(No Model.)

L. DRESCHER.

GALVANIC CELL.

No. 369,505. Patented Sept. 6, 1887.

Fig. 1.

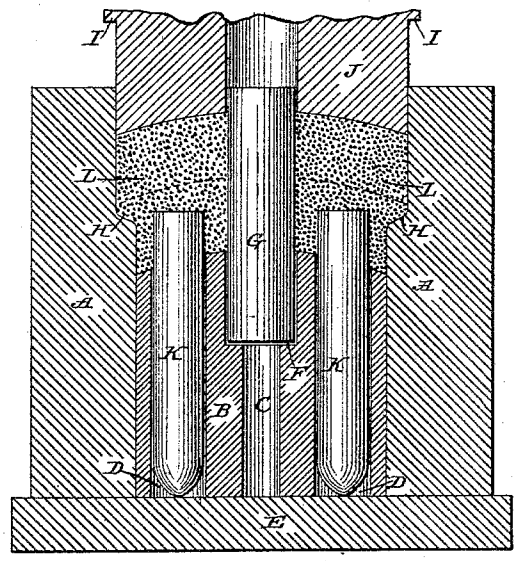


Fig. 2.

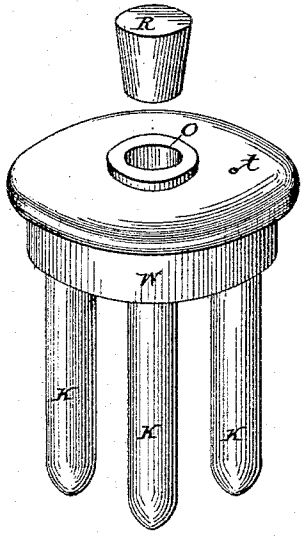


Fig. 3.

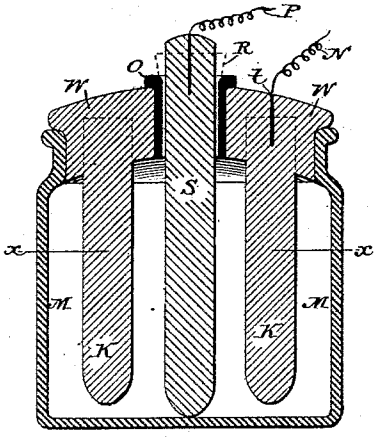


Fig. 4.

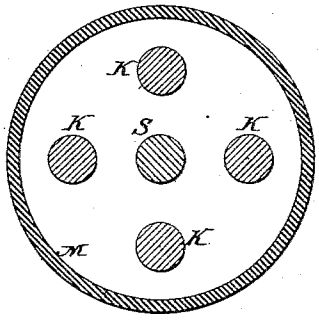
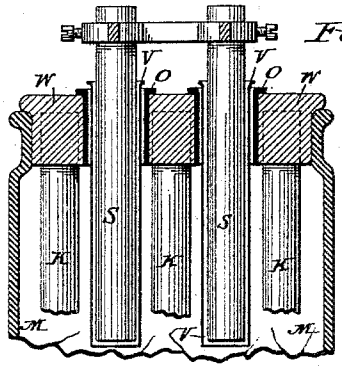


Fig. 5.



Attest:

A. N. Jesberg

L. A. Blanc

Inventor:

Luis Drescher

By David A. Burr

Atty.

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

UNITED STATES PATENT OFFICE.

LUIS DRESCHER, OF NEW YORK, N. Y.

GALVANIC CELL.

SPECIFICATION forming part of Letters Patent No. 369,505, dated September 6, 1887.

Application filed December 29, 1886. Serial No. 222,854. (No model.)

To all whom it may concern:

Be it known that I, LUIS DRESCHER, of the city, county, and State of New York, have invented a new and useful Improvement in the Construction of Cells for Galvanic Batteries; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a diametric vertical section of the mold and plunger used in the manufacture of my improved carbon heads or covering-plates for galvanic cells; Fig. 2, an elevation in perspective of the improved carbon head detached, illustrating it as fitted with a central insulating-collar for receiving the zinc, the stopper for closing the aperture in the collar being also shown above it. Fig. 3 is a diametric or vertical section of a galvanic cell fitted with my improved carbon head or covering-plate, serving as a stopper for the cell, and showing the zinc element in position therein. Fig. 4 is a transverse section in line *x x* of Fig. 3; Fig. 5, a vertical section of a rectangular cell, showing the combination therewith of my improved carbon head or covering-plate carrying a series of zinc and carbon rods.

