

**No. 628,686.**

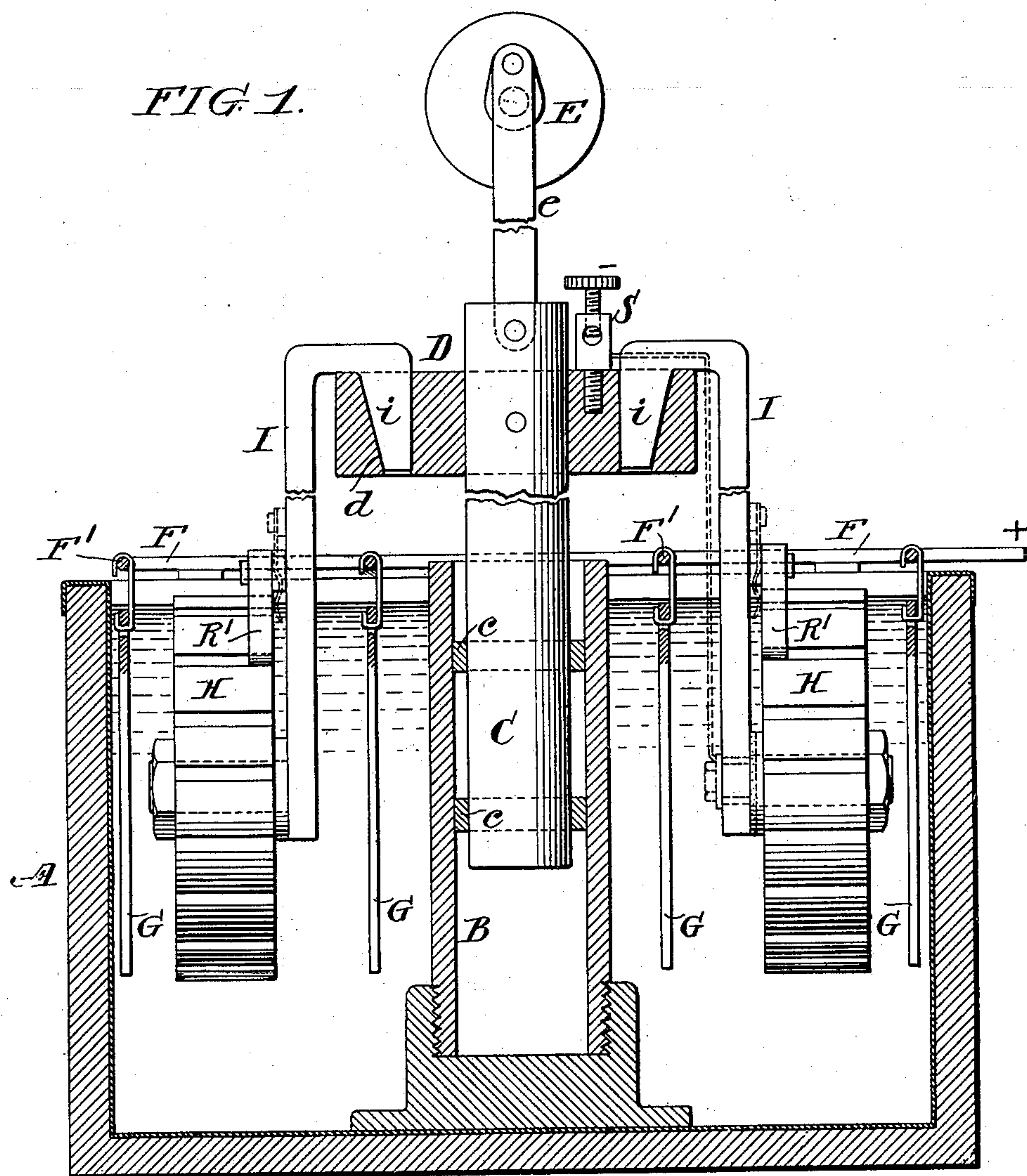
**Patented July 11, 1899.**

**H. R. BOISSIER.**  
**PLATING MACHINE.**

(Application filed Dec. 22, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
Henry Drury  
R. M. Kelly.

