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M. A. JULLIEN & E. L. DESSOLLE.
APPARATUS FOR MAKING COPPER.

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Fig. 1.

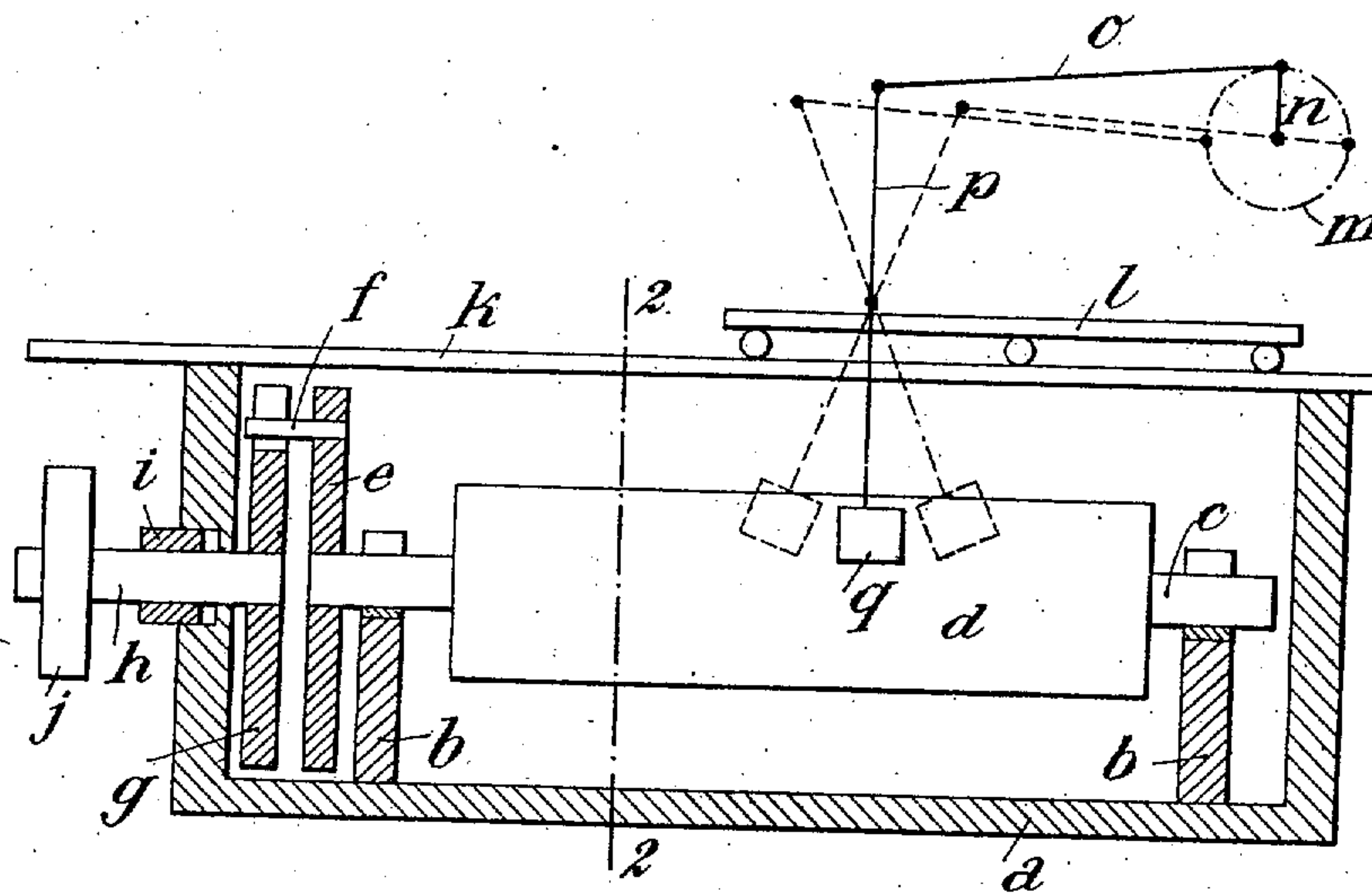
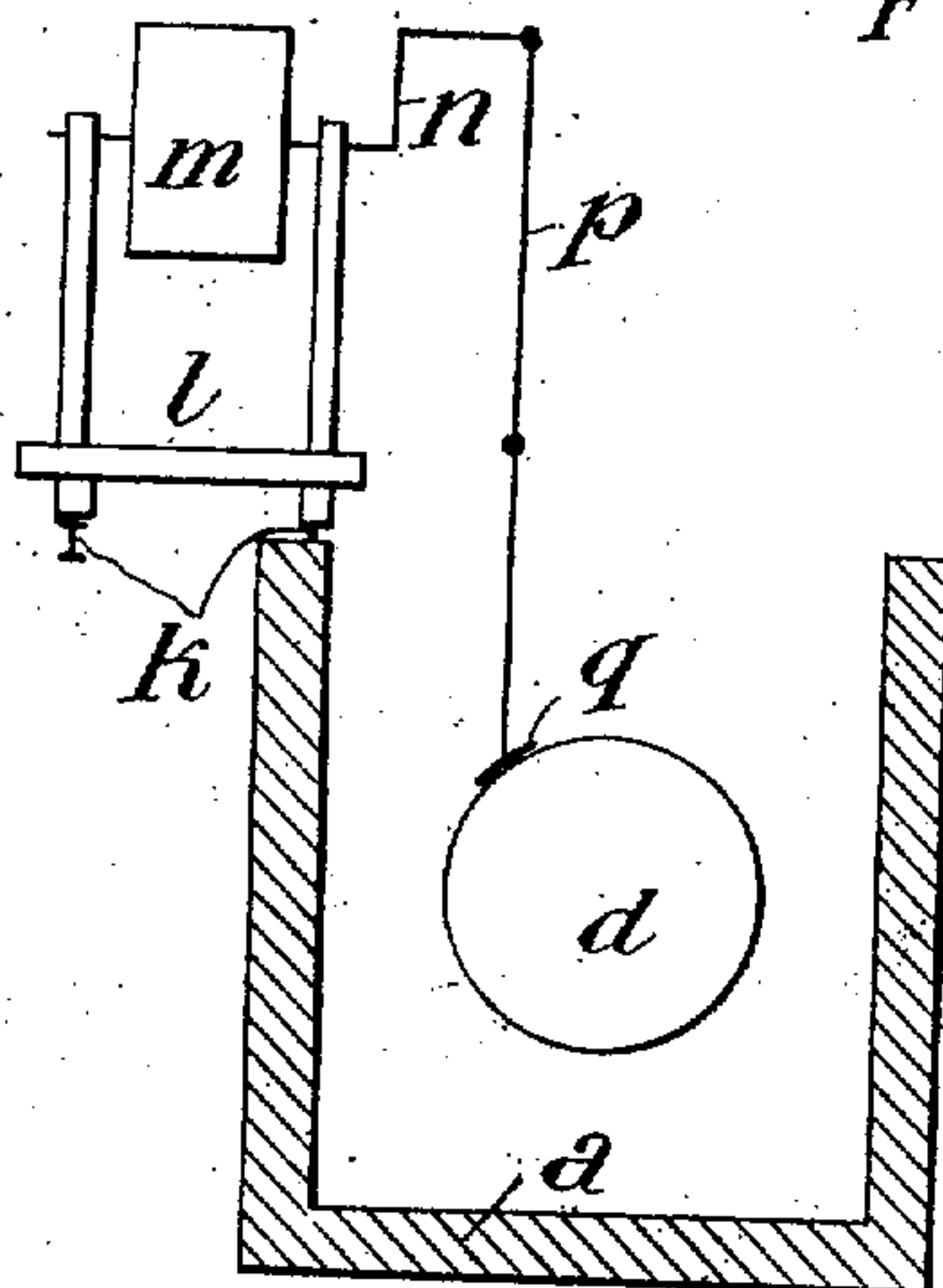


