

(No Model.)

2 Sheets—Sheet 1.

O. C. D. ROSS.
GALVANIC BATTERY.

No. 294,335.

Patented Feb. 26, 1884.

Fig. 1

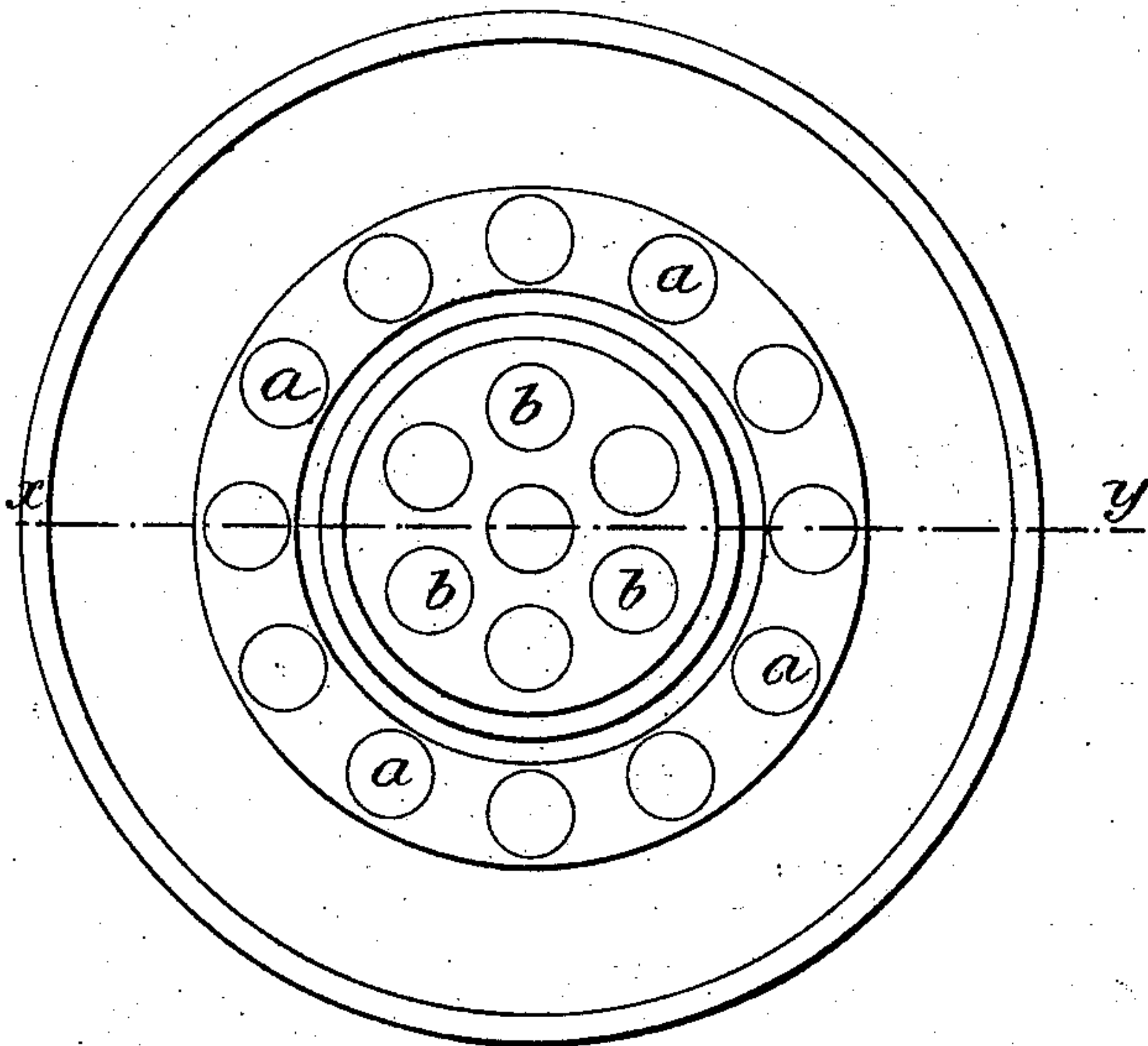
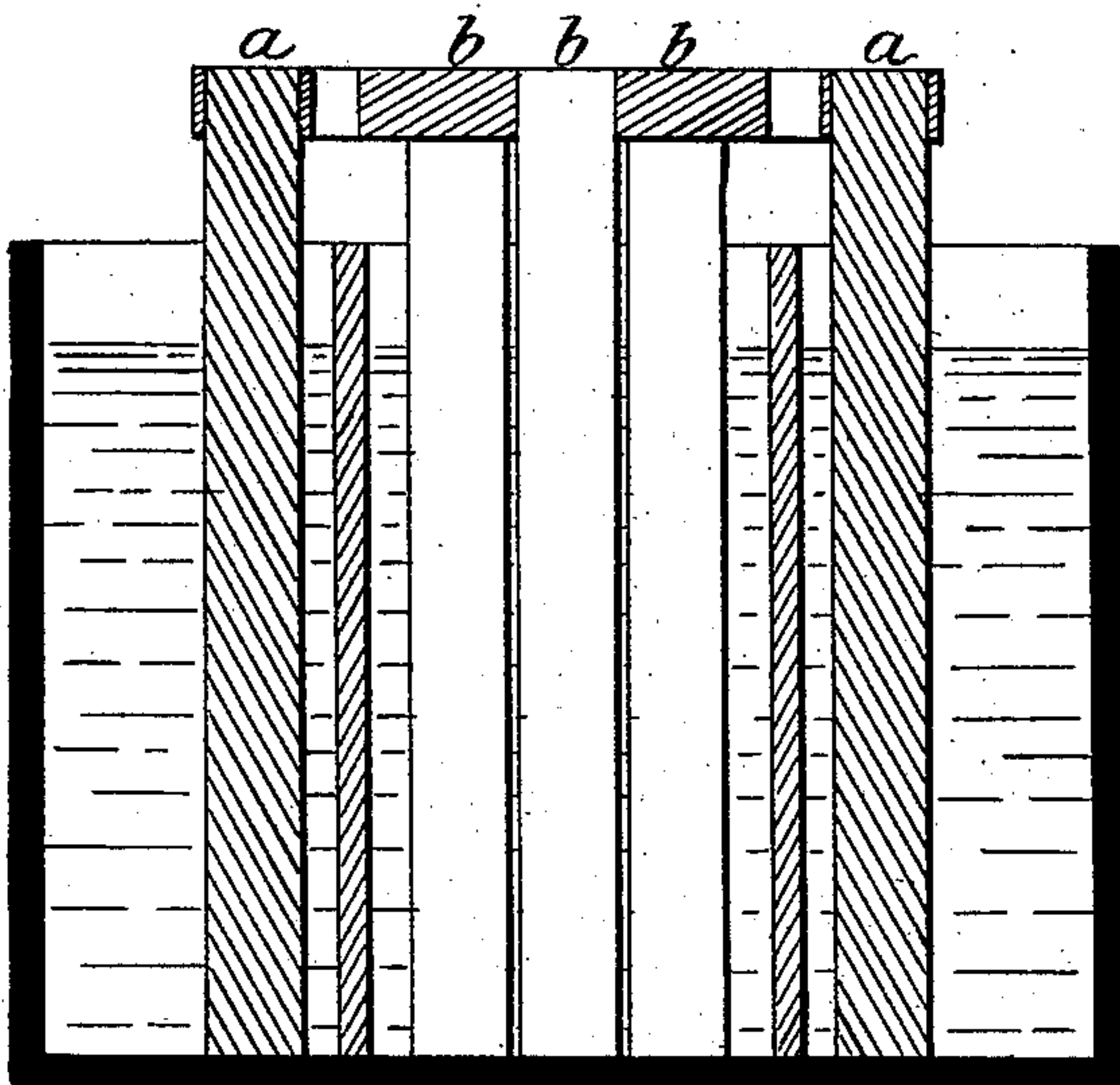


