

No. 665,609.

Patented Jan. 8, 1901.

C. B. DE LAMARRE.
ELECTRICAL BATTERY.

(Application filed Aug. 15, 1900.)

(No Model.)

Fig. 1.

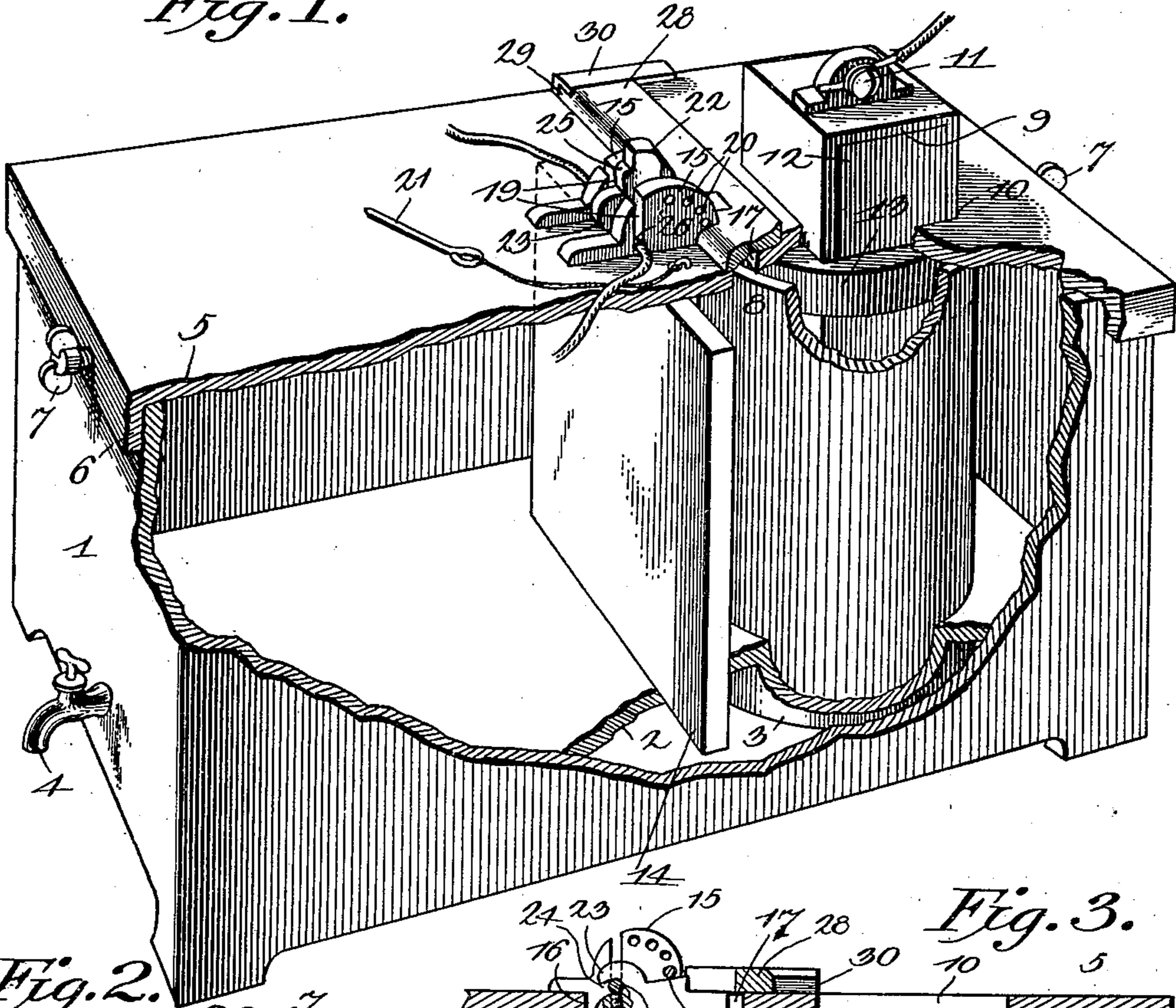


Fig. 2.

