

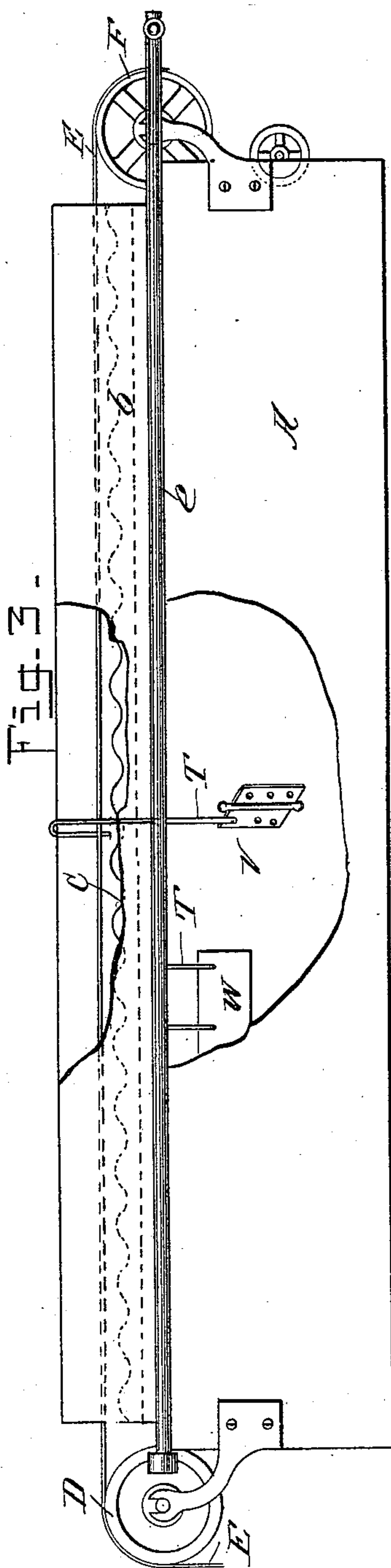
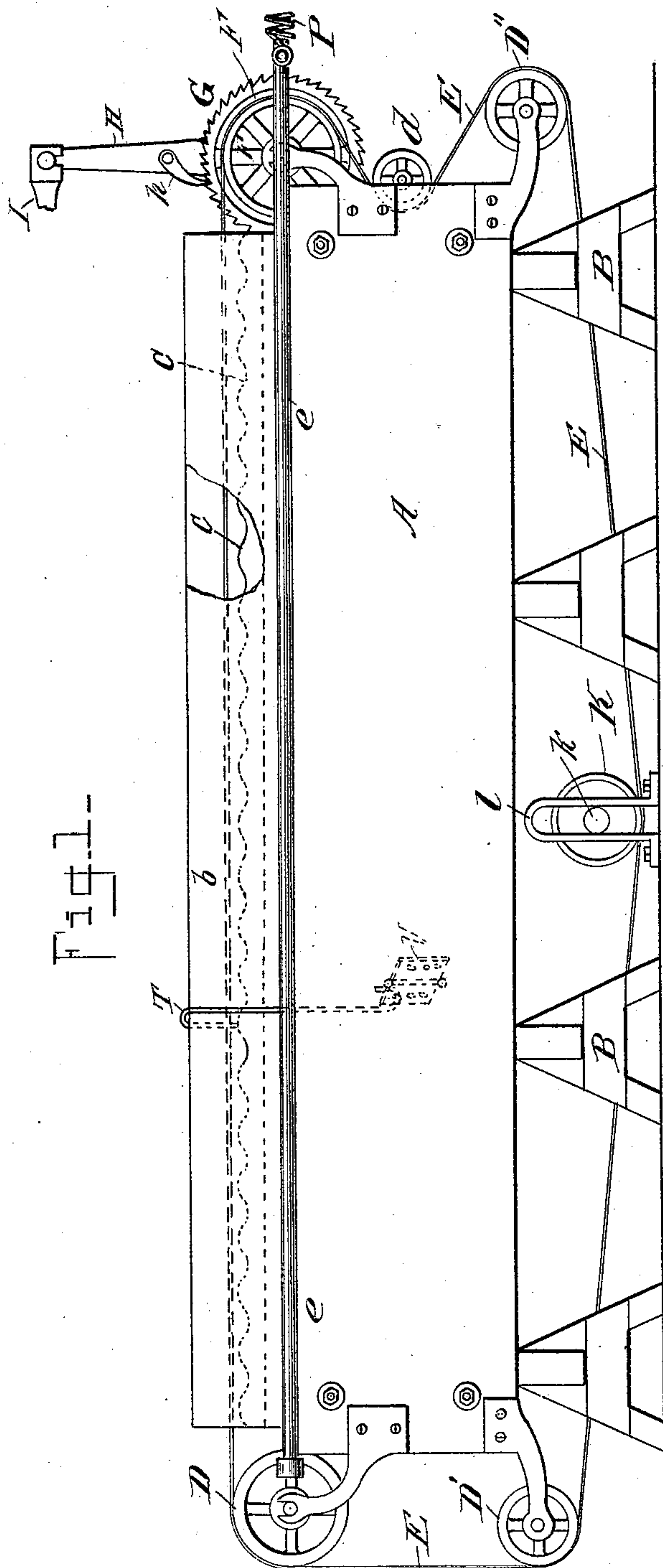
(No Model.)