Fig. 2



Witnesses.
J. A. Rutherford
Robert Everett

Fig. 3



Fig. 4

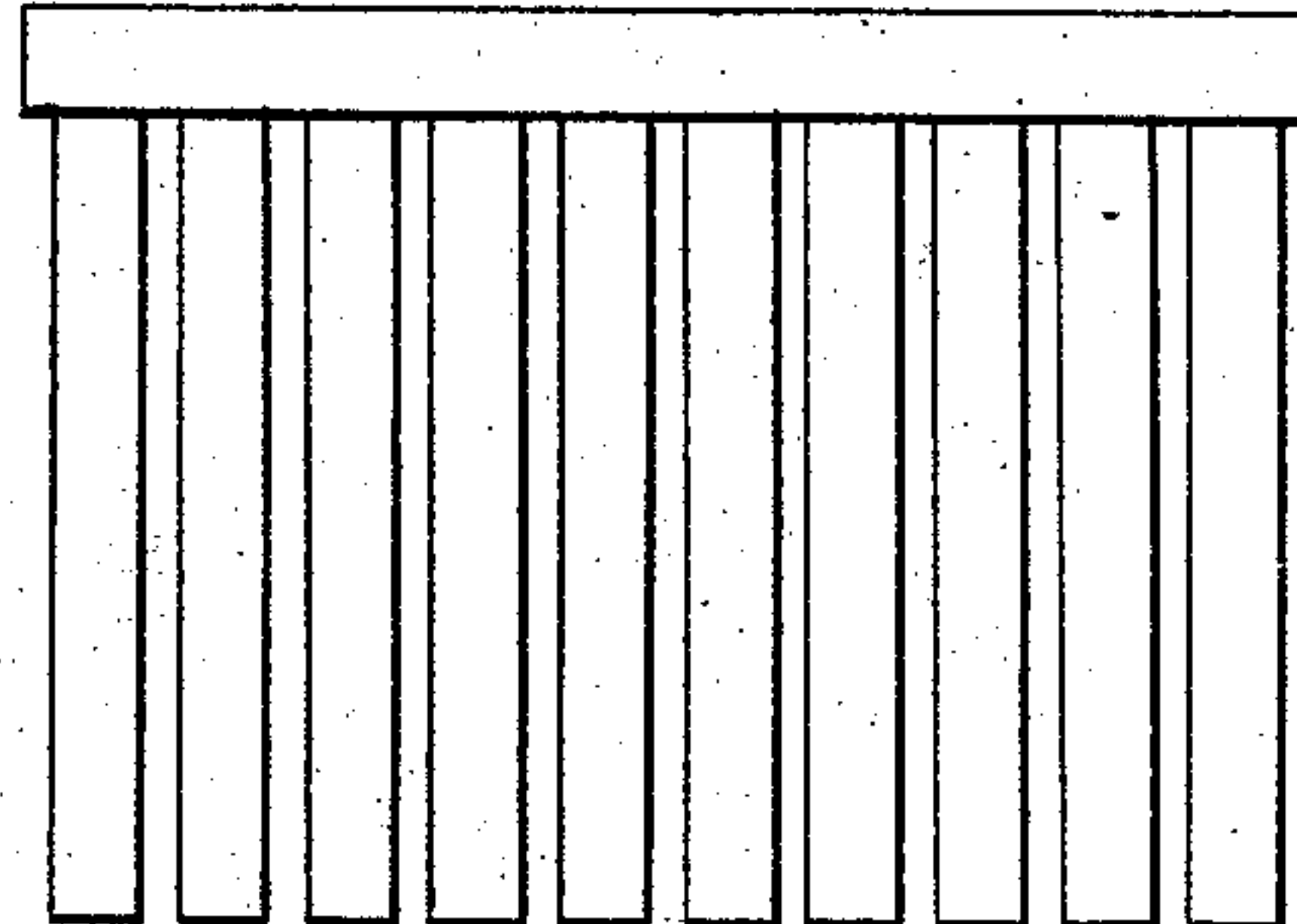


Fig. 5

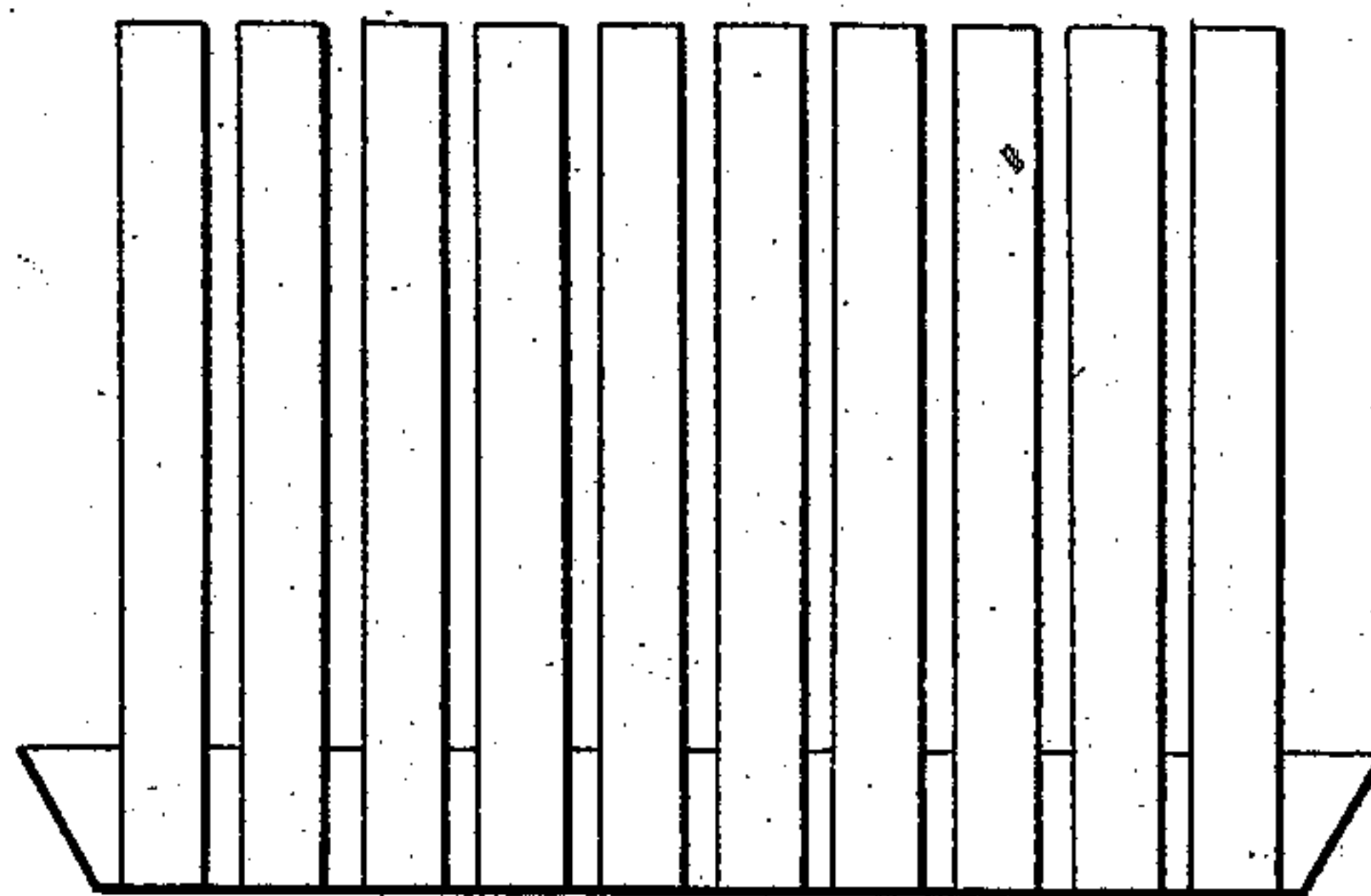