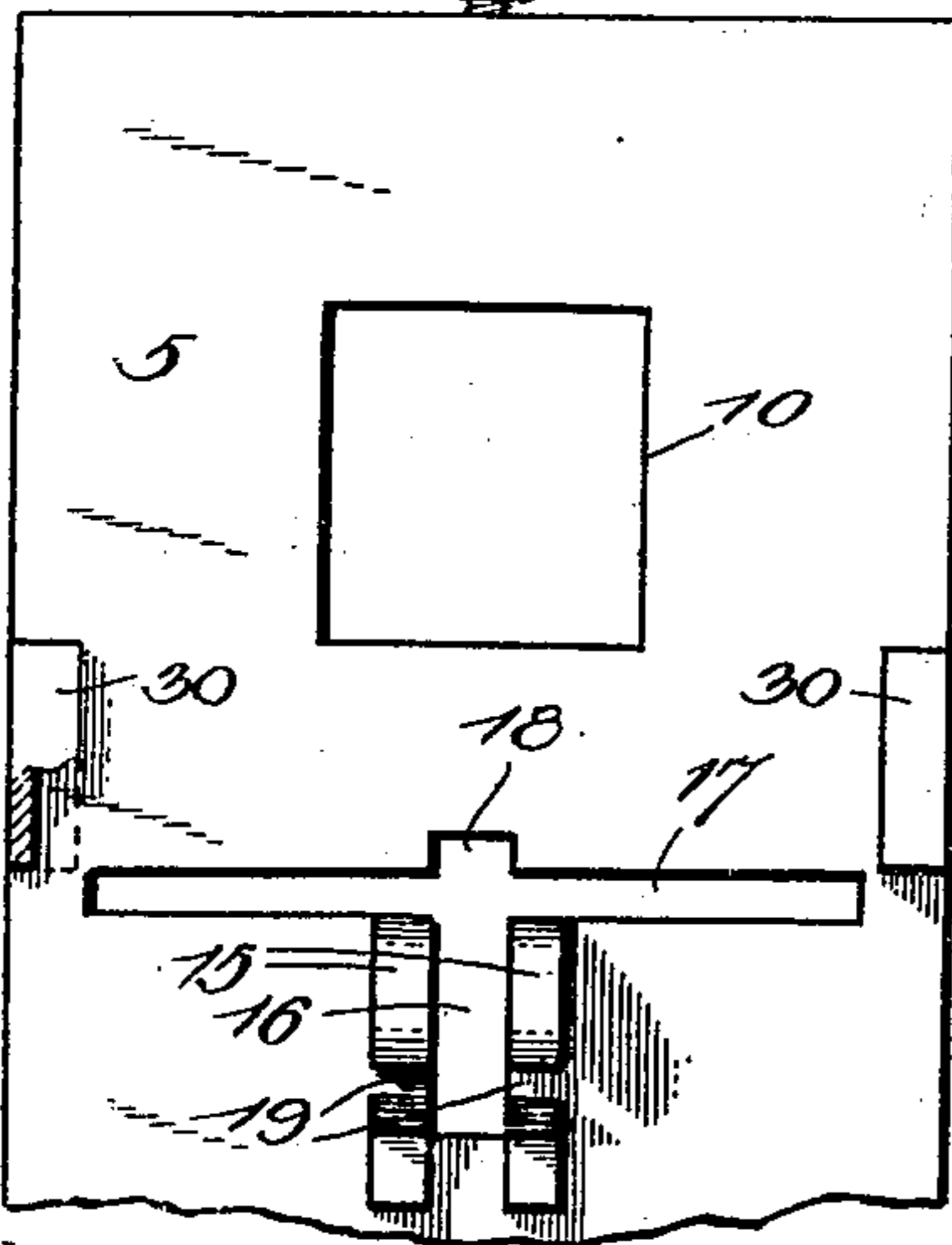


Fig. 3.

