

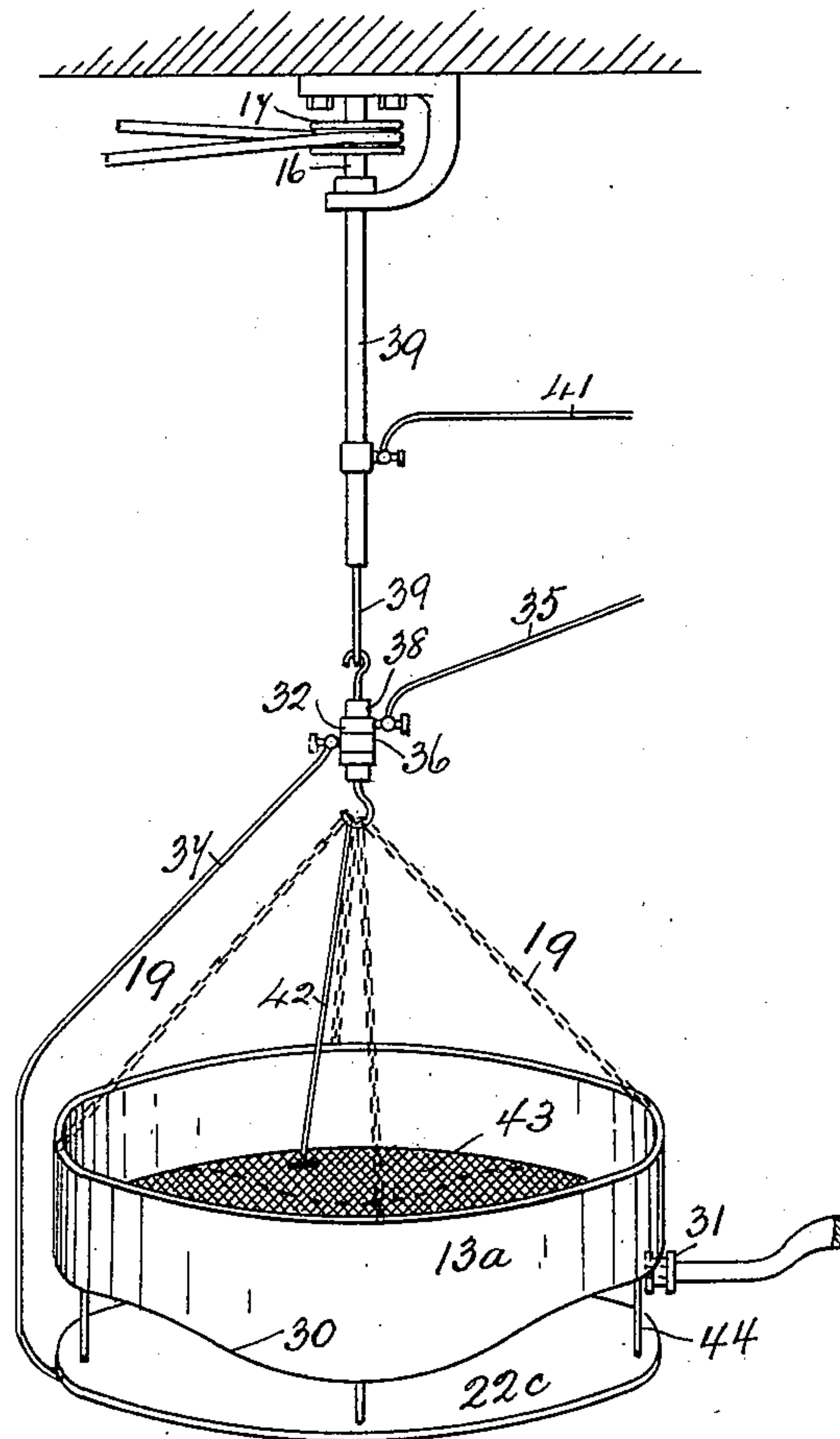
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Patented Dec. 13, 1898.

