

954,833.

G. L. WALLACE.
WIRE PLATING MACHINE.
APPLICATION FILED AUG. 30, 1909.

Patented Apr. 12, 1910.

4 SHEETS—SHEET 1.

Fig. 1.

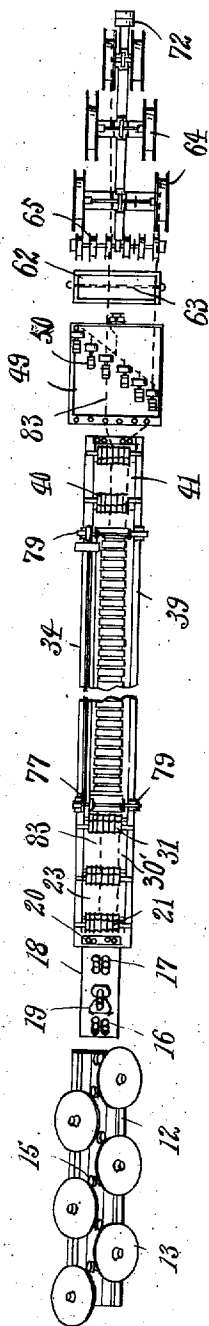
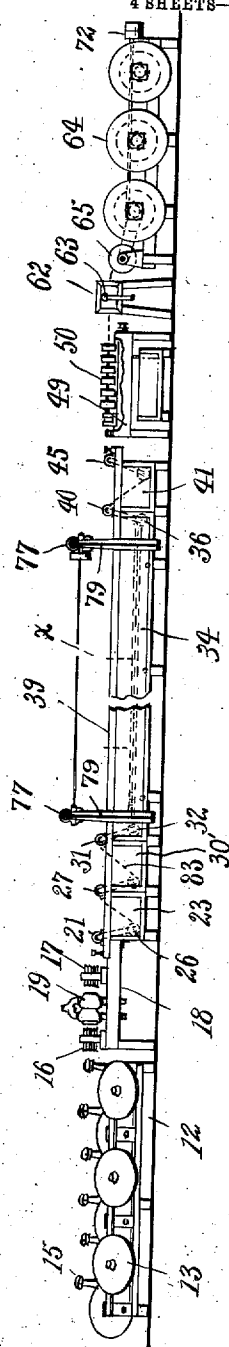


Fig. 2.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 3.

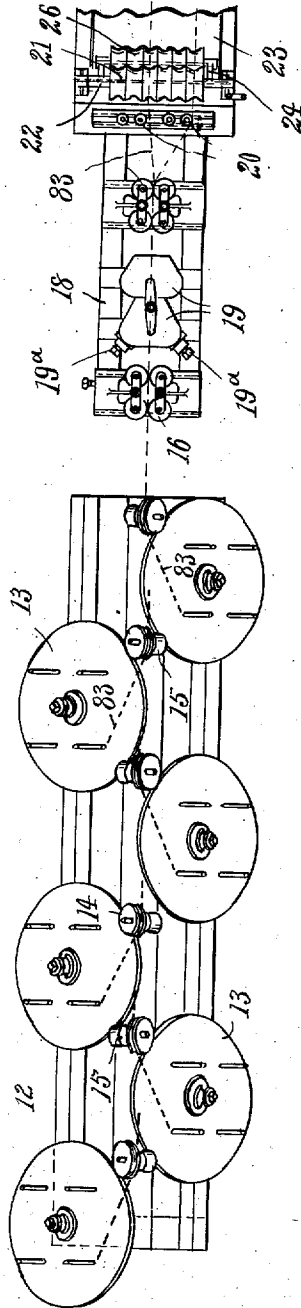
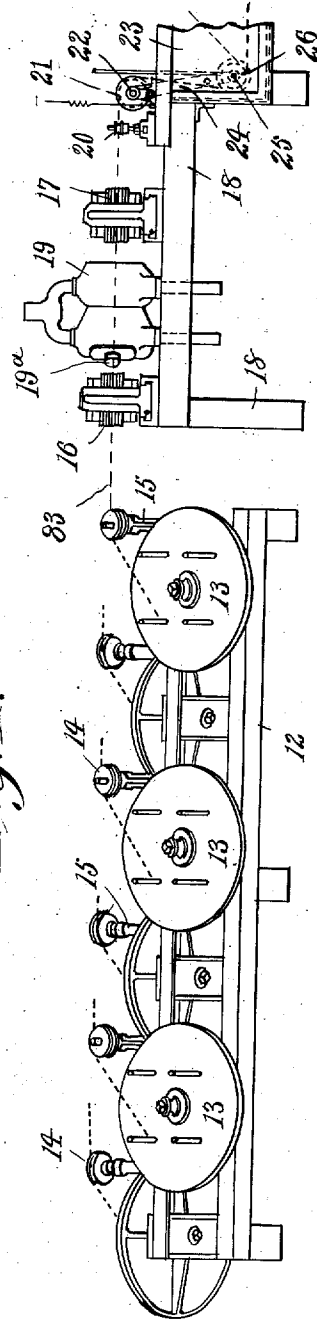


