A. VAN WINKLE & J. T. DANIELS.

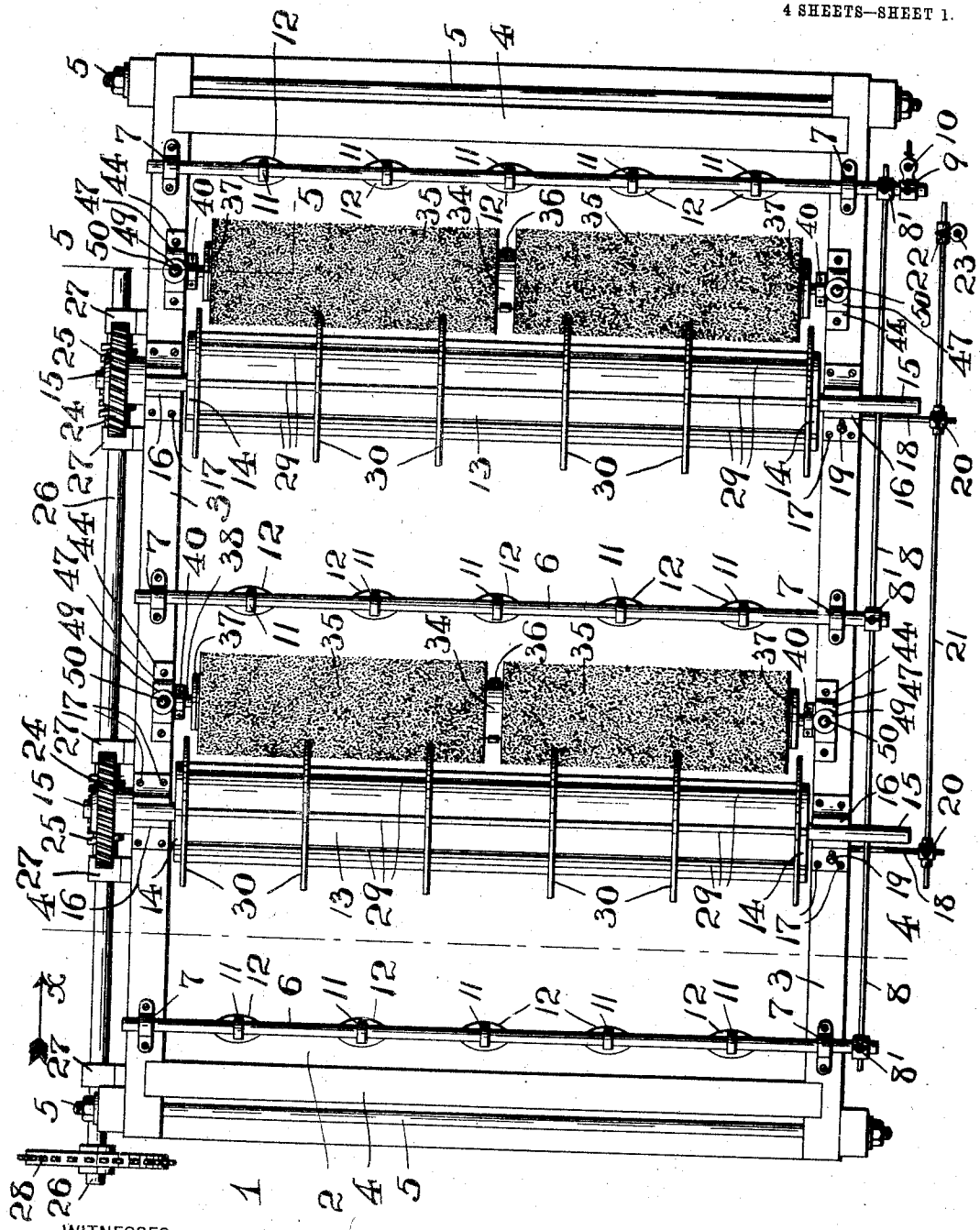
ELECTROPLATING APPARATUS.

APPLICATION FILED JUNE 29, 1907.

907,425.

Patented Dec. 22, 1908.

4 SHEETS—SHEET 1.



WITNESSES:

F. H. W. Fraentzel

Anna L. Alter.

Fig. 1

INVENTORS:

Abraham Van Winkle &

John T. Daniels,

BY

Fraentzel and Richards,

ATTORNEYS

A. VAN WINKLE & J. T. DANIELS.

ELECTROPLATING APPARATUS.

