

No. 675,455.

Patented June 4, 1901.

J. B. TIBBITS, Dec'd.

LE GRAND C. TIBBITS, Administrator.

PROCESS OF MANUFACTURING LEAD SALTS BY ELECTROLYSIS.

(Application filed Mar. 6, 1894.)

(No Model.)

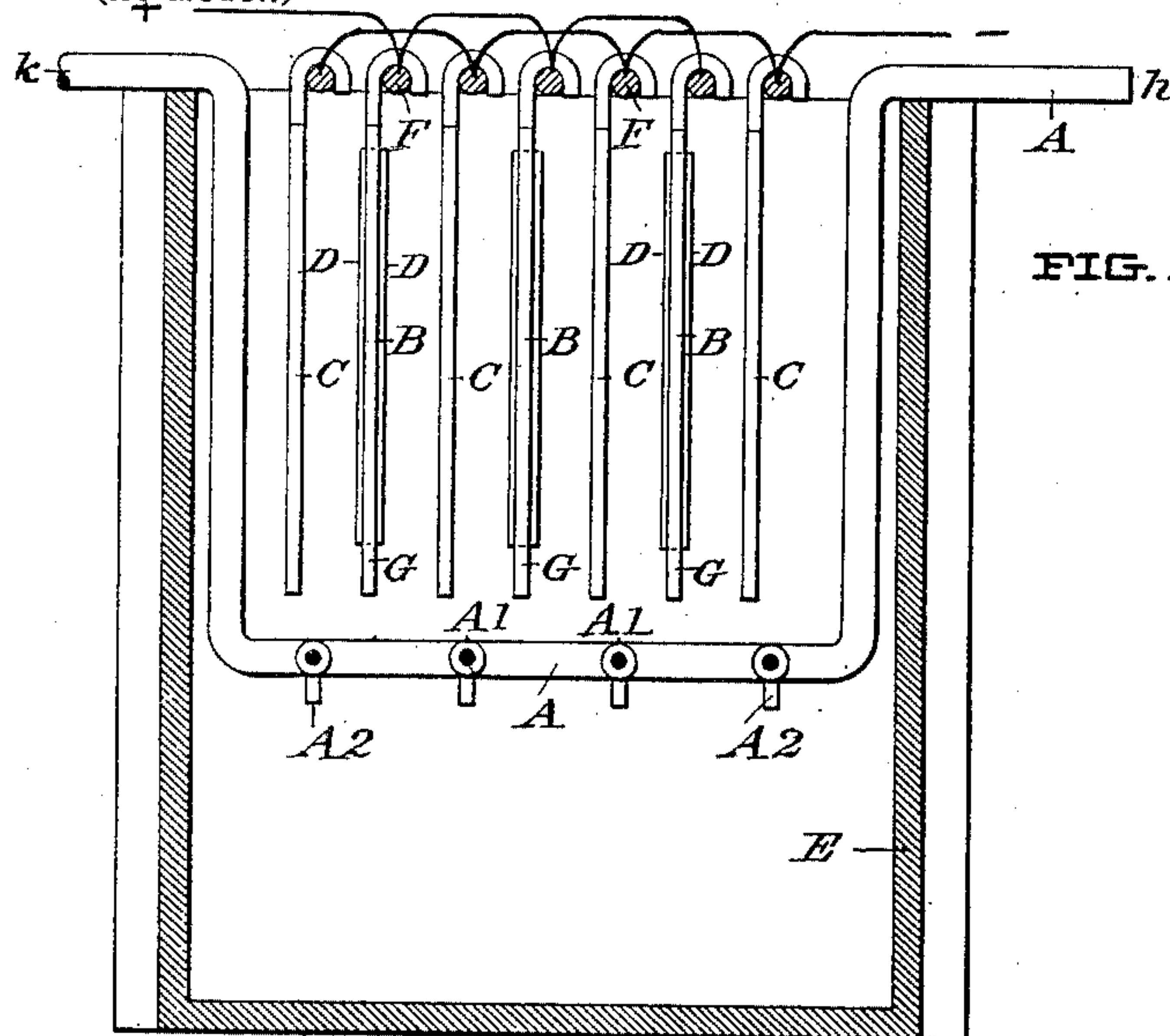


FIG. 1.