Fig. 4.



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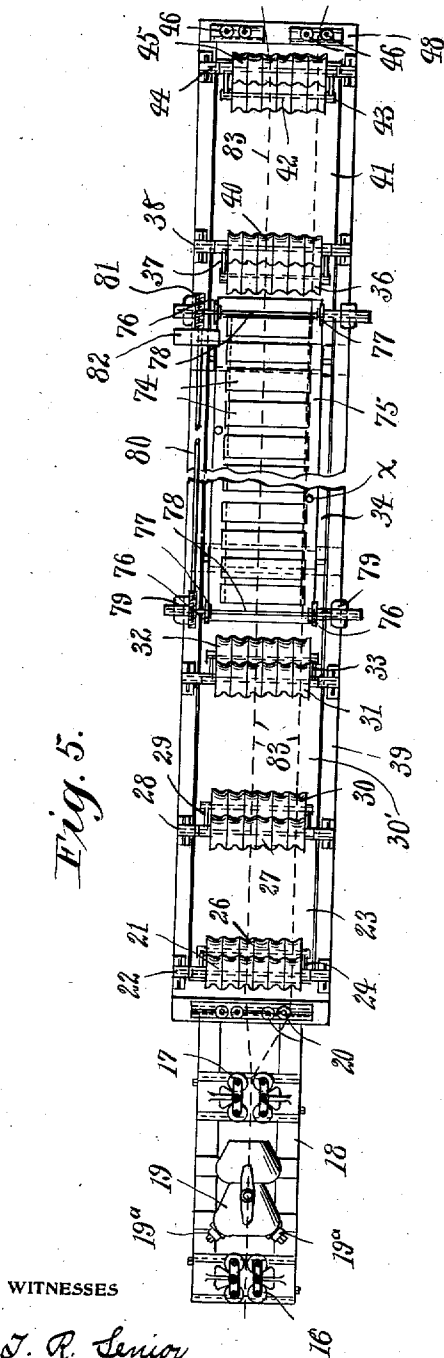
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4 SHEETS—SHEET 3.

Fig. 5.

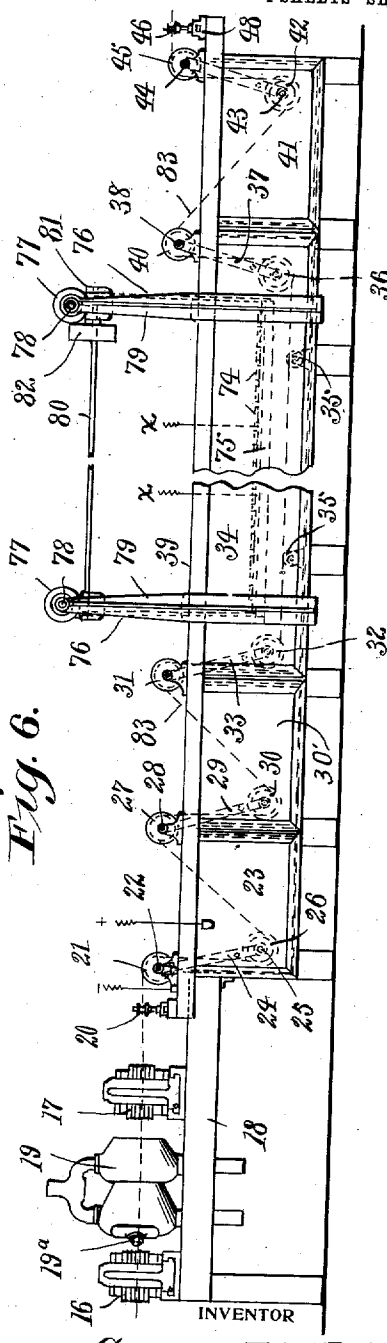


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Fig. 6.



