A. VAN WINKLE & J. T. DANIELS.

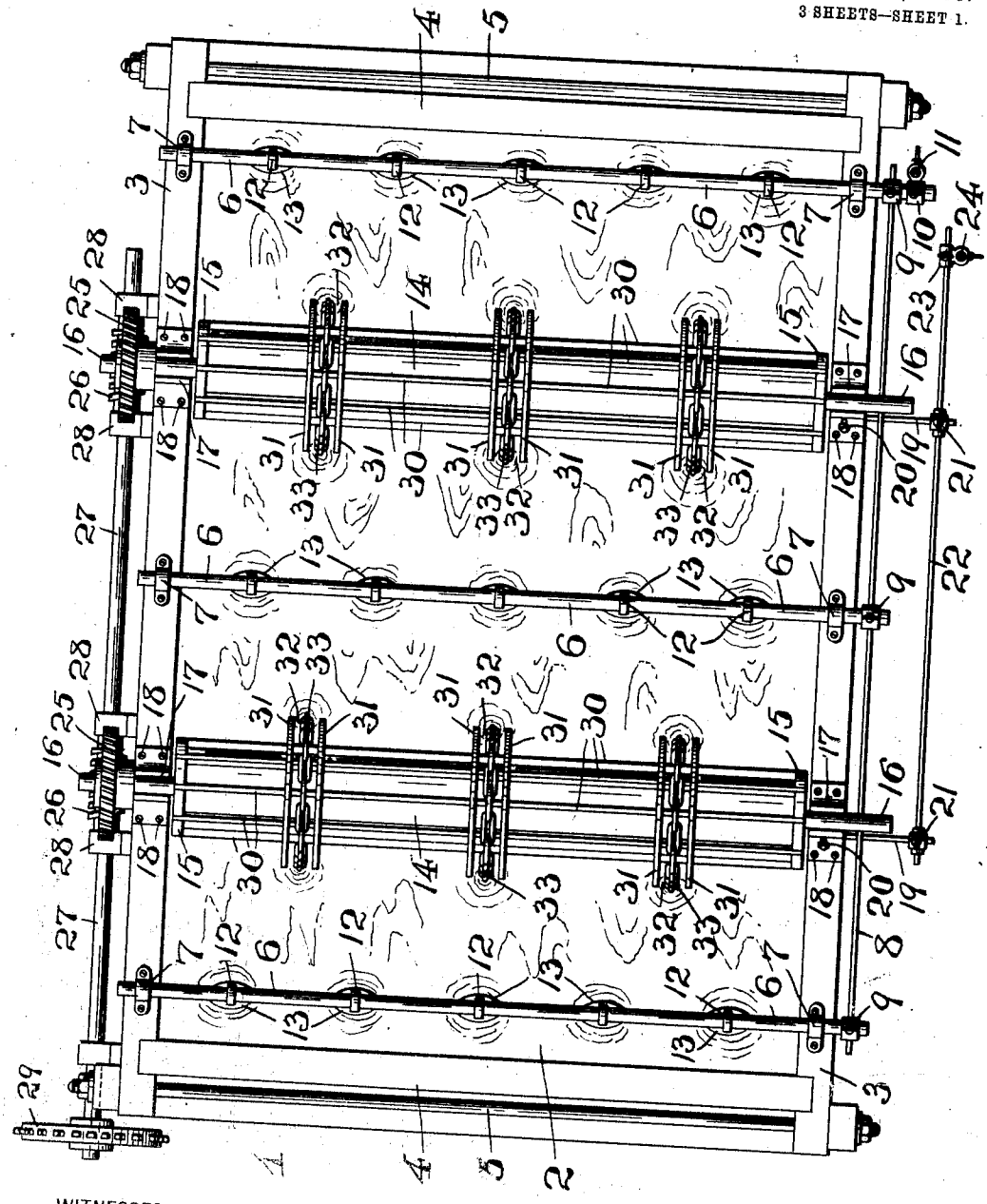
ELECTROPLATING APPARATUS.

