No. 677,055. Patented June 25, 1901.

C. W. BENNETT.

CATCHER FOR PLATING MACHINES.

(Application filed Oct. 15, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

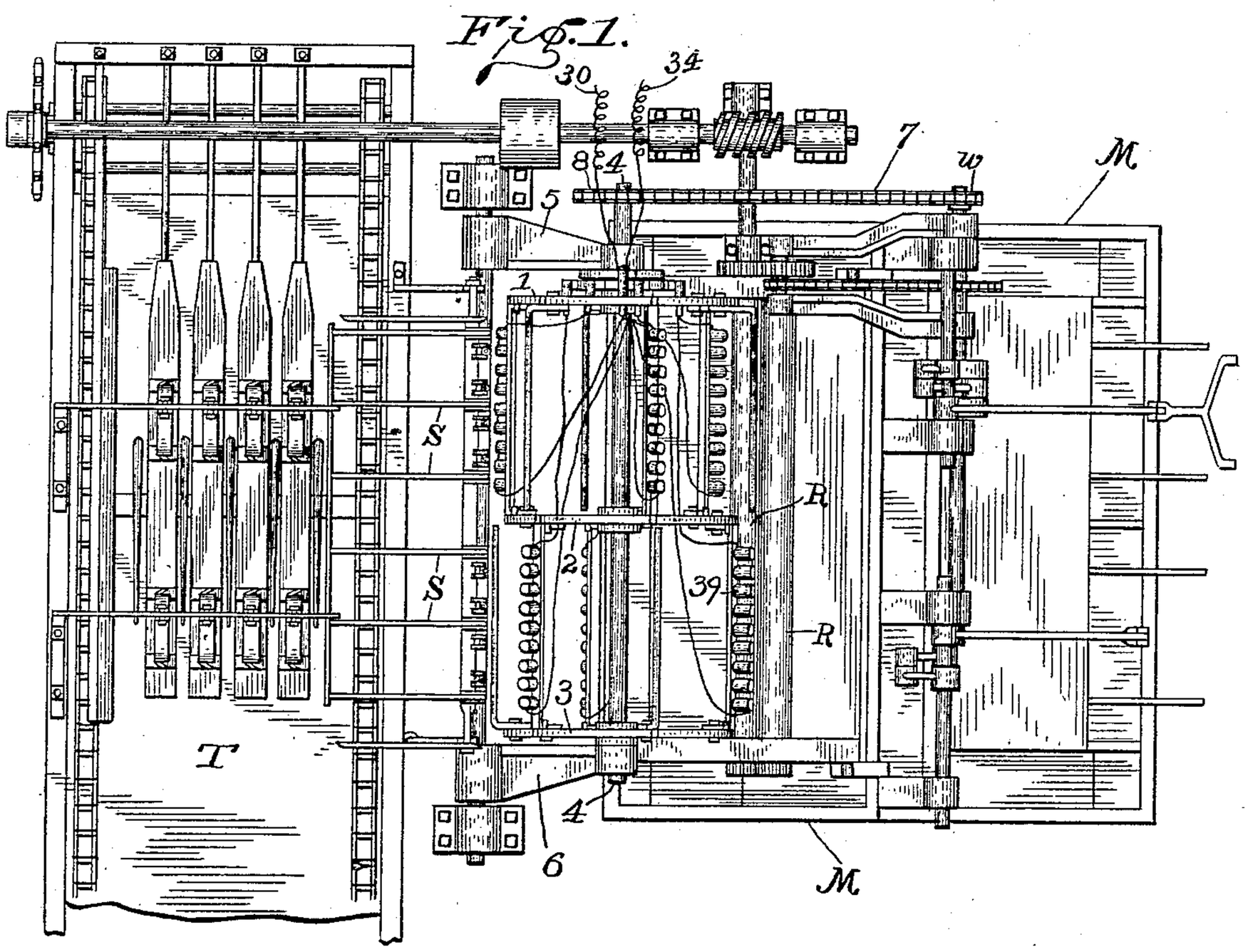

Fig. 2.

