(No Model.)

W. P. FREEMAN.

GALVANIC BATTERY.

No. 534,036. Patented Feb. 12, 1895.

Fig. 1.

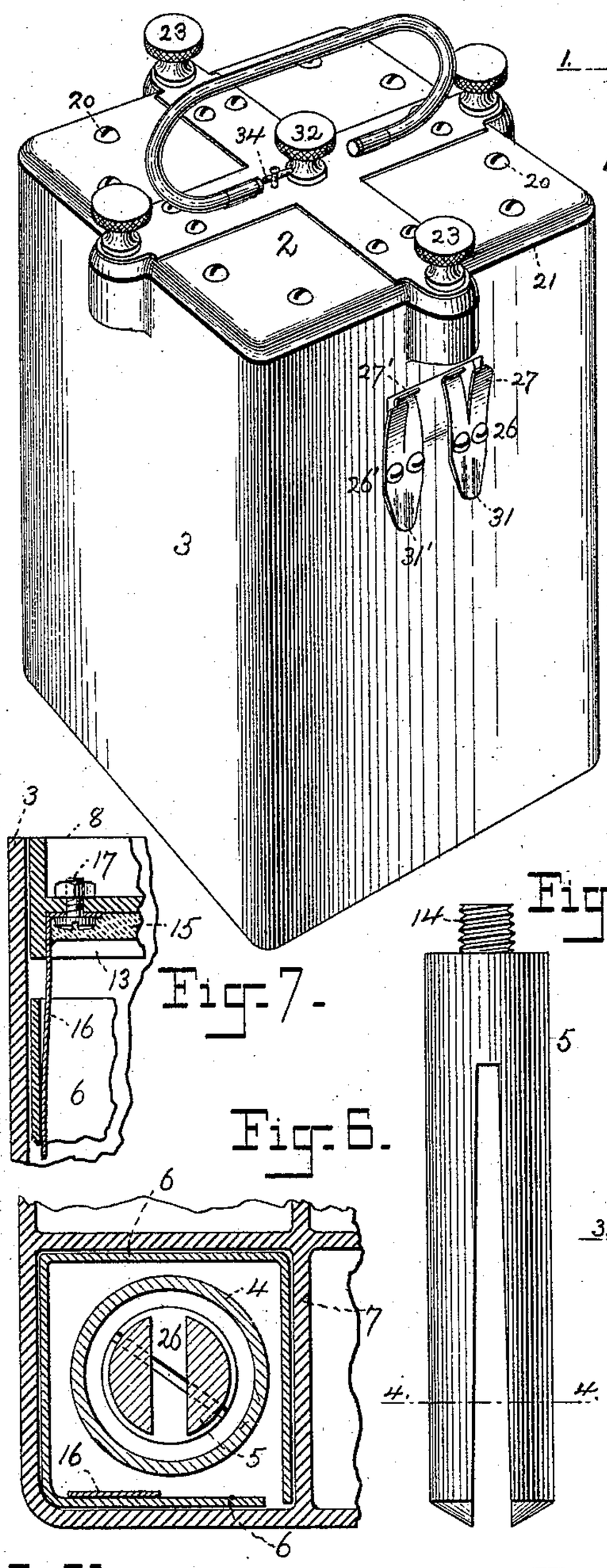


Fig. 2.

