No. 894,482. PATENTED JULY 28, 1908.

S. C. CATLIN.

PLATING MACHINE.

APPLICATION FILED MAR. 12, 1907.

3 SHEETS—SHEET 1.

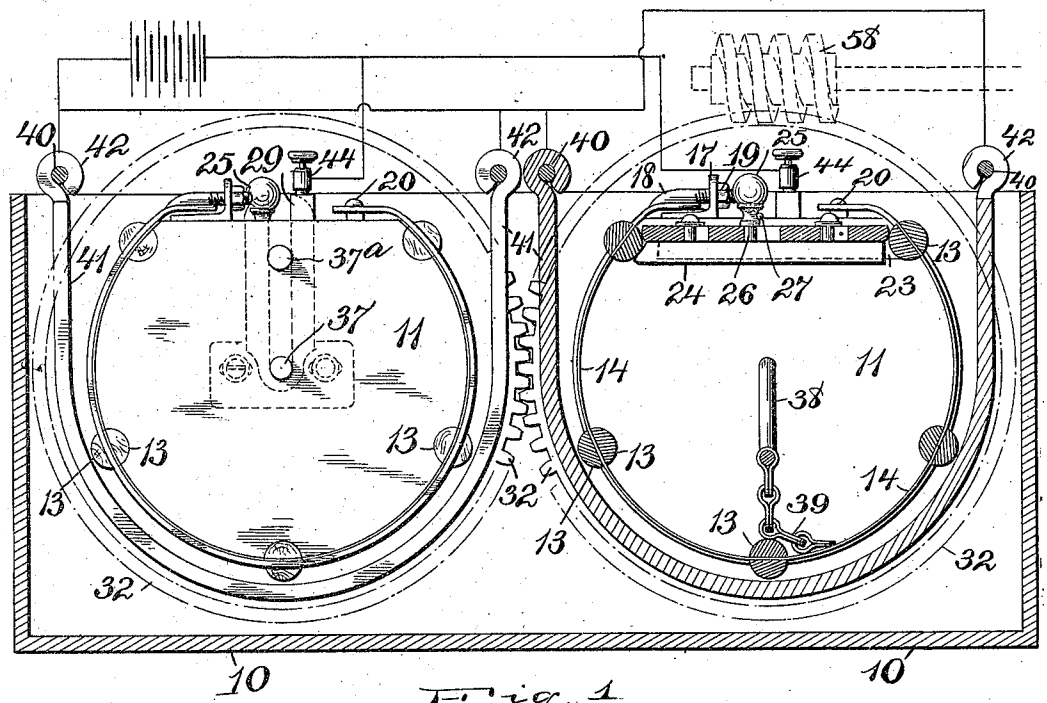


Fig. 1

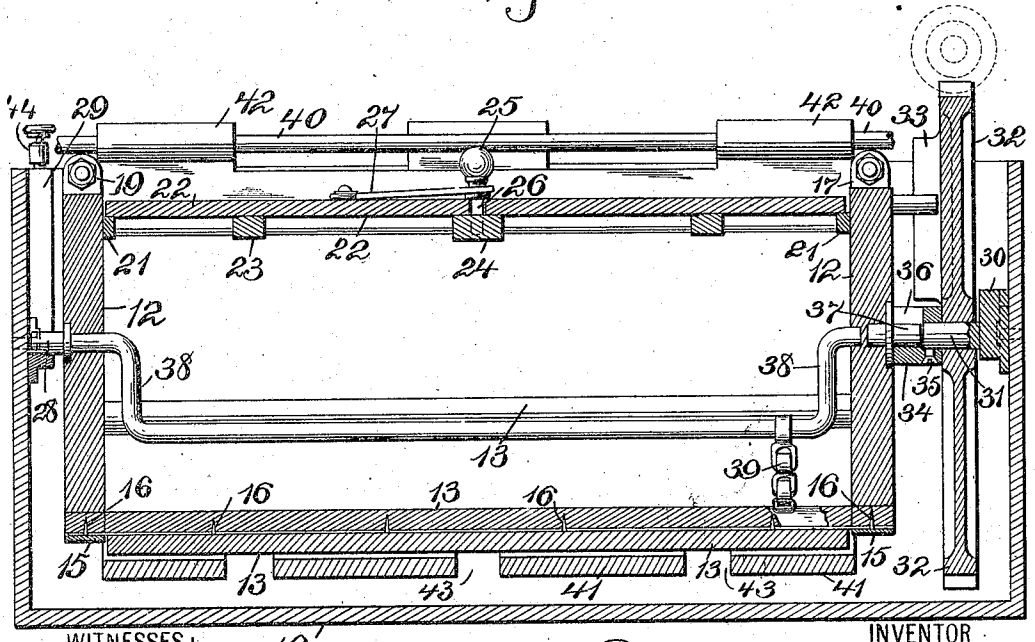


Fig. 2

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