FIG. 6. Inventor:  
Hermann R. Boissier  
By his atty  
Thos. H. Brown

No. 628,686.

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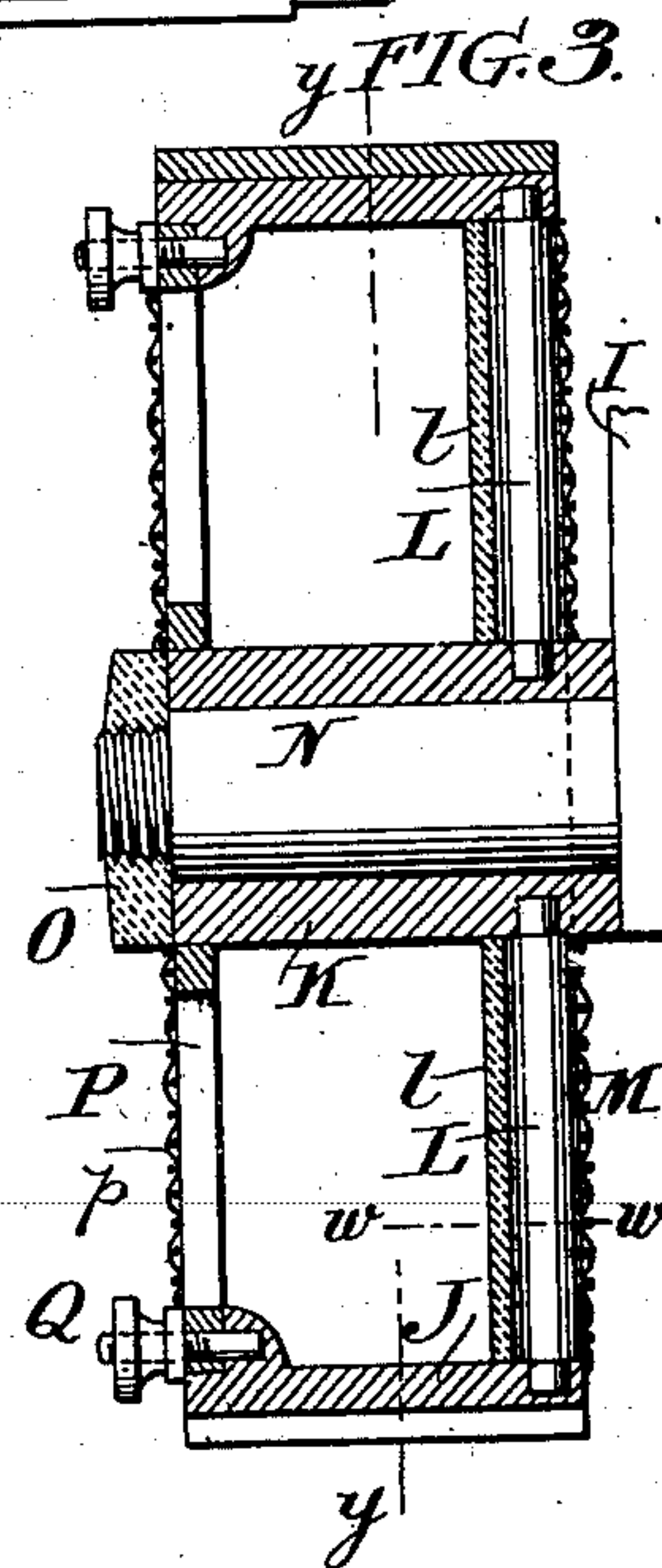
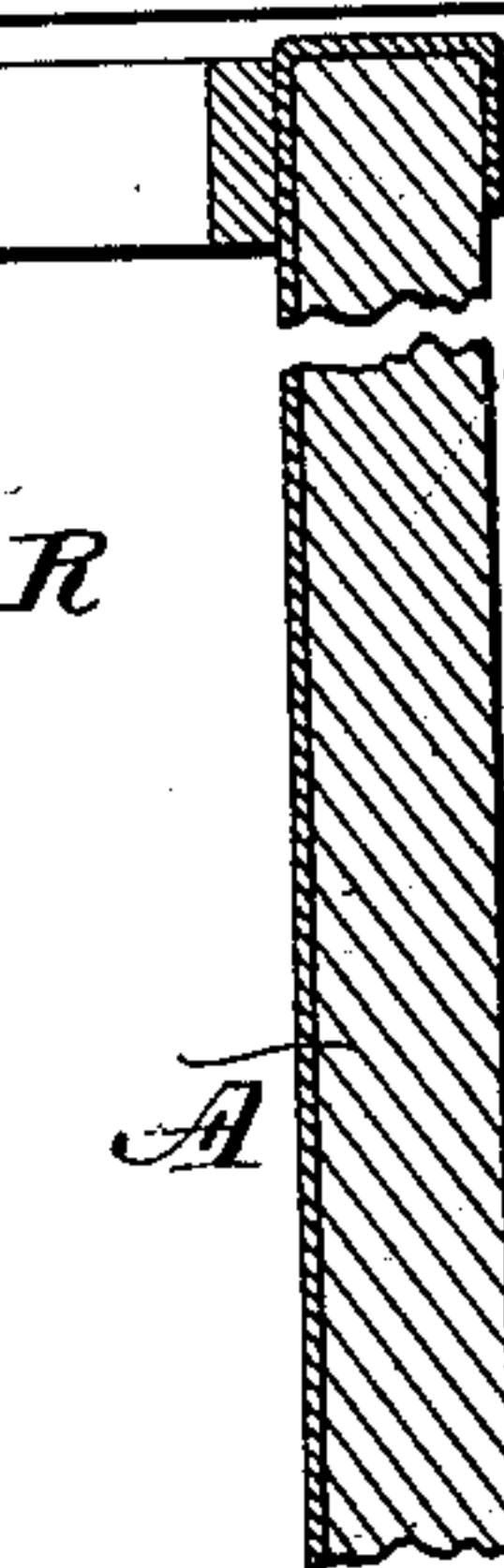
