

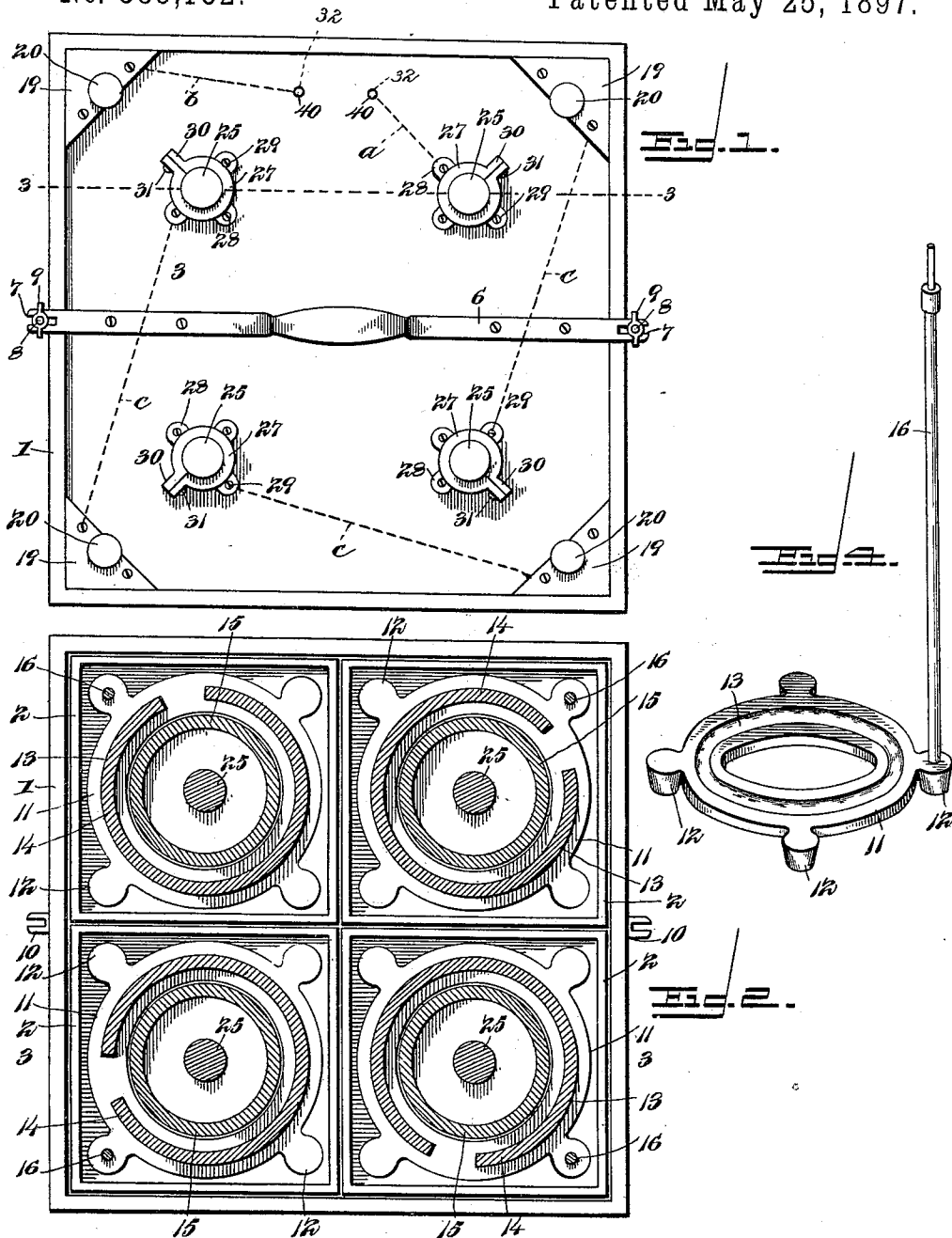
(No Model.)

2 Sheets—Sheet 1.

H. M. SUTTON & W. L. STEELE.
PRIMARY BATTERY.

No. 583,132.

Patented May 25, 1897.