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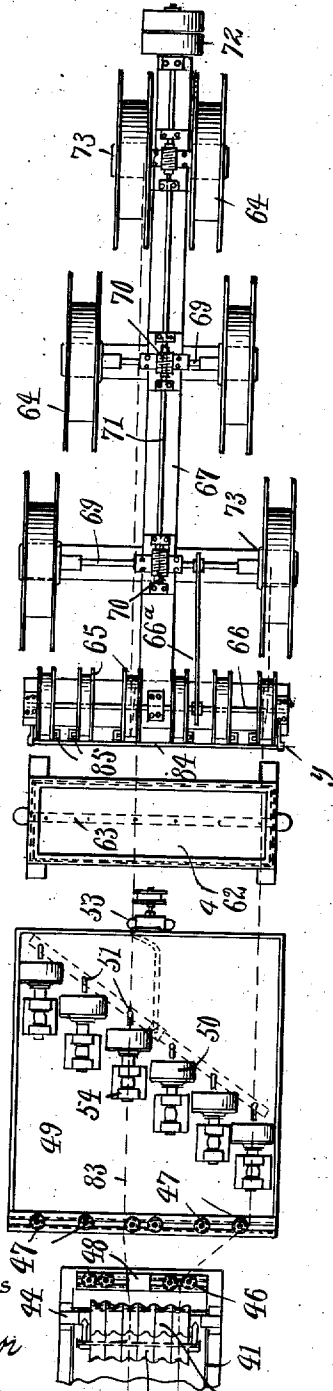
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4 SHEETS—SHEET 4.

Fig. 7.

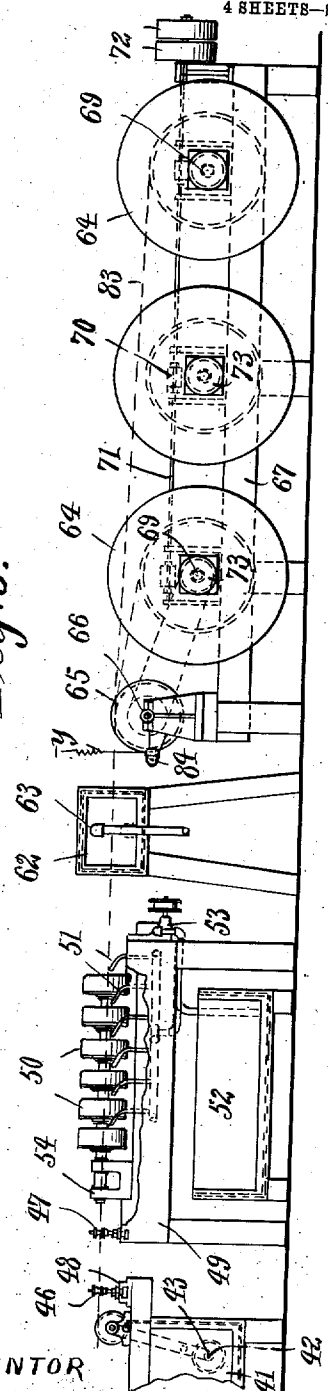


WITNESSES

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Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE L. WALLACE, OF BRIDGEPORT, CONNECTICUT.

WIRE-PLATING MACHINE.

954,833.

Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed August 30, 1909. Serial No. 515,166.

To all whom it may concern:

Be it known that I, GEORGE L. WALLACE, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Wire-Plating Machines, of which the following is a specification.

This invention relates to new and useful improvements in machines for electroplating continuous strips of metal, as for instance continuous lengths of flat strips, chains, round and barbed wire.