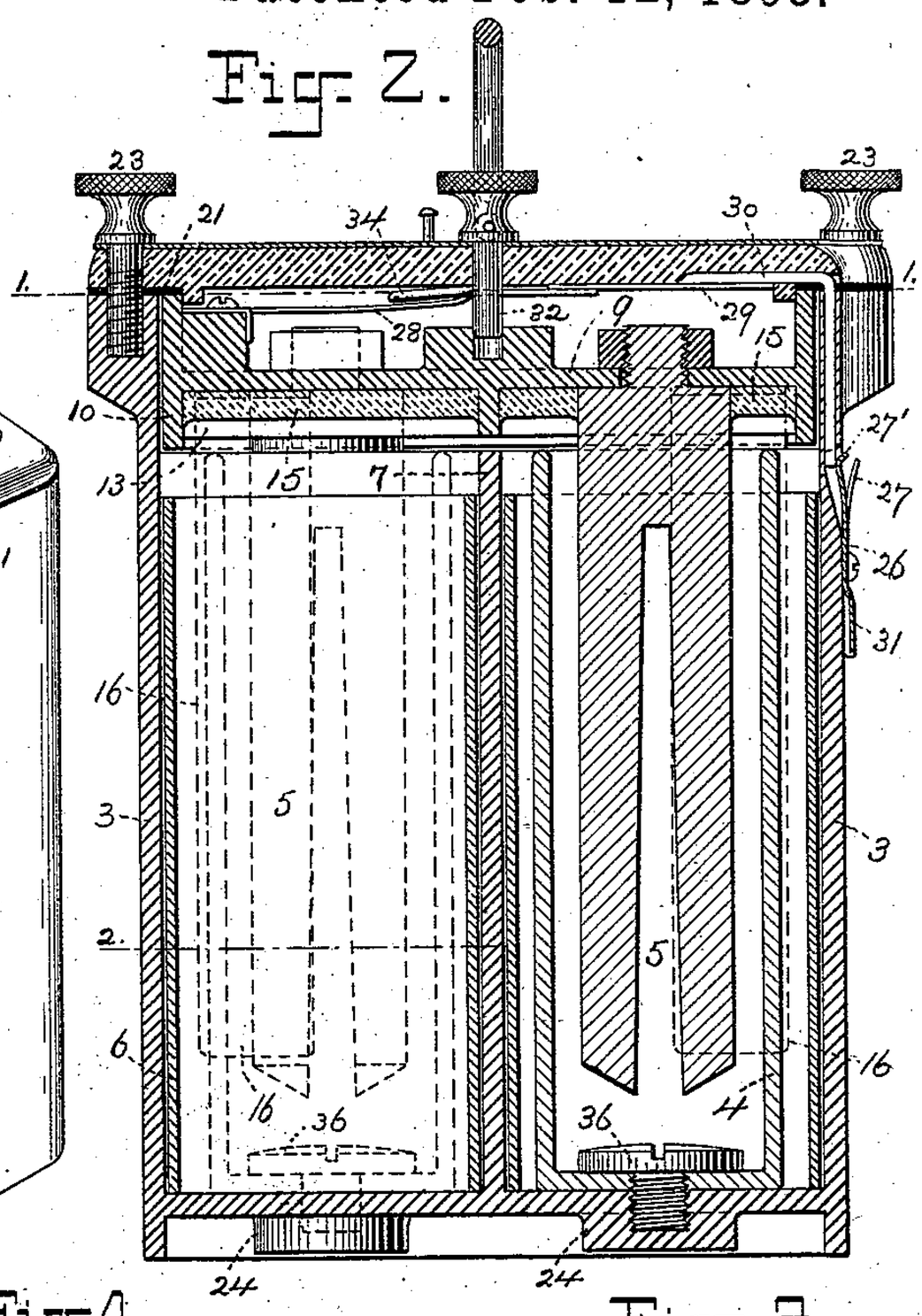


Fig. 7.

Fig. 6.

Fig. 4.

Fig. 3.

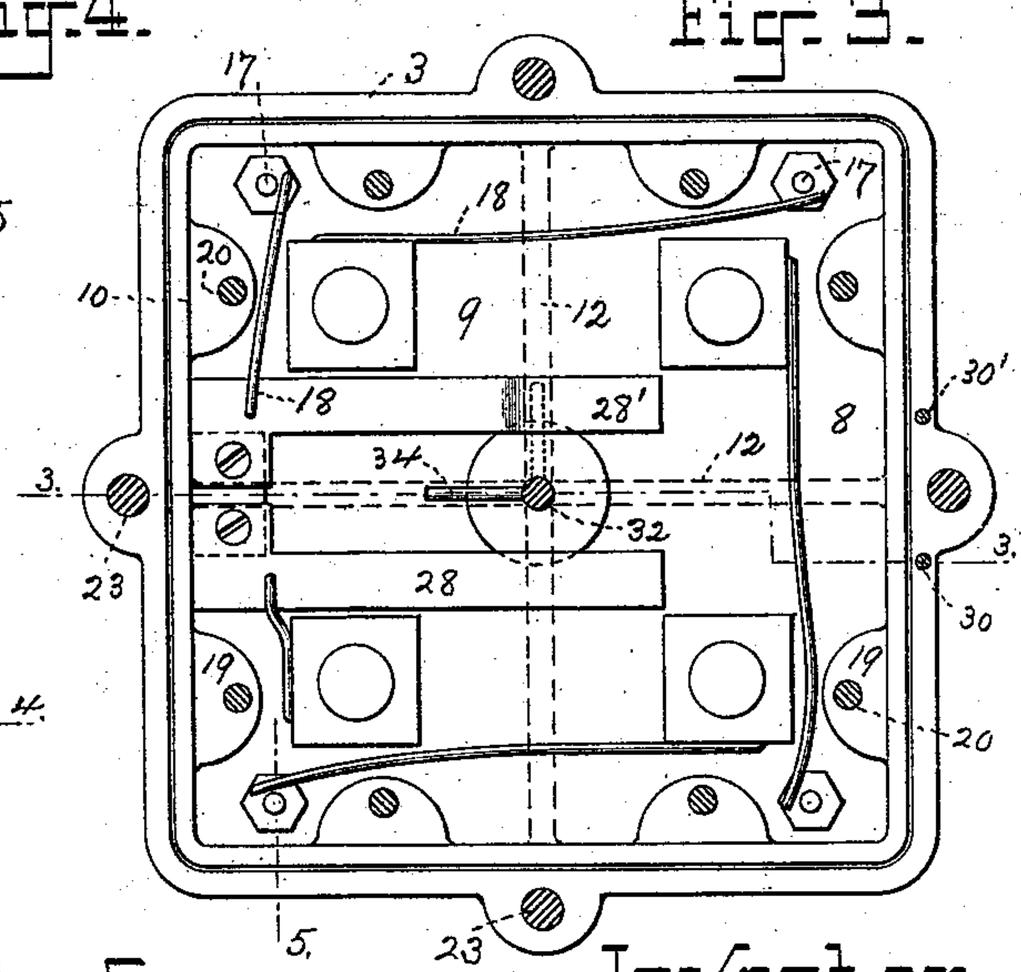
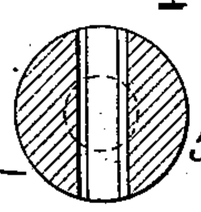


