

Jan. 27, 1942.

G. A. PADDOCK

2,271,129

NONFLOOD CELL COVER ASSEMBLY

Filed Aug. 3, 1940

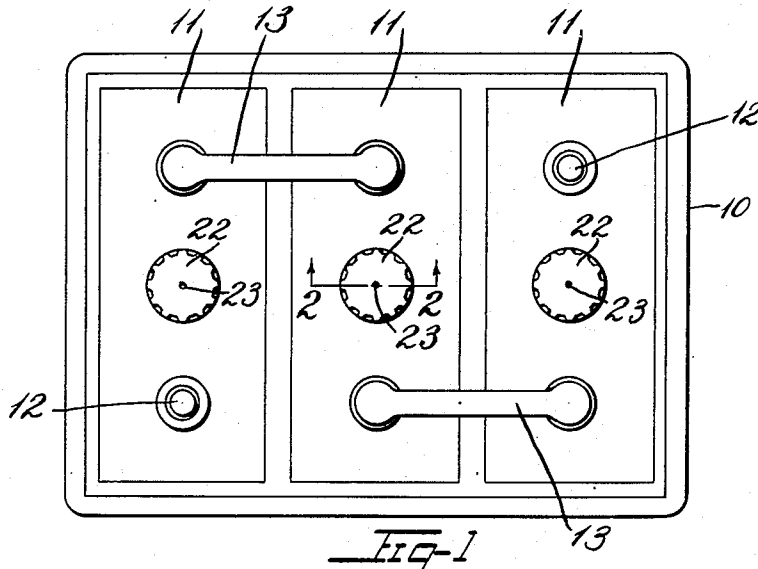
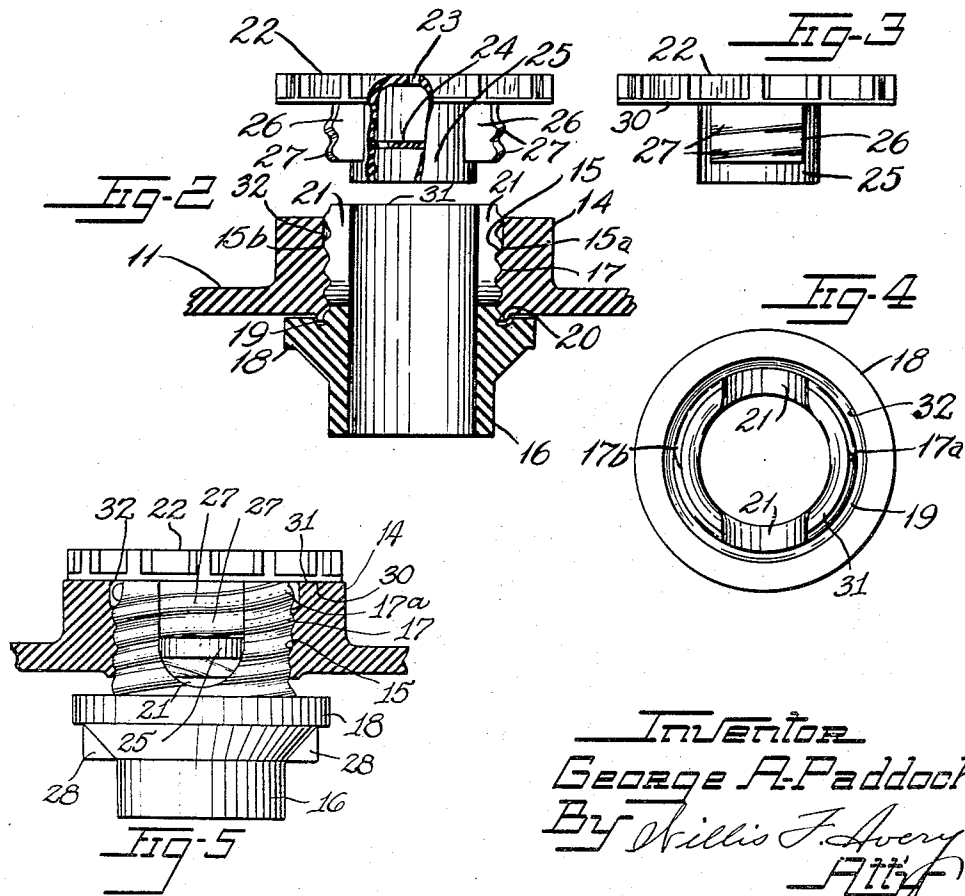


Fig-1



Inventor
George A. Paddock
By Willis J. Avery
Att'y

UNITED STATES PATENT OFFICE

2,271,129

NONFLOOD CELL COVER ASSEMBLY

George A. Paddock, Stow, Ohio, assignor to The
B. F. Goodrich Company, New York, N. Y., a
corporation of New York

Application August 3, 1940, Serial No. 350,319

2 Claims. (Cl. 136—178)

This invention relates to non-flood cell cover assemblies for storage batteries and constitutes an improvement over the construction disclosed in my co-pending application Serial No. 230,231, filed September 16, 1938.