2 Sheets—Sheet 1.

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ELECTRODEPOSITING DEVICE.

No. 542,986.

Patented July 23, 1895.



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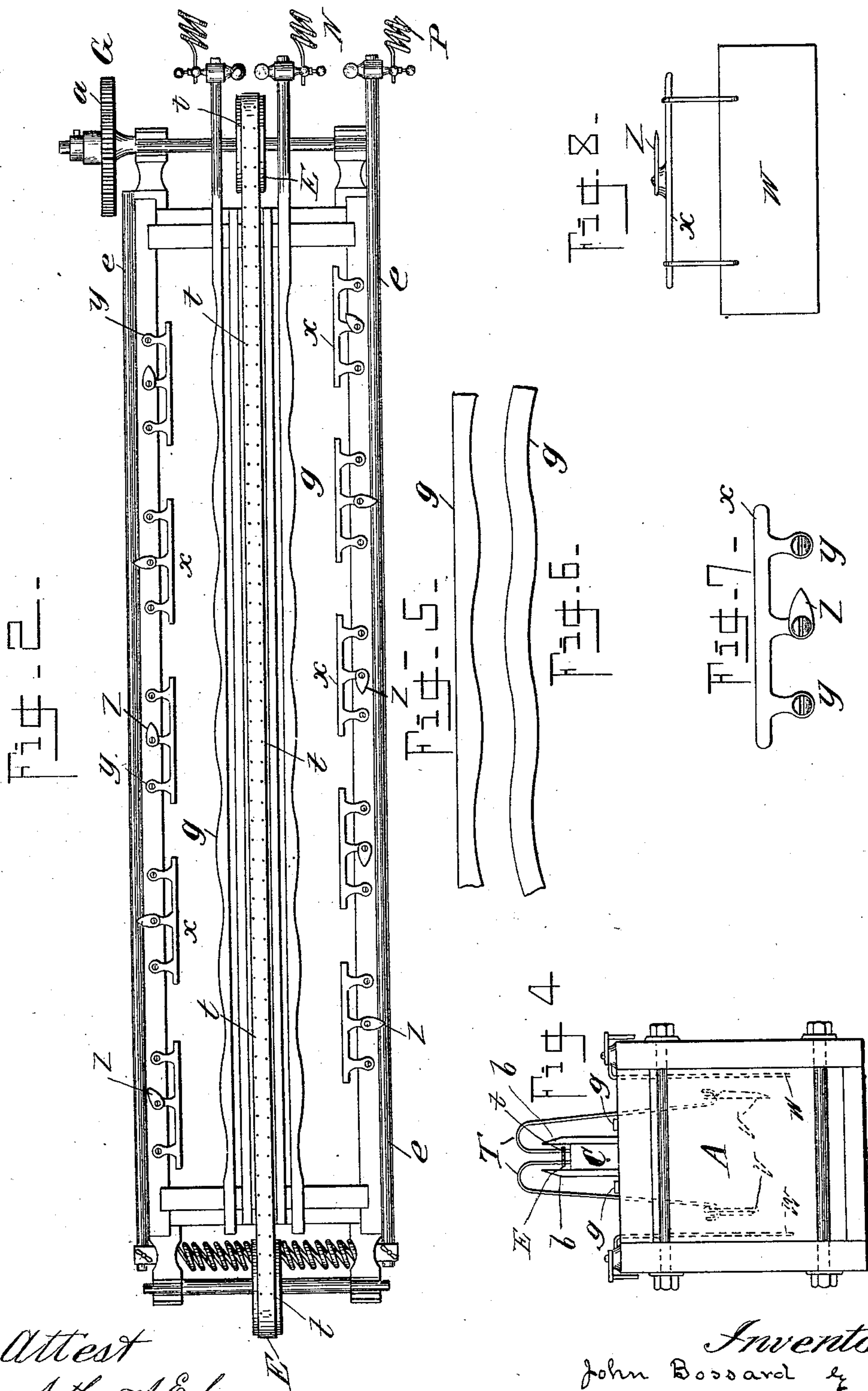
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UNITED STATES PATENT OFFICE.

