(No Model.) 2 Sheets—Sheet 1.

J. SERSON.

GALVANIC BATTERY.

No. 367,451. Patented Aug. 2, 1887.

Fig. 1.

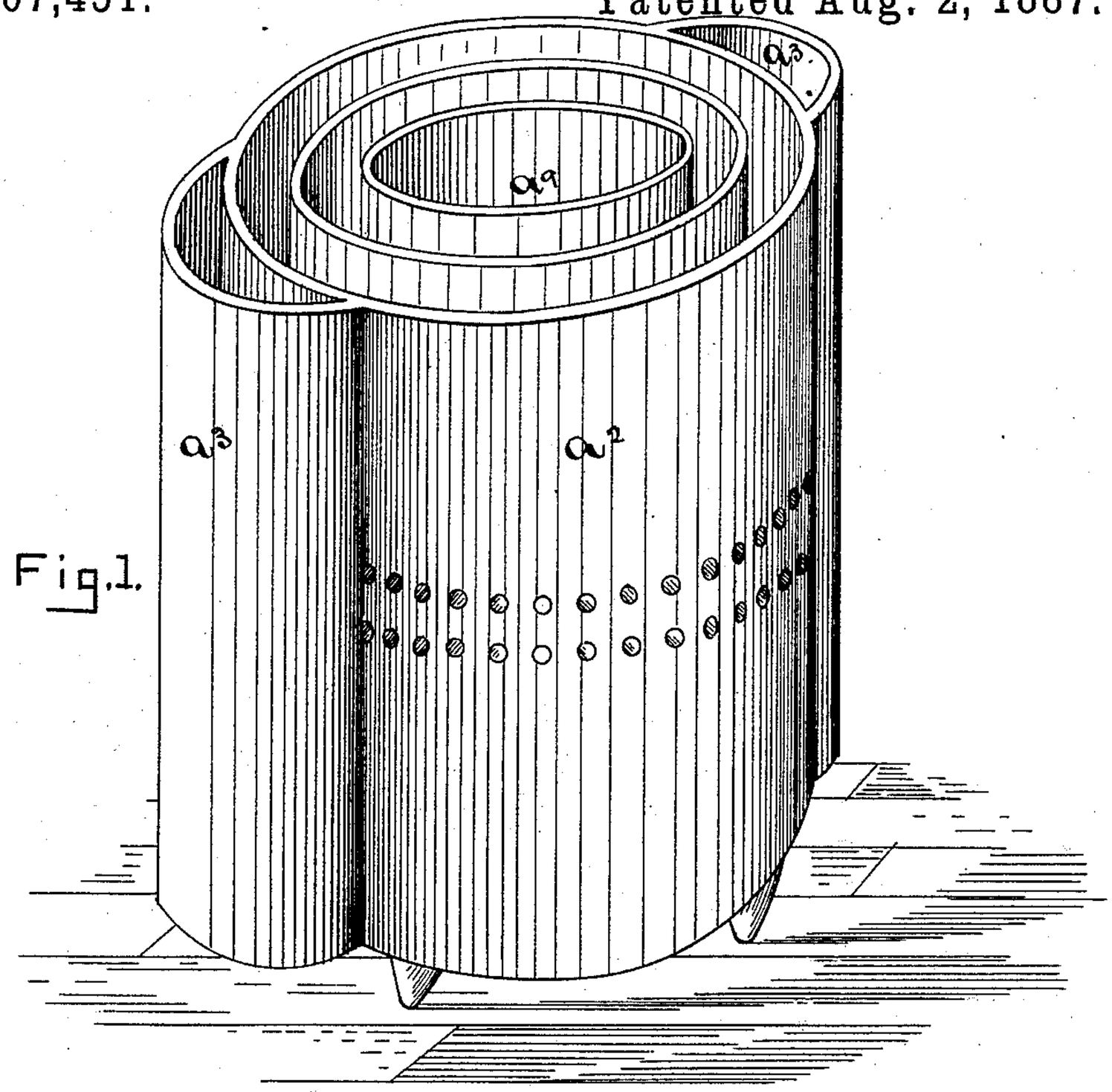
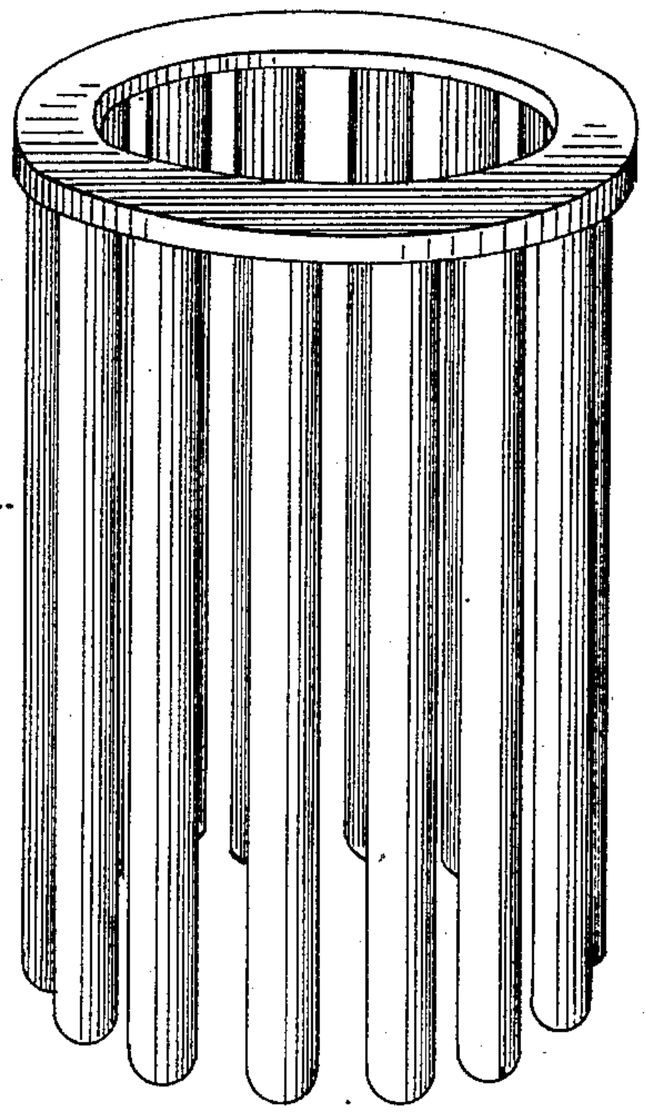