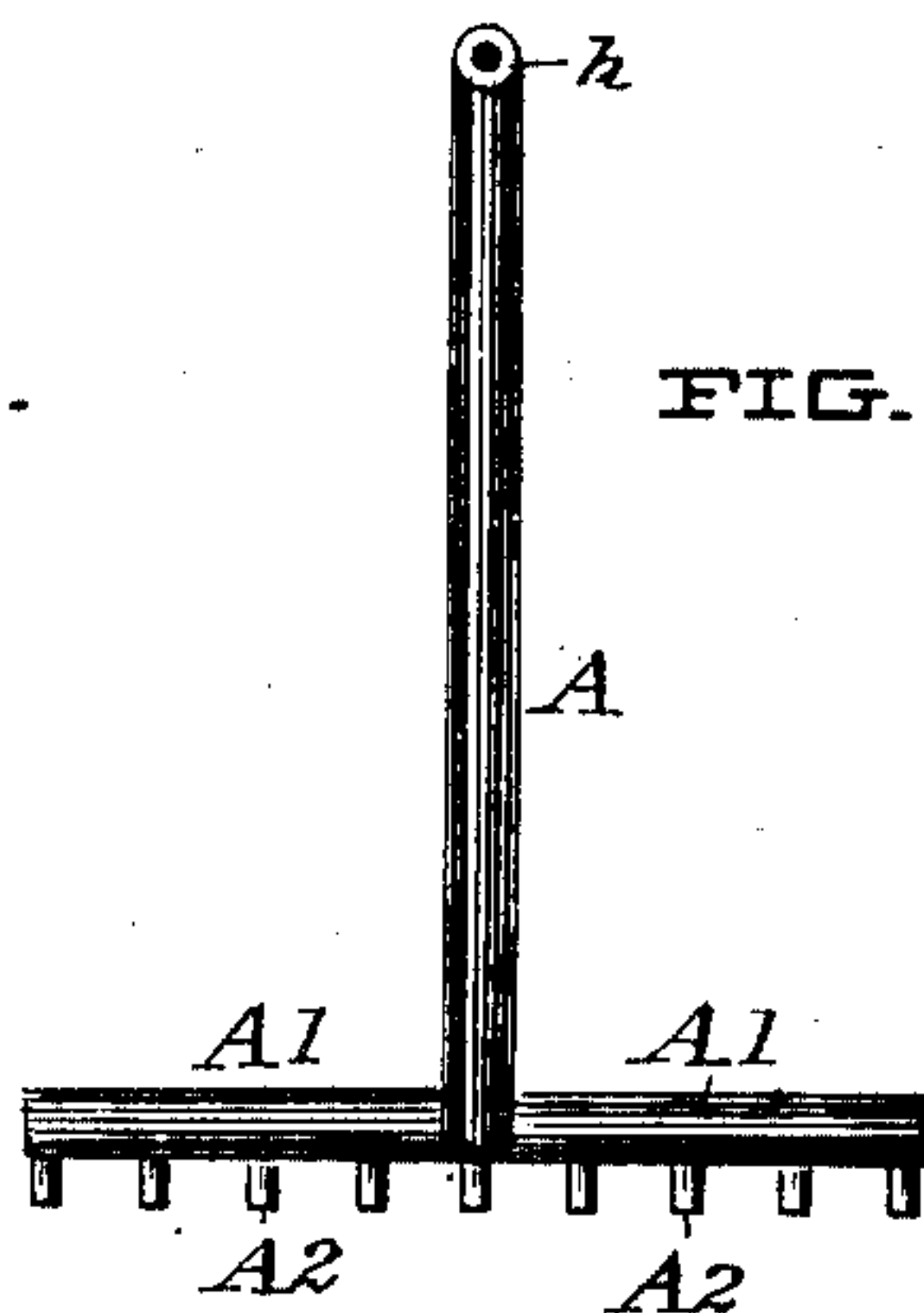


FIG. 5.

