

(No Model.)

W. S. DOE.
BATTERY.

No. 576,095.

Patented Feb. 2, 1897.

Fig: 1.

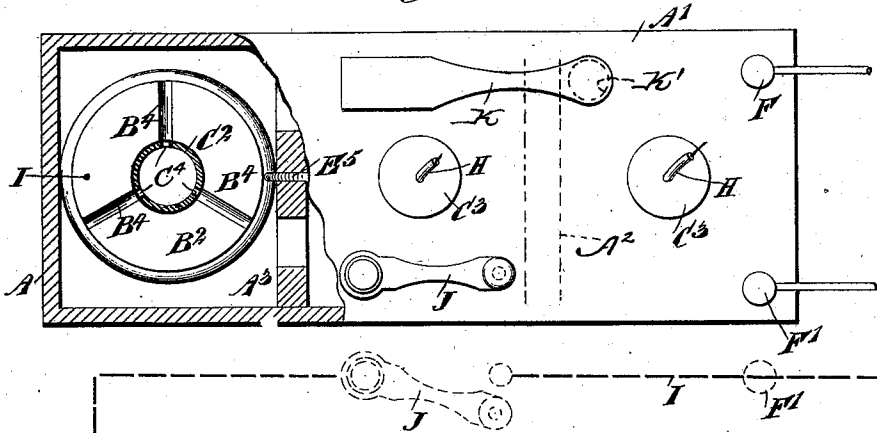


Fig: 2.

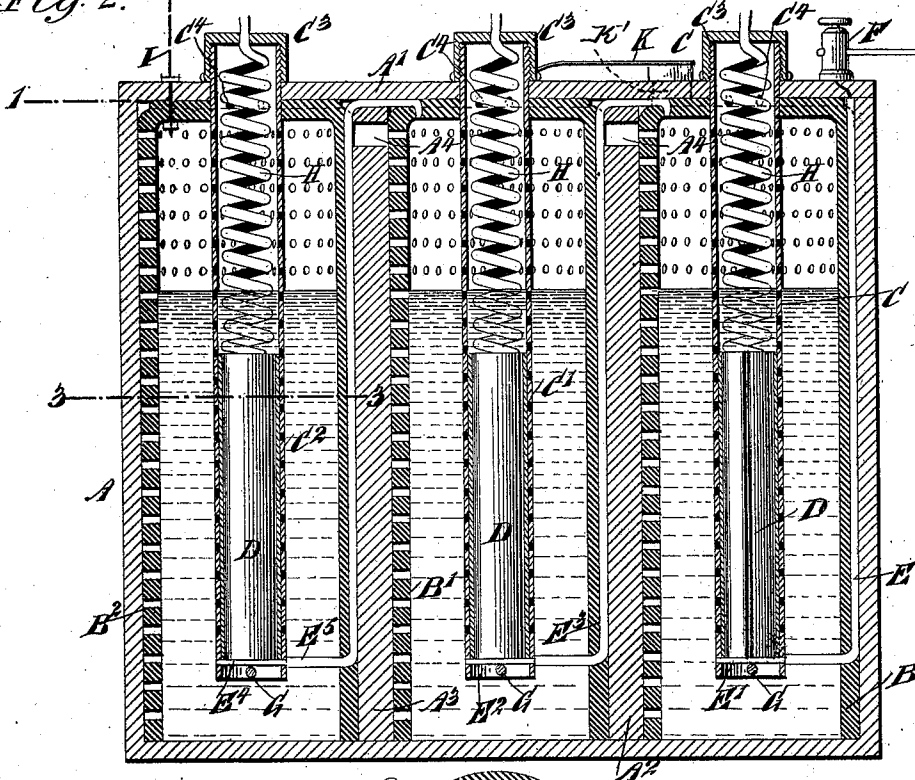
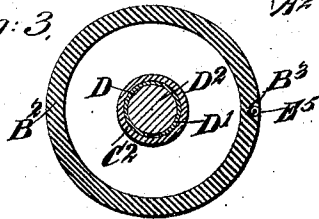


Fig: 3.

WITNESSES:
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UNITED STATES PATENT OFFICE.

WALTER S. DOE, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO
HENRY THOMPSON, OF SAME PLACE.

BATTERY.

SPECIFICATION forming part of Letters Patent No. 576,095, dated February 2, 1897.

Application filed February 29, 1896. Serial No. 581,290. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. DOE, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Battery, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved battery designed for furnishing sufficient electricity for lighting electric lamps used on bicycles and other devices, the battery being arranged to permit the user to readily and conveniently recharge the same, so as to obtain a light for any desired length of time.

The invention consists principally of a perforated tube adapted to extend into the exciting fluid and adapted to receive a depolarizer.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement with part in section on the line 1 1 of Fig. 2. Fig. 2 is a sectional side elevation of the improvement, and Fig. 3 is a sectional plan view of part of the improvement on the line 3 3 of Fig. 2.

The improved battery is provided with a suitably-constructed casing A, having a cover A' and a series of transversely-extending partitions A² A³, forming a number of separate compartments in said casing, each compartment being adapted to form a cell of the battery. In the compartments are set the carbon cylinders (without bottoms) B B' B², adapted to receive an exciting fluid, such as diluted sulfuric acid, the walls of the cylinders being perforated to permit a circulation of the fluid in the respective compartments.