Similar letters indicate like parts in all of the figures.

My invention relates to the manufacture of an improved carbon for a galvanic cell and to the combination of said carbon with the cell and its positive element.

The object of my invention is to simplify the manufacture of the negative element and to obtain the largest possible extent of available carbon-surface therein. These objects are attained by the process of manufacture hereinafter described, and by constructing the negative element of a series of carbon rods or pencils so united to a head-piece of carbon as to be integral therewith, and in such form as that the head may serve as the covering-plate or stopper for the cell and as a support for the positive element. The rods are made to project from the under side of the head about a central opening fitted with an insulating-collar, through which the zinc piece for the cell is inserted, or through which a porous cell, encircling the zinc, may be introduced, and the electrode-wires are attached directly, the one to the carbon head and the other to the zinc piece.

In the accompanying drawings, A represents a strong metal mold in which to form my improved carbon head. This mold consists of a hollow cylinder, within which is fitted a shorter cylindrical block, B, and which is preferably enlarged in diameter at a distance above the top of the block B, corresponding to the thickness required in the head, so as to form an encircling offset, H. (See Fig. 1.) The cylindrical block B is pierced with a central aperture, C, and with a series of encircling-apertures, D D, extending through it, and which are preferably disposed in a concentric circle about said central aperture. For convenience, the mold may be fitted upon a bottom plate, E, which serves to close the apertures in the block B. The central aperture, C, is enlarged in diameter about midway to form a shoulder, F, which serves as a support for a solid cylindrical block or rod, G, fitting in said enlarged part, and which is made long enough to extend from said shoulder to the top of the mold. The diameter of this rod G is made to correspond with that required in the central aperture of the carbon head-piece. An annular or centrally-perforated plunger, J, is fitted to work in the upper enlarged portion of the mold, so as to close down therein within a short distance of the shoulder F, (see dotted lines, Fig. 1,) and to encircle the central detachable rod, G. Its descending movement is arrested at the proper point by means of an outer encircling shoulder, I, which strikes upon the top of the mold.

In the use of this mold, carbon pencils K K, such are used for electric lights, or other equivalent carbon rods or prisms, are inserted in each of the apertures or recesses D D. These pencils are cut of a length to project up above the block B far enough to nearly reach the level of the offset H in the mold. The solid cylinder or rod G is then placed in the central hole of said block. The mold is filled to the top with a carbon paste, L, such as is commonly employed in the manufacture of carbons for electrical purposes, and which, being well known to the art, need not be herein more particularly described, and the

annular plunger J is forced down upon the paste, so as to compress and condense it about the projecting ends of the rods or pencils K K. The depth of the mold is so proportioned as to permit the charge of paste filling it to be compressed until the offset I of the plunger shall strike the top of the mold, so that the paste shall have been condensed to the exact thickness required in the carbon head, as indicated by the dotted lines in Fig. 1. By this process of compression the carbon paste L is so united to the finished carbon rods or pencils K K as to become virtually integral therewith. The molded head or cell-stopper W, carrying the pencils K K, is then removed from the mold, dried, and baked or calcined, as is customary in the manufacture of carbons for electrical purposes.

Instead of placing the carbon pencils K K in the mold A and forcing and compressing the paste L around the ends thereof within the mold, iron rods may be substituted for the pencils K K in the mold and the paste L be compressed about said rods in manner as described, and then, after removing from the mold the head thus formed by the paste L, and while it is yet in a soft and plastic state, forcing the ends of the pencils K K into the recesses formed by the iron rods in said head. The moist paste will then cling and adhere to the carbon pencils and become practically integral therewith when the head is subjected to heat, so that the finished head will be similar in all respects to that in which the union of the paste and pencils was effected directly within the mold, as first described, and I regard the one process of manufacture as an equivalent for the other. After the head W is thus finished it is by preference saturated so far as possible with paraffine, to prevent the acid solution of the cell in which it is to be used from saturating it and to fit it for making a tight joint with the neck of the cell when used as a stopper for it. The central opening in the head is fitted with a collar, O, of hard rubber, glass, or other insulating substance permanently secured thereto.

