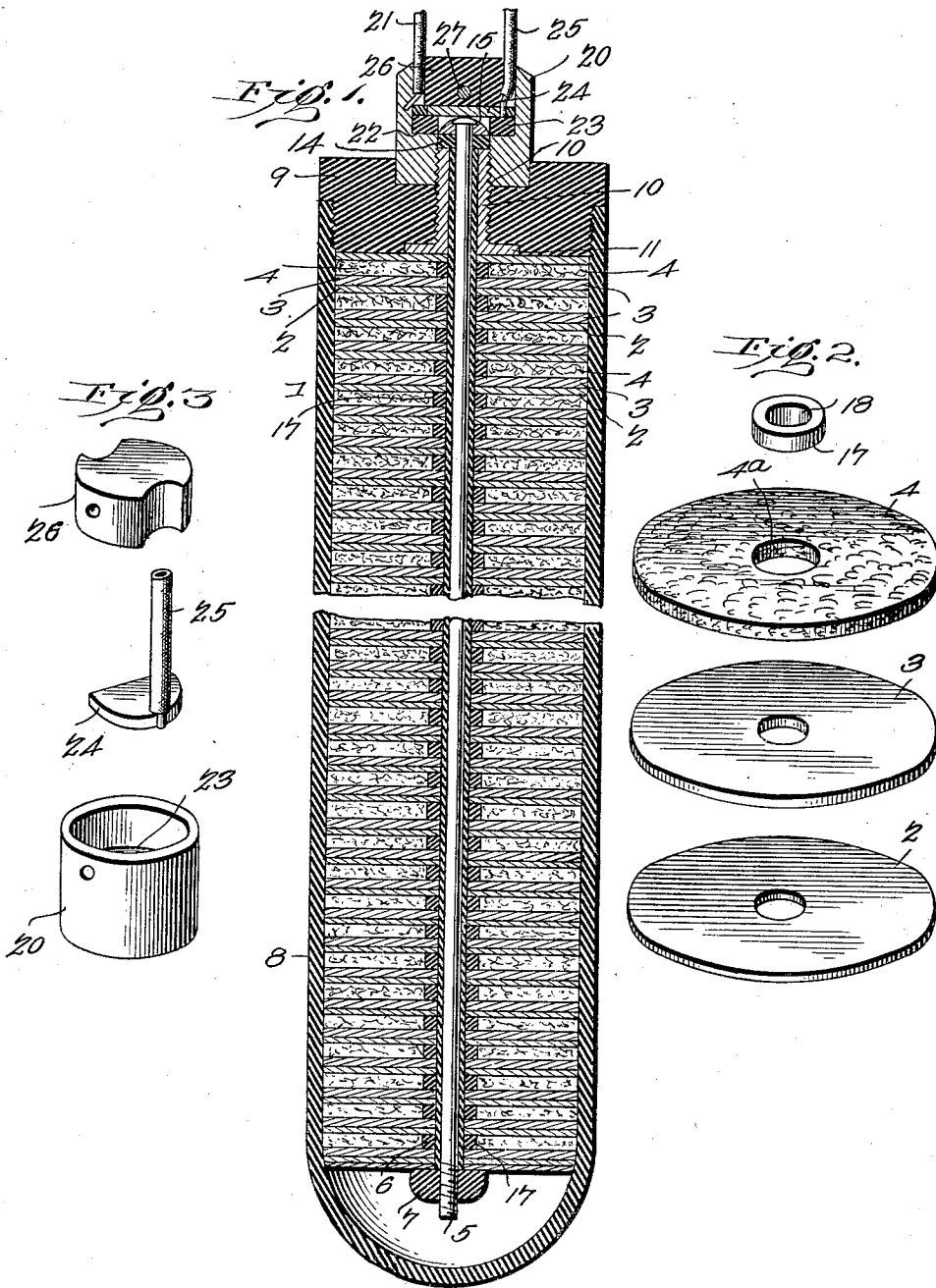


G. S. BENNETT.  
BATTERY.

(Application filed Aug. 6, 1901.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE SEDOM BENNETT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO  
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## BATTERY.