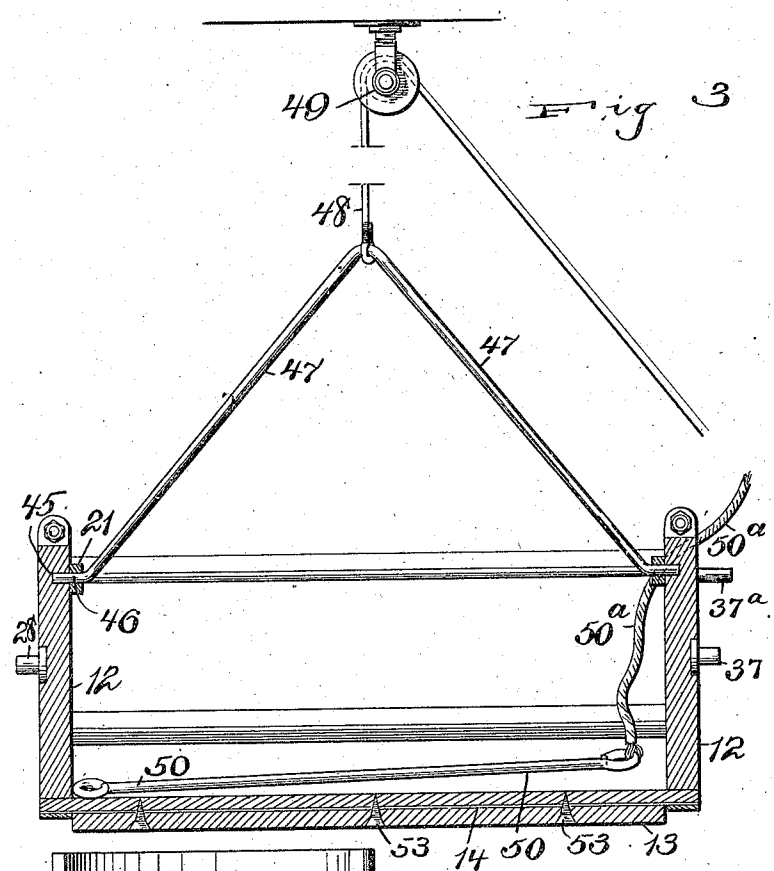


Fig 3

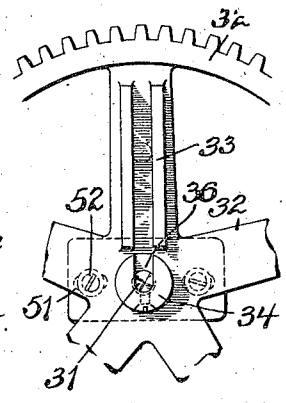


Fig. 4

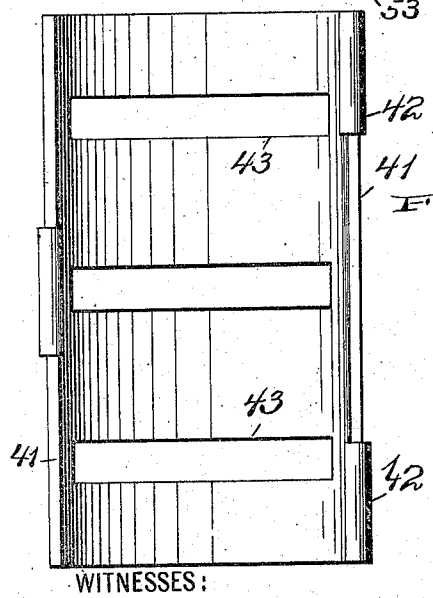


Fig. 5.

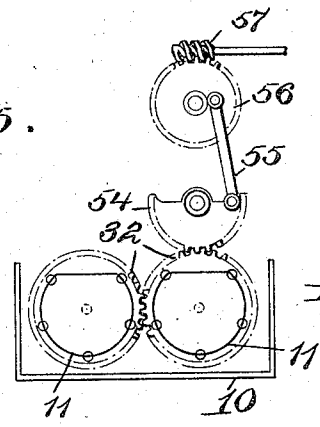


Fig. 6

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3 SHEETS—SHEET 3.

