C. J. CHARLTON.

ROTARY ELECTROPLATING APPARATUS.

APPLICATION FILED NOV. 7, 1913.

1,093,384.

Patented Apr. 14, 1914.

3 SHEETS—SHEET 1.

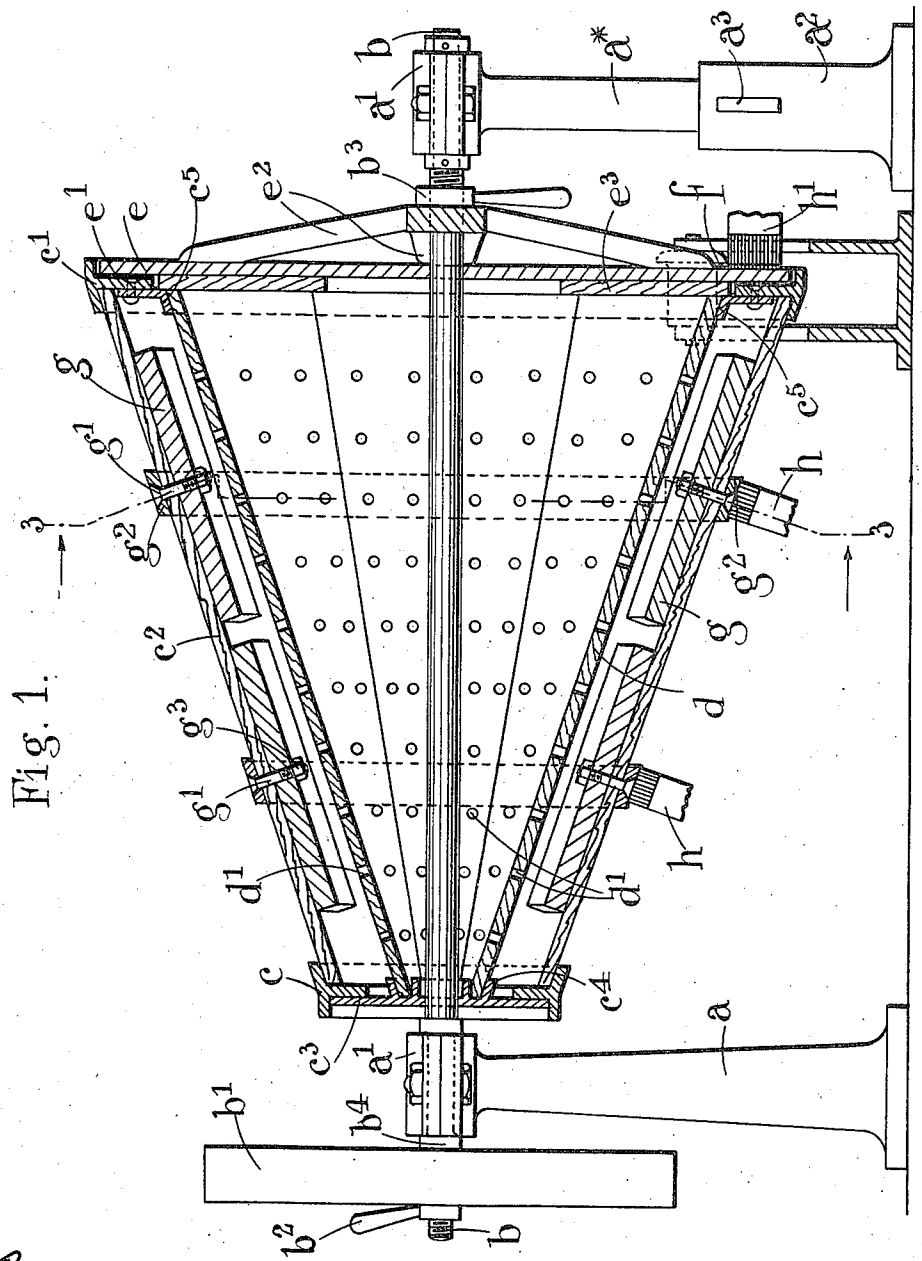


Fig. 1.