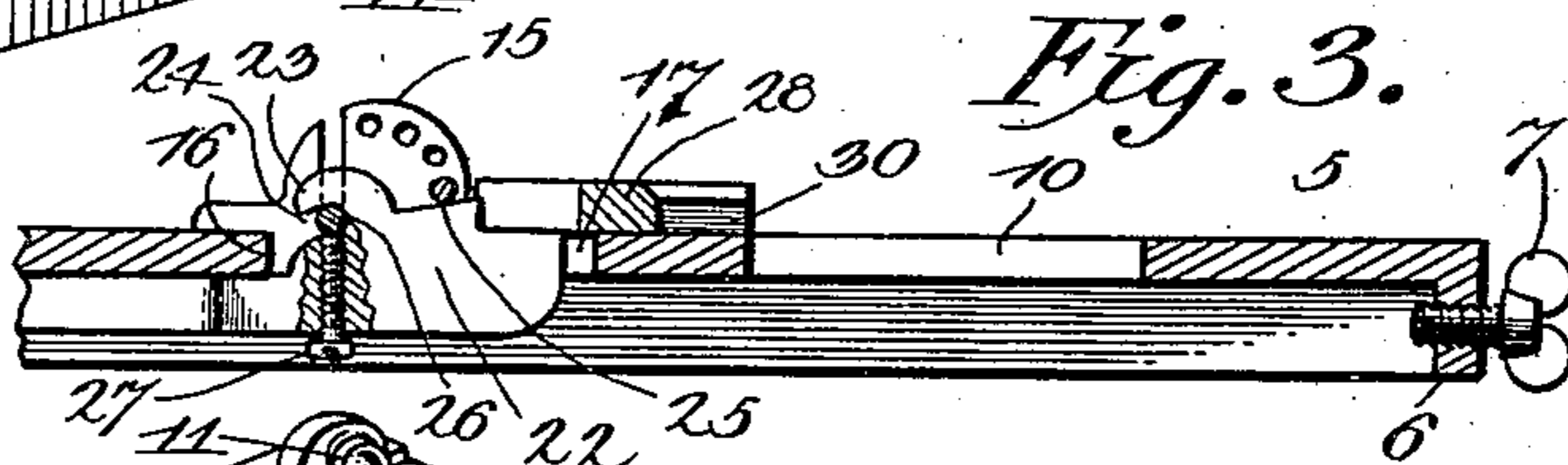


Fig. 5.