SPECIFICATION forming part of Letters Patent No. 701,253, dated May 27, 1902.

Application filed August 6, 1901. Serial No. 71,095. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE SEDOM BENNETT, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a new and useful Battery, of which the following is a specification.

My invention relates to certain improvements in electric batteries; and the object of the invention is primarily to construct a compact and acceptable form of voltaic pile of simple construction and of the highest efficiency and to render the same liquid-proof and odorless, so that it may be carried in the pocket or at other convenient points without danger of leakage.

A further object of the invention is to so construct a battery as to insure the retention of moisture by the absorbent layers between the elements of the battery and to provide for the convenient attachment of conducting-wires to the battery.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as well be hereinafter more fully described and particularly pointed out in the claims, it being understood that changes may be made in the form, proportions, and minor details without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of an electric battery constructed and arranged in accordance with my invention. Figs. 2 and 3 are views of detail of the battery structure, more particularly referred to hereinafter.

Referring to the drawings, 1 represents a voltaic pile formed, as usual, from a series of positive and negative elements—in the present instance, copper and zinc separated by a layer or disk of felt or similar absorbent material—2 representing the copper disks, 3 the zinc disks, and 4 the disks of felt or other absorbent material. The disks are all centrally perforated, and through the line of perforation extends a metallic rod 5, surrounded by a tube 6, of rubber or similar non-conducting material, the lower end of the rod being screw-

threaded and provided with a nut 7, also of conducting material, which is in electrical contact with the lowermost element of the battery. The pile is removably fitted within an elongated cylindrical casing 8, preferably formed of hard rubber, closed at its lower end and at its upper end being provided with internal screw-threads for the reception of a closely-fitting cap or cover 9, also formed of hard rubber, a liquid-proof joint being formed by the screw-threaded connection which will prevent the escape of the acid and acid fumes. Extending centrally through the cap is a threaded collar 10, having a lower flange 11 in electrical contact with the uppermost element of the battery, this collar forming one of the battery-terminals. Through the collar extend both the rod 5 and the insulating-tube 6, the latter terminating at the upper end of the collar, at which point a disk 14 is placed around the rod 5, and the upper end of the rod is firmly secured to a contact-block 15, forming the opposite battery-terminal.

The various battery elements are held to the cap or collar 9 and clamped in place by the nut 7, so that the unscrewing of the cap or cover from the containing casing will enable the removal of the battery as a whole.

The disks 4 are saturated with an electrolyte of any suitable character and are clamped by the nut 7 between the positive and negative elements of each series. In order to prevent excessive compression of the absorbent disks and the consequent reduction of their capacity for the absorption of the electrolyte, the central perforations 4<sup>a</sup> of the disks 4 are somewhat larger in diameter than the aligning perforations of the elements, and in this enlarged perforation is placed a small collar 17, of hard rubber, vulcanite, or other non-conducting materials, having a central opening 18, which will permit the passage of the tube 6, and being of a height about equal to the thickness of the absorbent disk. This non-conducting collar rests against and between the opposing elements of one series, and the whole series of collars, together with the intervening metallic battery elements, forms a practically incompressible column between

the collar 10 and the lower nut 7, the nut being screwed sufficiently tight to clamp all of the disks in place, but any undue compression of the absorbent material being prevented.

5 On the upper threaded end of the collar 10 is screwed a socket 20, with which is electrically connected one end of a line-wire 21, the screwing on of the socket member bringing the line-wire into electrical contact with the collar 10, which forms an upper terminal of the battery. The head of the socket member is recessed and is provided with a flange 22, on which is seated a ring 23, of insulating material, the latter forming a support for a metallic disk 24, secured to the end of the line-wire 25 and held in place within the socket by an upper block 26, also of insulating material, the various insulating-sections serving to prevent any contact between the plate 24 and the metal portion of the socket. The upper block 26 is removably held in place by a pin 27, so that the various portions of the socket member may be readily disassembled and repaired when occasion requires. The plate 24 is so arranged that on the screwing up of the socket it will be brought into electrical contact with the metallic block 14 and the head of the conducting-rod 5, and thus place the line-wire 25 in electrical connection with the lower end of the battery. When the battery is to be charged, the socket member may be removed in order to prevent the soiling of the line-wires, the latter in an apparatus of this kind being preferably covered by expensive silk braiding.