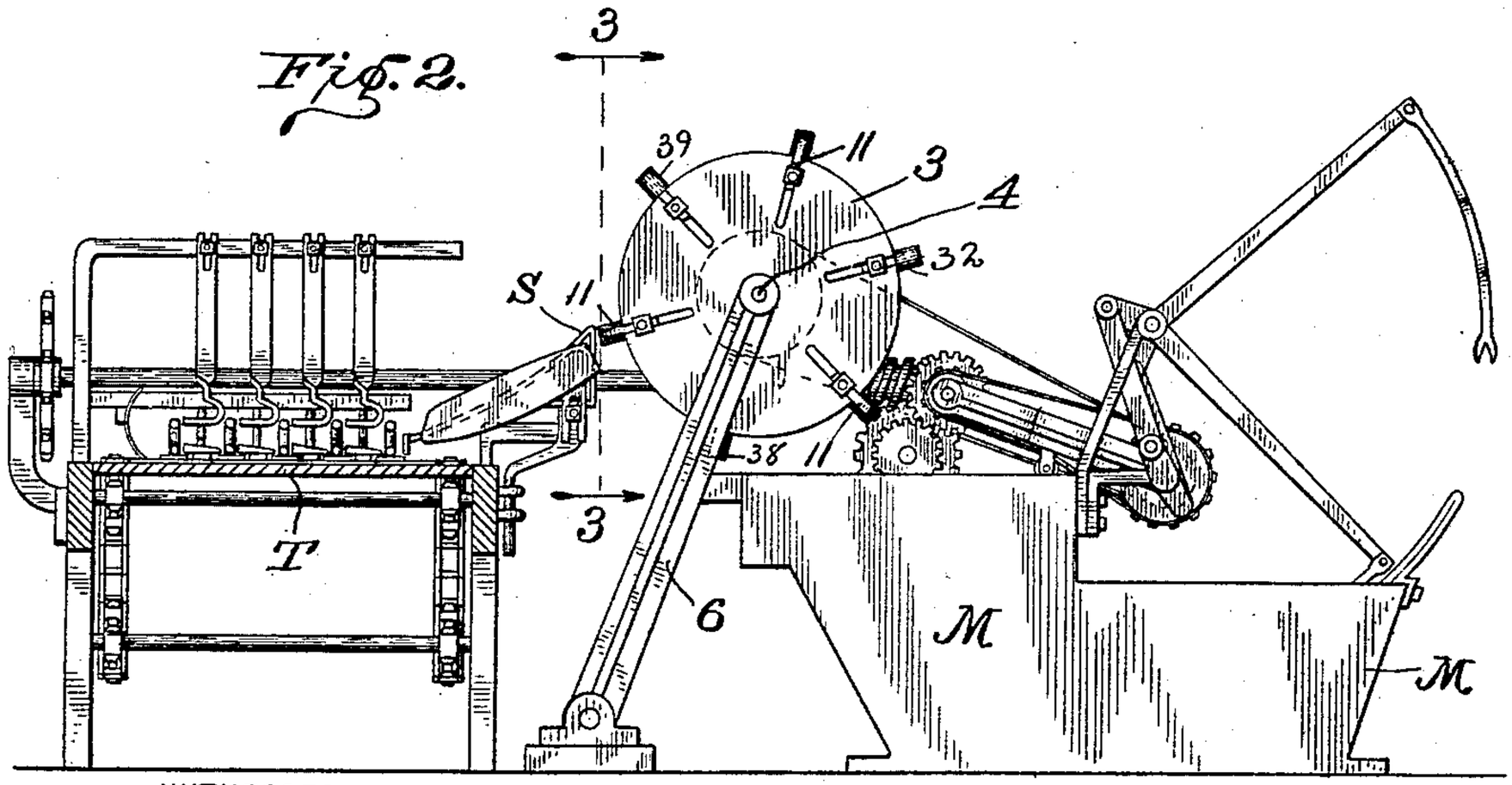

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Fig. 3.