Witnesses

E. H. Stewart
L. P. Hollander

By their Attorneys,

Inventors
Henry M. Sutton
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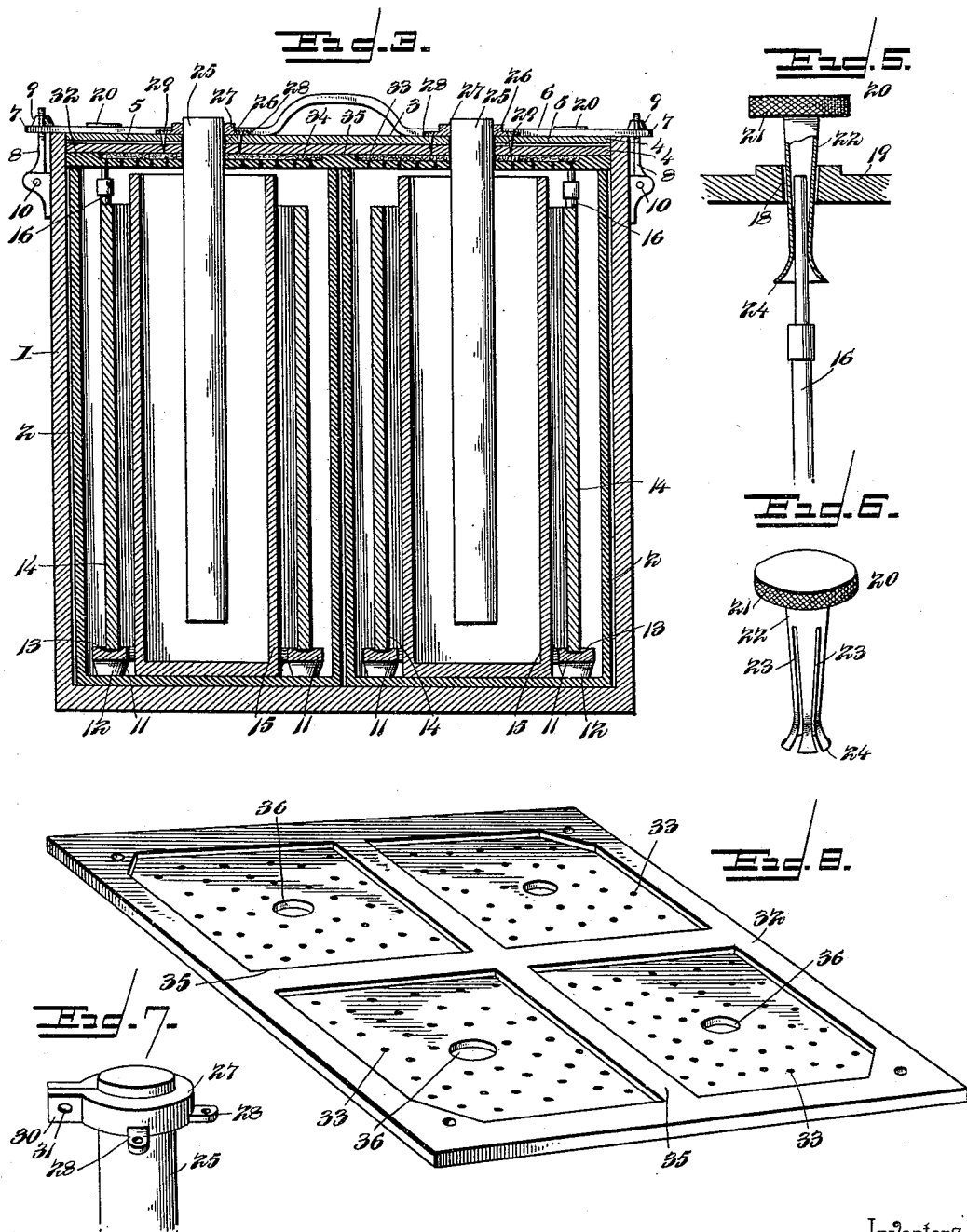
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UNITED STATES PATENT OFFICE.

HENRY M. SUTTON AND WALTER L. STEELE, OF DALLAS, TEXAS, ASSIGNORS
OF ONE-THIRD TO MICHAEL COERVER, OF SAME PLACE.

PRIMARY BATTERY.

SPECIFICATION forming part of Letters Patent No. 583,132, dated May 25, 1897.

Application filed March 17, 1896. Serial No. 583,588. (No model.)

To all whom it may concern:

Be it known that we, HENRY M. SUTTON and WALTER L. STEELE, citizens of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented a new and useful Primary Battery, of which the following is a specification.

This invention relates to primary batteries; and it has for its object to simplify the construction of batteries of this character whereby the parts thereof may be readily removed and replaced without special tools by unprofessional persons, while at the same time providing a construction of primary battery involving new and useful connections for the positive and negative elements thereof.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a top plan view of a complete primary battery constructed in accordance with this invention. Fig. 2 is a similar view, partly in section, with the cover removed. Fig. 3 is a vertical transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is a detail in perspective of the copper ring-support for the zinc cylinder or positive element. Fig. 5 is an enlarged detail sectional view illustrating the connection between the connecting-plug and conductor-rod for the copper ring-support. Fig. 6 is a detail in perspective of one of the connecting-plugs. Fig. 7 is a detail in perspective of the clamp-ring fastening for the carbon pencil or negative element of the battery. Fig. 8 is a detail in perspective of the absorption pan or tray.

