(No Model.)

A. V. MESEROLE.

BATTERY CELL.

No. 364,660. Patented June 14, 1887.

Fig. 1.

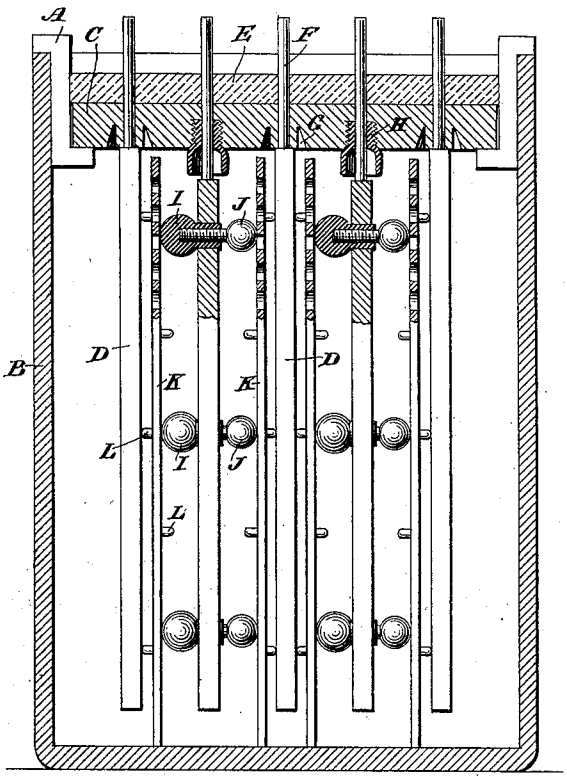


Fig. 2.

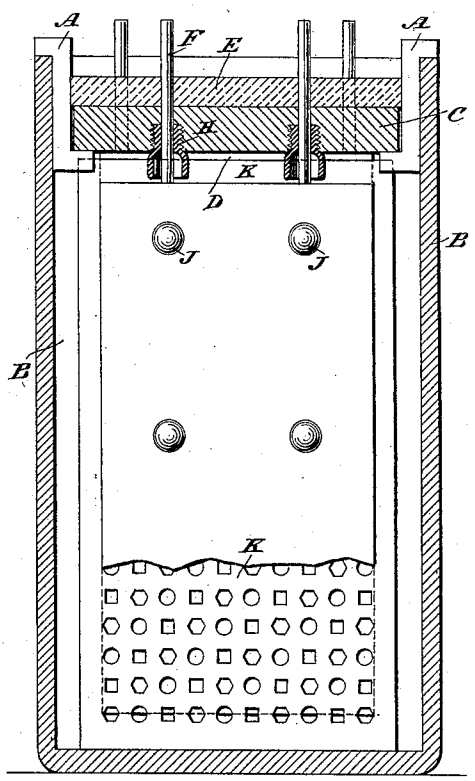
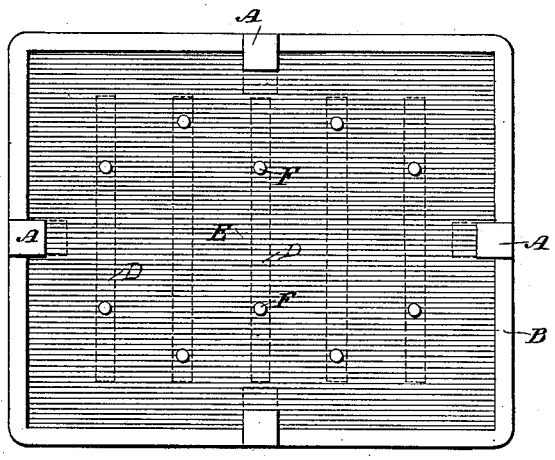


Fig. 3.



Witnesses

Jeff Chandlee

C. B. Creecy

Inventor

Abraham V. Meserole

By his Attorneys

Offield Towler & Shelf

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ABRAHAM V. MESEROLE, OF NEW YORK, N. Y., ASSIGNOR TO THE RIVER AND RAIL ELECTRIC LIGHT COMPANY, OF WEST VIRGINIA.

BATTERY-CELL.

SPECIFICATION forming part of Letters Patent No. 364,660, dated June 14, 1887.

Application filed December 1, 1886. Serial No. 220,392. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM V. MESEROLE, a citizen of the United States, residing in the city of New York, county and State of New York, have invented a new and useful Improvement in Battery-Cells, which I desire to protect by Letters Patent of the United States, and of which the following is a specification, this application being designated as Case D.

My invention has for its object to provide cheaper and more convenient means for supporting the top of the cell than have heretofore been used and more efficient devices for securing insulation between the plates than have heretofore been known; and it consists of certain details of construction, hereinafter described, and pointed out in the claims.

In the drawings annexed, forming a part of this specification, Figure 1 is a vertical section of a battery made according to my invention, taken at right angles to the plates. Fig. 2 is a vertical section of the same, showing the side of one of the plates; and Fig. 3 is a plan view.

Heretofore it has been common to provide a support for the top piece of the cell by cutting away a shelf or shoulder along the inside of the mouth of the cell, or by forming a ridge therein projecting inwardly. The former construction has the disadvantage of weakening the cell, and the latter is inconvenient to construct for the reason that the cheapest way to make these cells is by the use of a plunger for forming their interior surfaces. Moreover, an inwardly-projecting ridge interferes with the introduction of the battery-plates, making it necessary to use narrower plates than the width of the cell.

