

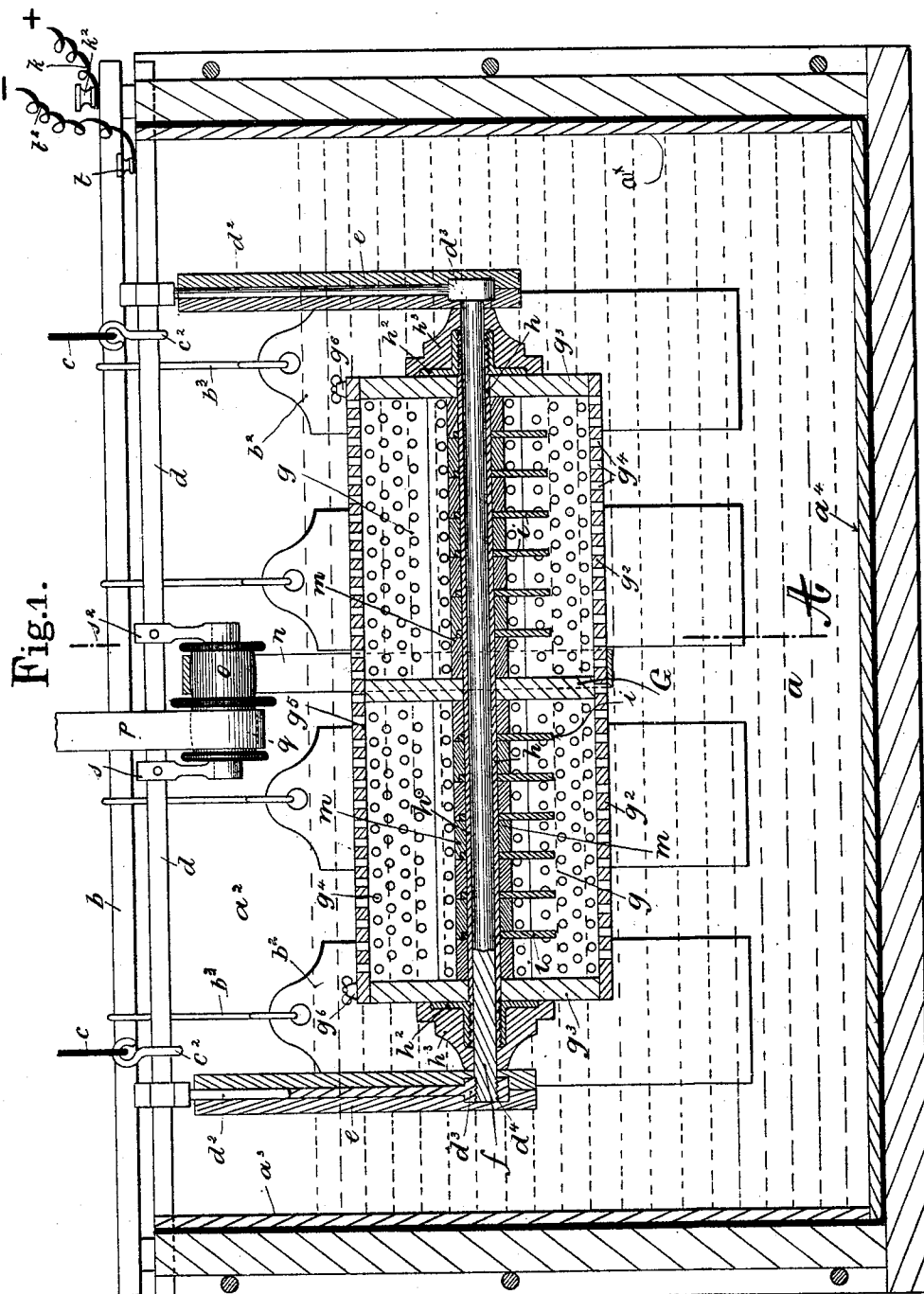
(No Model.)

2 Sheets—Sheet 1.

A. S., T. A., R. J. & S. SMITH & T. DEAKIN,
APPARATUS FOR ELECTRODEPOSITION OF METALS.

No. 585,051.

Patented June 22, 1897.



Witnesses
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Alfred Frank Piddell.

Inventors
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

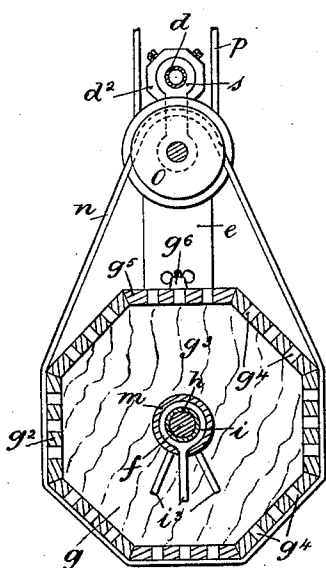


Fig. 3.