Fig. 5.



Witnesses.

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GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 534,036, dated February 12, 1895.

Application filed June 11, 1894. Serial No. 514,126. (No model.)

To all whom it may concern:

Be it known that I, WARREN P. FREEMAN, a citizen of the United States, residing at Brooklyn in the county of Queens and State of New York, have invented certain new and useful Improvements in Galvanic Batteries; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to galvanic batteries, so-called, more particularly multiple cell and such as are designed for portable use.

The purpose of my invention is to produce a battery which is perfectly liquid tight, or one in which the substance of the exterior casing is not perforated for the attachment of various operating parts and one which will not leak when carried from place to place; secondly, in creating an upper space or chamber for the location of the electrode connections, such space to be isolated from the cover and thereby free from all acid vapors and fumes so destructive to the electrodes under the present methods of construction.

Other peculiar and novel features will be hereinafter described, the most notable of which is the attachment of the carbons to a tray, so-called, whereby in case a carbon gives out a new one can be replaced without disturbance of the others.

The drawings represent in Figure 1 a perspective view, and Fig. 2 is a vertical sectional elevation of a galvanic battery complete on line 3. 3. in Fig. 3. Fig. 3 is a sectional plan on line 1. 1. in Fig. 2 of the tray with electrode connections. Fig. 4 is a side view of a carbon; Fig. 5, a cross-section of the same on line 4. 4. Fig. 6 is a horizontal section of the tray in part on line 2. 2. in Fig. 2. Fig. 7 is a vertical section on line 5 in Fig. 3 showing in part the connection of the circuit-closers with the tray.

In the above drawings the exterior casing or battery box consists of a cover 2 and a body 3. This lower portion is a seamless or molded box of rectangular shape and preferably composed of acid-proof material to contain the acid solution and divided into a series of cells. Within this box are to be assembled the various elements which go to make up a working battery. These comprise the usual porous cups 4, the carbons 5 and the zincs. In this instance the latter are shown as small oblong boxes 6 open at the top and are employed for their compactness of form and economy in space, while displaying a large exposed surface.

Since the various co-operating instrumentalities are continually deteriorating and require frequent renewal, it is necessary that each and every part, although affixed in some way to preserve the proper relative position with the other parts, shall be capable of ready disengagement and removal.

To carry out my invention particularly with respect to the carbons, and at the same time provide an acid-proof chamber for the location of the various electrode connections, I proceed as follows.