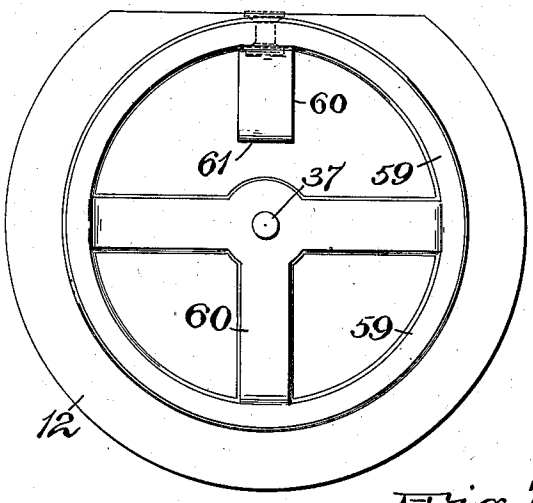


Fig. 7

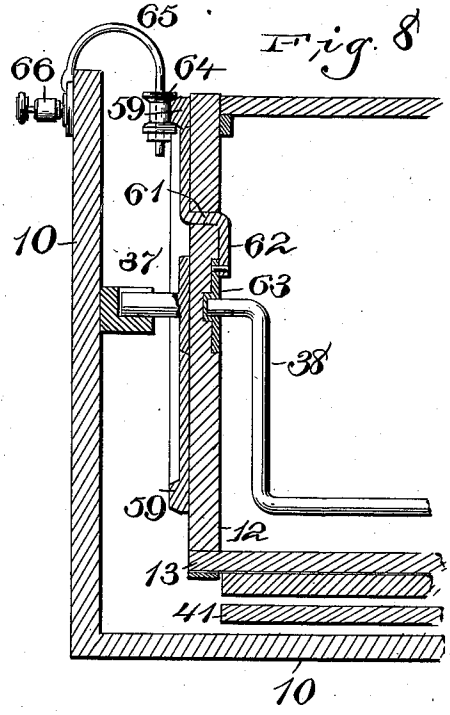


Fig. 8

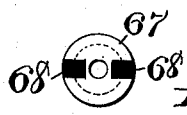


Fig. 9

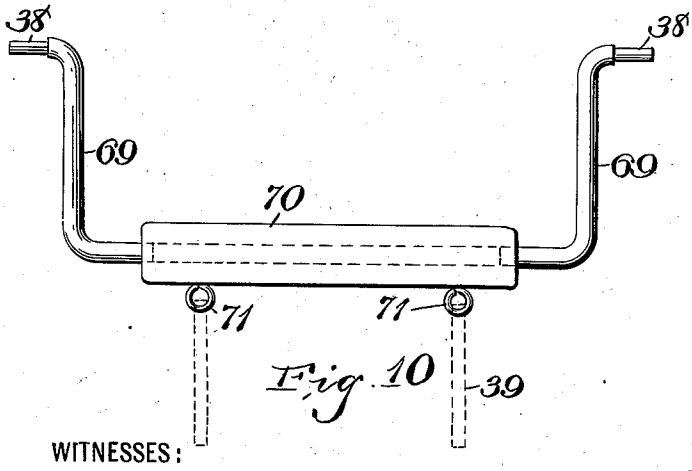


Fig. 10

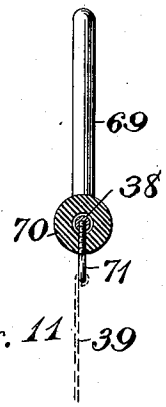


Fig. 11

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UNITED STATES PATENT OFFICE.

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PLATING-MACHINE.

No. 894,482. Specification of Letters Patent. Patented July 28, 1908.

Application filed March 12, 1907. Serial No. 361,986.

To all whom it may concern:

Be it known that I, SETH C. CATLIN, a citizen of the United States, residing at Bloomfield, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Plating-Machines; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to a machine used for electroplating, and embodies a casing provided with baskets or receptacles capable of a rotary motion, these baskets or receptacles being arranged in bearings in the sides of the casing.

