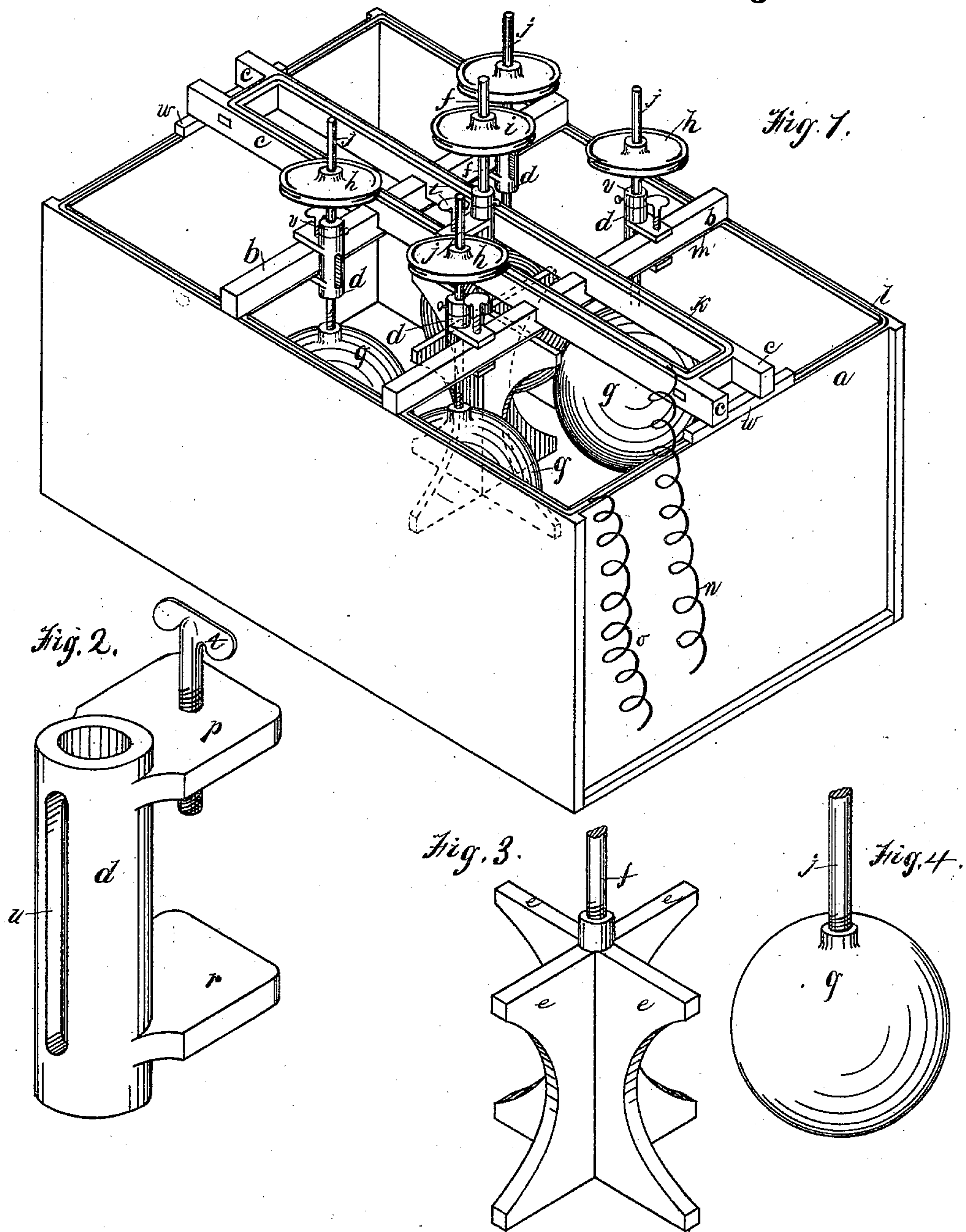


(No Model.)

F. & F. H. ENGELHARD.
APPARATUS FOR ELECTROPLATING.

No. 544,668.

Patented Aug. 20, 1895.



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APPARATUS FOR ELECTROPLATING.

SPECIFICATION forming part of Letters Patent No. 544,668, dated August 20, 1895.

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To all whom it may concern:

Be it known that we, FRANK ENGELHARD and FREDERICK H. ENGELHARD, citizens of the United States of America, residing in Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Apparatus for Electroplating, of which the following is a specification, reference being had to the accompanying drawings, and letters of reference marked thereon, in which like letters of reference indicate like parts.

Figure 1 is a perspective view of the complete apparatus, with the exception of the driving-belts. Fig. 2 is a perspective view of the removable hanger or support. Fig. 3 is a perspective view of the anode, and Fig. 4 is a perspective view of a float or cathode, mounted upon its supporting-shaft.

In detail, *a* indicates the tank; *b* and *c*, cross-ties or supports mounted thereon.

d indicates removable hangers or bearings.

e indicates the anode; *f*, the supporting-shaft for the same.

g indicates the floats or cathodes; *i*, the pulley for rotating the anode, and *j* shafts upon which the float or cathode is mounted.

k indicates a conductor, of metal, mounted upon the upper edge of the tank-walls.

m indicates conducting-strips mounted upon the lower face of the cross-ties or supports *b*.

n indicates a conducting-strip, and *o* indicates the negative wire to complete this circuit.