APPLICATION FILED JUNE 29, 1907.

907,425.

Patented Dec. 22, 1908.

4 SHEETS—SHEET 2.

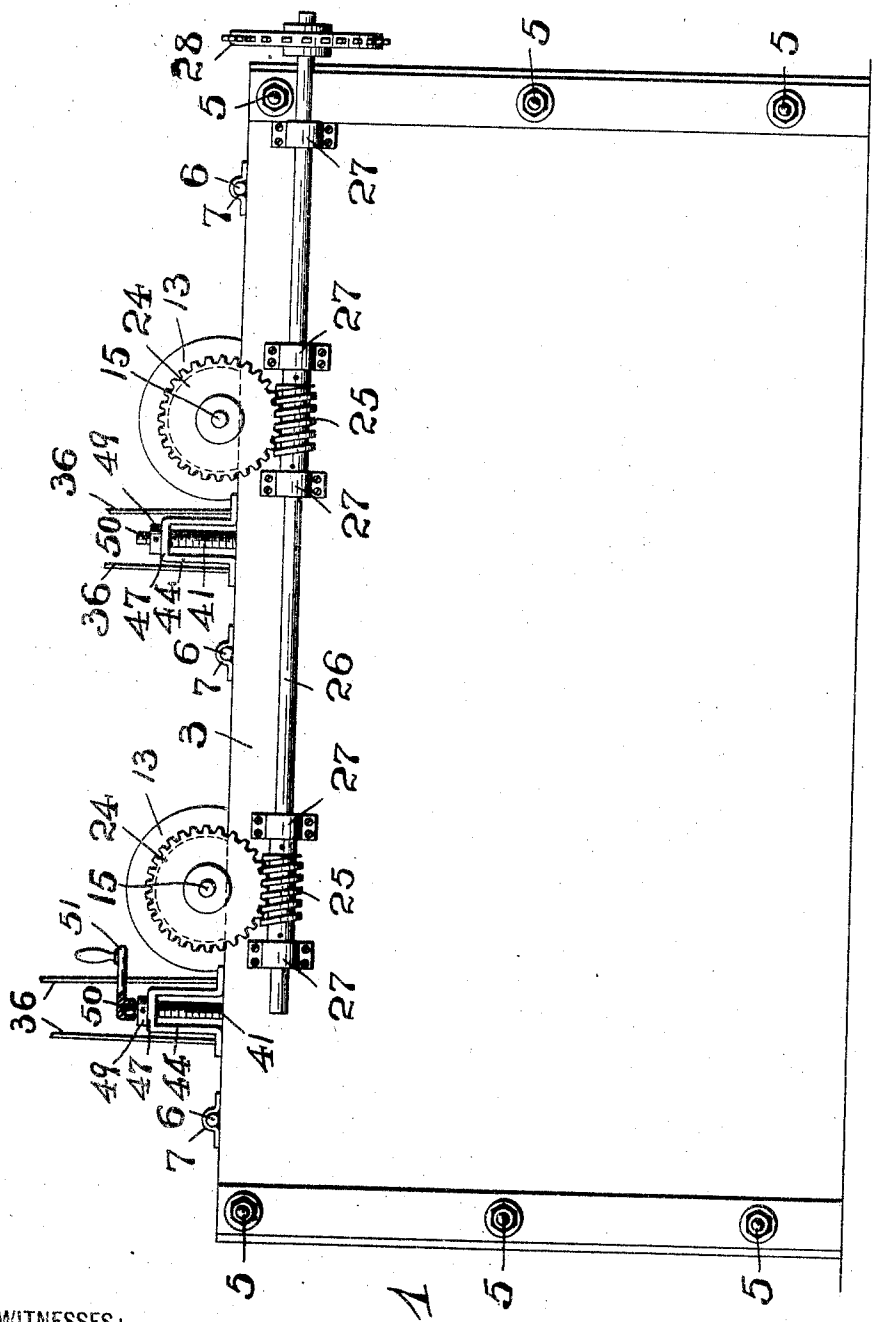


Fig. 2.

WITNESSES:

F. H. W. Fraentzel

Anna St. Peter.

INVENTORS:

Abraham Van Winkle &

John T. Daniels,

BY

Fraentzel and Richards

ATTORNEYS

A. VAN WINKLE & J. T. DANIELS.

ELECTROPLATING APPARATUS.