A battery constructed as described is liquid-proof and may be carried in the pocket without danger of leakage or dripping of the acid fluid upon the body or clothing, and it possesses many advantages for use in connection with electrotherapeutics which will be readily apparent. The battery as a whole may be removed from the casing by simply unscrewing the top cover, and the various battery elements may be disassembled by the removal of the single holding-nut 7. The positive and negative terminals are brought to a convenient point at one end; and by employment of the socket member no auxiliary binding-post or other terminal connections are rendered necessary.

Various slight changes may be made in the details of construction herein specified within the scope of the claims without departing from the spirit or intent of the invention, and hence I do not wish to be understood as limiting myself to the precise details of construction herein set forth.

60 Having thus described my invention, what I claim is—

1. A battery comprising in combination, a casing, a cap therefor, a voltaic pile, a sleeve secured in the cap and forming one terminal of the battery, a conducting and supporting

rod for the pile, forming the opposite terminal of the battery, said rod extending through but insulated from the sleeve and serving to firmly connect the battery elements to the cap.

2. A battery comprising a voltaic pile, a casing inclosing the same, a cap or cover arranged at the upper end of the casing and to which the voltaic pile is secured, terminal connections carried by said cap or cover, a socket member removable from the cap and having terminal contacts connected to the line-wires, said contacts being adapted to make contact with the terminal connections of the cap or cover when the socket member is in place.

3. The combination in a battery, of a casing, a cap therefor screwing into the casing, a voltaic pile secured to and carried by the cap, a sleeve carried by the cap and forming a terminal connection from the uppermost of the battery elements, a conductor-rod passing through the sleeve and insulated therefrom and forming a terminal connection from the lowermost of the battery elements, and a socket member connected to one of the line-wires and adapted to said sleeve, and an inner contact carried by and insulated from the socket member and connected to the opposite line-wire, substantially as specified.

4. The combination in a battery, of a casing, a central rod of conducting material, a series of disks of positive and negative elements supported on said rod and insulated therefrom, said central rod being in electrical contact with the lowermost element, a casing cap or cover of non-conducting material through which the central rod passes, a sleeve of conducting material passing through the cap and having a lower flange in contact with the uppermost element, and means for attaching the line-wires to the central rod and to the sleeve.

5. In the device of class specified, a socket-attaching member comprising a threaded socket electrically connected to a line-wire, a ring of insulating material supported on a shoulder within said socket, a contact-plate supported by said ring and in electrical contact with an opposite line-wire, and a securing-block of insulating material acting to hold said contact-plate in position.

6. A voltaic pile comprising a centrally-arranged rod of conducting material, a tube of insulating material surrounding the same, alternate layers of positive and negative electric elements arranged in series, disks of absorbent material situated between adjacent elements of opposite properties, and separating-sleeves of insulating material arranged around the tube at the central portions of the absorbent disks to prevent compression of said disks, substantially as specified.

7. A voltaic pile comprising in combination, a centrally-arranged rod of conducting material, a tube of insulating material sur-

rounding the same, perforated disks of positive and negative properties arranged on said tube, disks of absorbent material disposed between adjacent elements and having central perforations of a diameter greater than those formed in the elements, and separating-sleeves of non-conducting material fitting around the tube and arranged in the central perforation of each of the absorbent disks,

and a clamping-nut provided on the said central rod, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE SEDOM BENNETT.

Witnesses:

JOHN H. JAMES,

R. B. TREAT.