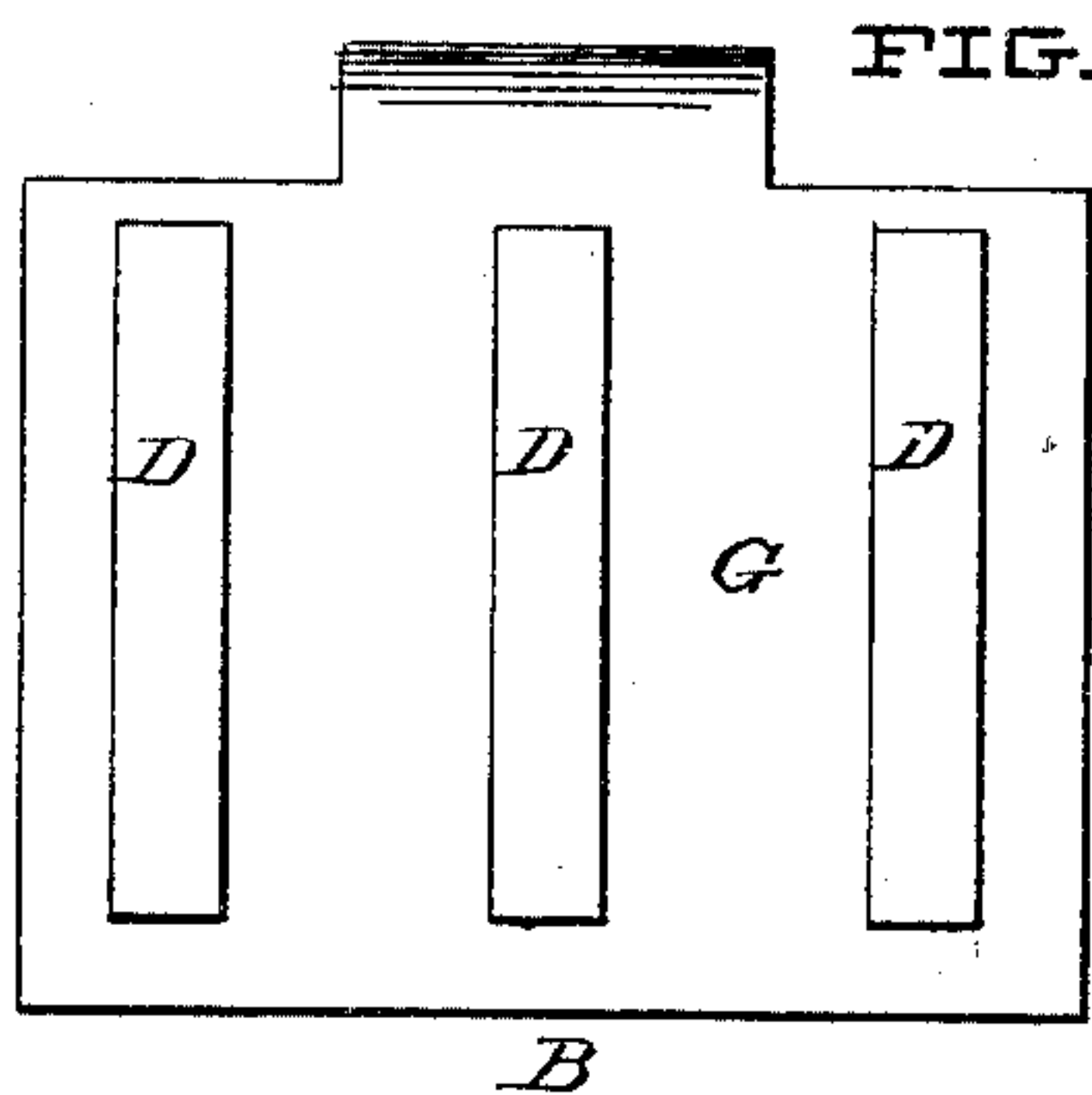


FIG. 2.