APPLICATION FILED JUNE 29, 1907.

907,425.

Patented Dec. 22, 1908.

4 SHEETS—SHEET 3.

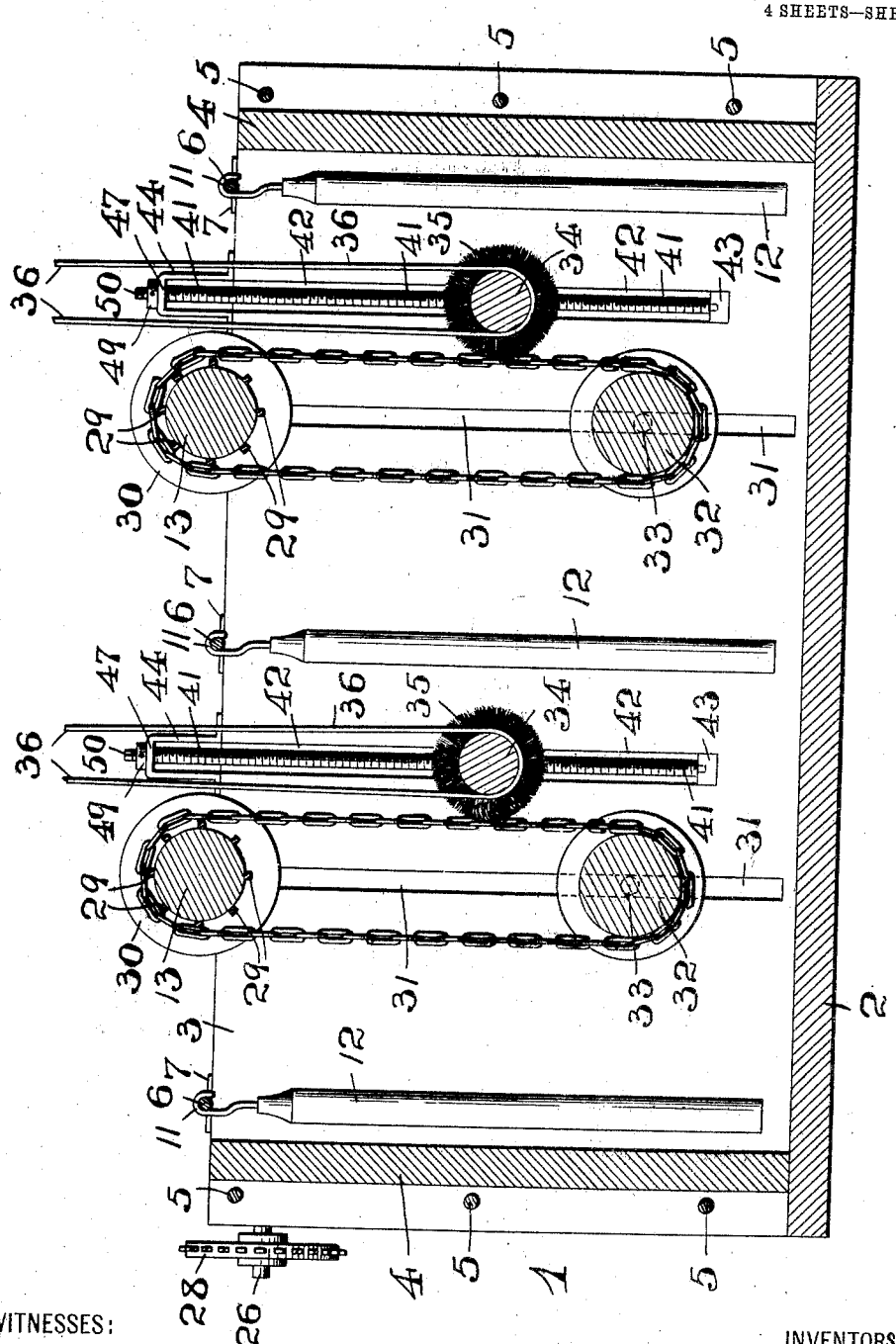


Fig. 3.

WITNESSES:

F. H. W. Fraentzel

Anna H. Alter

INVENTORS:

Abraham Van Winkle &

John T. Daniels,

BY

Fraentzel and Richards,

ATTORNEYS

A. VAN WINKLE & J. T. DANIELS.

ELECTROPLATING APPARATUS.