The support which I propose to use consists of a detachable clip or bracket, A, provided with an arm at each end, one of these arms projecting over and catching upon the top of the cell B, and the other arm receiving the weight of the cell-top C, from which the battery-plates D may be suspended. These brackets A throw the weight of the top vertically upon the sides of the cell instead of giving an oblique strain, as is the case where the top is supported on an inwardly-projecting shelf. They may be applied to cells of all materials with equal advantage and to cells of all sizes and shapes. They may therefore be made in such quantities as to cost little. They take up but little room in the cell and permit removal of the top without inconvenience. The top pieces are recessed to receive the brackets, as shown in Fig. 3, and, holding them against the sides of the cell, the structure as a whole is strong and durable.

The layer E is the ordinary filling of wax or pitch or similar material, which is poured in and allowed to solidify above the top piece. This filling of wax or pitch, however, is not a necessary part of the battery. I find, in fact, that when the top is set down into the cell, as is the case when my improved support is used, the wax or pitch filling may be in many cases dispensed with, as there is little liability of the liquid to slop out of the jar.

A difficulty experienced where battery-plates are suspended from a top piece has been that liquid bridges have been likely to form along the under side of the top piece from one plate to the next. To prevent this, I propose to provide the under side of the top piece with recesses about the conductor extending from the plate up into the top piece, which shall cause the liquid to collect and drop back into the cell.

In the drawings the upwardly-extending conductor is shown at F, and the recess in the plate about it at G. The recess may be circular or polygonal. An equivalent construction would be that of an umbrella insulator surrounding the conductor, which I have also shown, the recess being furnished between the conductor and the inside sloping surface of the umbrella shaped insulator H. I suppose, in fact, that any sort of an irregularity on the surface of the top piece about the conductor would cause the liquid to form into drops and fall back, and that this might be secured by a projecting ridge as well as by a recess. I do not confine myself to any particular material in the construction of the brackets or of the umbrella insulator. I find hard rubber to be a good material for both.

My invention further consists of improvements in the bolts passing through the plates, the heads of which serve to separate adjoining

plates from each other. I propose to make these bolts in two parts, I and J, the part I being in effect a head or nut for the bolt J, this nut being extended through the plate, the object of this extension being to give a stronger hold to the nut upon the bolt than the nut would have otherwise.

Battery-plates, especially when they are made of laminæ, have in use a tendency to expand or bulge, which throws considerable strain upon the bolts, and is likely to tear off the nuts if they have only a short screw-bearing upon the bolts. Bolts constructed according to my present invention might be used without the screw-thread between their two parts, since the length of bearing between the parts is such that it will hardly be possible for the plates to bulge sufficiently to permit either part of any bolt to fall out were the screw-threads omitted. If made without screw-threads, other materials than hard rubber—such as glass or earthenware—might be used. I find it desirable to use these insulating-bolts upon the negative plates of a secondary battery, and to place between each two adjoining plates, in comparatively close proximity to the positive plate, a grating or perforated plate of insulating material, (shown at K,) which is provided upon the side next to the positive plate with nipples or projections L. This grating prevents laminæ which may break off and fall down from the negative plate from striking the positive plate and forming a bridge between the two. It is desirable that the space should be greater between the grating and the negative plate than between the grating and the positive plate, for the reason that breaking up of the negative plate is more likely to occur than of the positive plate, and if the grating were placed in close proximity to the latter there would be greater possibility that particles of metal might fall or project through its perforations.

It will of course be understood that I may use my improved insulating-bolt without using the grating; so, too, the grating may be relied upon alone for separating adjoining plates, and in that case it is desirable that the nipples or projections L be provided on both sides of the grating. The grating, however, may be used plain—that is, without the projections L—though these projections are desirable in order to permit the free circulation of the liquid between the grating and the plate and through the grating.

The material of which I propose to make the gratings is hard rubber, this being light and passive in the battery solution.

It will of course be understood that the several features of my invention—to wit, the supporting-clips, the insulating-grooves, the separating-bolts, and the grates—may each be used with or without any or all of the others.

Having thus described my invention, what I desire to claim and protect by Letters Patent is—

1. A battery-cell provided with detachable clips or brackets for supporting the cell top piece.

2. A battery-cell having a plain interior surface and provided with detachable clips for supporting the cell top piece.

3. A battery-cell provided with detachable clips for supporting the cell top piece, the said top piece being recessed to receive the clips.

4. A battery-cell provided with a two-armed clip for supporting the top piece.

5. As an article of manufacture, a two-armed or Z-shaped clip for supporting battery-cell tops.

6. The combination, with the battery-cell top piece, of plates suspended therefrom, and conducting-rods passing from said plates up through said top piece, said top piece being provided with intercepting irregularities of formation about the conducting-rods, whereby the formation of liquid bridges between the adjoining plates is prevented, substantially as set forth.

7. The combination, with a battery-cell top piece, of plates arranged in said cell and conducting-rods passing from said plates up through said top piece, the said top piece being provided with an intercepting recess about the conducting-rods, whereby the formation of liquid bridges between the adjoining plates is prevented, substantially as set forth.

8. An insulating-bolt separator for battery-plates, provided with a bolt-head prolonged so as to pass through the plate about the bolt, substantially as and for the purpose set forth.

9. A separating-bolt for battery-plates made in two parts, one part being adapted to receive the other, and both parts, when applied to the plate, passing through the same from side to side.

10. In a battery, a separating-partition consisting of a perforated hard-rubber plate.

11. In a battery, a separating-partition consisting of a perforated hard-rubber plate provided with lateral projections.

12. A battery wherein all the negative plates are provided with insulating-bolts and separating hard-rubber grates are placed in proximity to the positive plates, said bolts bearing against said grates.

ABRAHAM V. MESEROLE.

Witnesses:
M. H. PHELPS,
ALBON MAN.