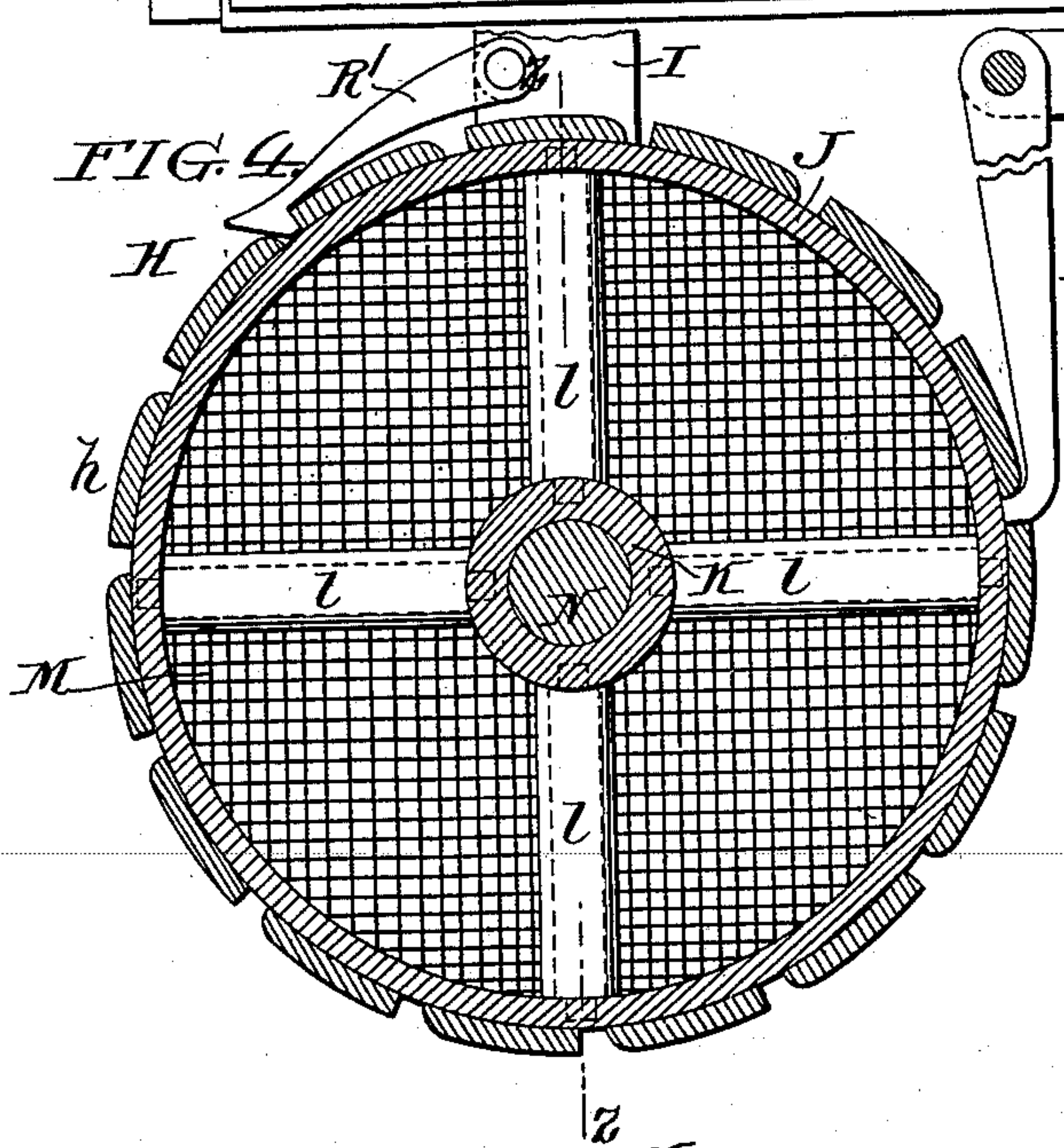
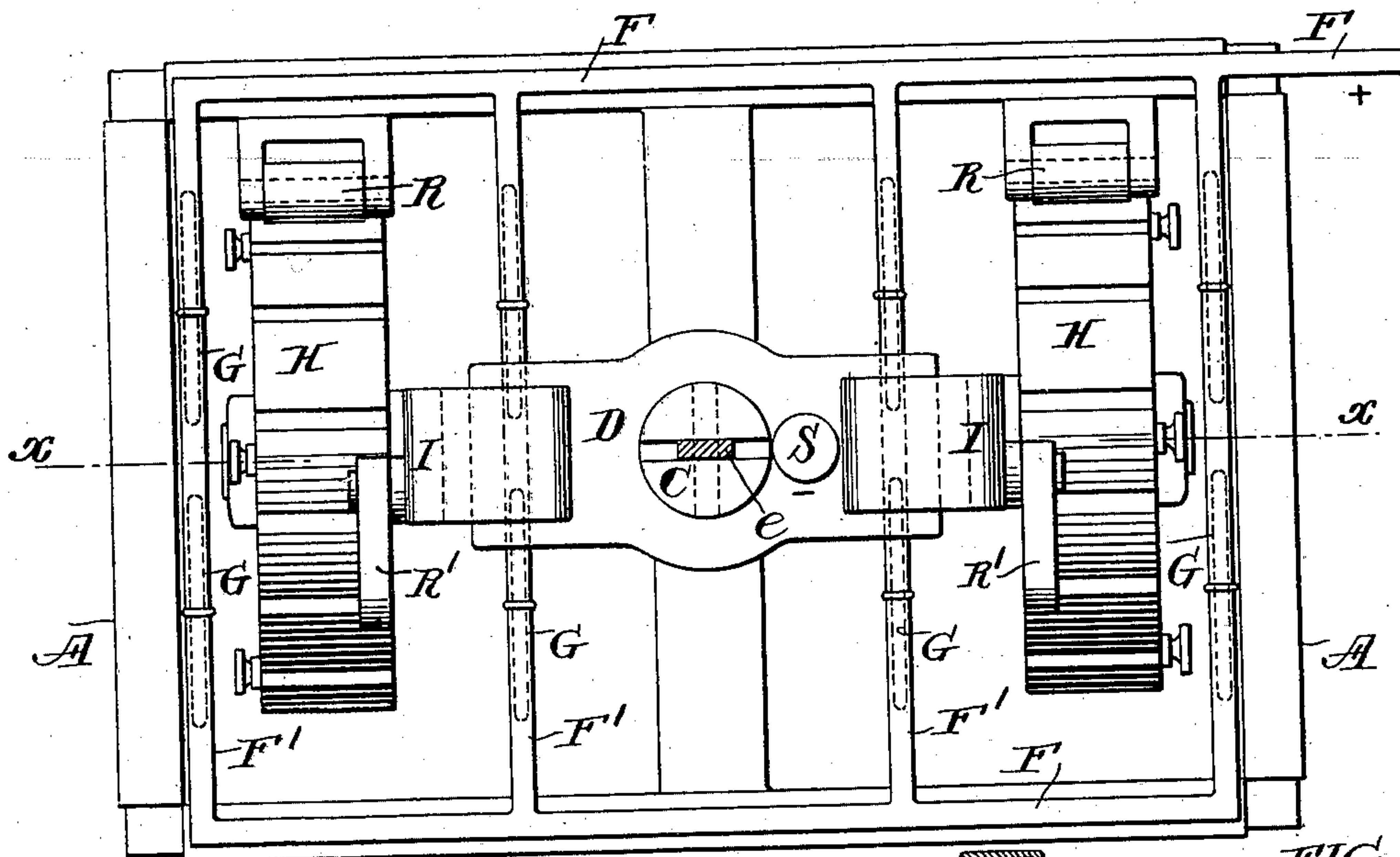
H. R. BOISSIER.  
PLATING MACHINE.