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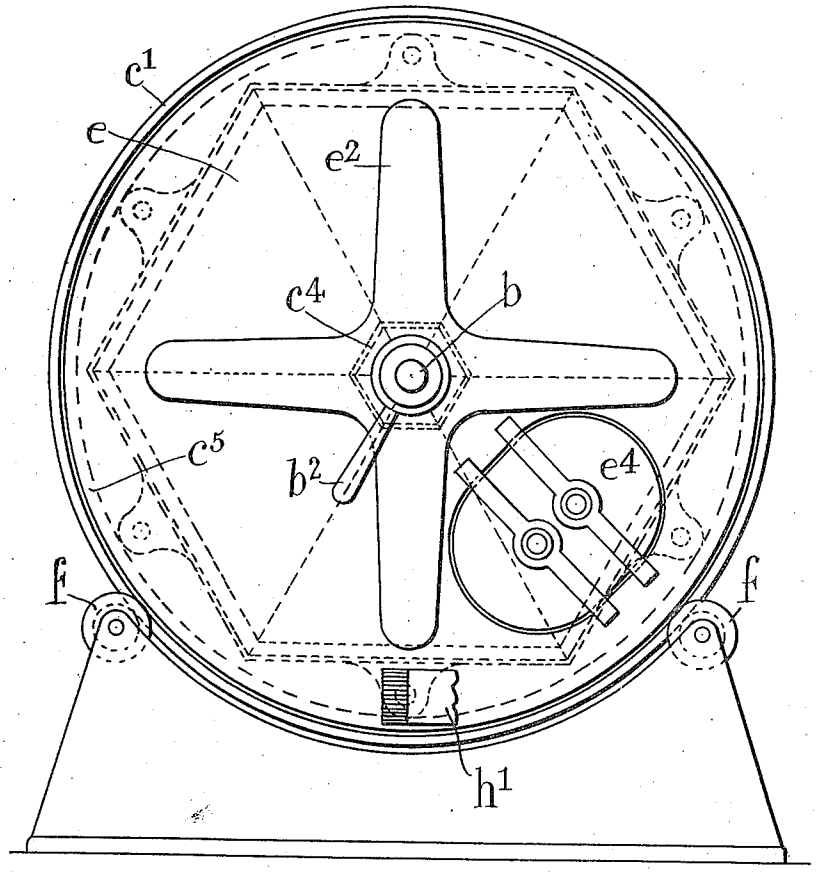
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3 SHEETS—SHEET 2.

Fig. 2.



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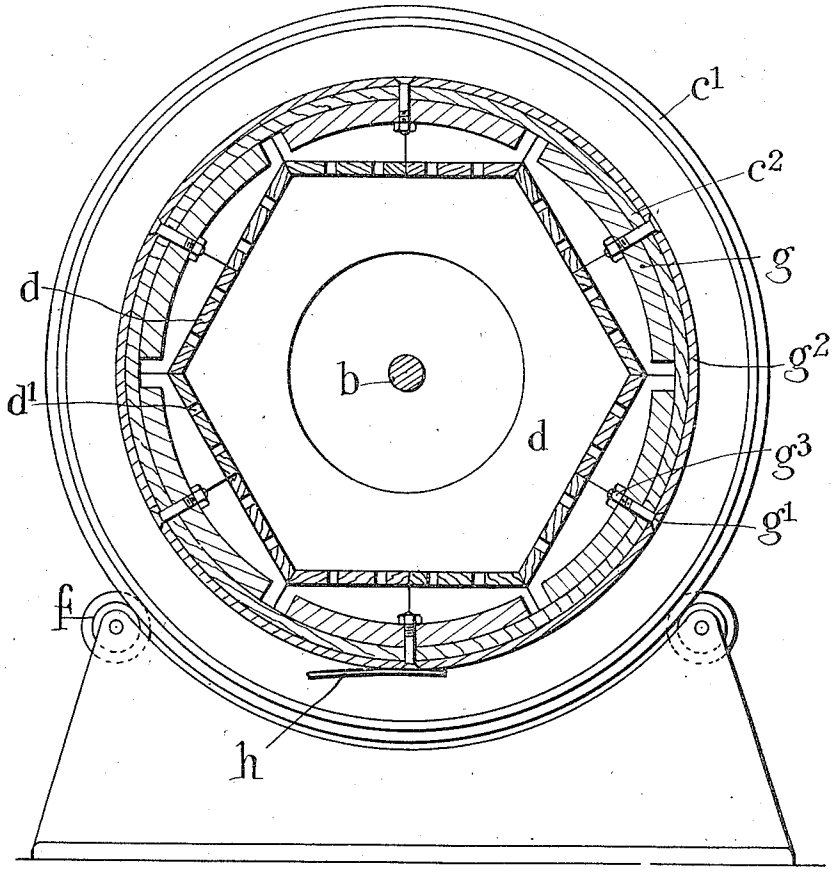
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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ROTARY ELECTROPLATING APPARATUS.