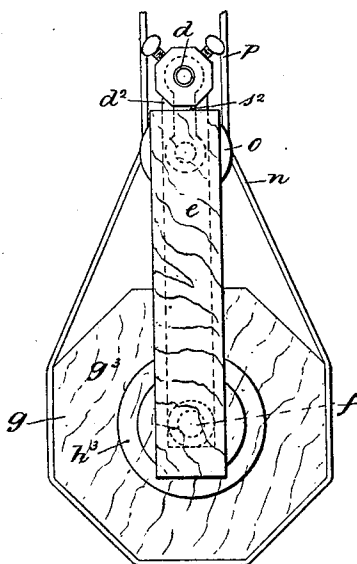


Fig. 4. Fig. 5.

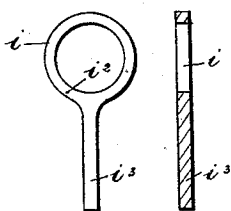
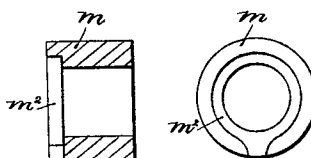


Fig. 6. Fig. 7.



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UNITED STATES PATENT OFFICE.

ALFRED SIDNEY SMITH, THOMAS ALFRED SMITH, ROLAND JOHN SMITH, SYDNEY SMITH, AND THOMAS DEAKIN, OF WALSALL, ENGLAND, ASSIGNORS TO THE ELECTROLYTIC PLATING APPARATUS COMPANY, LIMITED, OF SAME PLACE.

APPARATUS FOR ELECTRODEPOSITION OF METALS.

SPECIFICATION forming part of Letters Patent No. 585,051, dated June 22, 1897.

Application filed August 27, 1896. Serial No. 604,116. (No model.)

To all whom it may concern:

Be it known that we, ALFRED SIDNEY SMITH, THOMAS ALFRED SMITH, ROLAND JOHN SMITH, SYDNEY SMITH, and THOMAS DEAKIN, subjects of the Queen of Great Britain, residing at Walsall, in the county of Stafford, England, have invented certain new and useful Improved Apparatus for the Electrodeposition of Metals, of which the following is a specification.

This invention relates to an improved apparatus for the electrodeposition of metals upon various articles; and the object of our invention is to "bright-plate" the said articles, so that no subsequent process is required to give them the desired brilliant and mirror-like surface. Hitherto articles upon which a deposit of metal has taken place have been brought out of the electrolytic bath in a dull or unpolished condition and then subjected separately to another process for polishing or burnishing them.

Now by our invention the articles to be treated are placed within a revolving barrel, hollow drum, or container suspended or supported within the electrolytic bath and, during the time that the deposition of the metal is taking place, subjected to a rolling-over-and-over or shaking process, which gradually, effectively, and completely polishes brilliant their surfaces.

The revolving barrel, hollow drum, or container, which is mounted centrally upon a long insulated metal sleeve, is made of non-conducting material, and its walls are perforated or pierced in such a manner as to entirely allow the solutions to freely circulate through the same and to act upon the work contained therein. The said long sleeve with the barrel or drum carried by it, as aforesaid, is fitted to a central metal (preferably copper) rod, bar, or carrier suitably supported within metallic bearing-brackets clothed in wood or other suitable insulating material and fitted at equidistant points in its length with copper contact-arms, which latter are mounted in such a manner as to be in intimate contact with the articles contained within the barrel

or drum, so as to act as channels for the passage of the electric current to the negative pole of the generator.

In order to particularly describe our invention and the manner in which the same is to be performed, we annex herewith a sheet of drawings made upon a small scale from a full-sized working model.

In this sheet Figure 1 illustrates a longitudinal vertical section of an electrolytic bath constructed, arranged, and fitted for the deposition of nickel, according to our invention, the apparatus being supported therein so that its operative portion and preferably the whole is within the solution. This view clearly illustrates the perforated and revolving barrel, hollow drum, or container, wherein the work is placed, suitably mounted and insulated by wood coverings and also the means for rotating or driving the same. It will be observed that the anodes are slung upon their supporting-rods around the inside walls of the vat or tank in the ordinary manner and that nothing is contained within the interior of the barrel or drum to interfere with the continued rolling-over-and-over movement of the articles placed therein. Fig. 2 is a transverse vertical section taken upon the dotted line A, Fig. 1, illustrative only of the revolving barrel or drum and its cognate parts. Fig. 3 represents an end elevation of Fig. 2; and Figs. 4, 5, 6, and 7 are views showing, respectively, one of the copper contacts and the insulating distance-pieces.

The same letters of reference are used to indicate corresponding parts in the whole of the figures of the sheet of drawings.