Fig. 2.



Witnesses.
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Chas. Geoghegan

Inventor.
James Serson

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

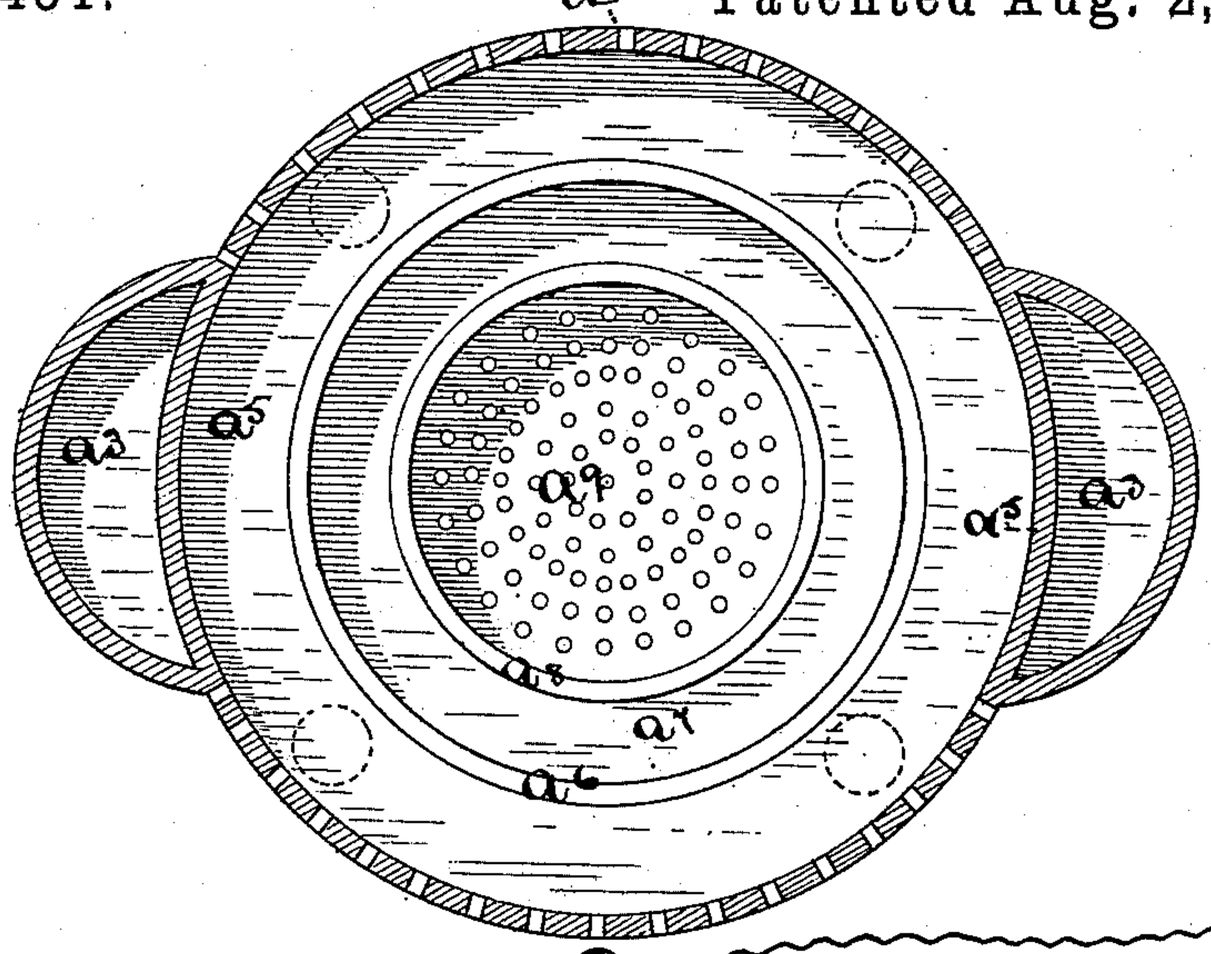
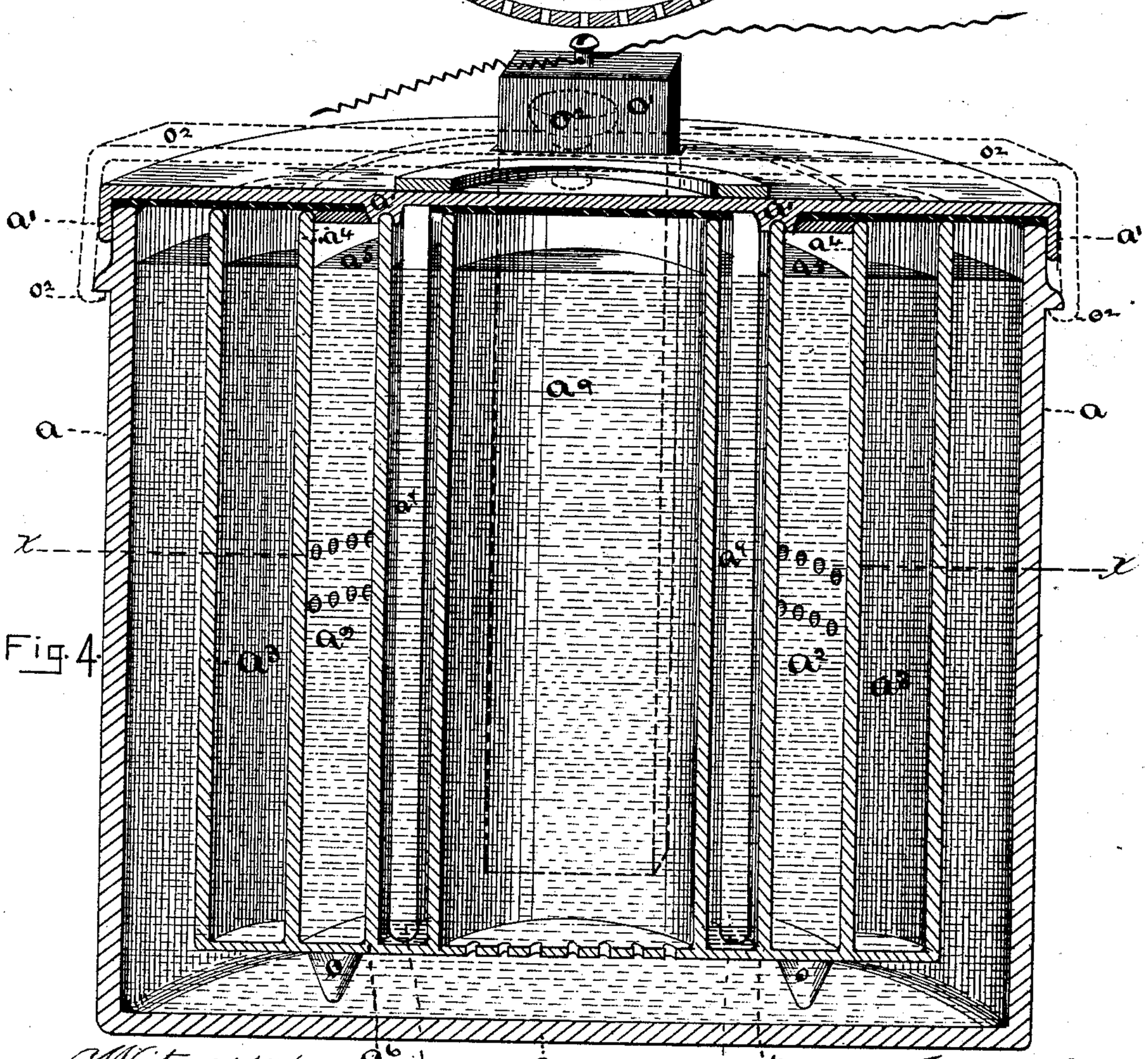