1,093,384. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed November 7, 1913. Serial No. 799,721.

To all whom it may concern:

Be it known that I, CHRISTOPHER JAMES CHARLTON, a subject of the King of Great Britain, residing at South Benfleet, in the county of Essex, England, have invented certain new and useful Improvements in Rotary Electroplating Apparatus, of which the following is a specification.

The invention relates to that type of electro-plating apparatus having an outer rotating drum and an inner perforated drum which latter contains the articles to be plated and is fixed to the outer drum. In such apparatus anodes are located between the two drums and are carried by the outer drum. Such drums have been polygonal in cross section but not tapered. A rotating tapered perforated drum, polygonal in cross section, has also been used in a fixed vat.

The object of the present invention is to construct an improved form of apparatus.

According to the present invention I employ a conical outer drum containing a tapered perforated drum which is polygonal in cross section and I connect the anodes with bands surrounding the outer conical drum which not only strengthen the outer conical drum but also act as conductors. The door closing the inner and outer drums according to the present invention acts also as the cathode.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a longitudinal section of the complete apparatus. Fig. 2 is an end elevation omitting the standards by which it is carried. Fig. 3 is a section on the line 3—3 of Fig. 1.

a, a^* are standards provided with suitable bearings a', a', in which is mounted the shaft b, provided with a driving pulley b', which may be connected to the shaft b by tightening up the nut b^2 on the shaft b and thus jamming the pulley b' against the collar b^4 fixed on the shaft.

The outer conical drum consists of two end rings c, c', connected by wooden boards c^2, which are connected together liquid-tight and fitted within the rings c, c'. The ring c is closed by a metal plate c^3, which carries a suitable seating c^4 for one end of the boards d forming the inner drum. The ring c' is closed by the door e, mounted on the shaft b and acting as a cathode, which door e is seated against a washer e', and is pressed against this washer by a cross frame or spider e^2, which is held in position by the nut b^3 on a screw-threaded part of the shaft b. The door e is lined with wood e^3 over part of its surface, leaving its center exposed, as shown, to cause the current to pass to the center of the cathode and consequently properly through all the articles being plated.

On the ring c' is carried a suitable seating c^5 for the other ends of the boards d, forming the inner drum, which, as shown, is hexagonal in cross section. The boards d are provided with holes d' to allow the plating solution to freely circulate therein.

The apparatus is supported in use by means of the plate c^3 and the door e which fit the rotating shaft b carried by the bearings a'. To the inner surface of the conical drum are fixed the anodes g, by means of bolts g', which pass through the metal bands g^2 fitted around the conical drum and acting as collectors. The bolts g' have nuts g^3 on their inner ends. Suitable brushes h are in contact with the bands g^2 and convey electric current to the anodes g through the bolts g' and nuts g^3. Another brush h' is in contact with the exterior surface of the metal door e, thus completing the electric circuit. The door e is provided with a small door e^4 which is constructed like a man-hole cover in a steam boiler.