APPLICATION FILED JUNE 29, 1907.

907,425.

Patented Dec. 22, 1908.

4 SHEETS—SHEET 4.

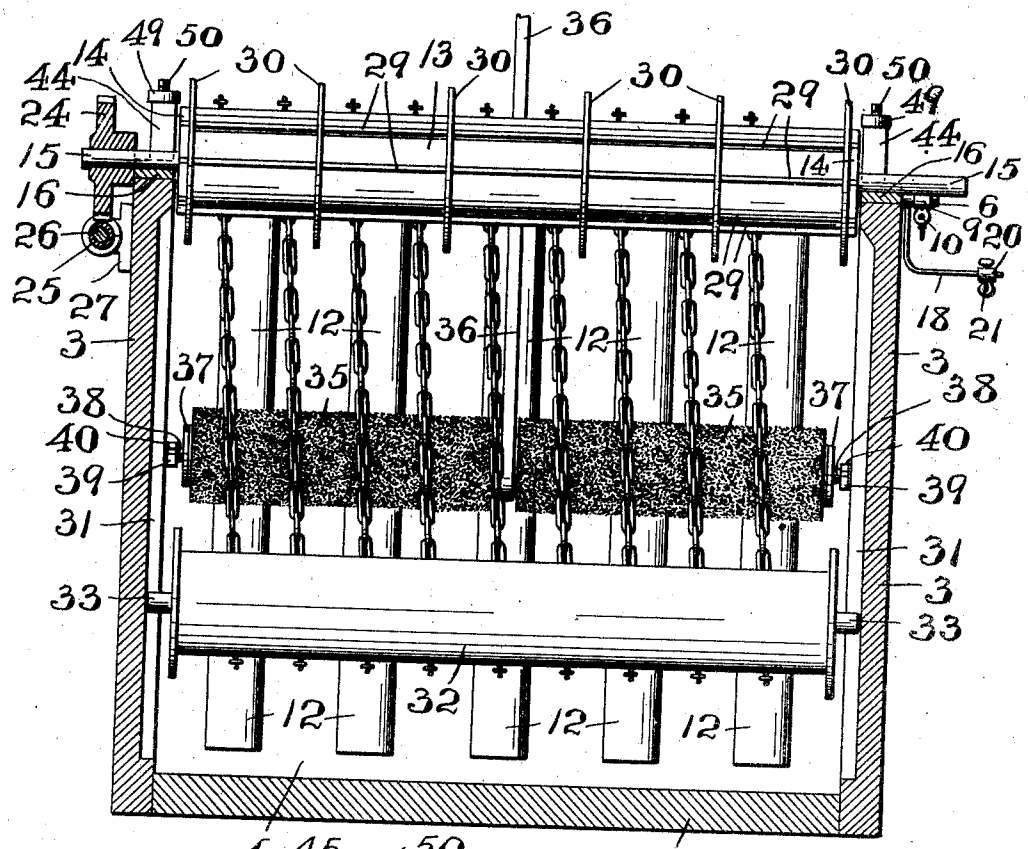


Fig. 4

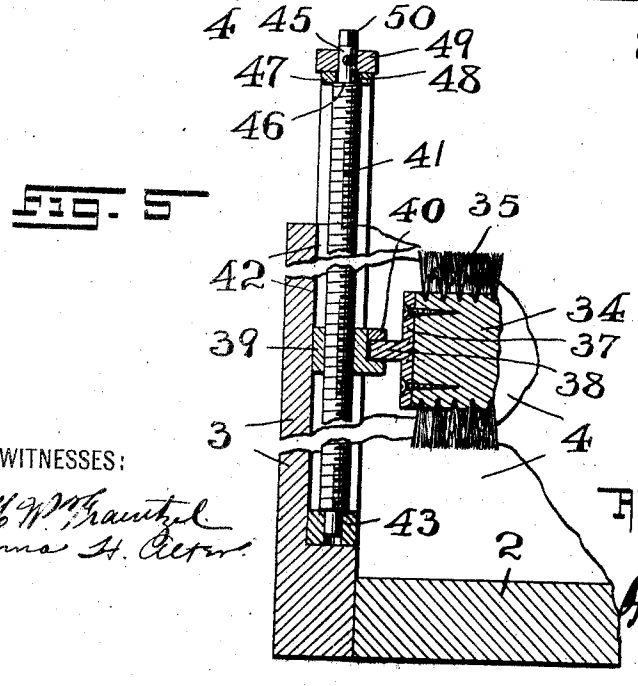


Fig. 5

WITNESSES:

Fitz W. Fraentzel

Anna H. Peters

INVENTORS:

Abraham Van Winkle

& John T. Daniels,

BY

Fraentzel and Richards

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ABRAHAM VAN WINKLE AND JOHN T. DANIELS, OF NEWARK, NEW JERSEY, ASSIGNORS TO THE HANSON & VAN WINKLE COMPANY, A CORPORATION OF NEW JERSEY.

ELECTROPLATING APPARATUS.

No. 907,425. Specification of Letters Patent. Patented Dec. 22, 1908.

Application filed June 29, 1907. Serial No. 381,385.

To all whom it may concern:

Be it known that we, ABRAHAM VAN WINKLE and JOHN T. DANIELS, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electroplating Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

Our present invention is in the nature of improvements in electroplating apparatus; and the present invention relates more particularly to a novel electroplating apparatus and method of electroplating such bodies, as chains, or the like, arranged in the form of continuous loops moving upon and about conveying rolls or drums, the apparatus hereindescribed being an improvement on that form and style of electroplating apparatus described and illustrated in our former application for Letters-Patent, filed June 7, 1907, Serial No. 377,690.

The present invention has for its principal objects to provide a novel and simply constructed electroplating apparatus for the electro-deposition of metals upon the heavier articles of manufacture, such as chains, or other hoop or loop-shaped bodies, which are to be arranged upon and roll or move with a revolving support or supports, all with a view of simplifying the method of electro-deposition, and providing in connection therewith a novel means for producing simultaneously with the electrodeposition of the metal, a bright finish of the plated surface or surfaces.

A further object of this invention is to provide an adjustable means, for the purpose of producing a bright finish of the metal, said means being movable into or out of the electroplating solution, so as to be operative either in an immersed position beneath the surface of the electroplating fluid, or being operative above the surface of the fluid, as may be desired, and as may be necessary according to the kind of electro-plating work which is being done.

Other objects of this invention not at this time more especially enumerated will be clearly understood from the following detailed description of the same.

With the various objects of our present invention in view, the same consists, primarily, in the novel electroplating apparatus hereinafter set forth; and, furthermore, this invention consists in the various arrangements and combinations of devices and parts, as well as in the details of the construction of the same, all of which will be more fully described in the following specification, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

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

Figure 1 is a top or plan view of the apparatus embodying the principles of this invention; Fig. 2 is a side elevation of the apparatus; and Fig. 3 is a central longitudinal vertical section of the apparatus. Fig. 4 is a transverse section of the apparatus, said section being taken on line 4—4 in said Fig. 1, looking in the direction of the arrow *x;* and Fig. 5 is a detail vertical section, said section being taken on line 5—5 in said Fig. 1.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now to the several figures of the drawings, the reference-character 1 indicates a suitably constructed tank or vat, the same comprising a base 2, the sides 3, and ends 4, all of which are suitably connected and may be tied with tie-bolts 5. Extending across the upper open portion of the tank or vat is an arrangement of one or more rods or bars 6, which are held in place preferably by means of suitable fastening devices, as 7. An electric conductor 8, in the form of a wire or rod, is connected with said anode-rods or bars by means of suitable contact-producing sleeves 8^1, and upon one of the said rods or bars 6 is another contact-sleeve 9, or similar fastening device, with which is suitably connected an electric conductor, such as a wire or rod 10, which leads from the main source of electricity. Suspended from each rod or bar 6, by means of hooks 11, or in any other suitable manner, are any desirable number of metal anodes, as 12, which are thus arranged in the electrolyte or electroplating fluid contained in said vat or tank.