Fig. 4



Witnesses.
F. B. Poole
Ch. Houghton

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UNITED STATES PATENT OFFICE.

JAMES SERSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE UNCLE SAM ELECTRIC LIGHT AND BATTERY COMPANY, OF PORTLAND, MAINE.

GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 367,451, dated August 2, 1887.

Application filed October 14, 1886. Serial No. 216,270. (No model.)

To all whom it may concern:

Be it known that I, JAMES SERSON, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a new and useful Improvement in Apparatus for Generating Electric Fluid, of which the following is a specification.

My invention relates to apparatus and materials for generating electricity by the chemical decomposition and recombination of metallic substances, the object of it being to provide means of producing a continuous and useful current of electric fluid at a moderate cost; and it consists in the inclosing-tank, the inner jar, and metallic, mineral, and chemical substances hereinbelow described.

In the drawings annexed, Figure 1 shows a vertical perspective of an integral jar having an outside wall and bottom, two concentric inner walls, a central cylindrical chamber with a perforated bottom, two concentric spaces between the vertical outer wall and the two inner concentric walls, and two vertical pockets or cups on the outside of the outer wall of the jar, extending the whole height of it on opposite sides of it, all being in one integral piece, made of soft porous pottery molded and fired by the usual methods. The jar has short legs or feet under its bottom floor, which support it, with an open space under it. Fig. 2 shows a vertical perspective of a group of zinc anodes united together at the upper end by a zinc bar bent in form of a ring and soldered or otherwise suitably affixed to the anodes. In use these anodes set in the inner concentric chamber of the jar, the upper ends of them and the connecting-bar of zinc being above the top of the cover of the inclosing-tank through which they extend. When desirable, these anodes can be lifted out of the jar. Fig. 3 shows a transverse section of the jar, Fig. 1, on the line $x\,x$ in Fig. 4. Fig. 4 shows a vertical section of the whole apparatus, consisting of an outer inclosing-tank of glass, porcelain, or other suitable material of proper form and dimensions to receive and inclose the inner jar shown in Fig. 1, which is placed in it and secured by a cover over the whole.

a is the outer inclosing-tank, cylindrical or elliptical in its vertical form, large enough to admit the inner jar within it and leave a space of one to two inches between it and the jar. Indentations may be made in the inside of the bottom of it to secure the feet of the jar and prevent it sliding. On the outside, near the top, is a projecting rib extending around it, under which the claws of a clamp engage to hold the cover over the top of the tank in its place.

a' marks the cover of the inclosing-tank. This cover is made to fit over the top of the body of the tank, a lip on its edge extending downward on the outer surface of the upper edge of the tank. The under side of the cover also rests against the upper edge of the several concentric walls of the jar with circular grooves, into which they enter, and in which they are packed with suitable material, so that when the cover is clamped down in its place the fluids in the concentric chamber will be retained without leakage and consequent mixing. There are apertures through this cover for the carbon blocks and for the zinc anodes, which will extend through and above it.

a^2 marks the inner jar, which is made in one integral piece of clay pottery, as shown in Fig. 1, a vertical cylindrical vessel having three vertical cylindrical concentric walls standing on the same floor or bottom, the inner wall inclosing a cylindrical central chamber, the bottom of which is perforated to allow the fluid in the inclosing-tank to flow into and fill it, the second concentric wall inclosing a concentric chamber between it and the inner wall, the bottom of which is not perforated, and the third concentric wall, which is the outer wall of the jar, inclosing a concentric chamber between it and the second concentric wall, the bottom of which is not perforated. This third and outer wall is also perforated, so that the fluids in the inclosing-tank may mingle with the fluids in the outer concentric chamber. On the outside of this outer wall of the jar, on opposite sides of it, are two vertical pockets extending the whole height of it and having closed bottoms.