The vat or tank *a*, for containing the solution, is composed or built up of sides *a*², ends *a*³, and bottom or base *a*⁴ in the ordinary manner. If preferred, the interior of the vat can have a non-conducting lining *a*^x. It is provided with anode-supporting rods *b*, one only of which is illustrated. The parts shown in section in Fig. 1 are indicated by suitable reference-numerals and have been described at different points in the specification. The anodes, which are marked *b*², are suspended

to the rods b in the ordinary manner by hooks b^3 , the positive wire k being also connected thereto by a terminal k^2 . Suspended by means of rods, chains, or their equivalents c from suitable pulleys through the intervention of hooks c^2 , or otherwise supported, is a horizontally-disposed metallic rod d , having connected thereto hangers or brackets d^2 for supporting a horizontal rod, bar, or their equivalents f , around and upon which a barrel, drum, or container g is placed and revolves, as hereinafter described. These hangers d^2 , which are adjustably connected to the rod d , are constructed from copper, and those parts of them which are immersed in the solution are covered up by wooden sheaths e , each of which is made in two halves to allow of easy fitting. The lower parts d^3 of each of these hangers d^2 are fashioned into bosses and are fitted with a screwed hole d^4 for the purpose of accommodating like screwed ends of a copper rod, bar, or their equivalents f , around and upon which the barrel, drum, or container g revolves. This said barrel, hollow drum, or container g , within which the articles to be nickeled are placed, is made octagon in cross-sectional shape and built up of a number of wooden staves g^2 , connected to ends g^3 . Each of these wooden staves has holes or perforations g^4 at equidistances apart throughout its entire surface, and one of them, g^5 , is made removable for the putting in and taking out of the articles under treatment, thumb-nuts and screws g^6 being provided for the purpose.

A wooden partition G is fitted crosswise within the interior of the barrel g to prevent the work contained therein from getting crowded at either end, and the said barrel is fixedly connected to and carried by a metallic tube or long sleeve h through the intervention of metallic fittings h^2 , insulated from the solution by wooden bosses h^3 .

The long sleeve or tube h , which constitutes a hub to the barrel or drum g , is made to fit over the central rod f , and is provided at equidistances in its length with copper contacts i , spaced by insulating-pieces m . These copper contacts i are made in the form of a ring i^2 with an extended portion i^3 , the first-named part being fitted into a recess m^2 , made to receive it in the side of the insulating distance-piece m , and the said contacts i are loosely fitted onto the tube or sleeve h , and as the drum rotates said contacts hang downward instead of turning with the drum. These contacts constitute the cathodes or channels for the return of the electric current to the generator, the greater part of them always being in contact with the work or articles contained within the barrel or drum, this result being due to the fact that these contacts remain hanging downward as the drum turns. A band n , for rotating the drum g , works around the outside of the same and over the sheave of a pulley o , driven by another band p through the intervention of a pulley q , the said pulleys being supported

from the horizontal carrier-rod d by depending brackets s s^2 , the band p coming from some motive power. A terminal t , for the connection of the negative wire t^2 , is fitted to the carrier-rod d .

The drum g , containing the articles under treatment, rotates at various speeds, according to the size of the drum and the class of work under operation, and to effect this speed-pulleys or other means may be employed.

Operation: The articles to receive the deposit of metal or to be bright-plated are prepared for plating in the ordinary manner and are placed within the hollow interior of the barrel or drum g , by way of the removable stave g^5 , at a time when the same is lifted from the vat by the suspending means c . The drum or barrel is then placed in the solution and a revolving movement communicated to it by the bands p and n . The current is then sent through the solution and back to the generator by means of the contacts i , sleeve h , rod f , hangers d^2 , rod d , and negative wire t^2 .

It will be seen that our invention can be easily and at small expense applied to existing electrolytic vats and that all kinds of articles capable of rolling over and over upon themselves in a drum can be effectively operated upon, the details of the apparatus being modified to suit their size, shape, and character.

The drum g may partake of a gyratory, oscillating, or other movement, if desired, as well as the rotary movement described.

Having now fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an electrolytic tank the combination with a vat having anodes, of a perforated drum capable of revolution in the vat and in an electrolyte therein and adapted to receive articles to be plated, contacts loosely suspended from a conducting axial sleeve, and negative and positive wires connected to supply current to the anodes, and to carry it from the suspended contacts, back to the generator of electricity, substantially as described.

2. In an electrolytic tank furnished with anodes, the combination with a perforated drum, of a vat for the electrolyte, conducting devices for suspending the drum therein on a conducting-axis, separated contacts loosely mounted on a sleeve inclosing the axis, means for rotating the drum, and negative and positive wires, the former connected to the device supporting the anodes, and the latter to the support for the separated contacts, substantially as described.

3. The combination, in an electrolytic vat having a horizontal, conducting-rod, of a shaft and pulleys suspended therefrom, a perforated drum suspended from said horizontal rod by conducting-hangers, a conducting-axis for the drum, a band surrounding the body of the drum and driven by one of the pulleys on the suspended shaft, contacts having rings

which loosely surround a conducting-sleeve on the axis of the drum, being separated thereon by insulating contacting-pieces, anodes suspended in the vat from a conducting-
5 support, and negative and positive wires, substantially as described.

4. In an electrolytic vat having anodes suspended in the electrolyte, the combination with conducting-hangers of a perforated
10 drum, a conducting-rod forming the axis and supported by said hangers, a conducting-sleeve inclosing the axis, contacts loosely mounted on said sleeve and hanging from it

as the drum turns, and means for rotating said drum, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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THOMAS ALFRED SMITH.
ROLAND JOHN SMITH.
SYDNEY SMITH.
THOMAS DEAKIN.

Witnesses:

HOWARD SMITH,
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