Fig. 6

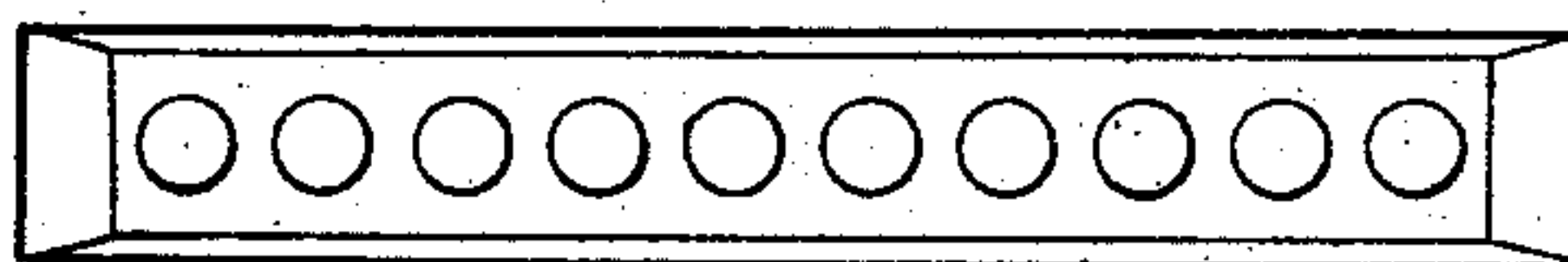
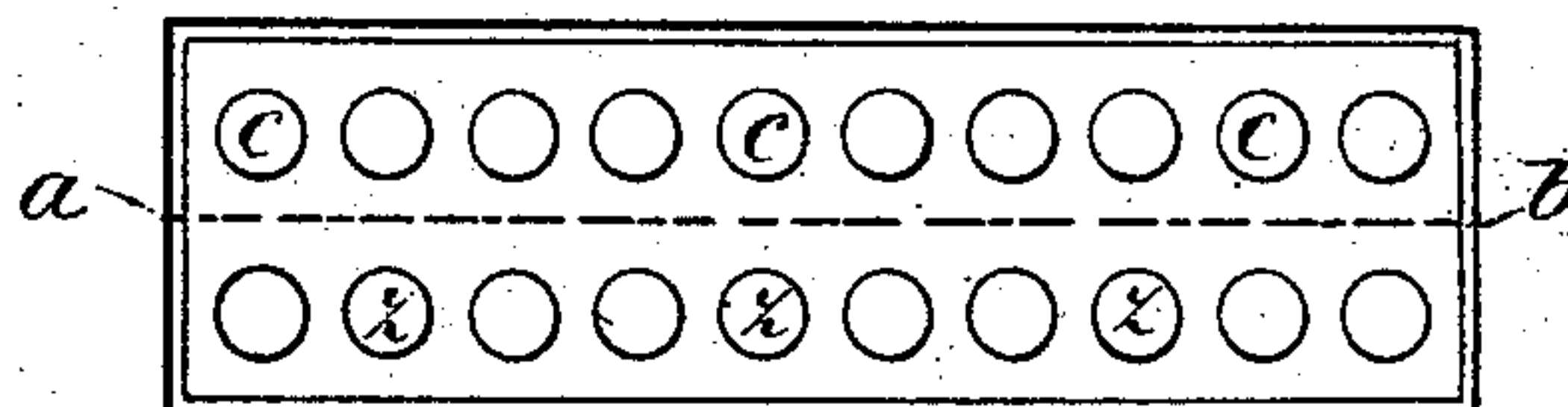


Fig. 7



Inventor.
Owen C. D. Ross,

By James L. Norris,
Atty.