The invention is further designed to provide a machine, of this kind, that provides the baskets with either a continuous rotary motion or a reciprocating rotary motion, and means are provided for transmitting motion from one basket to the next, whereby a series of baskets can be installed in the same casing.

Another object of the invention is to provide a means for rotating the baskets, this means allowing a ready withdrawal of the basket when the cover of the basket is uppermost.

Another new feature about this device is the means for engaging the articles being plated so as to insure their being in the electrical current, this means embodying a construction that provides for this absolute contact, both when the baskets are rotating continuously, or when they have the reciprocating motion.

A still further object is to provide the baskets or receptacles with means for causing a positive "tumbling" or agitation of the articles being plated which is desirable and necessary for good work, this "tumbling" being caused by the construction of the receptacle itself, the baskets being adapted, more particularly, for the plating of small articles, such as safety pins, and other pieces of work that are thrown into a plating machine in considerable quantities.

A still further object of the invention is to provide an anode electrode that comforms largely to the shape of the baskets containing the work, and this anode electrode is thus enabled to be close to the work, which brings about better plating, the object in all machines being to bring the work as near as possible to the anode. The anode is also designed to provide for the circulation of the solution in the plating tank, and for easy means for securing the anode to the machine.

A further object of the invention is to provide an improved means for conducting the current from the outside of the receptacle, for the work, to the inside of the basket to the cathode electrode, or in other words to the work, and also to provide a bail shaped electrode that is not apt to be coated or plated, and which provides a more direct application of current to the work.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a section of a plating machine of my improved construction, showing one of the receptacles, and one of the anode electrodes in elevation. Fig. 2 is a transverse section through one of the receptacles. Fig. 3 is a section of a receptacle showing a means for withdrawing it from the machine, and also illustrating a modified form of cathode connection. Fig. 4 is a view of a part of one of the gear wheels used for causing the rotation of the baskets. Fig. 5 is a plan of one of the improved anode electrodes, and Fig. 6 is a diagrammatic view showing one means of supplying the receptacles or baskets with a rotary reciprocating motion. Fig. 7 is an end view of a basket with a modified form of means for conducting current to the inside of the basket or recptacle, and Fig. 8 is a section of the end of the basket, within the tank, and showing in section the means illustrated in Fig. 7. Fig. 9 is a modified form of a roller used in connection with the apparatus shown in Figs. 7 and 8. Fig. 10 is an elevation of a modified form of bail shaped electrode, and Fig. 11 is a cross-section of the same.

I employ, in this machine, any usual form of casing 10 which is provided with the receptacles or baskets 11, these baskets being arranged to hold the work to be plated which is connected to or becomes the cathode electrode. These baskets each consists of end plates 12 which are preferably made of wood, or can be made of other insulating or non-conducting material, and connecting these end plates 12 are semi-circular strips 13, the inner ones being attached to the end plates,

and the outer ones being removable to allow the installation of the covering 14 which is usually made of a fabric, such as cotton duck or canvas, or it can be made of other fine fabric which will hold small articles, but allow the circulation of the solution in the casing. The circumference of the end plates 12, and the outside surface of the inner strips 13 are provided with small recesses or holes into which can be set the pins 16 which hold the fabric after it is stretched, and the outer semi-circular strips 13 are then secured in place by means of the screws 53, shown in Fig. 3. Around the outside edge of each of the end plates 12 is a strip 15 usually made of brass, and one end of each strip having secured, by solder or otherwise, a screw 18 which passes through and is secured to a bracket 17, by means of a nut 19 which causes the band 15 to be drawn very taut, the other end of the band 15 being secured to a stud or screw 20 by means of a key-hole slot arranged in that end.

The basket or receptacle is opened at the top, and has, on each end of the opening, a strip 21 shown more particularly in Fig. 2, which strip receives the cover 22 which has the bars 23 with one end cut away to fit under one of the longitudinal strips 13, and having a center bar 24 which can slide, and has one end to engage the other side of the receptacle and fit under one of the semi-circular strips 13. When the cover is to be disengaged, the handle 25 is slid back which causes a stud 26, secured in the bar 24, to move the bar back, and the cover can be withdrawn. When the cover is put in place, a spring 27, bearing on the handle 25, insures the locking of the cover, and no accidental loss of articles in the receptacles is apt to occur. On one side each basket or receptacle is provided with a stud 28 which fits into a slotted bearing 29, which will be described hereinafter.