Referring to the accompanying drawings, the numeral 1 designates a substantially rectangular cell case or box, made in any suitable size to accommodate therein a group or series of battery-cells 2, which are made in the usual manner of hard rubber or glass and rest within the case or box 1, directly on the bottom thereof.

The cell case or box 1 is made of wood or metal, and is adapted to be inclosed at its open upper end by the case-cover 3. The

case-cover 3 is preferably laminated and consists of the separate cover-sections 4 4, secured together in any suitable manner and preferably having formed therebetween suitably-arranged wire-grooves 5, adapted to receive therein the connecting-wires for the carbon or negative elements of the battery, as will be more particularly referred to. The cover 3 has fastened on the upper side thereof a transverse fastening strap or bar 6, the opposite ends of which project beyond the side edges of the cover and are provided therein with the notches 7 to detachably receive the pivoted clamp-screws 8, carrying the thumb-nuts 9 and pivotally mounted at 10 at opposite sides of the cell case or cover 1, near the open upper end thereof. It will be obvious that when the cover 3 is fitted within the open upper end of the case or box 1, over the open upper ends of the cells 2 therein, it is simply necessary to swing the screws 8 into engagement with the notched ends of the strap or bar 6 and to tighten the nuts 9 to provide for tightly and securely fastening the cover in position. The said fastening strap or bar 6 is further provided centrally between its ends with a handle portion 10, which provides convenient means for the ready handling and carrying about of the battery.

While any desired number of cells 2 may be arranged within the case or box 1, a group of four cells is illustrated for the purposes of this invention, and each of said cells 2, which is independently removable from the case or box, is adapted to have removably seated within the same and on the bottom thereof a ring-support 11. The ring-support 11 is of a diameter nearly equaling the interior area of the cell within which it is arranged, and is preferably made of copper in order to provide for the ready conducting of the electric current. The said ring-support 11 is provided with a peripheral series of short depending supporting feet or lugs 12, which rest directly on the bottom of the cell and provide for a slight elevation of the ring-support above the bottom of the cell, and the said support is provided in its upper face with an annular rest-groove 13, which receives the lower end of the zinc cylinder 14, which forms the positive element of each cell of the battery. By reason

of arranging the zinc cylinder 14 directly on the ring-support 13 it will be obvious that such cylinder can be readily removed and replaced, and besides serving to properly support the zinc cylinder 14 within the cell the said ring-support 13 provides for properly positioning the porous battery-cup 15. The porous battery-cup 15 is of an ordinary form and subserves its usual function, but in the present invention the lower closed end of said battery-cup rests directly on the bottom of the cell and is disposed inside of the ring-support 13 for the zinc cylinder or positive element of the battery, thereby providing an arrangement which insures the proper positioning of the porous cup 15 in the center of the cell.

In order to provide for the completion of the electric circuit with the zinc cylinder or positive element 14 of each cell, the copper ring-support 11 in the cell has suitably connected to one of the peripheral supporting feet or lugs 12 thereof the lower end of an upright conductor-rod 16, which extends up the entire height of the cell and the upper end of which is designed to project through the cover 3 and centrally into a tapered opening 18, formed in a metallic corner-plate 19, fitted to the upper side of the cover 3, and said upper end of rod 16 is designed to be detachably engaged by a connecting-plug 20. The connecting-plug 20 essentially consist of a thumb-head 21 and a tubular tapered shank 22, working within the tapered opening 18 of the plate 19 over the upper end of conductor-rod 16. The said tubular tapered shank 22 of the plug 20 is provided with a series of longitudinal slits 23 and an outwardly-flared lower end 24, which latter part of the plug prevents its withdrawal from the opening 18 and also assists in guiding the upper end of rod 16 within the tubular shank of the plug. This plug when forced down onto the upper end of rod 16 and within the opening 18 completes a direct metallic connection between the zinc cylinder or positive element 14 and the plate 19, with which plate suitable wire connections are designed to be made in any suitable manner. By reason of preferably employing a group of four cells within the case or box it will be observed that the plate 19 for each of the cells is secured to the cover at one of the corners thereof, so the said cover is illustrated as being provided with a corner-plate 19 at each of its four corners.