Fig. 2.



Witnesses:

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APPARATUS FOR MAKING COPPER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, MARCEL ANDRÉ JULLIEN and EMILE LOUIS DESSOLLE, two citizens of the Republic of France, residing at 5 Levallois-Perret, in France, have invented new and useful Improved Apparatus for Making Copper, of which the following is a specification.

This invention relates to a method of rendering electrolytic copper absolutely homogeneous, so that it has the same resistance and the same tensile strength in every direction.

This method chiefly consists in a polishing 15 action effected by means of a suitable apparatus.

In the accompanying drawing given by way of example:—Figure 1 is a longitudinal section of an apparatus suitable for carrying 20 out the invention, and Fig. 2 is a cross-section on the line 2—2 of Fig. 1.

The apparatus comprises a water-tight wooden case or vat *a* provided inside with two uprights *b b* on which rests the spindle *c* 25 of a drum or cylinder *d*. At one end of the said spindle is mounted a kind of tappet or cam *e*, the projection *f* of which engages with a recess in an arm *g* mounted at the end of a driving shaft *h* which passes through one of 30 the sides of the vat *a* and is provided with a stuffing box *i* to prevent leakage.

The shaft *h* is provided with an outside driving pulley *j* for rotating the spindle *h* and consequently the cylinder *d*.

35 Above the vat *a* is arranged a rolling track *k* on which can move a carriage *l* carrying a suitable electric or other motor *m* to the spindle to which is keyed a crank shaft *n*. The said crank shaft is connected by a rod *o* 40 to an oscillating lever *p*, the pivot pin of which is supported on the carriage *l*. At the bottom end of the said lever *p* is arranged a polishing tool *q* adapted to be applied against the cylinder with a suitable pressure.

45 The vat *a* contains as usual a suitable electrolytic bath, and the copper is deposited on the cylinder *d*, but, as it is being deposited, the carriage *l* moves longitudinally on its track *k*, the result of which is the movement 50 of the polisher *q* on the cylinder *d*, while at the same time the said polisher receives from the electric motor *m* a reciprocating movement of suitable amplitude. In moving along the cylinder *d*, the polisher *q* describes

therefore on the latter a screw-thread of a 55 comparatively small pitch, but at the same time it describes in a continuous manner about the said screw a kind of sinuous curve. The amplitude of movement of the polisher *q* and the pitch of the screw-thread are fixed in 60 such manner that the adjoining sinuous curves intersect, and that no point of the metal surface produced on the cylinder *d* by the deposit of the electrolytic copper, escapes the action of the polisher, the pressure 65 of which on the cylinder is suitably determined.

It will be seen from the foregoing that movement is imparted to the polisher in a manner to cause the same to move through 70 or describe sinuous intersecting paths or in other words the polisher moves through a plurality, or in the embodiment shown, two prescribed courses, one of which results from the bodily movement of the polisher and the 75 other of which results from the independent movement imparted thereto.

Experience has shown that electrolytic deposit thus treated acquires an absolute homogeneity, such that the tensile strength 80 and the resistance of the metal are the same in every direction, while in the metal obtained by ordinary processes, the resistance is generally greater in the direction of the rotation than in the longitudinal direction. 85

The copper deposit thus treated can be used for making tubes, plates, etc. The metal thus obtained is much more suitable for the various machining operations than the electrolytic copper obtained by ordinary 90 processes.

In the accompanying drawing the polishing tool is shown applied to the upper portion of the cylinder *d*, but it can also move on any generatrix of the said cylinder with the 95 same results.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed *d*, we declare that what we claim is:— 100

1. An apparatus for polishing electrolytic copper comprising a vat provided with a spindle carrying the cylinder on which the metal is deposited, an outside shaft driving the spindle of the said cylinder by means of a 105 wooden tappet, a carriage arranged above the said vat and moving longitudinally thereon, and carrying a motor operating, by

means of a connecting rod and crank, an oscillating lever provided at its end with the polishing tool substantially as described.

2. An apparatus of the class described
5 comprising in combination, a receptacle for the electrolytic bath, an actuated member on which the metal is deposited, a carriage movable with respect to said member, a polisher carried by said carriage and bodily
10 movable abreast of said member, and means for moving said polisher with respect to said member independently of the bodily movement imparted to said polisher.

3. An apparatus of the class described
15 comprising in combination, a receptacle for the electrolytic bath, an actuated member on which the metal is deposited, a carriage movable with respect to said member, a polisher carried by said carriage and bodily
20 movable abreast of said member, and means mounted on said carriage for imparting movement to said polisher independently of said bodily movement.

4. An apparatus of the class described
25 comprising in combination, a receptacle for the electrolytic bath, an actuated member on which the metal is deposited, a carriage movable with respect to said member, a polisher pivotally mounted on said carriage and
30 bodily movable abreast of said member, and

means mounted on said carriage for imparting movement to said polisher about its pivotal mounting.

5. An apparatus of the class described comprising in combination, a receptacle for 35 the electrolytic bath, an actuated member on which said metal is deposited, a polisher engaging said member, and means for imparting movement to said polisher through a plurality of prescribed courses so that the 40 path described by said polisher will intersect thereby effecting continuous engagement of said polisher with the peripheral surface of said member.

6. An apparatus of the class described 45 comprising in combination, a receptacle for the electrolytic bath, an actuated member on which the metal is deposited, a polisher engaging said member, and means for imparting movement to said polisher to cause 50 the same to describe sinuous intersecting paths.

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

MARCEL ANDRÉ JULLIEN.
EMILE LOUIS DESSOLLE.

Witnesses:

JULIEN CAVERUX,
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