On the opposite end a bearing plate 30 is provided with a stud 31, on which is loosely arranged a gear-wheel 32. These gear-wheels 32, on each basket, are arranged to be in mesh, and in this way the motion in one is transmitted to the other. The gear-wheel 32 of each receptacle is provided with a pair of guides 33 forming a way between them, and this is designed to hold a pin 37^a which is arranged eccentrically on the end plate 12 of the basket. On the stud 31, outside of the gear-wheel 32, is a collar 34 that is secured against rotation on the stud by means of a screw 35. The collar is slotted to receive a stud 37 which is free to rotate in the collar 34. It will thus be seen that the receptacle can be withdrawn by having the studs 37^a and 37 pass up in the way between the guides 33, when the cover of the receptacle is uppermost. At the same time the receptacle can be rotated, positively, by this means. In the receptacle or basket is arranged a bail shaped electrode 38 which is provided with a series of short chains 39, the electrode being preferably made of spring metal and adapted to be rotatably arranged in the end plates, and held therein by its own spring action. The chain 39 might be dispensed with, but is thought desirable on account of its passing through the work when it is composed of small articles, and insuring the contact electrically. Arranged around each receptacle is my improved anode electrode 41 which, in cross-section, is U-shaped and has the end loops 42 which are bent over and suspend the anode from the rods 40 which can be secured in any desired way. The anode has slots 43 arranged transversely and preferably confined to its lower portion, these openings providing for the ready flow of solution through the anode into the basket or receptacle thus insuring a perfect circulation. The electrical current passes through these anodes and then through the work, the other connection of the machine being through the binding posts 44, these binding posts 44 being arranged on the bearings 29, the connections being illustrated in Fig. 1, and Fig. 2 showing how the current will pass from the bearing 29 through the stud 28, into the electrode 38, by reason of the contact of the electrode with the stud.

When the machines are large and a good many articles are put into a basket, they are extremely heavy to lift and time can not be taken to let them drain properly. To obviate this difficulty, I provide each of the side pieces with a perforation 45 into which fits the ends 46 of a handle 47, the ends 46 being sprung into the perforations or recesses 45, and held therein by their spring action. A rope 48 over a suitable pulley 49, which can be attached to a moving element, permits the removal and also the draining of the basket.

It will be seen from the construction of machine herein described, that one basket can be removed out of a series, and the rest will keep up their action, as the gear-wheels 32 remain in the machine and form a transmitting medium. The bearings for the bearing plates 30 are usually formed of the screws 52, fitting in the slots 50 and being screwed into the casing 10, whereby any adjustment necessary can be secured.

When a reciprocating motion is desired, a reciprocating semi-circular rack 54 is in mesh with one of the gear-wheels 32, and a link 55, a cog-wheel 56, and a suitable worm-wheel 57 will cause the required motion of the basket. When a steady rotary motion is desired, the worm-wheel 58, shown in dotted outline in Fig. 1, is in mesh with one of the gear-wheels 32. When the connection is made as shown in Fig. 2, between the bearing 29, the stud 28, and the electrode 38, the stud 28 will become plated, to a slight extent, under some conditions, and it is necessary, on each removal of

the basket, to file the stud slightly to remove the plating therefrom. To overcome the slight objection some operators might have to this, I have devised a reciprocating motion, and in this construction I employ a cathode electrode 50, shown in Fig. 3, which can be laid into the work in the basket, and the wire 50ª can be led in through a slot in the cover, or a slot in one of the side plates, and it can be provided with enough slack to allow any backward or forward motion due to the rocking of the basket. In the baskets, the longitudinal semi-circular strips 13, on the inside, act to engage the articles being plated, and to insure their being "tumbled" or agitated, and provides for a thorough mixing of the articles on each rotation being carried part way around on these semi-circular strips, and then being deposited back at the bottom after they have arrived above the center of the basket, as will be understood.

In the modified form of basket connection shown in Figs. 7 and 8, I employ an annular metallic ring 59, preferably aluminum, on account of its tendency to throw off any plating, in other words it will not plate, and this annular ring 59 has arms 60 which connect with a central hub on which is mounted the stud 37 on which the basket rotates. One of the arms 60 is turned in, at 61, and passes through the end wall of the basket and down on the inside, as at 62, where it connects with a metal plate 63 in which is rotatably arranged the bail shaped electrode 38. As the basket rotates, the ring 59 connects with a roller 64 which is mounted on a spring arm 65, and has the binding post 66 for making electrical connection. Thus the basket can pass from the binding post into the electrode 38, and the basket can be revolved continuously.