In the prior application I have disclosed a non-flood cell cover assembly in which a filler well structure is threadedly mounted in an opening in the cell cover for vertical movement between an upper sealing position and a lower venting position of said well structure, and a vent cap is provided in detachable engagement with the upper end of the well structure, the arrangement being such that the cap is detachable from such structure only in the raised, sealing position of the latter. This makes possible removal of the cap for filling purposes where a seal is effected so that the well limits the level of the liquid, and the cap remains in the structure in the lowermost, venting position thereof in which condition the battery may be charged without leakage by bubbling under release of gases.

In the prior construction, however, the vent cap was engaged only with the filling well structure and detachment was effected by a lateral movement of the cap.

In accordance with the present invention I have found that greater ease and facility and reliability of operation may be provided if the cap can be handled more nearly in the normal manner of a simple screw cap, the invention making it possible to engage the cap directly with the cover and also with the well structure by a straight inserting and screwing motion, and in a manner that promotes correct manipulation of the apparatus by the operator.

The chief objects of the invention are to provide an improved assembly having the foregoing characteristics and to provide for convenience of manufacture and economy of material. These and further objects will be apparent from the following description, reference being had to the accompanying drawing in which:

Fig. 1 is a plan view of a three-cell battery constructed according to and embodying the invention.

Fig. 2 is a section of the cell cover and filling well structure taken along the line 2—2 of Fig. 1, the filling well structure being shown at its raised position, the vent cap being shown above the filling well structure in side elevation, portions of the cap being broken away, the retaining lugs of the vent cap being shown as aligned with the cooperating slots in the filling well.

Fig. 3 is an elevation of the vent cap of the assembly, the cap being in a position 90° rotated from the position of Fig. 2.

Fig. 4 is a plan view of the filling well structure.

Fig. 5 is an elevation of the filling well structure and cap in assembled relation for venting, the cover of the cell being shown in section.

With reference to the drawing, a battery container 10 is divided by partitions into three cells, each having a cover assembly 11. The battery is provided with the usual terminal posts 12, 12 and inter-cell connections 13, 13.

Each cell cover has a boss 14 which is apertured and internally threaded at 15 for the reception of a valve and filling well structure 16, this well structure being tubular and at its upper end being exteriorly provided with threads 17 matching the threads 15 of the cell cover opening. The well structure 16 in its uppermost position extends downward a distance sufficient to provide a gas-trapping space the level of the liquid being thereby limited by the lower end of the well structure such that complete filling of the cell is prevented. A flange 18 extends about the well structure and has an annular groove 19 adapted to receive a ridge 20 on the underside of the cover for providing a water seal to assure no escape of gas at this position during the filling of the cell. With such water seal a spacing of the flange from the bottom of the cover is made possible without resulting leakage, but if desired such flange may be brought into contact with the cover or with a film of the liquid between the cover and the flange to effect sealing.

The upper portion of the well structure 16 has its wall slotted at diametrically opposed positions 21, 21, each slot extending downward a sufficient distance so that, it is completely closed in the uppermost position of the well structure, and the lower portion of each slot will be exposed to the space beneath the cover when the well structure has been screwed down to the lowermost position indicated in Fig. 3. In such lowermost position of the well structure gas is permitted to vent from the space above the liquid through the slots 21 into the interior of the well structure 16 and out through the cap to the atmosphere.

For manipulating the well structure between its uppermost and lowermost positions a cap 22 having a vent opening 23 and an apertured baffle plate 24 has a downward extension 25

adapted to fit within the bore of the well structure 16.