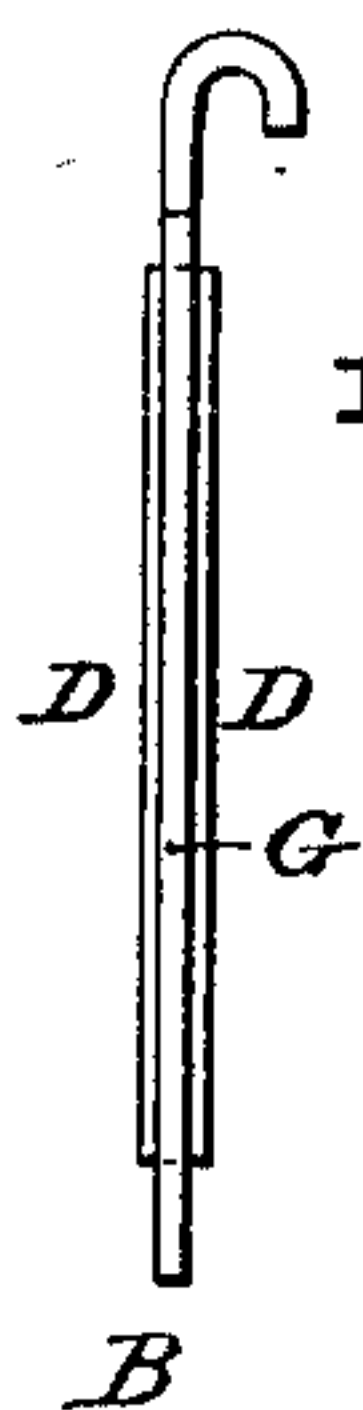


FIG. 3.