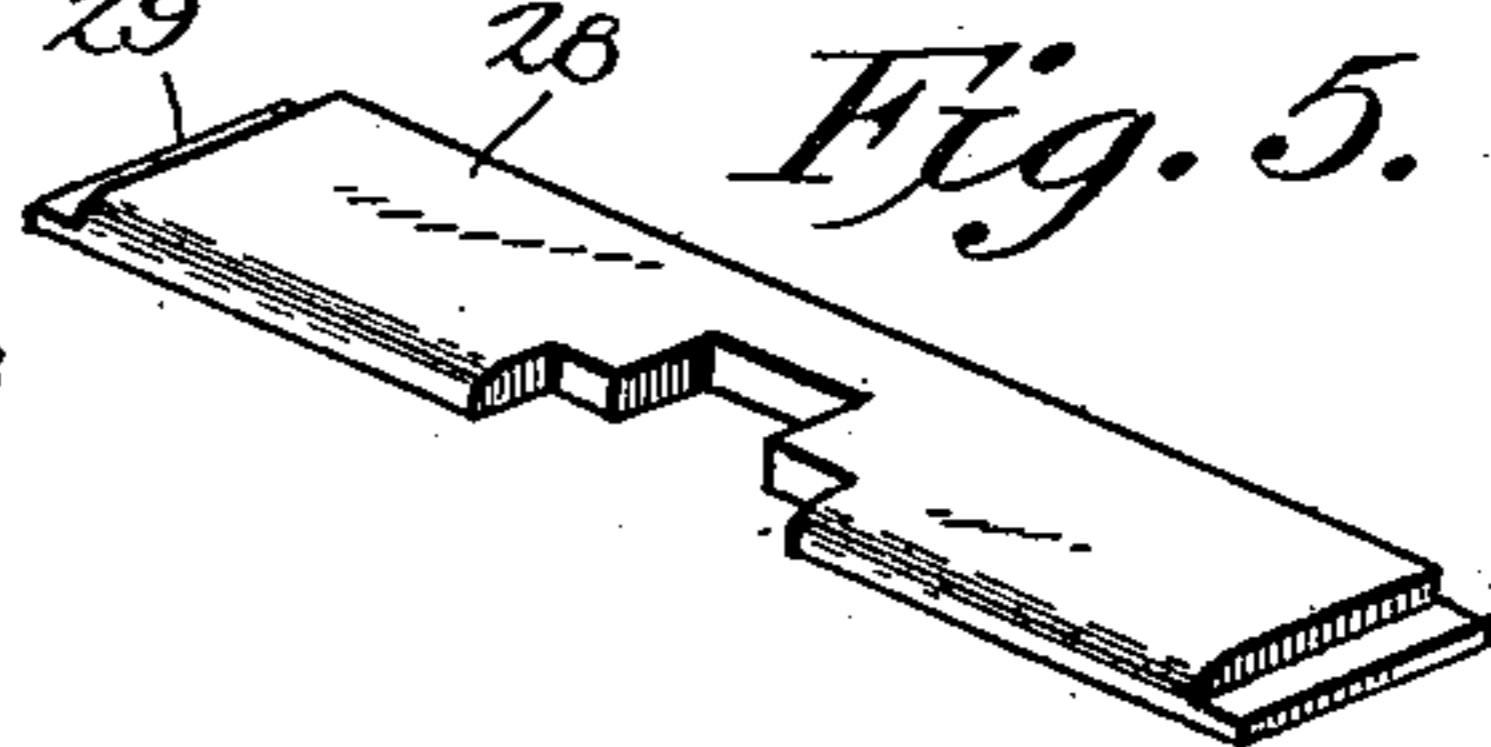
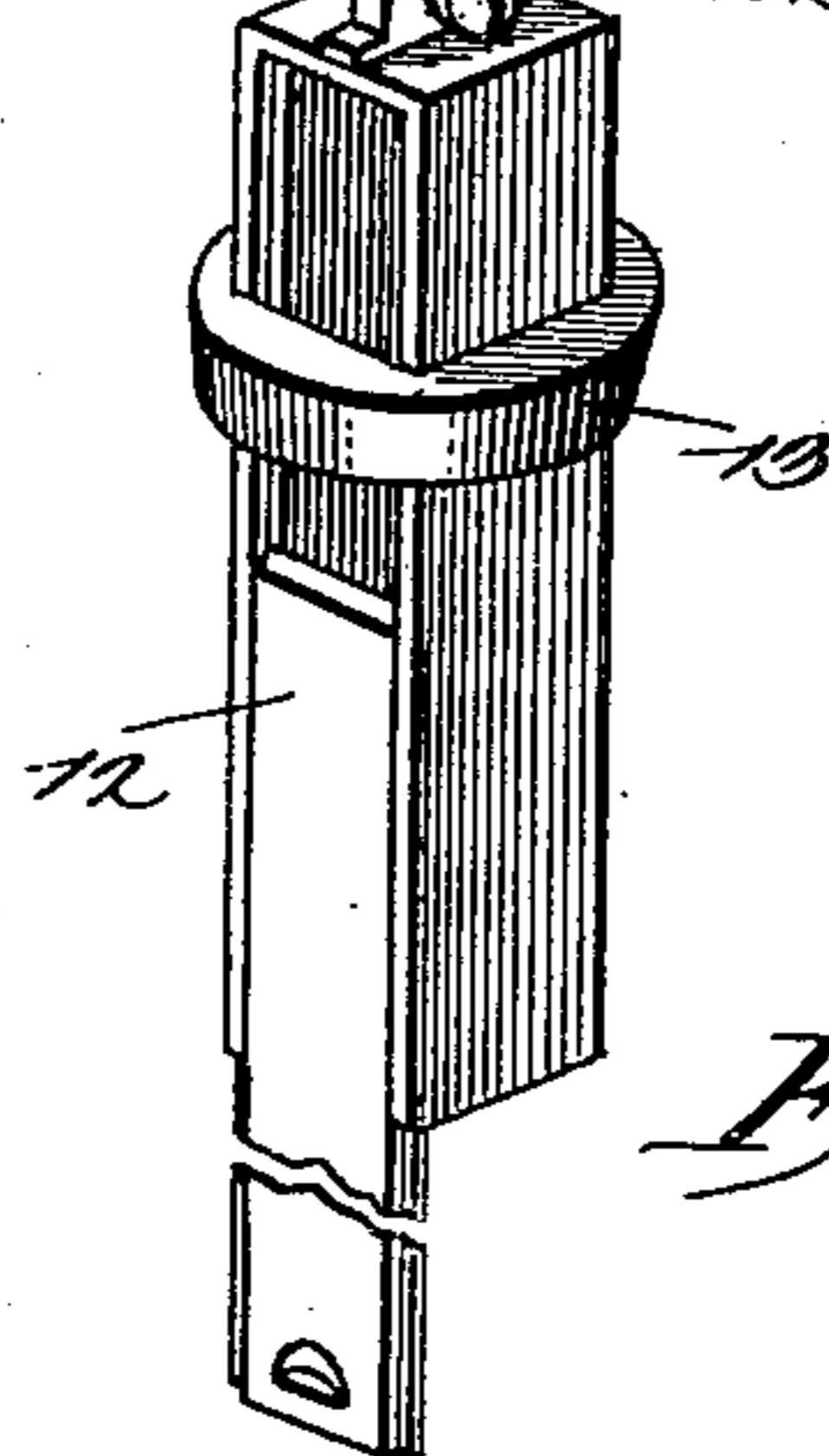


Fig. 4.