APPLICATION FILED JULY 29, 1907.

907,426.

Patented Dec. 22, 1908.

3 SHEETS—SHEET 1.



WITNESSES:

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FIG. 1

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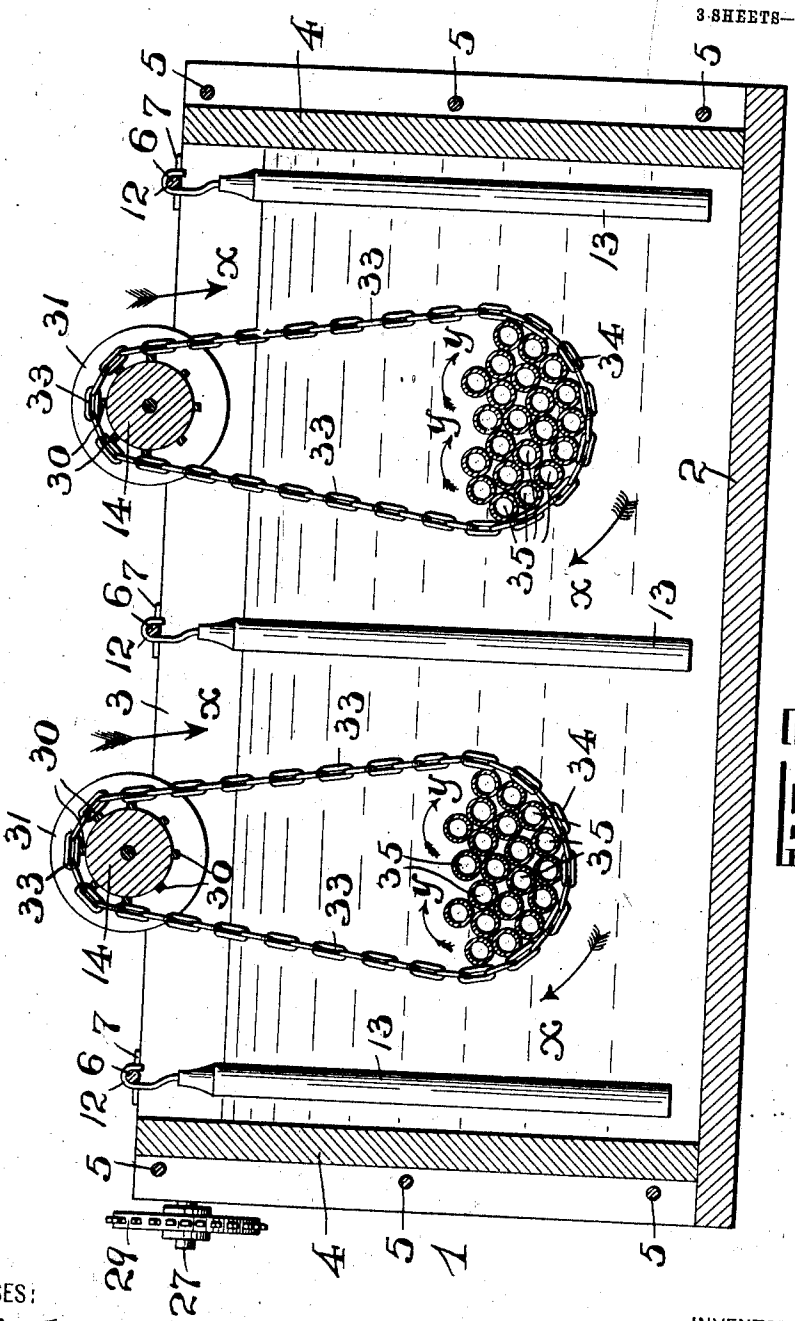


Fig. 2.

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3 SHEETS—SHEET 3.