(Application filed Dec. 22, 1898.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 2.



Witnesses:  
Henry Dwyer  
R. M. Kelly

FIG. 5.

Inventor:  
Hermann R. Boissier  
By *[Signature]*



# UNITED STATES PATENT OFFICE.

HERMANN R. BOISSIER, OF NEW YORK, N. Y.

## PLATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 628,686, dated July 11, 1899.

Application filed December 22, 1898. Serial No. 700,042. (No model.)

*To all whom it may concern:*

Be it known that I, HERMANN R. BOISSIER, of the city, county, and State of New York, have invented an Improvement in Plating-Machines, of which the following is a specification.

My invention has reference to plating-machines; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a suitable apparatus especially adapted for plating small articles, but which by slight modification may also be employed for the plating of larger articles.

My object is further to enable the plating of the articles more quickly than has heretofore been customary and at the same time prevent what is technically known as "burning."

In carrying out my invention I provide the plating-bath with suitable anodes between which the work is placed and reciprocated vertically. The anodes connect with the positive terminal, and the cathode, comprehending the work and its support, is adapted to be reciprocated by a suitable power device, so as to be moved between the anodes, which will have the effect of permitting a larger current to be employed without burning the work. The reciprocating support for the cathode is operated by a crank and connecting-rod or in any other suitable manner and acts as the negative terminal for the electric circuit.

Where the work is large, the reciprocating frame may simply be provided with depending hangers upon which the work may be hung; but where small work is to be plated I then arrange the cathodes in the form of a wheel or cage journaled upon the lower end of the hanger and in which the work to be rotated is placed. I then rotate the said cage automatically during its reciprocation vertically between the anodes. It is evident that a single anode or set of anodes may be employed to one side of the work; but I prefer to employ double sets of anodes, so that the work is placed intermediate of them and

adapted to be acted upon from both sides. In the construction herein pointed out it will be seen that the work will be constantly shifting its position within the cage, and thereby present new surfaces toward the anodes for plating, and, furthermore, the work will constantly be shifting its position vertically relative to the anodes, and will also cause a constant circulation of the electrolyte, and will thereby prevent burning, notwithstanding the employment of a very strong current for quick plating.

My invention also comprehends details of construction, all of which will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a plating apparatus embodying my invention, taken on line *x x* of Fig. 2. Fig. 2 is a plan view of my improved plating apparatus. Fig. 3 is a vertical sectional elevation through the work-supporting cage, taken on line *z z* of Fig. 4. Fig. 4 is a sectional elevation of the work-supporting cage, taken on line *y y* of Fig. 3. Fig. 5 is a cross-section of one of the spokes of the work-supporting cage on line *w w* of Fig. 3, and Fig. 6 is an elevation of the modified form of the hanger adapted to large work.

A is the tank or vat and may be made of any suitable construction, but preferably of wood, rectangular in shape, and lined with lead.