The part 25 is provided with means for detachably engaging the well structure to rotate the same and also for threadedly engaging the cover itself. For this purpose the downwardly extending part 25 is provided with lugs 26, 26, at diametrically opposed positions, these lugs being of a width suited to slip into the slots 21, 21 of the well structure and being formed at their outer surfaces with threads 27 matching the internal threads of the cover so that the cap may be screwed into the cover. Also, as it is perhaps best shown in Fig. 5, the threads 27 upon the lugs are so disposed as to be in continuation with the threads 17 of the well structure when the underside 30 of the cap is in contact with the top surface 31 of the filler well, this condition being true whether a lug of the cap be inserted in one slot or the other of the well structure. To permit axial insertion of the cap to this extent, when the filler well structure is at its most elevated position shown in Fig. 2, in the cell cover opening, the filler well is preferably dimensioned to project above the upper surface of the cell cover boss 14 in this position, and the boss is counterbored, as at 32, at its upper end to a diameter larger than the threads and to a depth at least equal to the axial depth of the lugs 26, minus the amount the vent well structure projects above the boss.

The arrangement is such that, starting with the position of Fig. 2, which is the filling position of the well structure, the cap is axially inserted so that the lugs 26, 26 enter the slots 21, 21 of the well structure until the under face 30 of the cap 22 contacts the top face 31 of the filler well structure and the threads 27 of the lugs are in alignment with the threads 17 (Fig. 5). This alignment is made possible and facilitated by the provision of two threads 15a, 15b, starting at diametrically opposed positions corresponding to the two threads 17a, 17b, which also terminate at diametrically opposed positions (Fig. 4), the sections of threads 27, 27 of the lugs on the cap matching the other threads. The twin threads permit ready entrance and engagement therewith by both lugs 26, 26 at the same time, and the twin threads further facilitate a quick closing movement, good results being obtained by a patch of the threads such that complete closing or opening movement of the valve is effected by about one-half a revolution of the vent cap.

The cap, well structure and cover may be individually molded of rubber material and as a result of the construction hereinabove described no machining is necessary. For facilitating the removal of the well structure from the mold, this structure may be formed with lugs 28, 28 integral therewith which lugs may be engaged by a suitable tool for unscrewing the structure from the mold.

I claim:

1. A cover assembly for a container for electrolyte comprising a cover having an opening the wall of which is threaded therethrough, a tubular valve and filling well structure threaded exteriorly to its top to cooperate with the threaded wall of the cover opening for bodily vertical

movement of said structure upon rotation thereof in said opening and having a portion depending below the cover for providing between the cover and the normal electrolyte level a gas-trapping space adjacent said well structure beneath the cover in the raised position of said well structure, said well structure being slotted in the threaded portion thereof down from the top of the structure to an extent such as to put the well in venting communication with said space below the cover when said well structure is in its lowered position and to shut off such communication when said structure is in its raised, gas-trapping position, and a vented cap having a portion adapted to enter said slot in the well structure by relative axial movement when said well structure is in its uppermost position for manipulating said structure, said portion of the cap being threaded to supply a threaded portion thereof in said slot in continuation of the threaded portion of said well structure and adapted to engage the threaded portion of the cover for securing the cap in the threaded wall as the cap compels lowering of the well structure during rotation thereof in such threaded wall, and for freeing the cap from such threaded wall when the well structure is elevated to its raised position by reverse movement.

2. A cover assembly for a container for electrolyte comprising a cover having an opening the wall of which has a pair of threads terminating at diametrically opposed positions at the upper ends thereof below the top of the opening and extending to the bottom thereof, a tubular valve and filling well structure threaded exteriorly to its top to cooperate with the threaded wall of the cover opening for bodily vertical movement of said structure upon rotation thereof in said opening and having a portion depending below the cover for providing between the cover and a normal electrolyte level a gas-trapping space adjacent said well structure beneath the cover in the raised position of said well structure, said well structure being slotted in diametrically opposed threaded portions thereof down from the top of the structure to an extent such as to put the well in venting communication with said space below the cover when said well structure is in its lowered position and to shut off such communication when said structure is in its raised, gas-trapping position, said well structure having a radial flange and said cover having a dependent ridge about said threaded opening for cooperating therewith to provide a seal in the raised position of said well structure, and a vented cap having diametrically opposite portions adapted to enter the slots in the well structure by relative axial movement when said well structure is in its uppermost position for manipulating said structure, said portions of the cap having threads adapted to engage the threaded portion of the cover in alignment with the threads on said structure for securing the cap in said structure as the cap compels lowering of the latter, and for freeing the cap from said structure when the latter is elevated to its raised position by reverse movement.

GEORGE A. PADDOCK.

CERTIFICATE OF CORRECTION.

Patent No. 2,271,129.

January 27, 1942.

GEORGE A. PADDOCK.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 51, for "patch" read --pitch--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of December, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.