Each cell of the battery is completed by a carbon pencil or negative element 25, which is substantially of the same length as the porous cup 15 within the cell, and is disposed centrally within such porous cup. The carbon pencil 25 for each cell extends at its upper end through an opening 26, formed within the cover 3, and is detachably clamped within a split clamp-ring 27, arranged on top of the cover 3. The split clamp-ring 27 is provided with a series of offstanding screw-eyes 28 to receive fastening-screws 29 for fasten-

ing the clamp-ring to the outer side of the cover, and said ring is further provided at its contiguous ends with the parallel clamp-lugs 30, which receive the clamp-screw 31 for tightening and loosening the clamp-ring on the upper extremity of the carbon pencil to provide for the ready removal and replacing thereof when necessary. In connection with the several carbon pencils carried by the cover 3 it is to be noted that the wires arranged in the wire-grooves 5 of the cover are suitably connected therewith and are arranged in a suitable manner to provide for completing the proper circuit with the corner-plates 19, as will be readily understood by those skilled in the art.

The wire-receiving grooves 5 are plainly illustrated in the sectional view of Fig. 3 of the drawings, but to illustrate the manner of arranging these grooves when the cells of the battery are wired in series the proper circuit connections are indicated in dotted lines on Fig. 1 of the drawings, it of course being understood that the wire-receiving grooves 5 follow the disposition of the wires therein. In connection with the wiring of the cells, as illustrated in Fig. 1 of the drawings, the case-cover 3 has fitted thereto a pair of ordinary binding-posts 40, respectively having the wires *a* and *b* connected therewith. The terminal of the wire *a* opposite its connection with the binding-post 40 is connected with the metallic clamp-ring 27 for an adjacent carbon pencil 25, while the terminal of the wire *b* opposite the binding-post 40, with which it is connected, is connected with an adjacent metallic corner-plate 19. To complete the proper series connection between the cells, a series of circuit-wires *c* are employed, each wire *c* being connected at one terminal to the metallic clamp for the carbon pencil of one cell and at its other terminal with the metallic corner-plate 19 for the next adjacent cell.

A soft-rubber absorption pan or tray 32 is adapted to be arranged within the upper end of the case or box 1, directly on top of the cells 2 therein, so that when the cover 3 is fastened in place on top of the pan or tray 32 the open upper end of the cells 2 will be covered in a perfectly air-tight joint. The pan 32 is provided over each of the cells 2 with a series of vent-openings 33 and is designed to be filled with a suitable absorbent packing 34, preferably moistened with soda or common water, so as to absorb and neutralize the fumes liberated by the chemical action within each cell and which rise through the vent-openings 33. The pan 32 is partitioned by the partition-strips 35, so as to be provided with a separate section for each of the cells, and each section of the pan or tray is provided therein with a pencil-opening 36 to receive the carbon or negative element of the cell.

From the foregoing it is thought that the construction and many advantages of the herein-described primary battery will be read-

ily understood by those skilled in the art without further description, and it will also be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a primary battery, the combination of the cell-case, a plurality of cells arranged within the case, a case-cover provided at its corners with metallic plates, and with interior wire-receiving grooves leading to said corner-plates, conductor-wires arranged in said wire-receiving grooves and having metallic connection with the corner-plates, the zinc or positive battery elements arranged in the cells and having metallic connections with the corner-plates, and the carbon or negative elements for each cell fitted at their upper ends in openings in the case-cover and having metallic connection with the wires in said wire-receiving grooves, substantially as set forth.

2. In a primary battery, the combination with the cell-case having a cover, the cell, the zinc cylinder, porous cup, and carbon element; of an independent metallic supporting-ring encircling the lower end of the porous cup and provided with a peripheral series of supporting-feet resting on the bottom of the cell, and an annular rest-groove in its upper

face to receive the lower end of the zinc cylinder, a conductor-rod having a connection with said supporting-ring and extending above the top of the cell, and a detachable plug passing through the cover and engaging with the upper end of said conductor-rod, substantially as set forth.

3. In a primary battery, the cell-case, the cell arranged within the case, the zinc cylinder and porous cup and carbon element respectively arranged in proper relation within the cell, a metallic supporting-ring encircling the porous cup and removably seated within the bottom of the cell to support thereon the zinc cylinder, an upright conductor-rod connected at its lower end with said supporting-ring, the case-cover carrying a metallic plate provided with a tapered opening therein, and a connecting-plug passing through said opening and engaging the upper end of said conductor-rod, said plug essentially comprising a thumb-head and a longitudinally-slitted tubular tapered shank provided with an outwardly-flared lower end, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

HENRY M. SUTTON.
WALTER L. STEELE.

Witnesses:

W. D. SAMPSON,
R. LIEBMAN.