Arranged in the space between each pair

of anode-rods or bars 6 is a revolving work-supporting roll or drum 13, which is usually made of wood, and upon the ends of which are secured suitably formed plates or caps 14 of metal. Each plate or cap 14 is provided with an end-journal 15. By means of these journals each roll or drum may be rotatively and at the same time removably arranged in an arrangement of open or semi-circular bearings 16 which may be secured in place upon the upper edges of the sides 3, by means of bolts or screws 17. The bearings 16 upon the one side of the tank or vat have connected therewith and leading therefrom suitable circuit-wires or rods 18, being connected with and secured in place by means of the set-screws 19, or other suitable fastening means. The wires or rods 18 are provided with contact-producing members or elements 20 for the purpose of completing the return-circuit through a rod or wire 21, and by means of another contact-producing element 22 completing the electric circuit by means of the rod or wire 23 with the main source or supply of electricity. Upon the opposite end, the journal of each work-supporting roll or drum 13 is provided with a toothed or worm-wheel 24, each wheel 24 being in mesh with a worm 25 upon a driving shaft 26 which revolves in suitable bearings 27, substantially as clearly illustrated in Figs. 1 and 2 of the drawings. This shaft may be driven from a sprocket-wheel 28, over which may be arranged a link driving chain; or, the said shaft may be operated in any other suitable manner, as will be evident.

Each work-supporting roll, in order that it will serve as a good conductor for carrying the electric current into and through the work which is to be electroplated, is provided with a series of longitudinally extending metal strips, bands or plates 29, over which the chains or other looped or hoop-shaped goods of manufacture, which are to be electroplated, are suspended and which act to produce a rotary motion of the goods when the work-supporting roll is being operated, as will be clearly evident from an inspection more particularly of Figs. 3 and 4 of the drawings. Separating disks, plates, or partitions 30 may also be suitably disposed and secured upon each roll or drum, so as to provide a number of annular spaces upon each roll or drum for the movement therein of the work or cathode.

Each side 3 of the tank or vat may also be provided with a series of vertically disposed grooves or channels 31, forming suitable guides in which are retained, and are capable of vertical movements, the end portions of the journals 33 of other rolls or drums 32 around which the lower moving portions of the chains or looped bodies move, so as to retain the moving portions of said bodies in their properly separated relations to more readily deposit the metal upon all parts of said bodies, and at the same time to cause the one moving portion of the chain, or similar body, to move in constant and uniform engagement with the brushes or bristles 35 of suitable rolls or drums 34. These drums 34 which are revolved from a belt 36, substantially as shown in Figs. 1, 3 and 4 of the drawings, are provided with the end-plates 37 and journals 38, the end-portions of which revolve in suitable bearing-portions 40 forming parts of suitable screw-threaded sleeves or nuts 39. These sleeves or nuts 39 are adjustably disposed upon screw-threaded rods or spindles 41, which are preferably arranged within suitable grooves or channels 42 formed in the sides 3 of the tank or vat, said rods or spindles being held in vertical positions by suitable bearing-blocks 43 at their lower ends and brackets 44 at their upper ends, said brackets being suitably secured upon the upper edges of the said sides 3, substantially in the manner shown. That the said rods or spindles are rotatably retained with relation to said brackets, the upper end-portion of each rod or spindle is reduced, as at 45, so as to form a shoulder 46 which is fitted against the under surface of the part 47 of each bracket, each part 47 being formed with a hole 48 in which the reduced portion 45 is arranged, a collar 49 being secured upon that part of the portion 45 which extends above the part 47 of the bracket, and a squared or angularly formed end-member 50 being provided for the placing thereon of a wrench or operating member 51. It will thus be evident, that the said rods or spindles 41 can be turned in either direction, and the sleeves or nuts 39 made to move either upwardly or downwardly upon said screw-threaded rods, as may be desired, to adjust the brushes vertically, so as to locate the latter in their immersed positions in the electroplating solution, or above the same, according to the nature of the work which is to be plated and the kind of electroplating solution used.

Having thus described the general construction and arrangement of the devices and parts of the apparatus, the chains or similar work to be electroplated are readily arranged upon the rolls by raising the end-portions of the rolls sufficiently from their bearings, so that the portions of chain or the like can be slipped in rolling relation over each pair of vertically disposed rolls, and the free ends of the chain having been connected with a piece of binding wire or stout cord, and the rolls being replaced, the mechanism can be set in operation from the driving shaft 26. Proper electrical connection having also been made in the manner previously stated, the electric current is turned on, and the rolls or drums moving the work into and from the electrolyte or electrolytic fluid, process of the

electro-deposition of the metal from the anode or anodes to the work or cathode immediately takes place. The work, at the same time, being continuously rolled or moved against the brushes, a bright or burnished electro-deposited surface will also be produced, and the work can be removed from the apparatus in its finished condition.