B is an upright tube fitted to the center of the tank and extending to a short distance above the top thereof. Fitting within this tube B is a second tube C, having collars *c* about it, which are guided upon the interior of the stationary tube B. This tube C is reciprocated vertically by means of a crank and a connecting-rod *e*, or it may be reciprocated in any other suitable manner.

The tube B may be insulated from the electrolyte, or the collars *c* may be insulated or formed of insulating material, so that the negative terminal of the apparatus is not in electrical circuit with the electrolyte excepting through the work of its cage.

The vertically-reciprocating tube C has secured to it near its upper end a brass holder D, which has on opposite sides sockets *d*, preferably tapering. This brass holder has se-



cured to it the negative binding-post S, with which a flexible conductor connects, leading from the source of supply.

I are hangers of brass or other metal and have hook portions *i* at the top, which fit into the sockets and make a good electrical connection with the holder. The hangers I extend downward into the tank on opposite sides of the central tubular post B and are provided with journal-pins N, upon which the work-supporting drums or cages H are pivoted. Where large work alone is to be plated, the hanger is made as indicated in Fig. 6, in which the depending arm I' is made hook-shaped at the bottom, as at *n*, upon which the work may be hung directly or indirectly, as desired. It is immaterial what the particular shape of this hanger may be so long as it provides means for supporting the work directly or indirectly within the electrolyte.

F is the positive conductor, arranged above the tank and formed with the cross-bars F', to which are hung the plates G, which constitute the anodes. These anodes are arranged one upon each side of the hangers and also the cage where it is employed. The electrolyte and composition of the anode depend upon the character or kind of plating desired, whether it be for nickel, copper, or other metal.

The cages H for supporting the work, when small, are journaled upon the horizontal pins N of the hangers and are held in place by hard-rubber or other insulating-nuts O, which shield the hub portions of the cage from being plated fast to the pins N or the nuts O upon the screw-threads thereof. The periphery or cylindrical part J of the cage is fitted with a series of hard-rubber sections or teeth *h*, the space between two sections forming a notch into which a depending pawl R may catch and by the upward movement of the cage cause it to turn a portion of a revolution. A pawl R' prevents the backward movement of the cage, a result which might take place in descending on account of the natural distribution of the work. The speed of rotation may be anything desired, as I do not confine myself to any particular speed of revolution or reciprocations.

If desired, the hangers I may be insulated from the cages to avoid being plated.

The general framing of the cage may be formed in any suitable manner; but I prefer to connect its hub K with the outer or peripheral band J by means of brass rods L, insulated by a coating *l* of hard rubber. There are four or more of these radial arms, and the insulation on their outer surface is removed on one side, as shown in Fig. 5, and a circular screen M, of copper, brass, or aluminium, is attached to the rods. In practice I prefer to employ a screen of brass wire, as it is strong and a good conductor. The hub K and the outer band J may be formed of cast-aluminium. The front portion of the cage is closed by a suitable cast-aluminium frame P of any desirable construction, having attached

thereto the outer screen *p*, of the same material as the screen M, and this plate or cover is put into position so as to rest upon lugs and is clamped thereto by suitable clamping-nuts of hard rubber or other insulating material. The advantage of employing hard-rubber nuts O and Q is to prevent any possibility of the plating deposits from uniting the nut to the screw, which would make it impossible to readily separate the parts.

As shown in the drawings, I prefer to employ four anodes G to each cage or drum, two being arranged upon one side of the axis and two upon the other, it being desirable to so place the anodes that they will be directly in front of the work and not in front of the axis or hub and the hanger.

While the electric circuit is formed through the hanger I and its pin N, with the hub of the cage or drum, I may, if desired, provide additional spring-contact fingers T between the hanger and the annular rim of the drum portion J, as indicated in dotted lines in Fig. 1; but this is not essential.

While I prefer the construction shown, as being excellently adapted for the purpose, I do not confine myself to the minor details, as they may be modified without departing from the principles of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a plating-machine the combination of a tank containing the electrolyte, one or more anodes in said tank, a reciprocating holder, guides relatively stationary to the tank for guiding said holder, a detachable depending hanger for the work carried by the reciprocating holder, and electric circuits connecting with the anodes and detachable hanger.