Witnesses

J. Frank Leyswerwell.
Chas. D. Hoyer.

Charles B. de Lamarre, Inventor.
By C. A. Snow & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES BOUGOURD DE LAMARRE, OF BILOXI, MISSISSIPPI.

ELECTRICAL BATTERY.

SPECIFICATION forming part of Letters Patent No. 665,609, dated January 8, 1901.

Application filed August 15, 1900. Serial No. 26,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BOUGOURD DE LAMARRE, a citizen of the United States, residing at Biloxi, in the county of Harrison and State of Mississippi, have invented new and useful Improvements in Electrical Batteries, of which the following is a specification.

This invention relates to an electrical battery; and the object of the same is to provide a cheap, effective, and enduring battery for open or closed circuits; and to this end the invention primarily consists in the construction and arrangement of a battery comprising an outer rectangular glass or porcelain jar containing an unglazed earthenware porous cup having a hollow square or cylindrical carbon cup removably mounted therein and provided with a movable closing device within the body thereof to gain access thereto and serving as the negative electrode of the battery and a zinc electrode adjustably and removably mounted in the said jar and having positive characteristics.

The invention further consists in the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a sectional perspective view of a battery embodying the features of the invention. Fig. 2 is a top plan view of a portion of the lid or cover for the same. Fig. 3 is a longitudinal vertical section of a portion of the lid or cover. Fig. 4 is a detail perspective view of the improved carbon electrode, showing the manner of gaining access to the interior of the same. Fig. 5 is a detail perspective view of a closing-slide for a portion of the lid or cover.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates an outer rectangular glass or porcelain jar for containing sulfuric acid, and in the bottom 2 thereof, near one end, is a depressed seat 3, and in one end of the jar, at a proper elevation, a drain-cock 4 is attached to relieve the jar of its fluid contents when desired. A removable lid or cover 5 is fitted over the upper edge of the jar and has a surrounding depending flange 6, through the center of the end portions of which clamping-screws 7 extend to

bear against the adjacent portions of the jar ends, and thereby prevent the lid or cover from becoming accidentally disengaged from the jar. In the seat 3 the lower end of an unglazed earthenware porous cup 8 is removably disposed, which may be provided with suitable drainage means and has its upper edge extending up closely to the lower surface of the lid or cover. Within the said cup 8 a hollow square or cylindrical carbon electrode 9 is mounted and extends above the upper terminal of the said cup and through a similarly-shaped opening 10 in the lid or cover to a suitable distance above the latter and is provided with a top binding-screw 11 for obvious reasons. The interior of the said electrode is made accessible by the provision therein of a slide or movable covering device 12, shiftable longitudinally thereof, and in order to hold the said electrode in proper position within the cup 8 it is surrounded by a sleeve 13, of vulcanized rubber, porcelain, glass, or the like, which snugly fits in the cup and prevents intermingling of the contents thereof with those of the jar. It will be understood that the hollow carbon device just described is a negative electrode, and the wire attached to the binding-screw 11 will consequently be the positive wire, and the upper exposed portion of the said electrode will be suitably paraffined for well-known reasons, as well as other portions of the battery, where desired or found necessary.

The positive electrode of the battery consists of an amalgamated sheet of zinc, as 14, adjustably and removably carried by the lid or cover and depending into the jar 1 when in operative position. On an intermediate portion of the upper surface of the lid or cover a pair of longitudinally-extending ears or bearings 15 are located, the said ears or bearings being parallel and spaced apart from each other and adjacent the opposite side walls of a longitudinal slot 16 through the cover and in communication with a transverse slot 17, having a central counter recess 18 in line with the said slot 16. Each of the ears or bearings has a vertical slot 19 down to the plane of the top surface of the lid or cover, and both slots 19 are in transverse alinement. The portions of the ears or bearings on one side of the said slots 19 also have curved lines