It is the purpose of the design to provide an improved form of machine comprising a series of tanks, cleaners and polishers, through which a series of continuous lengths of material of the above class may be automatically passed for plating. The metal is first fed through a sand blast and then an electrocleaner tank and next a cleaning solution for rinsing preparatory to plating. It is thus drawn through the plating solution from whence it is again run through another cleansing solution and finally in a finisher for polishing, whereupon it is automatically wound upon rolls or forms as desired.

A further object of the invention is to provide a machine by means of which heretofore difficult pieces of work may be completely plated in continuous lengths as for instance chain, and especially barb wire, and in a way that the ends or edges as well as all other parts will be completely covered; to design the machine so that a number of such strands can be plated at the same time thus greatly increasing the capacity of the machine.

Other objects of the invention will hereinafter appear; and to these ends the invention consists of a device for carrying out the above objects, embodying the features of construction, combination of elements, and arrangements of parts having the general mode of operation, substantially as hereinafter fully described and claimed in the specification and as shown in the accompanying drawings in which,

Figure 1, shows a plan view on a very much reduced scale of my improved plating machine, the plating tank being broken away. Fig. 2, is a side view of the construction shown in Fig. 1. Figs. 3 to 8 inclusive show enlarged views of sections of the ma-

chine shown in Figs. 1 and 2, as for instance Figs. 3 and 4 shown upon an enlarged scale, a plan and side view respectively of the introductory end of the machine, as seen at the left of Figs. 1 and 2. Figs. 5 and 6 show upon a similar enlarged scale, a plan and side view respectively of the intermediate or central part of the machine shown in Figs. 1 and 2. Figs. 7 and 8 show a similar plan and side view of the finishing end of the machine as seen at the right of Figs. 1 and 2.

So far as I know barbed wire has heretofore been galvanized prior to its being twisted, woven or otherwise formed, with the result that the cutting of the wires in the formation and attachment of the barbs, resulted in leaving a raw or unplated end to such barbs that invariably rusted in advance of the other parts. It is also true that the plate will frequently flake or be worn through in places as a result of the necessary handling to form the same into barbed wire by automatic machinery. It is also a fact that where raw ends or bare iron places in galvanized wire of this kind remain unplated, galvanic action takes place when the wire becomes moist which sets up a decomposition between the two metals, causing the wire to deteriorate much more rapidly than it otherwise would if the ends were also plated like the main body of the wire.

In the drawings of this application I have shown my machine as adapted to simultaneously handle six strips of metal, though it will be obvious that a greater or lesser number can be provided for in a machine of the same type by increasing or decreasing the number and sizes of the respective sets of operative parts.

Referring in detail to the characters of reference marked upon the drawings 12 represents a bench upon which a series of reels 13 are rotatably mounted for the purpose of supporting rolls of material to be plated as for instance wire. These reels are preferably arranged in two rows one upon each side portion of the bench and are disposed outwardly at a suitable angle so that when the wire is mounted thereon it will readily run off upward and over the guide rolls 14 rotatably mounted upon the brackets 15 secured to the said bench.

The rolls 14 referred to are so arranged with relation to each other that the several

strands of wire can be drawn forward in close proximity to each other and guided through the two sets of compensating yieldable guide rolls 16 and 17 mounted upon an adjoining bench 18 as shown in Figs. 3 and 4. These rolls are made yieldable to compensate for any unevenness in the wire, as for instance the barbs or knots contained therein. Intermediate of these rolls 16 and 17 I arrange upon the same bench a sand blast 19 through which the several strands of wire are drawn for the purpose of cleaning the same of such foreign matter as may be present. This sand blast is best shown in Figs. 3 and 4 and in part comprises two side intake nozzles 19^a adapted to direct the blast against the work at an acute angle in a manner to thoroughly free the same of all scale and dirt as it is drawn through.