The standard a^* seen in Fig. 1 is mounted in a socket a^2 and is supported by a key or wedge a^3 passing through apertures in the standard a^* and socket a^2. When the bearing a' is unfastened and the key a^3 is withdrawn, the standard a^* falls into the socket, allowing the cross frame e^2 and door or cathode e to be removed. Before the standard a^* is lowered it is advisable to support that end of the apparatus by placing a suitable support below the ring c', otherwise the weight of the apparatus might bend the shaft b. For this purpose the apparatus is provided with rollers f which are lightly in contact with the outer periphery of the ring c'. These rollers f do not actually support the weight of the apparatus when the shaft b is properly supported in the bearings a' but when the right hand bearing is unfastened and the standard a^* is lowered the weight of the larger end of the apparatus is then supported by the rollers f. These rollers f enable the apparatus to be readily rotated for cleaning the interior thereof when the door e has been removed.

What I claim is:

1. In an electro-plating apparatus, the combination of an outer conical drum, an inner tapered perforated drum, a rotating shaft by which both drums are carried and rotated, anodes fixed to the inner surface of the outer drum and a cathode located at the larger ends of the two drums, substantially as set forth.

2. In an electro-plating apparatus, the combination of an outer conical drum, an inner tapered perforated drum polygonal in cross section, a rotating shaft by which both drums are carried, anodes located on the inner surface of the outer drum, metal bands fitted around the outer drum, bolts and nuts electrically connecting the metal bands to the anodes and a cathode located at the larger ends of the two drums, substantially as set forth.

3. In an electro-plating apparatus, the combination of an outer conical drum, an inner tapered perforated drum polygonal in cross section, a rotating shaft, by which both drums are carried, anodes located on the inner surface of the outer drum, metal bands fitted around the outer drum, bolts and nuts electrically connecting the metal bands to the anodes, a metal door mounted on the rotating shaft closing the larger ends of the two drums and acting as a cathode, a cross frame or spider pressing against said metal door and a nut on the shaft acting against the cross frame or spider, substantially as shown and described.

4. In an electro-plating apparatus, the combination of an outer conical drum, an inner tapered perforated drum polygonal in cross section, a rotating shaft by which both drums are carried, anodes located on the inner surface of the outer drum, metal bands fitted around the outer drum, bolts and nuts electrically connecting the metal bands to the anodes, a metal door mounted on the rotating shaft closing the larger ends of the two drums and acting as a cathode, a cross frame or spider pressing against said metal door, a nut on a screw threaded part of the shaft acting against the cross frame and a wooden lining over part of the inner surface of the metal door, substantially as shown and described.

5. In an electro-plating apparatus the combination of an outer conical drum, rings supporting the ends of the drum, two metal plates each acting against one of the rings and closing the ends of the conical drum, a tapered perforated inner drum polygonal in cross section, a seating carried by the plate closing the smaller end of the outer conical drum and a seating carried by the ring supporting the larger end of the conical drum by which seatings the inner drum is supported, anodes fixed to the inner surface of the outer drum and metal bands around the outer drum electrically connected to the anodes, substantially as shown and described.

6. In an electro-plating apparatus, the combination of an outer conical drum, a ring supporting each end of the outer conical drum, a plate acting against the smaller ring and closing that end of the drum, a tapered perforated inner drum polygonal in cross section, a seating carried by the said plate supporting the smaller end of the inner drum, a seating carried by the larger ring supporting the larger end of the inner drum, a metal plate pressed against the larger ring and acting as a cathode and a wooden lining over part of the inner surface of said cathode, substantially as shown and described.

7. In an electro-plating apparatus, the combination of an outer conical drum, rings supporting the ends of said drum, a rotatable shaft, plates mounted on said shaft and closing the two ends of the said drum, an inner tapered perforated drum polygonal in cross section, bearings supporting the ends of said shaft and rollers supporting that ring which supports the larger end of the outer conical drum, substantially as shown and described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CHRISTOPHER JAMES CHARLTON.

Witnesses:

CLAUDE K. MILLS,

WM. GIRLING.