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2 Sheets—Sheet 2.

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Fig 8

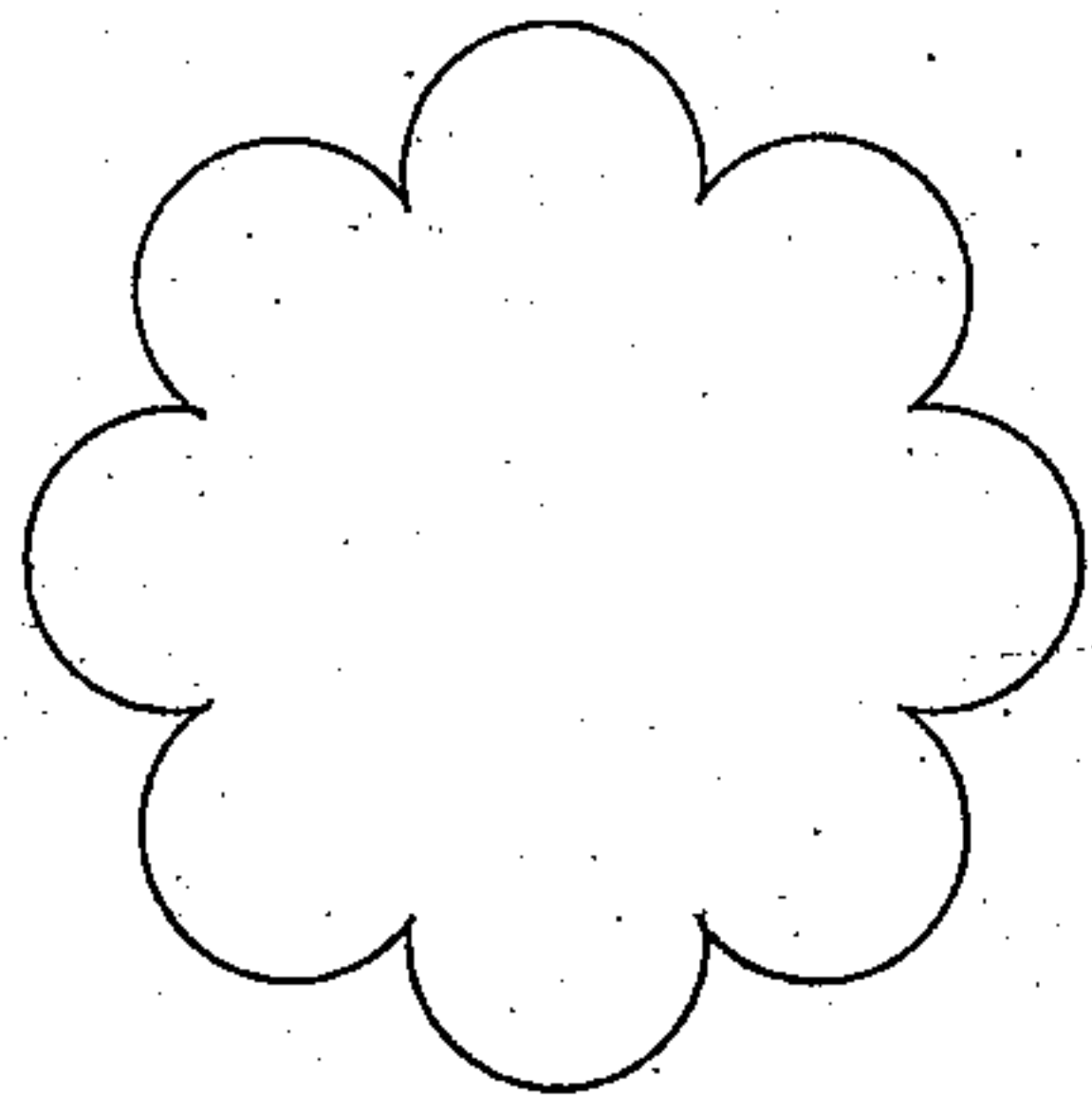


Fig 9

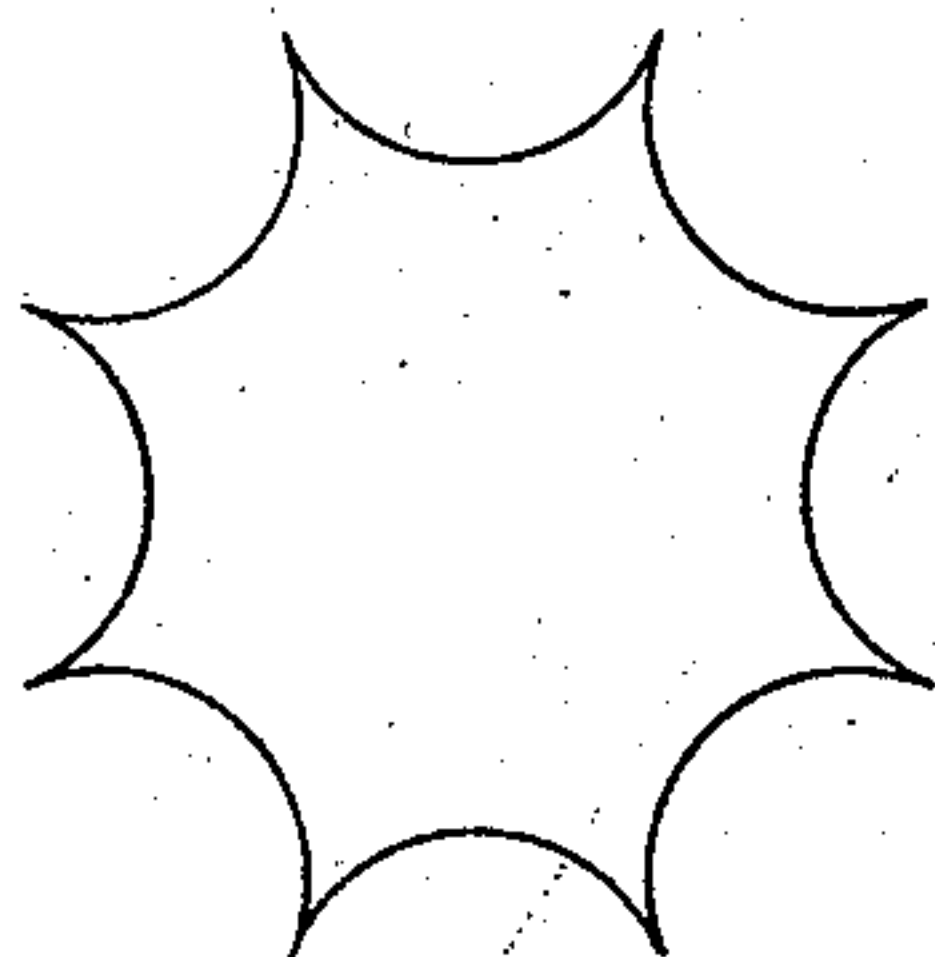


Fig 10