JOHN BOSSARD, OF DUBUQUE, IOWA.

ELECTRODEPOSITING DEVICE.

SPECIFICATION forming part of Letters Patent No. 542,986, dated July 23, 1895.

Application filed November 11, 1893. Serial No. 490,648. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOSSARD, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Electrodepositing Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electro plating, typing, or depositing devices wherein the article to be deposited upon is caused to automatically travel through the bath in such a manner that the deposit will be evenly, smoothly, and rapidly made upon the articles; and it consists, preferably, in an oblong tank or vat with a firm bridge longitudinally over the tank, from which the articles to be deposited upon are suspended.

It further consists in means for causing the articles to travel automatically through the bath in the tank while they are suspended from the bridge without the carrier coming in contact with the bath in the tank.

It further consists in means wherein the anodes are suspended within the bath and connected together in such a manner that each individual anode can be brought into the circuit in the bath and cut out at pleasure without destroying the effect of the remaining anodes, whereby the anode-surface may be increased or diminished at will to any extent and at any place along the line of the travel of the article.

My invention further consists in means for imparting to the articles to be deposited upon an undulatory or wavy motion in its passage through the bath, thereby causing the bath to be gently stirred, whereby the deposit is made much more rapidly and evenly on the articles in the bath; and still further it consists in devices for regulating and controlling the speed of the travel of the articles to be deposited upon through the bath.

As to the manner in which I accomplish these and other minor objects attention is invited to the specification and accompanying drawings, in which—

Figure 1 is a perspective of my invention, showing the tank with the bridge, the endless

belt, and means for causing the belt to travel along and over the bridge. Fig. 2 is a plan view of my tank, showing the endless belt, the manner of suspending the anodes, and means for imparting an undulatory or wavy motion to the articles to be plated in their passage through the bath. Fig. 3 is a side elevation of the tank and bridge with a portion cut away, showing the manner of suspending the articles to be plated from the bridge. Fig. 4 is an end view of the tank, bridge, and cathode-bar. Fig. 5 shows the form of the cathode-bar. Fig. 6 is a modification of Fig. 5. Fig. 7 is a plan view of the anode-carrier. Fig. 8 is a side elevation of one of the anodes. Like letters denote corresponding parts in all of the drawings.

A represents my improved tank, which is made water-tight in the usual manner and preferably of much greater length than width, and is firmly set on the horses B B. Above the tank A is secured a rigid and nearly inflexible beam or bridge C, with a smooth metallic upper surface which extends longitudinally over the tank A from end to end, to either side of which bridge C is secured a piece *b*, both of which extend above the body of the bridge and serve as a guide for the endless belt E encircles the tank longitudinally, passing over the bridge a short distance above it and between the guides *b b*, attached to the sides of the bridge and entirely free from any contact with the bath in the tank. The belt E is preferably made of leather, and is perforated at *t t* near its outer edges, at short intervals throughout its length, and through it the hooks T T pass, with their upper ends resting on the upper metal surface of the bridge C. To these hooks T T are suspended the articles *v v* to be plated.