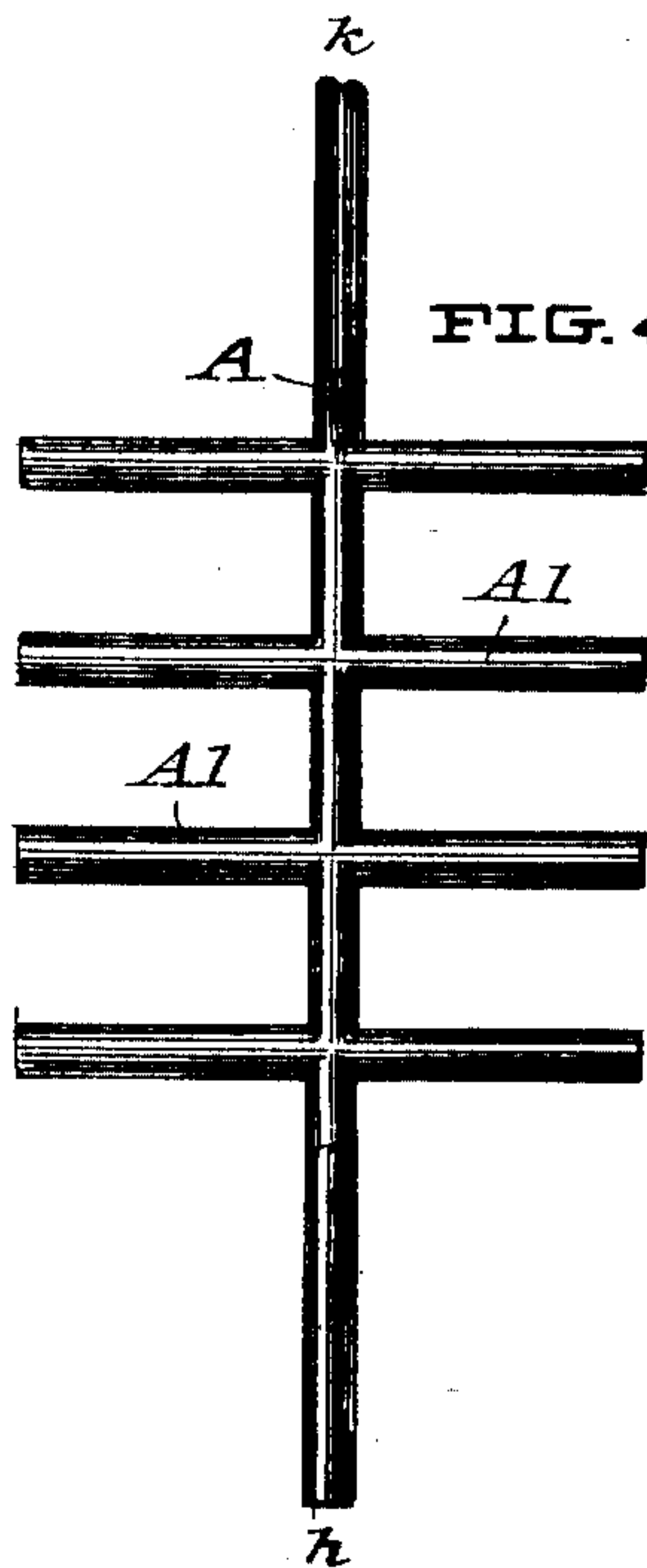


FIG. 4.

WITNESSES:

Wm. Wilcox.
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UNITED STATES PATENT OFFICE.

JOHN BLEECKER TIBBITS, OF HOOSICK, NEW YORK; LE GRAND C. TIBBITS
ADMINISTRATOR OF SAID JOHN BLEECKER TIBBITS, DECEASED.

PROCESS OF MANUFACTURING LEAD SALTS BY ELECTROLYSIS.

SPECIFICATION forming part of Letters Patent No. 675,455, dated June 4, 1901.

Application filed March 6, 1894. Serial No. 502,570. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN BLEECKER TIBBITS, of the town of Hoosick, in the county of Rensselaer and State of New York, have
5 invented certain Improvements in the Art of Manufacturing Lead Salts by Electrolysis, which invention is an improvement upon the invention set forth in Letters Patent of the United States of America No. 414,935, issued
10 November 12, 1889, to Turner D. Bottome, which Letters Patent are now owned by me; and I hereby declare that the subjoined description of the process for carrying out said invention and of the best method of working
15 the same constitutes a specification thereof.

The object of the present invention is to obtain colored pigments having lead as bases by electrolytic action.

In the specification of the Letters Patent
20 above cited a process for manufacturing white lead by electrolysis of a solution with leaden anodes is described. According to the present invention I modify said process so as to produce shaded or colored hydrated
25 carbonate of lead.

For the purpose of best illustrating and explaining the process which constitutes the subject-matter of this invention I have shown a simple apparatus in the accompanying
30 drawings which is adapted to carry out the process constituting my invention.

Similar letters in said drawings indicate corresponding parts.

Figure 1 is a vertical section of the precipitating-tank, taken transversely to the plates which form the electrodes. Fig. 2 is a face
35 view of one of the electrodes. Fig. 3 is an edge view of the same. Fig. 4 is a plan of the gas-distributing tubes, and Fig. 5 is an
40 end elevation of the same.