of apertures 20 in each, the opposite series of apertures being in transverse alinement and adapted to receive a removable pin 21 of suitable material. Extending upwardly through the slot 16 is the central reduced bearing-head 22 of the zinc electrode, having a front depending hanger 23 over a seat 24 and a bearing-surface 25, which is freely movable to swing between the apertured portions of the ears or bearings 15 for engagement with the pin 21 to hold the electrode adjusted as desired. Above the bearing-surface 25 the head 22 has a gripping extension for engagement by the hand of the operator in adjusting the electrode, and the recess 18 is to permit this extension to pass down into the lid or cover when adjusting the electrode to a horizontal position or entirely clear of the liquid within the jar when the battery is not in use, to thus prevent consumption of the zinc at such time, and thereby increase the life of the same. A portion of the wire 26 for the zinc electrode is stripped of its non-conducting covering and let down in the slots 19 of the ears or bearings 15 flush with the upper surface of the lid or cover, and the hanger 23 is placed thereover to dispose the said stripped portion of the wire in the seat 24, and the wire is then immovably secured, in connection with the head 22, by a set-screw 27, extending there-through and having its clamping end bearing against the said wire portion to force the latter against the inner part of the hanger. This forms a wire connection for the electrode, as well as a pivot, and in detaching or removing the said electrode the wire is carried therewith. By the adjustment of the electrode 14 in the manner set forth it may be immersed in the liquid in the jar 1 any suitable distance to increase or decrease the strength of the battery and also be entirely withdrawn from the said liquid, as set forth. It is intended that the pin 21 be flexibly connected to the lid or cover of the battery in convenient position for use, and when the electrode 14 is removed the said pin is first disconnected. In withdrawing the said electrode the wire 26 is released from the slots 19 by drawing upwardly on the head 22, the head being long enough to permit this operation, and after such disconnection or release of the wire the head is moved longitudinally in the slot 16 until the electrode is in line with the transverse slot 17, when an easy removal will ensue. This is of material advantage, because a cover is permitted to be used for the battery with obvious benefits, and means are also provided for removing the positive electrode without detaching the cover. To keep the slot 17 closed, a slide 28 is employed and has its opposite reduced ends 29 movably engaging intumed guide-flanges 30 at opposite sides of the cover or lid, and at its center the slide is suitably recessed to permit it to be pushed close to the projecting portion of the head 22.

As before indicated, a dilute solution of sul-

furic acid is placed in the jar 1, in the porous cup 8 a strong solution of sulfuric and chromic acids, and in the hollow carbon electrode a compound of manganese dioxide in lumps and plumbic peroxid. The sulfuric acid in the porous cup imparts conductivity, and the chromic acid acts as a depolarizer. The dilute sulfuric-acid solution in the jar 1 and the acids in the porous cup diffuse electrolytically one into the other, and when the action commences a double set of chemical changes takes place in the liquids. The acid solution in the jar 1 acts on the zinc, the water is decomposed, and oxid of zinc and hydrogen are formed, the oxygen going to the positive element. Polarization takes place through the porous cup, the acids or oxidizing agents in the latter giving up oxygen readily to the free hydrogen forming $\text{Cr}_2(\text{SO}_4)_3$, said hydrogen being oxidized by the mineral pyrolusite contained in the carbon electrode, forming Mn_2SO_4 and M_2PbO_3 , the peroxid of the latter metal being mixed with the pyrolusite in the carbon. The ozone formed by the slow decomposition of the water with the reagents follows the current and is decomposed also by the oxidizing agents contained in the carbon, forming oxygen and monoxids when peroxids, for example, are used. The advantages derived from this extra supply of oxygen in the battery, as set forth, consist in giving an exceedingly-strong electromotive force, steady current, and a nominal resistance. Under some conditions it will be possible to dispense with the use of the porous cup and employ the carbon electrode alone, and the provision for raising the positive electrode to open the circuit and lowering the same to close the circuit renders the control of the battery very easy and convenient, and the energy of the battery is preserved against loss by allowing it to remain at rest when not in use. Moreover, the declination in a rapid manner of the depolarizing power of the solution in the porous cup due to an exhaustion of oxygen from the film of solution in immediate contact with the negative electrode and the matter accumulating on the positive zinc increasing the resistance can be easily obviated in the improved battery simply by swinging the zinc to and fro in the solution in the jar 1, and thereby agitating said solution, dislodging the hydrogen from the negative element and the sediment or accumulation from the zinc, and thus preserving uniformity in the solution. Consequently the right is reserved to use a carbon electrode of the character set forth containing the agents aforesaid and immersed in an electrolyte composed of the ingredients as stated or of sodium or ammonium nitrate and sulfuric acid, or sodium or ammonium nitrate with bichromate of soda and sulfuric acid, or chromic-acid solution with potassium-nitrate solution in the jar 1, these solutions being cheaper, lasting longer, and having less corrosive action on the zinc than the pure strong chromic-

acid solution, which, however, gives a powerful current when only short duration is wanted.