At one end of the tank are set the pulleys D D' and at the other end the pulleys D'' and *d*, upon all of which pulleys the endless belt E travels. For the purpose of regulating and controlling the time in which the article to be plated shall travel in the bath before it is sufficiently plated, which varies according to the size of the article and the character of the metal in the article, there is secured a wheel F at the same end of the tank as the pulley *d* and in line of the travel of the belt E, and

from which wheel F said belt E receives its motion. The wheel F is securely fastened to the axle of the ratchet-wheel G. To the outer end of the axle of the wheel G is pivoted the
 5 rocker-arm H, which is also pivoted at its outer end to the arm I, to which arm I power is applied. Upon the arm H is set a pawl *h*, which engages with the notches *a a* on the wheel G, the object of which will presently
 10 appear. It is manifest that various other means may be employed for driving the belt E at any given rate of speed and controlling the length of time the article to be plated shall remain in the bath before it is suffi-
 15 ciently plated, the one above shown being a simple and convenient one.

Beneath the tank A is an idle and weighted pulley K, which rests on the belt E and serves to take up the slack of the said belt E and
 20 always keep it taut. The axle *k* of the pulley K is loosely held between the arms of a guide *l*, which guide is secured to the floor.

Along each side of the tank A is placed a copper rod *e*, to which the anode-pole P of the
 25 electrical force is attached and to which the anode-carriers may be connected and from which they may be disconnected at will. Along the sides of the bridge C are fastened two cathode-rods *g g*, which are connected to
 30 the cathode-pole N of the electrical force and connected together by the straps *g' g'*, or the cathode element may be connected directly to the metal surface of the bridge. The rods *g g* are preferably flat strips of copper having
 35 one edge straight and the other edge crooked, as shown in Fig. 5, the object of which will presently appear. It is manifest that these rods may be crooked on both sides, as shown in Fig. 6, and answer the same purpose.

40 From the inner side of the tank A are suspended the anodes W W, from the upper edge of the sides of the tank and so close to the anode-rods *e e* that they may be readily connected with them by the means hereinafter
 45 described. A number of straps or carriers *x* are placed upon the edge of the tank A and are held in place by the ears or clips *y y*, from which carriers the anodes are suspended. Near the center of each of these straps or car-
 50 riers *x x* is pivoted a metal tongue *z*, which can be turned at right angles to the carrier *x* and connect the anode W with the copper rod *e* and thus connect the anode with the electrical force, and when this tongue *z* is turned
 55 in a line parallel with said carrier *x* this connection with the electrical force will be broken, all of which is shown in Fig. 2, with part of the anodes connected and part disconnected.

Having now described my invention, the
 60 manner of operating is as follows: To the hooks T T, at their lower ends, are secured the articles *v v* to be plated, which are suspended from the bridge at one end, with the upper end of the hooks T T through the holes
 65 *t t* of the belt E, and the point of the hooks resting on the top of the bridge C and the body