The tank may be of the usual construction, and upon the upper edge of the walls of the same we mount a conducting-strip *l*, this being of metal, preferably a flat strip of copper.

The cross-ties *b* are provided with like conducting-strips upon their lower faces, so that when these cross-ties are placed in position upon the top of the tank the metal upon the lower face thereof rests upon the metal upon the upper edge of the tank. Arranged preferably at right angles to the cross-ties *b* is a frame *c*, upon the upper face of which is mounted a conducting-strip *k*, to which the wire *n* may be attached in any convenient manner.

The anode is constructed preferably of the

same shape shown in Fig. 3, having four wings, and having the outer edges of these wings shaped to conform approximately to the exterior curvature of the float *g* or other cathode. A stem or shaft *f* is mounted in one end of the anode and is carried upwardly through a suitable support or hanger, and upon the upper portion of this shaft is mounted a driving-pulley *i*.

For a hanger we prefer the form of construction illustrated in Fig. 2, the same consisting of a body portion, having wings *p* and *r* made integral therewith, and one of said wings being provided with a set-screw *t*. The body is formed with one or more slots *u* through its wall to prevent heating and to facilitate the oiling of the shaft or bearing. Collars *v*, adjustably fixed upon the shafts, enable us to maintain the shaft at the desired height.

It will readily be seen that when the hanger or support is mounted upon the ties and the set-screw turned the opposite wing will be clamped against the supporting cross-piece, and that the metal of the hanger will be brought in close contact with the conducting-strip of metal mounted upon the lower face of the cross-ties *b*, and thus a sufficient contact formed to convey the electric current, and that the same hanger being employed to support the anode upon the frame *c* will serve as a conducting medium, owing to the fact that the end of the set-screw *t* will be brought in contact with the metal conducting-strip mounted upon the top of the frame *c*, so that while the several shafts of the parts may be adjusted vertically and horizontally the contact for the passage of the electric current is at all times maintained. A belt is provided which passes around the several pulleys, and in this manner both the anode and cathode are continually caused to revolve, thus producing a better result, while greatly facilitating the rapidity of the deposit.

It will readily be seen that one cathode only may be used with this apparatus, or that a greater number than as illustrated in the drawings may be arranged around the anode and a similar result accomplished. It will also be seen that the same arrangement of parts may be employed and a different-shaped anode be

supplied and a very beneficial result accomplished. We find, however, that the best result is accomplished by the arrangement herein illustrated and fully described. The
5 pulleys may be adjustably mounted upon their shafts in any convenient manner.

It will be observed that the method of vertically adjusting the shafts and the parts which are supported by them is accomplished
10 by loosening the set-screw in the collars *v*, adjusting the shaft in the desired position, and tightening the set-screw in the collar upon the shaft while the collar bears upon the top of the hanger *d*, and that horizontal adjust-
15 ment will be accomplished by loosening the set-screw in the hanger, moving the hanger to the desired position, and tightening it again to clamp the hanger to the support.

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

1. The combination of a tank, an electrolyte therein, a conducting strip mounted on the top edge thereof, a cross-tie provided
25 with a metallic conductor directly contacting with the conductor on the tank, a movable conducting hanger mounted thereon arranged with a part in contact with the conductor on the cross-tie, an electrode supported from said
30 hanger, a source of electric energy, and conductors therefrom to the conducting strip and to the electrolyte, substantially as described.

2. The combination of a tank, a conducting strip mounted on the top edge thereof,
35 cross-ties provided with metallic conductors, one or more of said cross-ties having said conductors in contact with the conducting strip, conducting hangers movably mounted on the
40 cross-ties arranged with a part in contact with the conductor on the cross-ties, a source of electric energy, and conductors therefrom to the conducting strip and to the hangers

electrically separated from said strip, substantially as described. 45

3. The combination of a tank having a conducting portion, a source of electric energy, a permanent connection therefrom to the conducting portion of the tank, a support for an electrode, removable from said tank, said support
50 having a conducting portion adapted to come in contact with the conductor on the tank when said support is placed in position, a support for the other electrode supported by said tank but electrically separated there-
55 from, and a permanent connection from the latter support to the source of electric energy, substantially as described.

4. The combination with a tank, of hanger supports thereon, hangers mounted on said
60 supports, having vertical shaft openings, electrode supports having shafts adapted to engage in said openings, and means for simultaneously rotating the electrode supports, substantially as described. 65

5. The combination with a tank, of hanger supports thereon, hangers, mounted on said supports, having vertical shaft openings, electrode supports having shafts adapted to en-
70 gage in said openings, adjustable collars on said shafts above said hangers, and means for simultaneously rotating the electrode supports, substantially as described.

6. The combination, with a tank, of hanger supports thereon, hangers horizontally ad-
75 justable on said supports, shafts vertically adjustable on said hangers, electrodes carried by said shafts, and means for simultaneously rotating the electrode supports, substantially as described.

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