From the foregoing description of the present invention, it will be clearly seen, that we have devised a simple, and effectively operating mechanism for electro-plating apparatus in which the work which is to be plated is continuously moved or rolled through the electroplating solution, which is of especial benefit in plating long chains, which are looped over the rolls of the apparatus.

We are aware that changes may be made in the arrangements and combinations of the devices and parts, as well as in the details of the construction of the same, without departing from the scope of this invention, and as clearly defined in the appended claims. Hence we do not limit our invention to the exact arrangements and combinations of the devices and parts as described in the foregoing specification and as illustrated in the accompanying drawings, nor de we confine ourselves to the exact details of the construction of the same.

We claim:—

1. An electroplating apparatus comprising a vat or tank, adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, and a rotary brush in said tank in engagement with the moving surfaces of the work.

2. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, and a rotary brush in said tank in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

3. An electroplating apparatus comprising a vat or tank, adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, and a rotary brush in said tank in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

4. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, combined with another support from which metal anodes are adapted to be suspended, electric circuits with which said supports are connected, and a rotary brush in said tank in engagement with the moving surfaces of the work.

5. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, combined with another support from which metal anodes are adapted to be suspended, electric circuits with which said supports are connected, a rotary brush in said tank in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

6. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, combined with another support from which metal anodes are adapted to be suspended, electric circuits with which said supports are connected, a rotary brush in said tank in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

7. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support, an electric circuit with which the work is connected, and a rotary brush in said tank in engagement with the moving surfaces of the work.

8. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support, an electric circuit with which the work is connected, and a rotary brush in said tank in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

9. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from

which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support an electric circuit with which the work is connected, and a rotary brush in said tank in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

10. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support, an electric circuit with which the work is connected, combined with another support from which the metal anodes are adapted to be suspended, electric circuits with which said supports are connected, and a rotary brush in said tank in engagement with the moving surfaces of the work.

11. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support, an electric circuit with which the work is connected, combined with another support from which the metal anodes are adapted to be suspended, electric circuits with which said supports are connected, and a rotary brush in said tank in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

12. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble support from which the work which is to be plated is suspended and is in rolling engagement with said support, the body of said support being a non-conductor of electricity, metal contact-strips upon said support, an electric circuit with which the work is connected, combined with another support from which the metal anodes are adapted to be suspended, electric circuits with which said supports are connected, and a rotary brush in said tank in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

13. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting rolls over which the work which is to be plated is arranged in rolling engagement, means for actuating said rolls, and a rotary brush in said tank in engagement with the moving surfaces of the work.

14. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting rolls over which the work which is to be plated is arranged in rolling engagement, means for actuating said rolls, and a rotary brush in said tank in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

15. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting rolls over which the work which is to be plated is arranged in rolling engagement, means for actuating said rolls, and a rotary brush in said tank in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

16. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting rolls over which the work which is to be plated is arranged in rolling engagement, means for actuating said rolls, an anode-bar from which metal anodes are adapted to be suspended, electric circuits with which said anode-bar and one of said rolls are electrically connected, and a rotary brush in said tank, in engagement with the moving surfaces of the work.

17. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting roll over which the work which is to be plated is arranged in rolling engagement, means for actuating said rolls, an anode-bar from which metal anodes are adapted to be suspended, electric circuits with which said anode-bar and one of said rolls are electrically connected, and a rotary brush in said tank, in engagement with the moving surfaces of the work, and means for vertical adjustment of said brush.

18. In an electroplating apparatus, a vat or tank adapted to contain an electroplating solution, a pair of vertically disposed supporting rolls over which the work which is to be plated is arranged in rolling engagement,

means for actuating said rolls, an anode-bar from which metal anodes are adapted to be suspended, electric circuits with which said anode-bar and one of said rolls are electrically connected, and a rotary brush in said tank, in engagement with the moving surfaces of the work, the brush being provided with end-journals, and means for the vertical adjustment of said brush, consisting of vertically arranged screw-rods, a sleeve movably arranged upon each screw-rod, and means connected with each screw-rod for operating the same, substantially as and for the purposes set forth.

In testimony, that we claim the invention set forth above we have hereunto set our hands this 26th day of June 1907.

ABRAHAM VAN WINKLE.
JOHN T. DANIELS.

Witnesses:
E. N. BOICE,
F. H. W. FRAENTZEL.