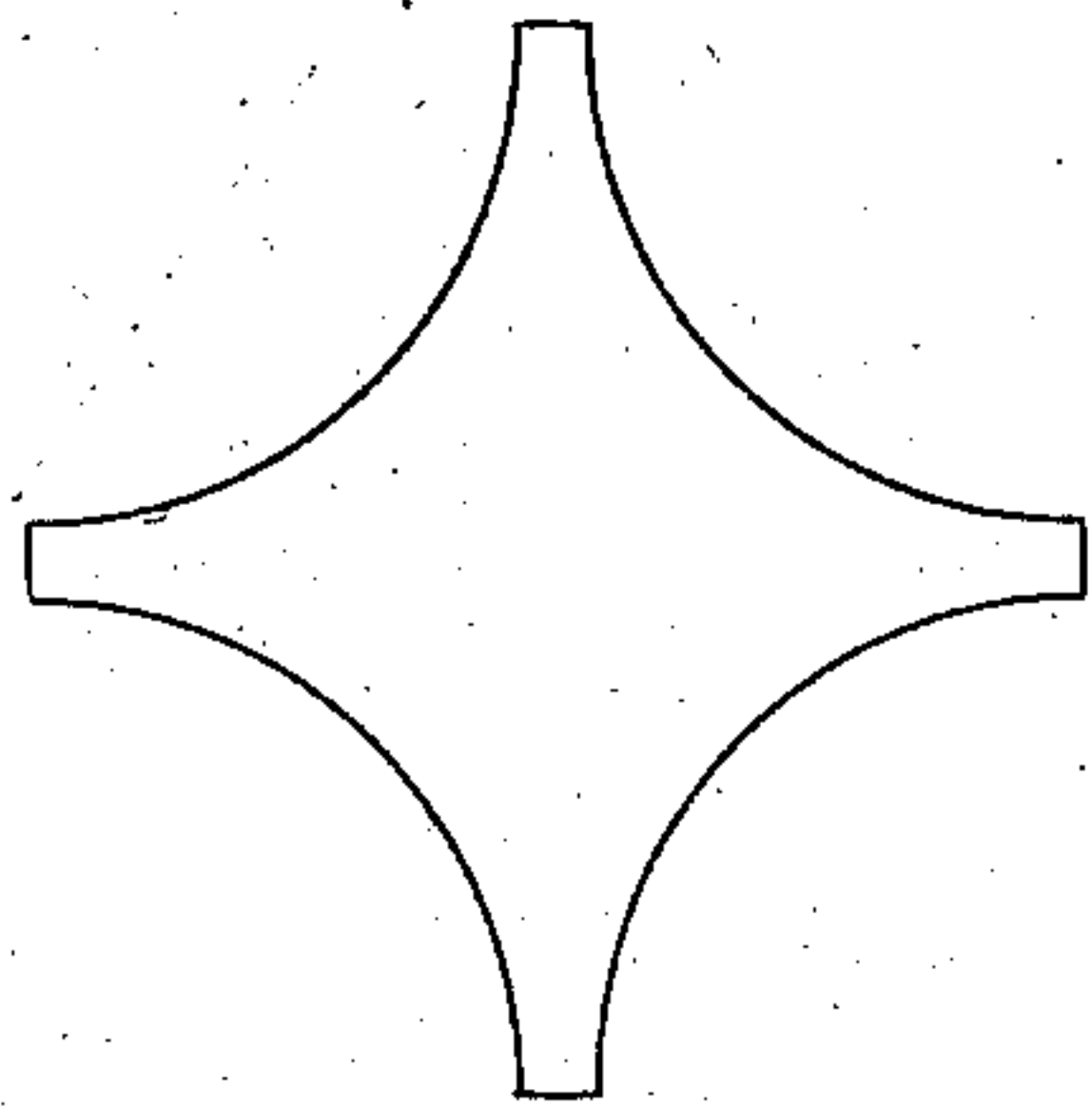


Fig 11

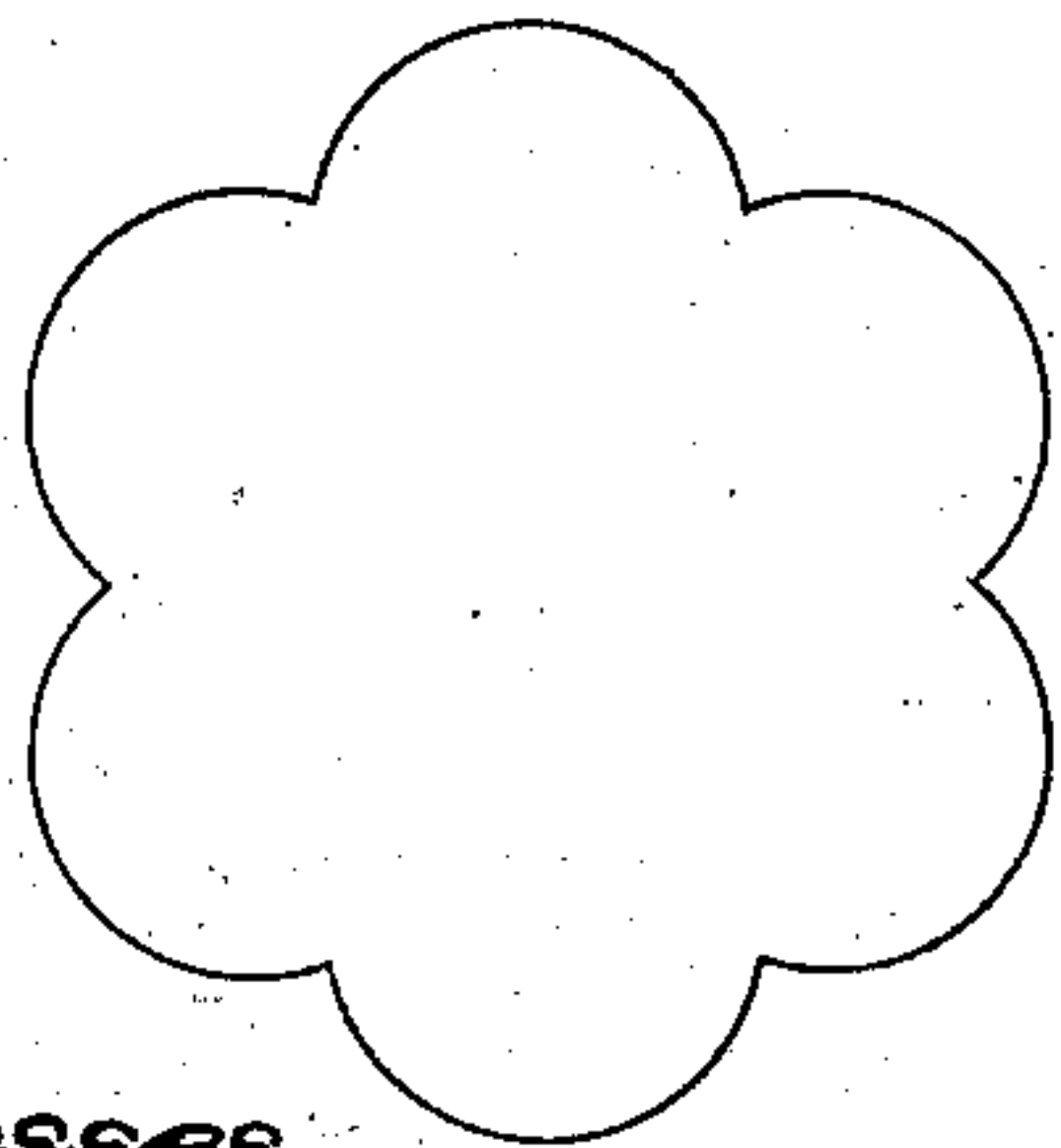


Fig 12