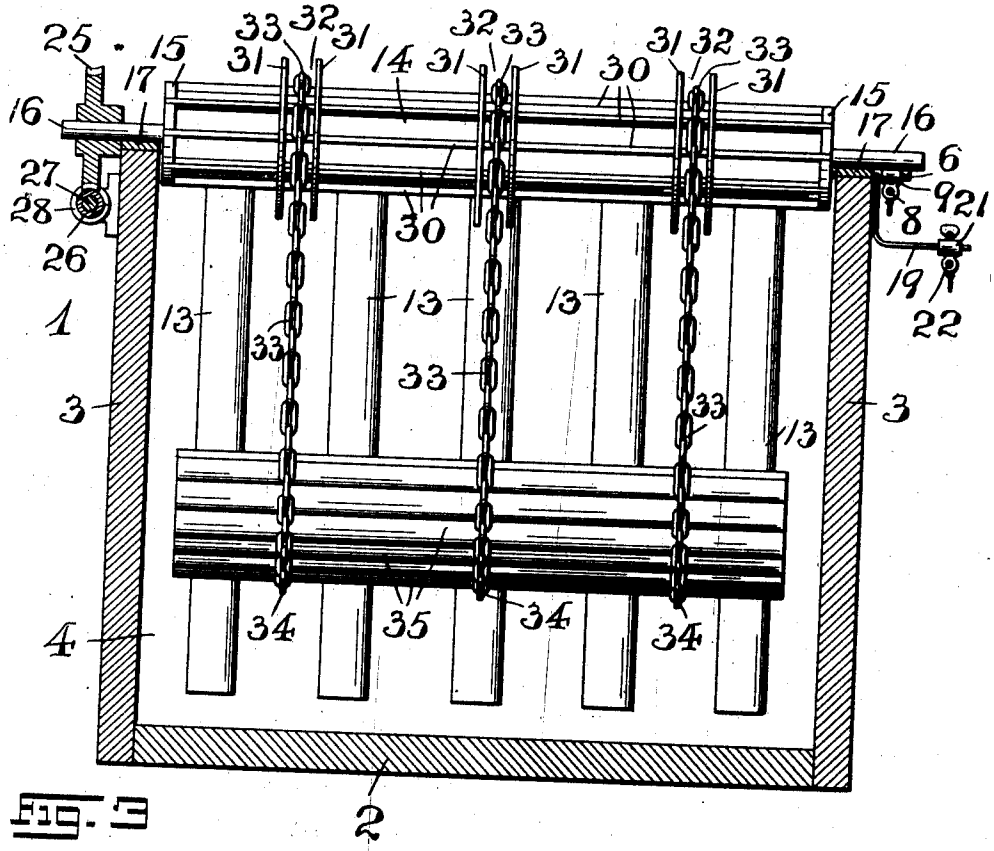


Fig. 3

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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. 907,426. Specification of Letters Patent. Patented Dec. 22, 1908.

Application filed July 29, 1907. Serial No. 386,036.

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 relates, generally, to improvements in electroplating apparatus; and, the invention has reference more particularly, to improvements in electroplating apparatus, arranged and constructed for the purposes of electro-depositing metals upon bodies made in the form of pipes, rods, or other similarly shaped bodies, which can be arranged in a rolling relation to each other within the electroplating fluid or electrolyte.

Our present invention, therefore, has for its principal object to provide a novel and simply constructed electroplating apparatus, comprising one or more contact-producing and supporting rolls, upon which are movably arranged metal supports, in the form of chains or other flexible supports, forming good conductors of electricity, and in the loop-shaped supporting portions of which are deposited, in rolling relation with each other, piles of tubes, pipes, rods or other similarly shaped bodies, which are to be electroplated.

Other objects of this invention not at this time more particularly mentioned will be clearly evident from the following specification.

With the various objects of our present invention in view, the said invention 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 claims 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 an electroplating apparatus embodying the principles of the present invention; Fig. 2 is a longitudinal vertical section of the apparatus; and Fig. 3 is a transverse section of the same.

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

Referring now to said figures, the reference-character 1 indicates a suitably constructed tank or vat, comprising a base 2, the sides 3, and the ends 4, all of which are suitably connected and may be tied with tie-bolts 5, as clearly indicated in the several figures of the drawings.