It will be understood that a plurality of the electrodes set forth may be disposed in one jar or inclosure, if desired, and which would be a simple duplication of the construction set forth, and in connecting up the battery it has been found that a current of intense strength will result if the negative and positive elements are coupled either in parallel or in series, as in the usual manner.

The seat 3 is formed for the purpose of allowing an equal capacity for liquids in the vessel 1 and the porous cup 8, it being understood from the foregoing that the raised bottom of the said vessel reduces the capacity of the same by making it equal to the capacity of the cup in view of the greater vertical extension of the latter. It will also be understood that instead of the apertures 20 in the ears or bearings 15 slots may be formed in and open out of the latter parts for receiving the pin 21, and which is an obvious equivalent.

Having thus described the invention, what is claimed as new is—

1. In a battery of the character set forth, the combination with a main jar or inclosure, of a hollow porous negative electrode having means for gaining access thereto in the side thereof, and a positive electrode adjustably mounted in the jar or inclosure and free to be swung to and fro, the jar or inclosure having an electrolytic fluid therein, and an oxidizing agent for the negative electrode.

2. A battery of the character set forth, comprising a jar or inclosure, a positive electrode adjustably mounted in said jar, and a porous negative electrode of hollow form with means in one side for gaining access thereto, the jar having an electrolytic fluid therein and an oxidizing agent for the negative electrode.

3. A battery of the character set forth, comprising a jar or inclosure, a positive negative electrode therein, a porous cup in the jar or inclosure, and a hollow carbon electrode in the said cup, said negative electrode being porous and having an opening extending longitudinally of the side thereof with a closing cover, the jar, cup and carbon electrode having chemical solutions or compounds therein for setting up an electrolytical diffusion and reaction.

4. A porous carbon or negative element for a battery having a hollow construction with a longitudinally-extending opening in the side thereof closed by a slidable cover for gaining access thereto and a wire-connecting device on the upper extremity.

5. In a battery of the character set forth,

the combination of a jar or inclosure having a removable lid or cover, a positive electrode adjustably and removably suspended from said lid or cover, a porous cup in the jar or inclosure, a hollow porous negative electrode removably mounted in the said cup and having means in the side thereof for gaining access thereto, and a non-conducting sleeve on the said negative electrode to fit into and close the cup and hold the negative electrode in position, the jar, cup and negative electrode having different and independent chemical solutions and compounds therein.

6. In a battery of the character set forth, the combination with a jar or inclosure, and a negative electrode therein, of a removable lid or cover for the jar or inclosure with slot therein, a positive electrode pivotally suspended from the said lid or cover and removable with the latter or through the slot therein, and means for locking the positive electrode in adjusted position.

7. In a battery of the character set forth, the combination with a jar or inclosure having a negative element therein, of a removable lid or cover for the jar or inclosure having longitudinal and transverse slots therein, a positive element having a portion thereof pivotally swung in the longitudinal slot and removable from the jar or inclosure through the transverse slot, and means for holding the positive element in adjusted position.

8. In a battery of the character set forth, the combination with a jar or inclosure having a negative element therein, of a removable lid or cover for the jar or inclosure, a positive element having a head pivotally mounted in the lid or cover, oppositely-disposed apertured devices adjacent said head, and a removable pin to engage said apertured devices and bear on the head to hold the positive element at different adjusted positions in the jar or inclosure or entirely clear of the chemical compound therein.

9. A battery comprising a jar or inclosure, a removable lid or cover therefor, a negative element in the jar or inclosure, a positive element pivotally swung from and removable with the said lid or cover, and a connecting-wire for the said positive element and having a portion thereof rested on the top surface of the cover and forming a removable pivot therefor.

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

CHARLES BOUGOURD DE LAMARRE.

Witnesses:

M. A. POST,
L. RAYNAUD.