Into the exciting fluid of the several carbon cylinders B B' B² extend perforated tubes C C' C², respectively, preferably made of hard rubber and extending with their upper ends through the tops of the cylinders and a cover A', the extreme upper threaded end of each tube screwing into a cap C³, resting with its

lower edge on the top surface of the cover A'. Each of the tubes C C' C² is adapted to receive a depolarizing-cartridge D, comprising an anode consisting of a zinc cylinder D', split longitudinally and adapted to receive a solid chemical D², preferably made of fused nitrate of soda. The cartridge D can be readily inserted into each tube upon removing the cap C³, and said cartridge is of a desired length according to the length of time the electric light is desired to be burned.

The lower end of the cartridge D in the tube C rests on the bare end E' of a conducting-wire E, covered with a suitably-insulated material and extending from the tube through an opening in the wall of the cylinder B to a vertically-extending recess B³, formed in the outer peripheral surface of said cylinder. The upper end of the conducting-wire E passes through the cover A' to connect with a binding-post F, attached to the cover. The bare end E' is supported in place in the lower end of the tube C by a transverse rubber pin G, secured to the tube.

In order to hold the cartridge D in contact with the bare end E' of the wire E, I provide a spring H, covered with rubber or like material and secured to the cap C³ to press with its lower end on the top of the cartridge D. The cartridge D in the tube C' is likewise in contact at its lower end with the bare end E² of a conducting-wire E³, similar to the wire E and extending into a groove in the cylinder B' to connect with the top of the cylinder B, as plainly indicated in Fig. 2. A like connection is made between the top of the cylinder B' and the cartridge D in the tube C² by means of a conducting-wire E⁴, having its upper end E⁴ extending in the lower end of the tube C².

From the top of the carbon cylinder B² leads a conducting-wire I to a binding-post F', and in this wire is arranged a switch J, held on the outside of the cover A', to open and close the circuit whenever desired. The cartridges D in the tubes C' C² are held in place against the bare ends E² and E⁴ of the wires E³ and E⁵, respectively, by springs H, similar to the spring mentioned in connection with the tube C, it being understood, however, that all the springs are secured at their upper ends in the

caps for the respective tubes, so that when a cap is removed the spring can be lifted out of the tube to permit of inserting a new depolarizing-cartridge whenever the old one is used up. The conducting-wires E^3 and E^5 are preferably made of platinum, and the pins G for holding the same in place are preferably made of hard rubber.

In order to provide for the escape of gases forming in the casing A , I provide a spring-valve K , normally closing an opening K' in the cover A' , said opening leading to one of the compartments and the several compartments being connected with each other by apertures A^4 in the upper ends of the partitions $A^2 A^3$, as shown in Fig. 2.

The tops of the carbon cylinders $B B^2$ are formed with radial grooves B^4 , registering with apertures C^4 , formed in the tubes $C C^2$ to permit of draining the exciting fluid from the compartment when it is desired to renew the same.

Now it will be seen that by the arrangements described a sufficient current of electricity is generated by the battery to light an electric lamp and keep the same burning, say, for two or three hours. The duration of burning the light depends on the size of the depolarizing-cartridge, which can be manufactured in different lengths, according to requirements. It will further be seen that in case a cartridge is entirely dissolved it can readily be replaced by a new one, the operator for this purpose simply unscrewing the cap C^3 of the corresponding tube or of all the tubes to insert a new cartridge in each tube and to replace the cap with its spring.

It is understood that the exciting fluid in the battery lasts for a number of cartridges in each tube $C C^2$, and consequently renewal of the exciting fluid is not necessary whenever the new cartridge is inserted. The chemical with which the zinc cylinder D' is filled is preferably in a solid form in the shape of cylinders, pills, or the like. It is further understood that the spring H will always hold the cartridge in contact with the bare end E' of the platinum conducting-wire, so as to insure a constant contact-generation of electricity, and consequently a steady light in the lamp.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. A battery, comprising a carbon cylinder adapted to receive an exciting fluid, a perforated non-conducting tube suspended in said cylinder, a cartridge in said tube comprising a cylindrical anode having an outward opening and a depolarizer in the anode, and a contact with which the anode engages, substantially as specified.

2. A battery comprising a hollow cathode, a perforated tube of non-conducting material suspended therein, an anode in said tube having a side opening, a depolarizer in said anode, a conductor-wire for engagement with said anode, and means for yieldingly holding the anode against said wire, substantially as specified.

3. A battery, comprising a casing formed with a number of compartments, a carbon cylinder in each compartment and adapted to receive exciting fluid, a perforated non-conducting tube in each cylinder, a split zinc cylinder held in each tube, a depolarizer in each zinc tube and an electrical connection between a zinc cylinder and the next carbon cylinder, substantially as specified.

4. A battery-casing, comprising a number of compartments, a battery in each compartment, the several batteries being connected in series and each battery comprising a carbon cylinder, a non-conducting perforated tube suspended therein, and having its upper end projected through the cover of the casing, a cover for said projected end, a zinc cylinder removably fitted in the tube and having an outward opening and a depolarizing chemical in the zinc cylinder, substantially as specified.

5. A battery comprising a carbon cylinder adapted to receive an exciting medium, and having grooves formed in its top, a non-conducting perforated tube suspended from said top and having perforations registering with the grooves, a split zinc cylinder in the tube, a depolarizing agent in the zinc cylinder, and a contact-wire for engaging with the zinc cylinder, substantially as specified.

WALTER S. DOE.

Witnesses:

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JAMES M. HENLEY.