To carry out this invention, a vat or tank E, which will not be affected by electrolytic action, is provided to hold the electrolytic solution and to receive the precipitate. This
45 solution is preferably alkaline. A system of tubing for introducing into and diffusing through this solution carbon dioxid is shown in Figs. 1, 4, and 5, which consists of a piece of rubber or glass tubing A, which is bent
50 substantially to the shape shown, that portion which traverses the tank beneath the

electrodes being provided with lateral arms A', which have small perforations or diffusing-apertures A², opening downwardly thereout, so as to effect a uniform diffusion of the gas
55 through the bath. The bars F F span the top of the tank, and from them the electrodes B and C are suspended, being disposed in alternation. In the illustrations the anodes are represented by the compound plates B B B
60 and the cathodes by the single plates C C C C. The body of the anode may be a plate of lead G, upon which are superposed copper strips D D D D. These attached metallic strips are termed "supplemental anodes." This com-
65 bination and relative disposition of material in the exercise of the process will produce a precipitate of a brilliant blue tint, the same consisting chiefly of carbonate of lead and carbonate of copper. The apparatus is ren-
70 dered effective by connecting all the anodes with each other and with the positive pole of the battery, and the cathodes are similarly connected with each other and with the negative pole of the battery. The gas-distributing
75 pipe A is then connected with the source of supply of the carbon dioxid by one or both of its terminals, and enough pressure is applied to the entering column of gas to effect its circulation through the bath. To procure
80 a colored precipitate of which the lead shall form the base, I join with the lead of the electrode another substance, which in the process of the electrolytic decomposition of said substance and of the lead of the anode and
85 its attendant reactions will impart a distinctive color to the resultant precipitate.

The following illustrates the operation of my invention: To produce a blue pigment having a lead base, I prepare an electrode (the
90 anode) by attaching a piece of copper to a lead plate, so that they shall be in contact, and immerse this composite electrode in the electrolytic solution, so that both metals shall be in contact with the solution. The other
95 electrode (or cathode) may be simply a plate of lead similarly immersed. Connection with the current is then made in the usual way, taking care, however, that the wire or other connection with the composite electrode is
100 made with the element offering the highest resistance to the current, which in this in-

stance is the lead. The path of the current is thus from the lead of the positive side of the battery, through the copper, with which it must be in contact, into and through the bath, 5 to the cathode. In its passage such a reaction is set up that a blue product is precipitated as a result of the electrolytic action, which may be recovered from the bath and after being washed is found to be a true metallic pigment of great body and purity of 10 color, the same consisting chiefly of carbonate of lead and copper. The depth of tone or intensity of color of the product is determined by the relative areas of the lead and 15 copper of the anode, the smaller the relative area of the copper used in comparison with that of the lead the lighter the tint.

A beautiful purple pigment can be obtained by coating all of the plates of the battery, both anode and cathode, with a strong 20 solution of iodine well dried on. Then place them in the electrolytic solution, to which has been previously added a sufficient quantity of aniline-red or other suitable dye, which may 25 be poured into said solution in liquid form or dropped thereon as a powder and stirred in. Then connect with the current, when the product will be precipitated, which will be of a strong purple or violet color, which may be 30 recovered and washed, as described in the Letters Patent before recited.

Besides iodine, above mentioned, any mineral substance may be substituted for the cop-

per if of a nature to produce a colored pigment when subjected to electrolytic action, 35 as described. I am unable to name all such substances or to state the reactions. These last will differ with different substances.

By the word "composite" as used in this specification I mean composed of more than 40 one material. By the words "pigment coloring" as used in this specification I mean adapted to give color to what would otherwise be a white pigment when subjected to electrolysis in the conditions stated. 45

I therefore claim as my invention the following:

1. A process of manufacturing colored pigments consisting in electrolytically dissolving in an alkaline solution an electrode consisting of lead and another substance capable of 50 imparting a color to lead salts, and supplying carbon dioxide to the bath.

2. A process of manufacturing colored pigments consisting in electrolytically dissolving 55 in an alkaline solution, an electrode consisting of lead and copper and supplying carbon dioxide to the bath.

In witness whereof I have hereto subscribed my name this 28th day of February, A. D. 60 1894.

JOHN BLEECKER TIBBITS.

In presence of—

GEORGE H. MYERS,
FRANKLIN SCOTT.