2. In a plating-machine the combination of a tank containing the electrolyte, one or more anodes in said tank, a reciprocating holder, guides relatively stationary to the tank for guiding said holder, a detachable depending hanger carried by the reciprocating holder having a horizontal pin or journal bearing, a work-inclosing cage having a central bearing adapted to the pin of the hanger, and electric circuits connecting with the anodes and detachable hanger.

3. In a plating-machine, the combination of a tank for the electrolyte, one or more anodes in said tank, a work-supporting hanger extending down into the tank so as to bring the work in front of the anode, and means for reciprocating the hanger vertically consisting of upright guides, a holder guided by said guides and supporting the hanger, and power devices for reciprocating the holder, the work supported by the hanger being electrically connected with one pole of the source of current and the anode with the other pole.

4. In a plating-machine, the combination of a tank for the electrolyte, one or more anodes in said tank, a work-supporting hanger extending down into the tank so as to bring the work in front of the anode, a work-inclosing



cage having open-work sides supported and moved by the hanger and so journaled thereon as to be rotatable, means for gradually rotating the cage, and means for reciprocating the hanger vertically, the cage being electrically connected with one pole of the source of current and the anode with the other pole.

5 In a plating-machine, the combination of a tank for the electrolyte, one or more anodes in said tank, a work-supporting hanger extending down into the tank so as to bring the work in front of the anode, a work-inclosing cage having open-work sides supported and moved by the hanger and so journaled thereon as to be rotatable, means for gradually rotating the cage, consisting of a series of teeth or projections about the circumference of the cage, and a pawl having a relatively-fixed pivot working in connection with said teeth or projections during the reciprocations of the cage, and means for reciprocating the hanger vertically, the cage being electrically connected with one pole of the source of current and the anode with the other pole.

6. In a plating-machine, the combination of a tank, an upright guide secured thereto, anodes arranged within the tank upon each side of the guide, a vertically-reciprocating frame guided by said guide, power devices to reciprocate said frame, detachable depending work-supporting hangers depending from the said frame upon opposite sides of the guide so as to move the work in front of the anodes, and means electrically connecting with the work-supporting hangers for supplying electrical current to the work sustained by the said hangers.

7. In a plating-machine the combination of a tank, an upright guide secured thereto, anodes arranged within the tank upon each side of the guide, a vertically-reciprocating frame guided by said guide, power devices to reciprocate said frame, detachable depending work-supporting hangers depending from the said frame upon opposite sides of the guide so as to move the work in front of the anodes, automatic devices for moving the pieces of the work relatively to each other during the reciprocation of such work by the hangers,

and means electrically connecting with the work-supporting hangers for supplying electric current to the work sustained by the said hangers.

8. The combination of a tank containing two anodes, with a work-holding cage of open-work, and means for reciprocating the cage between the anodes and at the same time supplying current to it, and also to cause it to have rotary movement in a plane parallel to the anodes.

9. The combination of a tank to contain an electrolyte, a vertical anode-plate, a work-supporting cage, means for moving the cage in a plane parallel with the anode, means for supplying electric current to the cage, and means for imparting a rotary motion to it.

10. The combination of a tank for the electrolyte, an upright tube, a plunger guided therein, a holder secured to the plunger and having a socket *d*, means to reciprocate the plunger and holder, and a work-supporting hanger having its upper end bent over into a hook *i* to fit into the socket, an anode within the tank, and means for supplying current to the anode and hanger.

11. In a work-supporting cage for a plating-machine, the combination of a drum having one side permanently closed by a screen or open-work, and its center provided with a central pivot and its spoke-arms insulated, a removable screen to close the other side, a series of teeth about the circumference of the drum formed of insulating material, and non-metallic nuts or catches for holding the removable screen in place.

12. In a work-supporting cage for a plating-machine, the combination of a drum having one side permanently closed by a screen or open-work and a central bearing, a removable screen to close the other side, and non-metallic nuts or catches for holding the removable screen in place.

In testimony of which invention I have hereunto set my hand.

HERMANN R. BOISSIER.

Witnesses:

R. M. HUNTER,

J. W. KENWORTHY.