The wires pass from the sand blast through the second set of rolls 17 and the several strands are then separated and drawn around guide rolls 20, see Figs. 3, 4 and 5 to guide the same over the respective metal rolls 21 mounted upon the cross shaft 22 journaled in bearings upon the top of the electric cleaner tank 23. Upon this shaft 22 is adjustably secured a pair of arms 24 which jointly carry a second transverse shaft 25 upon which is also mounted a series of insulating rolls 26 and under which rolls the strips of metal are guided to deflect and draw the same down through the cleaner solution contained within the said cleaner tank 23. From this tank the strips are drawn up over a second series of top rolls 27 journaled upon a cross shaft 28 mounted in a second pair of brackets secured to the two side rails connecting the several tanks. Upon this shaft 28 is also adjustably secured a pair of hangers 29 similar to the hangers 24 and for a similar purpose of supporting a shaft and series of insulated rolls 30 within a second tank 30' designed to carry water. The strips of metal are thus guided over the second series of top rolls and down into and submerged in the second tank where they are guided around the submerged rolls 30. A third set of insulated rolls 31 are mounted upon the side rails 39 of the tanks and serve to guide the strips up out of the water, and by the assistance of a third series of submerged insulated rolls 32 mounted upon a shaft carried by adjustable hangers 33 swung from the top roll shaft, are drawn underneath the said series of rolls 32 whereupon they are carried along horizontally upon bottom rolls 35 through the lower portion of the plating solution and toward the rear end of the tank where they are passed under and up around a further series of submerged insulating guide rolls 36 mounted upon a shaft attached to adjustable hangers 37 and secured to a shaft 38 secured in brackets attached to the side rails

39 of the tanks. This shaft 38 carries a further series of insulating rolls 40 over which the metal strips are drawn from the plating solution and to guide them back into a rinsing tank 41 arranged adjacent thereto. This tank like the preceding ones also contains a series of submerged insulating guide rolls 42 mounted upon a cross shaft 43 carried by hangers swung from a cross shaft 44 mounted in brackets secured to the side rails. This shaft also carries a further series of insulating rolls 45 up and over which the several strips of metal are guided after being drawn out from the rinsing solution. Two series of vertically disposed small guide rolls 46 and 47 are arranged beyond the said rinsing tank one series being arranged upon a cross beam 48 of the said tank and the second series upon a bench 49 adjacent thereto. These two series of rolls are for the purpose of better separating and spacing the respective strips of metal as they are brought from the several baths and to directly guide them through the polishers 50 mounted upon said bench 49, and adapted to be used upon plain round wire only.

These polishers are alike in construction, one employed for each strand of metal, and are adapted to be independently driven. They are provided with pipe connections whereby a continuous stream of lubricating fluid is deflected against the work as it passes through the machine. The lubricating fluid is supplied from a tank 52 located beneath the bench and is drawn up and forced into the said polishers by means of a pump 53.

The foregoing construction and arrangement of polishers, bench, etc., are not directly connected with the rest of the machine and can therefore readily be dispensed with if desired as in the plating of other forms of metal, than round wire.

62 represents a drier through which the strips of metal are passed for drying, and it comprises a suitable receptacle through the sides of which pipes 63 are arranged, having perforations in line with the path of travel of the strips of metal passing therethrough to direct a blast of heated air against the strip to dry the same.

A series of metal drawing rolls 65 are mounted on a cross shaft 66 journaled in bearings secured to the reel bench 67 and driven through a sprocket chain connection 68 from one of the cross shafts 69. These rolls are adapted to have the plated strips wound thereabout to afford a suitable grip upon the wire for drawing the same through the machine and better to guide the strips to their respective reels 64. These several reels are arranged in pairs, each pair being mounted upon a cross shaft 69 carrying a worm gear that meshes with and is driven by a worm 70 upon a longitudinal shaft 71

operated through pulleys 72 at the rear end. These reels are frictionally mounted upon slip hubs 73 of the several shafts 69 and are so arranged as to permit of the said reels slipping slightly thereon should they attempt to draw faster than the drawing rolls 65, owing to the increase in diameter of rolls due to the winding of the wire or metal strips thereon.

10 The plating tank 34 is provided with a series of anodes 74 which are preferably arranged horizontally and crosswise of the tank T above the work being mounted upon a suitable frame 75 that is designed to be
15 submerged within the plating solution and supported by chains 76 hung from pulleys 77 mounted upon cross shafts 78 and journaled in bearings in the upper ends of stands 79 attached to the sides of the said plating
20 tank. A shaft 80 provided with worm and gear connections 81 connects this driving shaft with cross shafts 78 that are adapted to be operated simultaneously through the medium of power applied to the belt pulley
25 82 upon the said shaft 80. By this medium the anode rack 75 together with the anodes supported thereon can be raised and lowered at will for hoisting the same from the plating tank, as for the purpose of renewing or
30 changing the anodes as occasion may require. Wires x connected with the anode frame represent the positive connections from the dynamo, not shown, and whereby the solution is made active, while the other
35 connections may be made through the respective wires or strips of metal to be plated, as indicated in part by dotted lines 83. The field wire y in this instance would connect with a cross rod 84 secured in brackets
40 mounted upon the side bearings of shaft 66 and carrying brushes 85 to make contact with each of the drawing rolls that engage the wire strips carried thereon, and which latter are in part submerged within the plating
45 solution and thus adapted to receive a deposit of metal.

