid in the reservoir and toward said one piston to move said one piston in said chamber and open said ports to said reservoir so that the liquid therein is forced by said other piston into said cells to activate said cells, and means in said housing for limiting the movement of said other piston under the action of said resilient means to a position in front of and closing said ports to prevent communication between said cells after they are activated.

3. An electric battery comprising a housing provided with a plurality of cells, a liquid receiving chamber and a plurality of ports between said chamber and said cells respectively, said ports opening into said chamber intermediate the ends thereof and being disposed in a common plane transverse said chamber, in combination with two pistons slidably mounted in said chamber and forming with said chamber a reservoir between said pistons, one of said pistons normally being positioned to shut-off said ports from said reservoir, resilient means in said housing and biasing the other of said pistons toward said one piston, releasable locking means in said housing and releasably securing said other piston against the action of said resilient means and in reservoir forming spaced relation from said one piston, whereby upon release of said locking means said other piston is biased by said resilient means against the liquid in the reservoir and toward said one piston to move said one piston in said chamber and open said ports to said reservoir so that the liquid therein is forced by said other piston into said cells to activate said cells, arresting means cooperative with said housing for locking said one piston immediately adjacent said ports after it has been moved to open said ports and thereby position the ends of said reservoir in substantially contiguous relation with said ports while the other piston is ejecting the liquid from said reservoir through said ports, releasing means controlling said arresting means and disposed for actuation by said other piston as it approaches said one piston to release said arresting means and permit further movement by said one piston, and means in said housing for limiting the movement of said other piston under the action of said resilient means to a position in front of and closing said ports to prevent communication between said cells after they are activated.

4. An electric battery as set forth in claim 2 wherein said other piston is provided with grooves in its periphery and a substance filling said grooves and having a coefficient of capillarity very different from that of the cell activating liquid, said grooves and substance being disposed to isolate said ports from each other when said other piston is positioned in front of said ports.

References Cited in the file of this patent

UNITED STATES PATENTS

1,310,586	Straub et al.	July 22, 1919
2,674,946	Hjelm	Apr. 13, 1954