J. E. & H. E. HARTLEY.  
ELECTROPLATING APPARATUS.

(Application filed Dec. 28, 1897.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

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## ELECTROPLATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 615,699, dated December 13, 1898.

Application filed December 28, 1897. Serial No. 663,962. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN EBORALL HARTLEY and HERBERT EDWARD HARTLEY, subjects of the Queen of Great Britain, and residents of 13 St. Paul's Square, in the city of Birmingham, England, have invented new and useful Improvements in Electroplating Apparatus, of which the following is a specification.

Our invention relates to improvements in electroplating apparatus; and its objects are to provide a cathode-carrier revoluble about a vertical axis, improvements in mode of carrying anodes, an intermittent shaking mechanism for disturbing the work under treatment, and improved means for conveying the currents to anodes and cathodes. We attain these objects by the mechanism illustrated in the accompanying drawing, which is a view in elevation of this our invention.

Reference-numbers are shown upon the drawing to simplify description.

13<sup>a</sup> is the cathode-carrier, which is freely hung upon a central rod 39 by means of chains or cords 19 and to which is given a rotative movement in a horizontal plane by means of spindle 16 and pulley 17 or other suitable mechanism—such, for instance, as the use of a motor of the well-known roasting-jack type. Preferably the carrier 13<sup>a</sup> is made to be raised out of and lowered into the bath by any ordinary device; but such raising and lowering mechanism not forming part of this our invention we have not illustrated any means of doing so.

22<sup>c</sup> is the anode, which is suspended below the carrier and carried in a horizontally parallel position therewith, so that it gives off a very equal action to the whole surface of the carrier.

The cathode-carrier 13<sup>a</sup> is made of wood, and the network 43, constituting the bottom, is usually made of copper, but in some cases may be made of brass. The anode 22<sup>c</sup> is supported from the wooden cathode-carrier 13<sup>a</sup> by means of the supports 44, which may be of any suitable material, and if of metal their connection to the anode is preferably non-conductive; but in any case it is non-conductive with the network 43. Deposition will of course take place upon the net bottom 44, but the anode 22<sup>c</sup> presenting a much larger sur-

face than the surface of the net and the latter being open-work there is ample flow of deposition through the mesh to the articles to be plated. The usual side anodes may be used in the bath, but simply to sustain the strength of the solution.

In order to give to the cathode-carrier an intermittent shaking movement, we may make the under side edge at 30 of a cam shape, which shall ride upon a fixed projection 31. Hence as the cathode-carrier revolves it is intermittently raised and lowered with a sudden movement, which shakes up the cathodes in the carrier.

In order to convey the current of electricity to the anode, the current passes through wire 35 and non-rotative collar 32, thence through rotative collar 36 and wire 37 to anode 22<sup>c</sup>. The two collars 32 and 36 are mounted upon a non-conductive stem 38, because the central metallic rod 39 is used as a conductor to the cathodes by means of the wire 41 and wire 42.

We are aware that revolving cathode-carriers have already been used, and therefore we do not claim such broadly; but

What we do claim, and desire to secure by Letters Patent, is—

1. In an electroplating apparatus the combination of the cathode 13<sup>a</sup>, and anode, rigidly connected and revoluble about a vertical axis, suspended by chains or cords 19, from stem 38, with electrical connections substantially as set forth and shown.

2. A vertically freely-suspended cathode-carrier having the undulated under edge 30 with fixed controlling projection 31, as set forth and shown and for the purposes specified.

3. In an electroplating apparatus the combination with a revoluble anode and cathode, of the revoluble non-conducting stem 38, a cathode connection passing through said stem, the conducting-collar 36, attached to said stem and electrically connected to the anode, the collar 32, loosely encircling said stem and resting upon the collar 36, and an anode connection to said collar 32.

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