of the hooks bearing against the cathode-rod *g*. The circuit is then established within the bath through the bars *g g* and *e e* or through the bridge alone. Power is applied to the
 70 arm I, which pushes the rocker-arm H back out of a perpendicular, and this movement draws the end of the pawl *h* along on the periphery of the ratchet-wheel G partly around, and as the belt E passes around the wheel F,
 75 there will be given a movement forward of the belt E, which will draw along the hooks T T on the bridge, and with them will be advanced the articles *v v* in the bath the same
 80 distance as the travel of the belt E. It will be noticed that this movement of the wheel G is intermittent and imparts an intermittent motion to the articles in the bath. This motion gently stirs the bath and causes the de-
 85 posit to be made quickly upon the articles. The rapidity with which the articles travel through the bath is regulated by the length of the swing of the arm H and the number of notches compassed by the pawl on the wheel
 90 G. It will be readily understood that when it has been determined how long it will require to thoroughly plate an article in the bath, this device may be set so as to cause the belt to travel the length of the tank in exactly
 95 that length of time by regulating the length of the swing of the arm H and the number of notches compassed by the pawl *h* at each swing of the arm H. As the articles advance through
 100 the bath, the hooks T T being suspended from the bridge and bearing against the cathode-bars *g g*, which are crooked on their outer edges, the articles are given a lateral undulatory movement as the body of the hooks to which the articles are suspended passes over
 105 the crooked surface of the cathode-bars *g g*. This also has a further tendency to gently stir the bath and cause the plating to be done much more rapidly and evenly. In order to control the amount of the anode-surface, the
 110 tongues *z z* are turned to connect with the rods *e e* or disconnected from said rods, and thus the influence of the anodes is under complete control of the operator without removing any of the anodes from the bath. It will be
 115 seen that they or any one of them may be connected at will along the tank, and in this manner any desired amount of the electrical force may be imparted to the bath through the anodes at any place at will along the tank
 120 and the deposit be effected much more rapidly, smoothly, and evenly and with little or no trouble to the operator. For the purpose of giving still another movement to the arti-
 125 cles in the bath, the upper surface of the bridge or the upper edges of the guides may be made uneven, and the same general wavy or undulatory movement will be imparted to the articles in the bath as is imparted by the crooked cathode-bar, but the movement will
 130 be an up-and-down movement, instead of a lateral one. It will also be noticed that by

the use of the ratchet-wheel with the pawl the belt and by it the articles in the bath will be given an intermittent motion.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An electro-depositing device, consisting of a tank and depositing bath therein, a bridge over said tank, hooks from which the articles to be deposited upon are suspended, electric connections between said bridge and hooks an endless belt traveling outside of the bath and engaging with the said hooks by means of which the articles are automatically drawn through the bath, and means for imparting an intermittent motion to said belt while drawing the articles through the bath for the purposes shown.

2. An electro-depositing device of the character described, consisting of a tank containing a depositing bath, one or more anode bars supported in said bath, hooks above the bath for supporting the articles to be deposited upon, one or more crooked cathode bars, along and against which the said hooks engage while passing through the bath, and an endless belt engaging with the aforesaid hooks for causing the article to travel through the bath, whereby said articles are given an undulatory or crooked movement for the purpose shown.

3. In an electro-depositing device of the character described, a tank containing a depositing bath, one or more anodes suspended in said bath, one or more cathode bars arranged above said bath, hooks supporting the articles to be deposited upon and resting against the said cathode bars and means for increasing and decreasing the anode surfaces to any extent and at any place at will along the line of travel of the articles through the bath, as and for the purposes shown.

4. An electro-depositing device, consisting of a tank containing a depositing bath, an endless belt for moving the articles to be deposited upon through the bath, one or more cathode bars above said bath, hooks for carrying the articles to be deposited upon and connected to the said belt one or more anodes

suspended in said bath and a switch attached to each anode whereby the electric current may be directed to any one or more points along the line of travel of the articles in the bath at will, for the purposes shown.

5. An electro-depositing device, consisting of a tank and depositing bath therein, a bridge over said bath from which the articles to be deposited upon are suspended, a belt above said bridge, means for causing said belt to travel above said bridge and outside of the bath, whereby the articles to be deposited upon are advanced through the bath and a cathode bar above said bath and having an undulatory or crooked bearing face for causing the articles to be deposited upon to take an undulatory or crooked movement through the bath for the purpose shown.

6. An electro-depositing device, consisting of a tank containing a depositing bath, a bridge spanning said bath longitudinally and above the bath, means for suspending the articles to be deposited upon in the bath and from said bridge and an endless belt traveling above said bridge and outside of the bath for advancing the articles through the bath for the purposes shown.

7. An electro-depositing device, consisting of a tank containing the depositing bath, one or more anodes suspended within the bath, means for connecting and disconnecting at will, one or more anodes with the electrical current without connecting or disconnecting the remaining anodes, one or more crooked cathode rods above the bath, a bridge from which the articles to be deposited upon are suspended, an endless belt for advancing the articles through the bath with their supporters bearing against said cathode bar, and means for determining the rate of speed the articles shall travel through the bath, for the purposes shown.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN BOSSARD.

Witnesses:

H. P. APPLETON,
MONROE M. CADY.