M represents a glass or rubber jar or bottle adapted to serve as the cell, and within whose neck the carbon head is adapted to fit very closely to serve as a stopper therefor, as shown in Fig. 3. The depth of the glass cell M is such as that the rods K K shall reach nearly to the bottom thereof when the head is fitted in place.

When it is desirable to seal the cell hermetically, so as to make it portable, the carbon head W may be permanently united to the glass cell by means of a cemented joint.

When the cell is not in use, the central opening encircled by the rubber collar O is hermetically closed by a stopper, R, (see Fig. 2 and dotted lines, Fig. 3,) which may be of soft rubber, so that the fluid contents of the cell may not leak out, and the cell may then, if desired, be carried with safety in any position after being charged.

When required for use, the stopper R is withdrawn and a zinc rod, S, is inserted through the collar O. The two electrode-wires are inserted, the one, N, in a socket, *t*, formed in the carbon head W, as shown in Figs. 2 and 3, and the other, P, in a similar socket in the end of the zinc rod S, so that no binding-screws are required.

In this improved construction of cell there are no joints between the several carbon rods which are immersed in the battery-fluid, nor any connections exposed to said fluid, and the electrode-wire N is brought into immediate connection with each and all of them from the fact that the entire carbon element is virtually in one single piece, with which the electrode is brought into direct contact. The cost of the carbon element is also very greatly reduced from the fact that waste material—such as the short lengths of electric-light carbons, broken before use or remaining after being partly burned—may be utilized for the projecting rods K K of the head, leaving only the main body W to be supplied. The form of the carbon head W, moreover, by permitting it to be used directly as a stopper for the open mouth of the cell M obviates the need and expense of an extra stopper, and the complete cell consists, in fact, but of four pieces—viz., the glass or rubber cell M, the carbon head W, with its points, the insulating-collar Q, and the zinc rod S—so that its cost is reduced to a minimum both as to material and labor. This complete cell admits, moreover, of being readily made tight and portable by means of the stopper R even when it is charged in readiness for use.

It is evident that any number or order of carbon points or pencils K K may be arranged in connection with a series of zinc rods to project from a common head piece or body, and such a multiple arrangement is illustrated in the sectional view, Fig. 5. Also, that while it costs less to make a head with the previously-prepared carbon pencils, flat bars or plates, or even curved or annular plates, may be formed, substantially in manner as described, integrally with the head-piece W to project therefrom into a cell.

The concentric arrangement of rods or pencils about a central zinc rod permits of the presentation of the largest amount of available carbon surface in connection with the zinc, and of the complete utilization of the entire space within the cell, the largely-preponderate carbon-surface, as compared with the zinc, serving to lessen very greatly the internal resistance and greatly increase the constancy of the battery in case it is used without a porous cup.

When a porous cup, V, is to be used, the opening or openings in the carbon head W are made larger, and the porous cup, containing the zinc element, is inserted in said opening, instead of the zinc alone, such an arrangement being illustrated in the view, Fig. 5.

I am aware that a negative electrode has

heretofore been made for a battery in the form of a carbon cup provided with a cover integral with it, the said cover having an opening therein for the reception of the positive electrode and being made to extend over the edge of the jar containing the battery-fluid, and I do not claim an electrode of this form.

I claim as my invention—

1. The within-described process of manufacturing a carbon stopper or covering-plate for a galvanic cell, to constitute the negative element thereof, which consists in compressing and condensing, in the manner substantially as herein set forth, a carbon paste about the ends of a series of separately-formed pencils or plates, to constitute a head from which they shall project as in one piece, and then baking and tempering the head, substantially in the manner described.

2. The combination, with a carbon cover or stopper for the inclosing-vessel of a galvanic cell, of a series of separate rods or pencils united integrally thereto, to project therefrom about an opening formed therein, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUIS DRESCHER.

Witnesses:
WILLIAM H. RIBLET,
S. A. STAVERS.