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 by means of suitable fastening devices, as 7, and substantially in the manner shown in said Fig. 1 of the drawings. An electric conductor 8, in the form of a wire or rod, is connected with said rods or bars 6 by means of suitably constructed contact-sleeve 9, or other similar fastening devices, and upon the end-portion of one of the said rods or bars is another contact-sleeve 10, with which is suitably connected an electric conductor, as a wire or rod 11, which leads from the main source of electricity. Suspended from each of said rods or bars 6, by means of suitable hooks 12, or in any other desired manner, are any desirable number of anodes 13, extending down into the electrolyte or plating solution.

Arranged in the space between each pair of anode-rods or bars 6 is a revolving drum or roll 14, each drum or roll being provided at its ends with suitably formed plates or caps, as 15, and extending from each plate or cap is a journal 16. By means of these journals each roll or drum is rotatively and at the same time removably arranged in open or semi-circular bearings 17, which may be secured upon the upper edge-portions of the sides 3, by means of suitable bolts or screws 18. Extending from the bearings upon the one side of the apparatus are suitable circuit-wires or rods 19, each wire having one end-portion secured to a bearing by means of a set-screw 20, or other suitable fastening means. These wires or rods 19 are provided with contact-producing members or elements

21, for connecting with said wires or rods 19 an electric circuit-wire or rod 22, which is connected by means of a contact-element 23 with the main circuit-wire 24 by means of which the return circuit to the main source or supply of electricity is completed. Upon the opposite end, the journal of each drum or roll 14 is provided with a toothed or worm-wheel 25, each wheel 25 being in mesh with a worm 26 upon a driving shaft 27 which revolves in suitable bearings 28. This shaft may be driven from a sprocket-wheel 29, over which may be arranged a link driving chain; or, the said shaft may be operated in any other suitable manner. Each roll, in order that it will serve as a good conductor of electricity for carrying the electric current into or from the work which is to be electroplated, is provided with a series of longitudinally extending metal strips, bands or plates 30, similar in arrangement and construction to those described in our Patent No. 901,399, issued October 20th, 1908. Suitably secured upon each roll or drum are disks or plates 31, said disks or plates being suitably disposed in pairs upon the said roll or drum, substantially as shown, so as to provide the spaces 32 between each pair of disks or plates. Movably supported and arranged in each space 32 is an endless chain 33, or other suitable flexible supporting means, the same being arranged in substantially the manner illustrated in the several figures of the drawings, so that suitable receiving and retaining loops 34 are provided, and in which can be arranged and suitably supported a number of pipes or rods, as 35, or other similar articles of manufacture which are to be electroplated, in the manner more clearly illustrated in Figs. 2 and 3 of the drawings. Having thus arranged the chains or other suitable flexible metal supporting means upon the rolls, drums or cylinders 14, and having supported and suspended the cylindrical bodies in piles in the electrolytic solution, when the rolls or drums 14 are made to revolve, by means of the shaft 27, and the worms 26 and worm-wheels 25, then the respective chains or supports 33 will move through the plating fluid, in the direction of the arrows x in said Fig. 2 of the drawings. At the same time, the movements of the chains or supports 33 will cause the independent revolving motions of the various cylindrical bodies 35 in the directions of the arrows y, so that all points of the surfaces of the said cylindrical pipes, rods, or similar bodies will be exposed to the action of the plating fluid. Thus, it will be seen, that when proper electrical connection has been made, and the pipes, rods, or similar bodies 35 are caused to move in the directions of the arrows y, and the electric current being turned on, the process of the electrodeposition of the metal from the anode or anodes, through the electrolyte to the said rolling bodies 35, immediately takes place, the electric circuit being completed through the moving chains or other flexible supporting means, and through the metal conductor-plates, bars or rods of the rolls or drums, and the circuit wires with the main source of electricity.