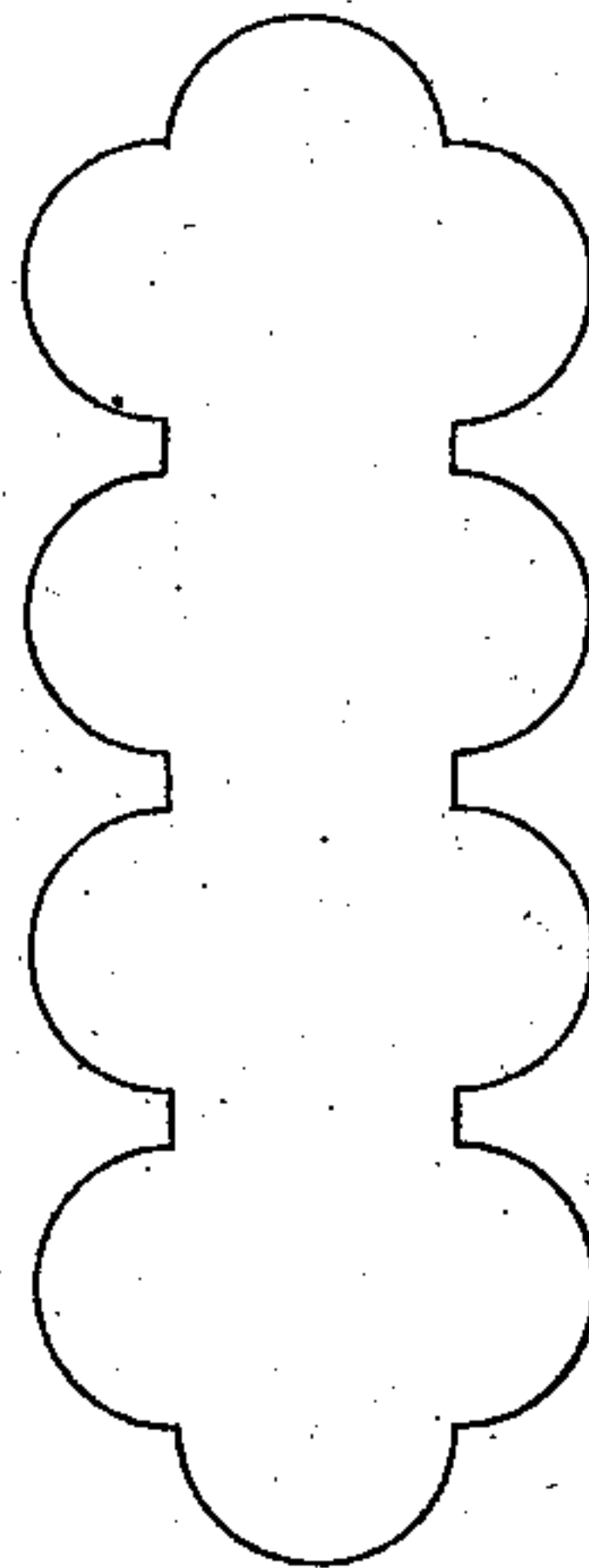


Fig 13

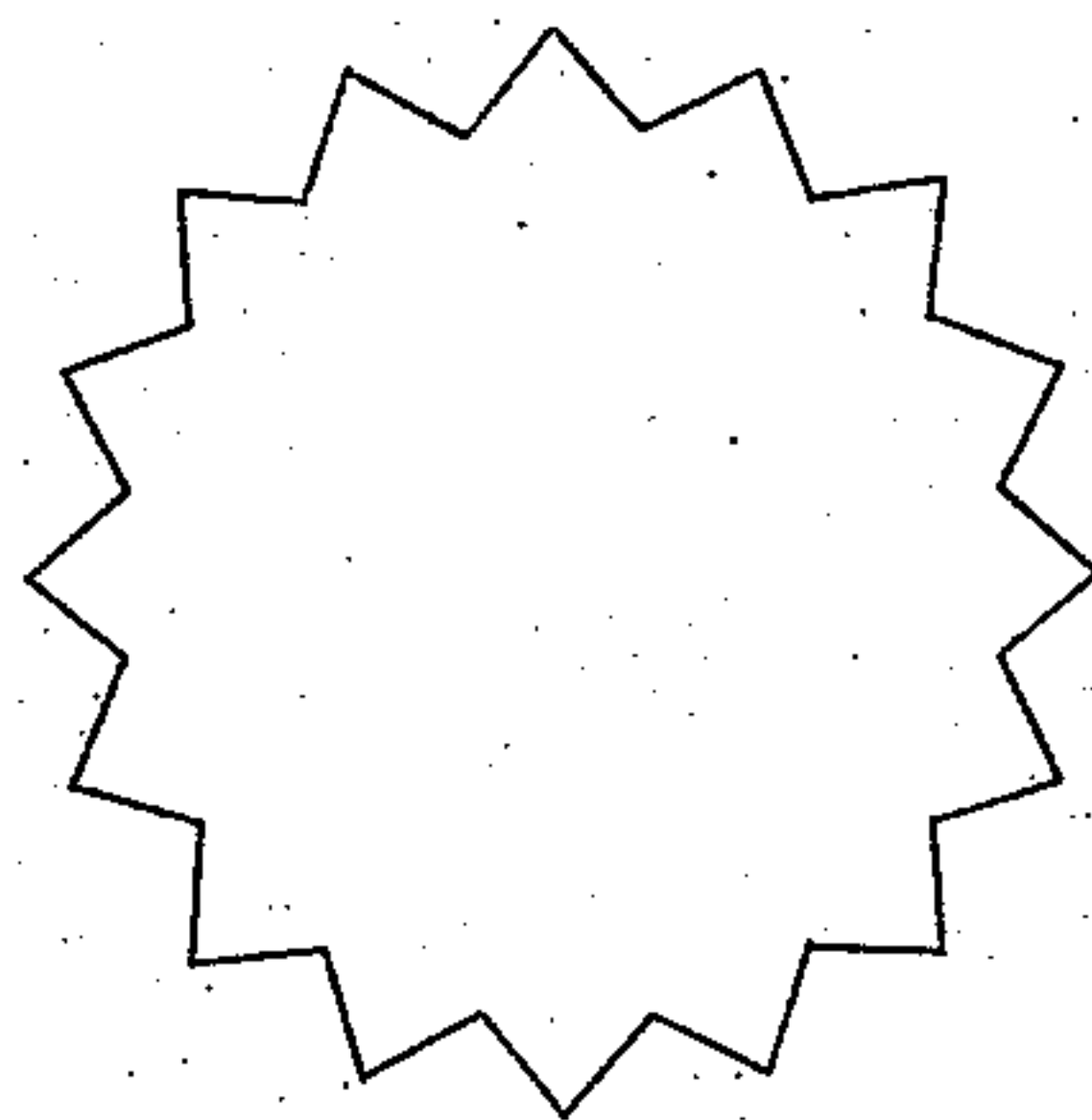
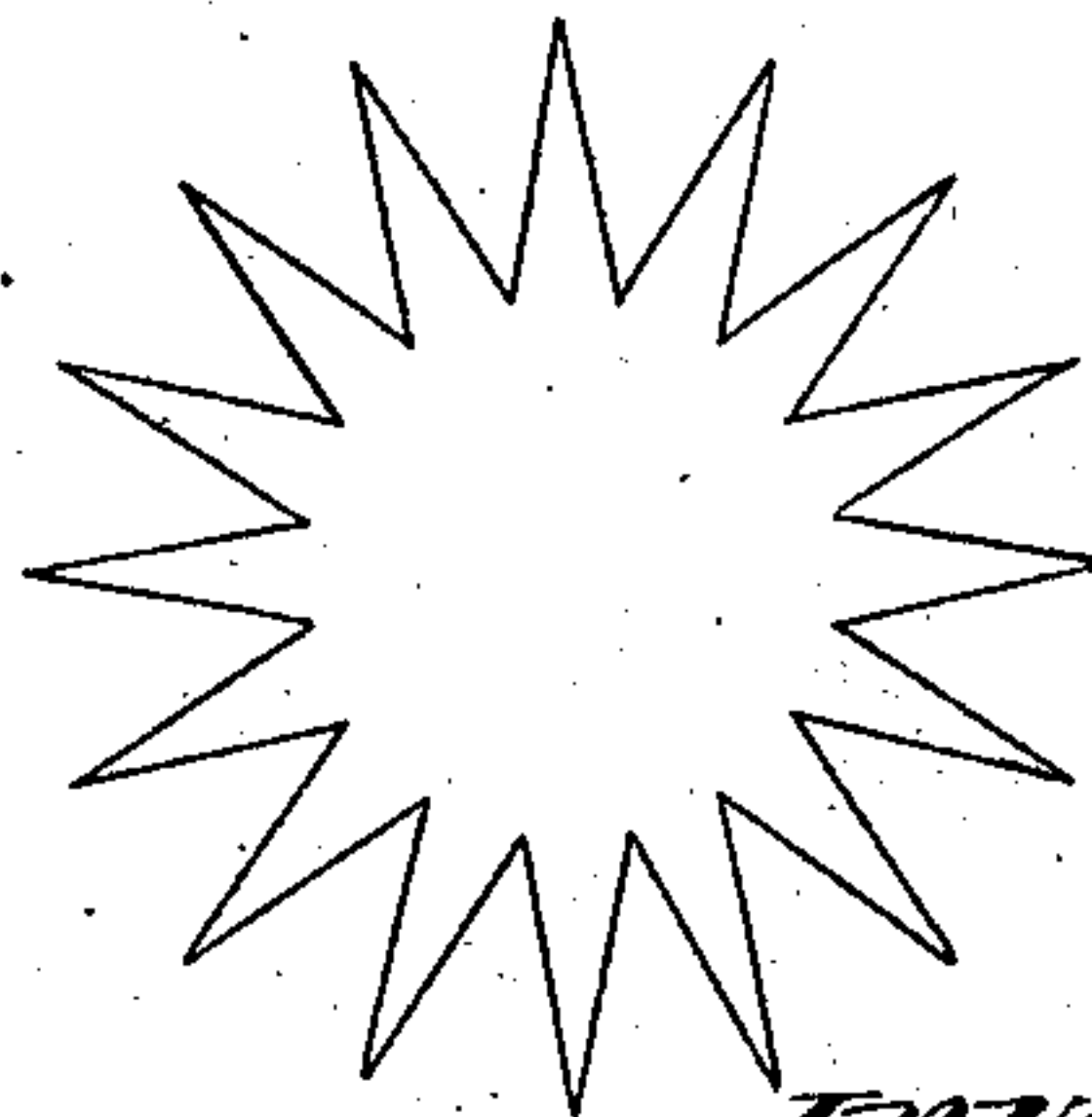