Within the upper portion of the box and resting upon the partitions 7 which subdivide the box vertically I have positioned an element which I term a tray 8. This latter is to snugly fit the interior of the box and is made up of a horizontal plate 9 with a continuous flange or web 10 which extends about it. Upon the lower side of the plate are formed or attached ribs 12 adapted to create pockets 13, which in number correspond with the number of the carbons. The latter are of the shape as shown in Figs. 4 and 5, that is, they are preferably bifurcated and terminate at the top in a screw-threaded cylindrical stem 14. Each pocket in the tray is centrally bored while metallic nuts engage the said stems, which project through the plate 9. After the carbons are firmly secured to the tray in a pendent position, the cells are filled wholly or in part with a sealing compound, indicated at 15 in the drawings. By this arrangement it will be easily understood that the escape of acid fumes or vapors from below is effectually prevented from passing through the tray at the point where the latter is pierced for their attachment to said tray. Furthermore a great advantage accrues from this construction and this is due

to the fact that any single carbon can be removed, a new one put into its place, and no disturbance of the remaining ones need occur.

Since it is necessary to electrically unite the carbons with the zincs, I have provided circuit-closers in the shape of thin plates 16, vertically positioned. Since this is a four cell battery these plates are four in number one for each zinc and are bent at the upper extremities and secured by a binding screw or nut 17 to the under side of the tray as shown. The zincs 6 as before mentioned are of rectangular shape and rest upon the bottom of the body 3 of the casing, while the pendent plates 16 being contiguous thereto present a large contact surface. This contact is clearly illustrated in Fig. 7 of the drawings. When the sealing compound is inserted in the pockets these fastening devices are covered and protected, and as they extend through the tray are connected to the proper carbons by the wires 18. A series of bosses 19 are created in the tray in which fastening screws 20 enter to unite the tray and cover. A gasket or packing 21 is disposed between the cover 2 and the flange of the tray and a sealed joint is produced. Hence the tray, the carbons and all electrode connections are fastened to the cover and are removed with said cover. Fastening screws 23 unite the cover to the body or casing 3 of the battery.

To secure the porous cups 4 removably to the bottom of the casing 3 a series of exterior knobs 24 are created which permit the fastening screws 36 to enter without perforating the bottom. Thus by my method of construction I create an imperforate molded box or casing for galvanic batteries. This is a positive preventive to leakage and enables the battery to be used as a portable one with entire safety. Moreover the tray enables any carbon to be removed without disturbance of the others, while the sealing compound allows the space in the top of the tray or that between the plate 9 and the cover 2 to remain free from acid fumes.

To electrically unite the various elements composing the battery with two terminals or electrodes proper 26 26′ in order to establish a circuit with a motor, lamp or other object to be supplied, I have mounted two spring metallic circuit closers 28. 28′ preferably in a horizontal position within the tray beneath the cover; the closer 28 being wired to a carbon, the closer 28′ to a zinc. Located above them, but attached to the cover are similar closers 29 29′ from which project stiff wire rods 30 30′. These are bent as shown and enter the front wall of the casing. In alignment with them and affixed exteriorly to the casing are the terminals or electrodes proper 26. 26′ before mentioned. These consist of spring plates bifurcated above at 27. 27′. One of these ears or clips is bent back to contact with the rods 30. 30′, while the corresponding ones extend forward to serve as hooks upon which to suspend a lamp, if so desired. The lower ends 31. 31′ are pointed and rounded in part to receive wires which may extend to a motor or device. A switch is secured centrally of the cover and comprises a post 32 with a circuit-breaker or lateral arm 34, which serves to press back one of the closers 28. 28′ from contact with the closers 29. 29′ on the cover, thereby breaking the circuit.

It will be seen that the gasket or packing 21 extends over the edge of the casing 3 and between it and the cover. Hence it not only seals the joint between the tray and the cover, but likewise that between the cover and the box.

What I claim is—

1. In a galvanic battery comprising an imperforate walled box, having a number of cells therein, an exterior boss on the bottom of the box for each cell, and corresponding to the porous cups within, combined with the porous cups, fastening elements which pass through the porous cups and enter said bosses, zinc electrodes, a transverse tray provided with a pocket in its under side above each cell, a carbon secured to and pendent from the tray in each pocket, means to seal the tray to the cover, and means to convey away the current; each pocket being provided with a sealing compound to prevent the acid fumes from escaping upward around the upper ends of the carbons, substantially as set forth.

2. In a galvanic battery, a box having imperforate walls, and containing a number of cells, a flanged tray placed in or upon the top of the box, a cover applied to the top of the tray and forming with the tray a sealed chamber, electrode connections within the chamber, a pocket in the under side of the tray above each cell, a carbon connected at its upper end to the tray within each pocket, and a zinc electrode in each cell; the pockets being filled with a sealing compound around the upper ends of the carbons to prevent the upward escape of acid fumes, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WARREN P. FREEMAN.

Witnesses:

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