From the foregoing description of our present invention, it will be clearly evident, that we have devised a simple and cheaply constructed electroplating apparatus, of the character and for the purposes herein-above stated, and which is most efficient in the electrodeposition of metal upon the surface-portions of a great number of pipes, rods, or similar bodies, arranged in bulk in the plating vat or tank, instead of each pipe or rod being independently connected in circuit, when placed in the tank, as is now ordinarily the custom.

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 do 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 drum or cylinder extending across said tank, longitudinally extending contact-bars upon said drum or cylinder, a means of electrical connection connected with said contact-bars, and a series of endless and flexible suspension devices movably arranged over said contact-bars, said suspension devices forming receiving loops extending into the electrolyte and adapted to receive and retain cylindrical bodies in bulk in the electrolyte.

2. An electroplating apparatus comprising a vat or tank adapted to contain an electroplating solution, a revoluble drum or cylinder extending across said tank, longitudinally extending contact-bars upon said drum or cylinder, a means of electrical connection connected with said contact-bars, and a series of disks arranged over the contact-bars upon said drum or cylinder, said disks being arranged in pairs, and an endless and flexible suspension device movably arranged between each pair of disks, said suspension devices forming receiving loops extending into the electrolyte and adapted to receive and retain cylindrical bodies in bulk in the electrolyte.

3. In an electroplating apparatus, the combination with a vat or tank adapted to contain an electroplating solution, bearings

connected with said tank, said bearings being open upon their upper surfaces, the body of said drum or cylinder being a non-conductor of electricity, a metal plate at each end of said drum or cylinder, a journal extending from each plate and mounted in said bearings, metal contact-bars upon said drum or cylinder and connected at their ends with said plates, and means arranged over said drum and said contact-bars for retaining cylindrical bodies in bulk within said solution and producing independent revoluble movements of said cylindrical bodies, substantially as and for the purposes set forth.

4. In an electroplating apparatus, the combination with a vat or tank adapted to contain an electroplating solution, bearings connected with said tank, said bearings being open upon their upper surfaces, the body of said drum or cylinder being a non-conductor of electricity, a metal plate at each end of said drum or cylinder, a journal extending from each plate and mounted in said bearings, metal contact-bars upon said drum or cylinder and connected at their ends with said plates, and means arranged over said drum and said contact-bars for retaining cylindrical bodies in bulk within said solution and producing independent revoluble movements of said cylindrical bodies, consisting of endless flexible suspension devices movably arranged over said drum, said devices being formed with loops in which said cylindrical bodies are supported, substantially as and for the purposes set forth.

5. In an electroplating apparatus, the combination with a vat or tank adapted to contain an electroplating solution, bearings connected with said tank, said bearings being open upon their upper surfaces, the body of said drum or cylinder being a non-conductor of electricity, a metal plate at each end of said drum or cylinder, a journal extending from each plate and mounted in said bearings, metal-contact-bars upon said drum or cylinder and connected at their ends with said plates, and means arranged over said drum and said contact-bars for retaining cylindrical bodies in bulk within said solution and producing independent revoluble movements of said cylindrical bodies, all combined with another support from which metal anodes are adapted to be suspended, and electric circuits connected with said drum and said anode-support, substantially as and for the purposes set forth.

6. In an electroplating apparatus, the combination with a vat or tank adapted to contain an electroplating solution, bearings connected with said tank, said bearings being open upon their upper surfaces, the body of said drum or cylinder being a non-conductor of electricity, a metal plate at each end of said drum or cylinder, a journal extending from each plate and mounted in said bearings, metal contact-bars upon said drum or cylinder and connected at their ends with said plates, and means arranged over said drum and said contact-bars for retaining cylindrical bodies in bulk within said solution and producing independent revoluble movements of said cylindrical bodies, consisting of endless flexible suspension devices movably arranged over said drum, said devices being formed with loops in which said cylindrical bodies are supported, all combined with another support from which metal anodes are adapted to be suspended, and electric circuits connected with said drum and said anode-support, 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 27th day of July, 1907.

ABRAHAM VAN WINKLE.
JOHN T. DANIELS.

Witnesses:
G. L. FELDMAN,
B. F. PIERSON.