Fig 14



Witnesses,

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Inventor,

Owen C. D. Ross,

By James L. Norris,
att.

UNITED STATES PATENT OFFICE.

OWEN C. DALHOUSIE ROSS, OF 50 TRAFALGAR ROAD, COUNTY OF SURREY,
ENGLAND.

GALVANIC BATTERY.

SPECIFICATION forming part of Letters Patent No. 294,335, dated February 26, 1884.

Application filed May 11, 1883. (No model.) Patented in England September 13, 1882, No. 4,355.

To all whom it may concern:

Be it known that I, OWEN CHARLES DALHOUSIE ROSS, a subject of the Queen of Great Britain, residing at 50 Trafalgar Road, in the county of Surrey, England, civil engineer, have invented certain new and useful Improvements in Galvanic Batteries, (for which I have obtained a patent in Great Britain, No. 4,355, dated September 13, 1882,) of which the following is a specification.

The object of my said invention is to provide an improved galvanic battery applicable to all ordinary purposes for which an electric current is required. The principal advantages are, first, that it is very economical; secondly, that it is free from the objectionable effects of polarization, and, thirdly, that it is moderately powerful. The electrodes which I employ are rods or plates of carbon and of amalgamated zinc placed in cells and connected and arranged in the manner hereinafter mentioned, so as to form, respectively, large and suitable surfaces. When using carbon and zinc rods in circular and annular cells, I connect and arrange such rods in groups, which are adapted to the form of the cell in which they are placed.

In Figure 1 of the accompanying drawings, which figure is a plan of a circular cell, the annular space is occupied by a group of rods, *a a*, forming the outer electrode, (commonly the zinc,) and the inner electrode, *b b*, occupies the central space. Fig. 2 is a vertical section of the same on the line *x y* of Fig. 1.

When the cells are of square or rectangular form the rods which form the electrodes are arranged and connected together, as shown in Figs. 3 and 4, which are respectively plan and elevation of such an arrangement. There may be one row or several rows of such rods, and I combine each group of rods by means of a metal cap into one electrode in order to obtain a large surface, and consequently also an increased quantity of electric current. A convenient method of uniting such a group is by placing the ends of the rods together in a suitable mold, as shown in Figs. 5 and 6, and running molten lead or other fusible metal to a depth of about three quarters of an inch. The rods are then inverted, and the metallic cap thus formed suitably groups them together.

When placed in the cells such zinc and carbon rods or groups of rods are respectively further connected together by conducting straps or wires or otherwise connected; or, again, they may be molded together in connected groups or pairs, so that one continuous metallic cap will cover both electrodes, leaving sufficient space between the two to allow of their being suspended in the battery one on each side of the solid diaphragm or partition which separates the two cells, as shown in plan in Fig. 7, in which the line *a b* represents the separating diaphragm, and the circles *c c c* the rods of carbon, and *z z z* the rods of zinc. The diaphragm *a b*, placed midway or thereabout between each pair, is porous. In order to increase the surface upon which the fluid acts, a great variety of forms are available, such as are shown in Figs. 8 to 14, for example, which are drawn to an enlarged scale. I fill the cell on that side of the diaphragm which is nearest to the carbon with a mixed liquid composed of three parts, by weight, of hydrochloric or sulphuric acid, three parts of water, and one part of nitrous acid. Such proportions may, however, be slightly varied. I also fill the other cell on the side of the porous diaphragm adjoining the zinc with water slightly acidulated with from one to two per cent. of sulphuric or hydrochloric acid. No clamps, terminals, or connecting-wires are required between the several cells of the battery so formed.

By the employment of nitrous acid mixed with sulphuric or hydrochloric acid and water, as hereinbefore described, I claim to have discovered a new and valuable combination of acids which has never been hitherto used, and by means of which I obtain a singularly useful battery because it is free from polarization and will maintain a current of constant strength for many hours, and is at the same time remarkably economical.

I am aware that a galvanic battery has been composed of a cell having a rubber plug from which is suspended a negative metal in the form of a coil of platinum around a central core, and a positive metal in the form of zinc rods; and therefore I do not claim such features; but,

Having thus particularly described and as-

certained the nature of my said invention and in what manner the same is to be performed, I claim—

1. A galvanic battery consisting of a cell
5 and electrodes composed of an outer group of carbon rods or plates, *a*, and an inner group of zinc rods or plates, *b*, all united at the top by a cap-plate.

2. The combination of the group of carbon
10 rods or plates *a*, the group of zinc rods or plates *b*, and metal plates connecting all the upper ends of the respective groups of rods or

plates with a single cell having a diaphragm separating the carbon from the zinc rods or plates, substantially as shown and described. 15

In testimony whereof I have hereto set my hand this 25th day of April, 1882.

O. C. DALHOUSIE ROSS.

Witnesses:

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5 *Quality Court, London, Patent Agent.*

J. WATT,

17 *Gracechurch Street, London, Notary and Clerk.*