a^3 a^3 mark the walls of the pockets on the

outside of the outer wall of the inner jar and the chambers they inclose. In use one of these pockets is filled nearly full with nitric acid and the opposite one is filled nearly full of sulphuric acid. The walls of these pockets and all the several walls and bottom of the inner jar are porous, so that the fluids may slowly percolate through them.

a^4 marks the outer wall of the inner jar.

a^5 marks the concentric chamber between the outer wall of the jar and the second inner vertical wall of it.

a^6 marks the second inner vertical wall of the jar.

a^7 marks the concentric chamber between the concentric wall a^6 and the inner concentric wall of the jar.

a^8 marks the inner concentric wall of the jar, which incloses the central cylindrical chamber in it.

a^9 marks the central cylindrical chamber in the jar, with its perforated bottom.

o marks the feet on the bottom of the inner jar, which, standing upon the bottom of the inclosing-tank, sustain the jar with a space between it and the bottom of the tank.

o' marks a block of what is known in electrical practice as "carbon," preferably rectangular in form of cross-sections, and long enough to reach from a point near the bottom of the chamber a^5, in which it is placed in a vertical position extending upward through and above the cover of the inclosing-tank. There are two of these carbon blocks opposite each other in this concentric chamber a^5, both having a metallic stud in the top end, to which a conducting-wire is to be attached.

o^2 marks the clamp by which the cover is secured to the top of the inclosing-tank and inner jar, and the thumb-screw by which a pressure is made on the cover.

To practice my invention, place the inner jar in its place in the inclosing-tank. Fill the pockets a^3 about two-thirds full, one with nitric acid and one with sulphuric acid. Place the carbon block a' in the concentric chamber a^5. Fill the remaining cavity in the concentric chamber a^5 with fragments of carbon and of manganese in about equal quantities. Cover the top of the filling in the concentric chamber a^5 with asphalt or pitch to make it fluid-tight. Put in the concentric chamber a^7 about an inch depth of mercury at the bottom, and partially fill with a mixture of acid and water. In this chamber the zinc anodes will be placed, being lowered into it through the aperture in the cover made to admit them, the lower end resting on the bottom in the mercury. Fill the central chamber, a^9, nearly full with crystals of chromic acid and bichromate of potash in about equal parts. Place a sheet of pure rubber or other equivalent over the top of the inclosing-tank, covering it and the inner jar, to pack the points of contact between the cover and the top edges of the tank and the jar and clamp the cover firmly to the tank. The zinc anodes will then be lowered through the cover into the concentric chamber a^7, the inclosing-tank being filled with the mixture of acid and water, which also fills the interstices in the materials in the central chamber and permeates the interstices in the materials inclosed in the concentric chamber a^5. Electric action will begin at once and continue uninterruptedly until the materials in the inner jar have spent their generating properties. The acids in the pockets a^3 a^3 will slowly pass through the porous walls and mingle with and re-enforce the strength of the fluid in the inclosing-tank and the chamber in the inner jar.

The inclosing-tank will generally be about twelve or fourteen inches in diameter and the inner jar of corresponding size, and each tank and jar with its contents constitute a cell. The number of these cells will be regulated by the work required of them, sometimes combining as many as twenty, or even more, by connecting the carbons in one with the zinc in the next, and so on through the series.

The zinc anodes may be in the form of a hollow cylinder with a vertical point rising from it through the cover, thus dispensing with a number of holes in the cover, which diminish its strength. Conducting-wires being affixed to the stud in the carbon above the cover and to the bar uniting the zinc anodes, the electric fluid generated is led to the point where it is to be used for lighting or other purposes.

Referring to Patent No. 338,194, issued to me March 16, 1886, for galvanic batteries, and not intending to claim anything set forth and claimed in that, I do claim as new and my invention—

1. In an apparatus for generating electric fluid, in combination, a tight inclosing-tank, a porous inner jar having several vertical concentric walls with pockets on the outsides of its outer wall, substantially as described, for the purpose specified.

2. In apparatus for generating electric fluid, in combination with the inner jar, a^2, the carbon and manganese in the chamber a^5, the mercury and zinc anode in chamber a^7, and the fluid mixture of acid and water around and in the inner jar, a^2, all substantially as described, for the purpose specified.

JAMES SERSON.

Witnesses:
CHS. HOUGHTON,
H. B. POOLE.