The electrocleaning tank 23 is also provided with positive and negative connections as shown in Figs. 4 and 6, whereby a current
50 can also be passed through the solution therein for the purpose of preliminarily treating the metal as it passes through to be plated.

This system of plating can be used very
55 advantageously for various sizes of wire, metal strips and sheet metal chains, and a beautiful coating of metal be deposited without danger of the links of the chain being fastened or stuck together as would be the case when hot plating metal is employed, as
60 in the hot plating process.

This machine could be used to advantage on articles other than those heretofore
65 enumerated, being especially well adapted for zinc, copper, brass and nickel plating.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In a machine for plating continuous lengths of wire, the combination with an electroplating tank, a series of continuously and uniformly operated drawing rolls, a series of continuously and uniformly operated shafts, a series of winding reels mounted upon the hubs of the shafts and adapted to slip and operate to conform to the movement of the wire from the drawing rolls. 70 75

2. In a machine for plating continuous lengths of wire, the combination with an electroplating tank, means for directing a series of wires to be plated through the said tank, a series of continuously operated drawings rolls to uniformly draw the several wires through the tank, a series of continuously operated winding reels to take the wires from the drawing rolls, cross shafts upon which the reels are mounted, and a longitudinal shaft with worm and gear connections for driving the cross shafts. 80 85

3. In a machine for plating continuous lengths of wire, the combination with an electroplating tank and means for guiding and drawing a continuous length of wire through said tank, a disconnected polishing device through which the said wires are drawn when drawn from the tank for the purpose of burnishing and finishing the same preparatory to being wound upon a reel. 90 95

4. In a machine for plating continuous lengths of wire, the combination with a series of reels for supporting wires to be plated, a sand blast through which the wires are passed, means for directing the series of wires one above the other through the sand blast, rolls for spreading the wires from said vertical to a horizontal alinement, and a tank into which the wires are guided preparatory to being plated. 100 105

5. In a wire plating apparatus the combination with a tank, of a transverse shaft mounted upon the top thereof, a series of insulating rolls mounted upon the shaft, hangers adjustably hung from the said shaft, a shaft mounted in the lower end of the hangers, a series of insulating rolls operatively mounted upon the lower shaft and adapted to be submerged so as to guide the wire into and through the tank. 110 115

6. In a machine for plating continuous lengths of wire, the combination of means for supporting a series of reels, a cleaner tank through which the wires from the reels are drawn, an electroplating tank through which the series of wires are also drawn, a frame within the plating tank located above the wires, anodes mounted upon the frame, means for raising and lowering the frame and anodes without disturbing the wires in the tank, a rinsing tank and drier, and a 120 125 130

series of rolls with means for operating the same to draw a series of continuous lengths of wire through the said parts for the purpose of plating said wires.

- 5 7. In a machine for plating continuous lengths of wire, the combination with an electroplating tank, means for directing a series of wires to be plated through the lower portion of the tank, a frame within
10 the tank above the said wires for supporting anodes, standards secured to the sides of the tank, winding shafts mounted in the upper portion of the standards, cables connected intermediate of the frame and the cross
15 shafts for raising and lowering the said frame, means for operating the said shafts to effect the said winding, and means for

drawing the said wires through the tanks for the purpose of plating the same.

8. In a machine for plating continuous 20 lengths of wire, the combination with an electroplating tank, a series of continuously and uniformly operated drawing rolls, and a series of frictionally driven winding reels adapted to receive the wire from the draw- 25 ing rolls at a uniform rate of speed.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 27th day of August, A. D. 1909.

GEORGE L. WALLACE.

Witnesses:

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