It has been found that good work will result from an interrupted current, and when this current is desired, I can employ the roller 67, shown in Fig. 9, which is of metal, and has the insulated strips 68 thereby forming a species of commutator in which the current is interrupted, and these insulated strips 68 can be disposed, as desired, only one being used in a roller for certain kinds of work, and four or five for another. To prevent the bail shaped electrode becoming plated or covered with a deposit, I can cover it as shown in Figs. 10 and 11, where I employ a rubber tubing 69 on each end of the electrode 38, the rubber tubing then being cut off, and the rest of the electrode, shown very much shortened in Fig. 10, is covered by an envelop 70 which is preferably made of wood. To connect with the work in the basket, I screw the screw-eyes through the envelop 70 up into the electrode 38, and from these screw-eyes depend the flexible trailers 39. This construction covers the bail shaped electrode, and the solution does not act on it, but at the same time it acts to readily transmit current from the ends of the basket, or its electrical connection to the cathode electrode, or in other words the work being plated.

It will thus be seen that I have devised a machine for plating that embodies a series of rotary baskets, one or all of which can be removed at will without stopping the machine on the removal of one and causing any cessation in the work of the other baskets.

Having thus described my invention, what I claim is:—

1. In an electro-plating machine, a basket comprising a frame made of end plates and longitudinal strips, a covering of flexible fabric on the strips, and means for removably securing the fabric to the end plates and the strips.

2. In an electro-plating machine, a basket comprising end plates, longitudinal strips connecting the end plates, and projecting partly within the basket, a fabric covering, and strips clamping the fabric to the first strips.

3. In an electro-plating machine, a basket comprising end plates, longitudinal strips connecting the end plates, and projecting partly within the basket, a fabric covering, strips clamping the fabric to the first strips, and a band on each end plate to clamp the fabric thereto.

4. In an electro-plating machine, a basket comprising end plates, strips connecting the end plates, the strips and the end plates being perforated, a fabric covering the basket, pins passing through the fabric and removably arranged in the perforations, a band covering the end plates and holding the pins therein, and a second set of strips covering the fabric on the first strips.

5. In an electro-plating machine, a basket comprising end plates, a fabric covering between the end plates, studs projecting from the end plates, an electrode in the basket and connected electrically with one of the studs.

6. In an electro-plating machine, a basket comprising end plates, a fabric covering between the end plates, studs projecting from the end plates, a bail shaped electrode in the basket and arranged to rotate in the end plates, one end of the electrode extending through its end plate to contact with one of the studs.

7. In an electro-plating machine, a tank having a basket to revolve thereon, studs on the basket, a bearing on one side of the tank to receive one of the studs, a bearing plate on the other side of the tank having a stud projecting from it, a gear-wheel loosely arranged on the stud of the bearing plate, a collar secured to the stud of the bearing plate and having a recess in its top edge to receive the other stud of the basket, a stud on the basket arranged on the end adjacent to the gear-wheel and being disposed eccentrically there-

on, and guides forming a way on the gear-wheel to receive the eccentric stud of the basket.

8. In an electro-plating machine, a tank, a basket arranged to revolve therein, studs on the end plates of the basket, a slotted bearing to receive one of the studs of the basket and having an electrical connection, an electrode in the basket and arranged to rotate therein and projecting through the end plate to contact with the stud, a bearing plate on the side of the tank from the slotted bearing, the bearing plate having a stud thereon, a gear-wheel loosely mounted on the stud, a collar on the stud beyond the gear-wheel, the collar being secured to the stud and having a slot in its upper edge to receive the second stud of the basket.

9. In an electro-plating machine, a basket comprising end plates, and a covering between the end plates, and an electrode adapted to rotate in the end plates, one end of the electrode extending through its end plate to provide an electrical contacting surface.

10. In an electro-plating machine, a basket comprising end plates and a covering, a bail shaped electrode rotatably arranged in the basket, the end plates having recesses in which the ends of the electrode are adapted to be sprung.

11. In an electro-plating machine, a bail shaped electrode having a central insulated portion, the ends of the electrode having a spring action tending outwardly, and a series of flexible conducting strands connected to the electrode through the insulation.

In testimony, that I claim the foregoing, I have hereunto set my hand this 8th day of March 1907.

SETH C. CATLIN.

Witnesses:
M. LOUISE CATLIN,
EMMA F. CATLIN.