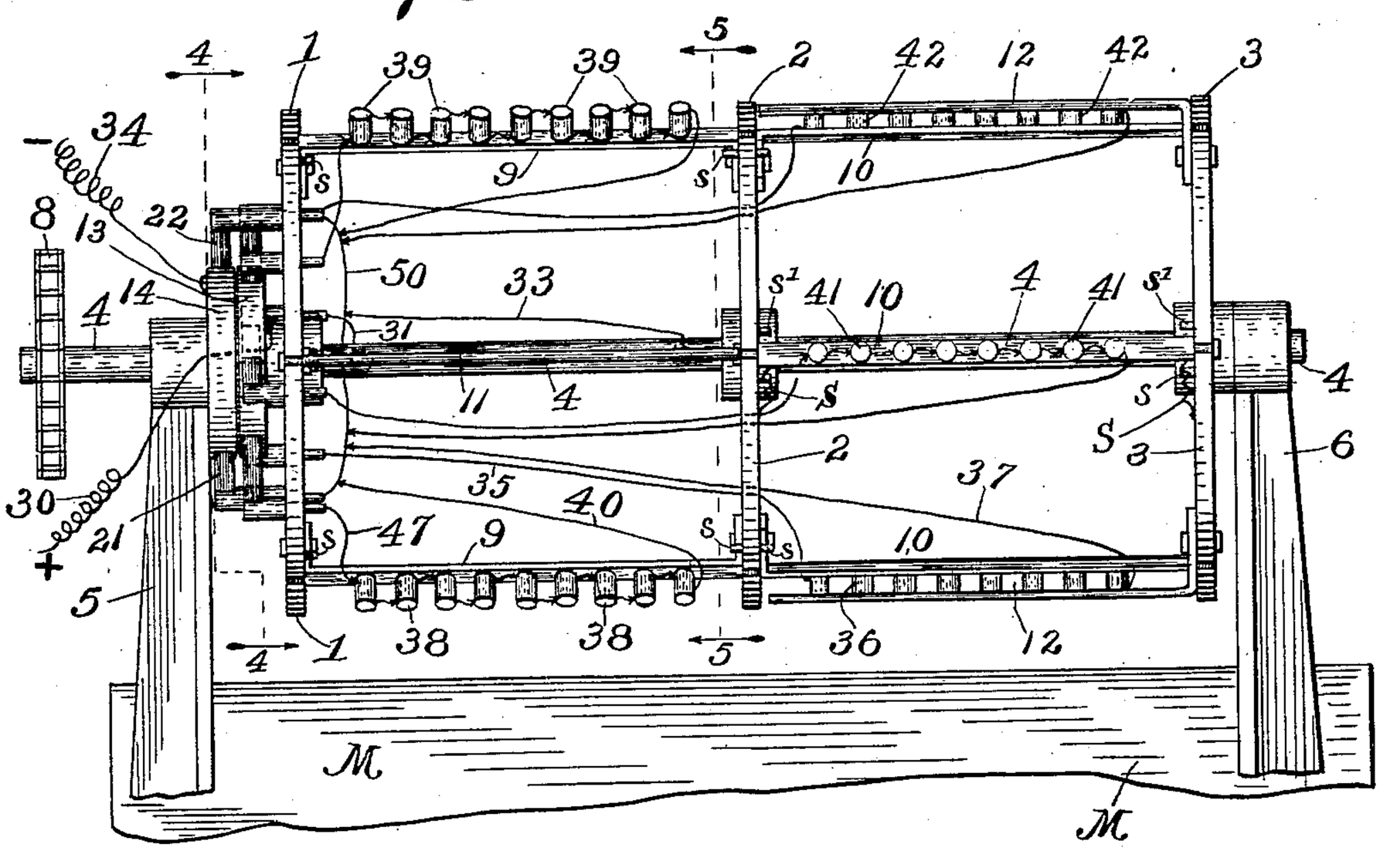

Fig. 4.

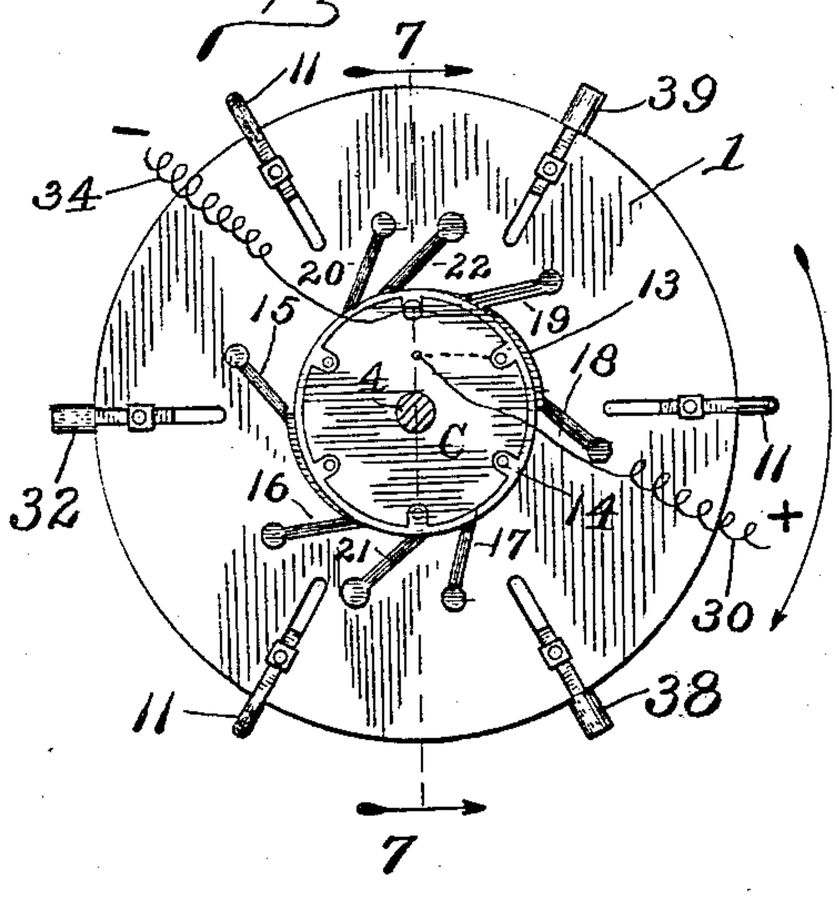

Fig. 5.

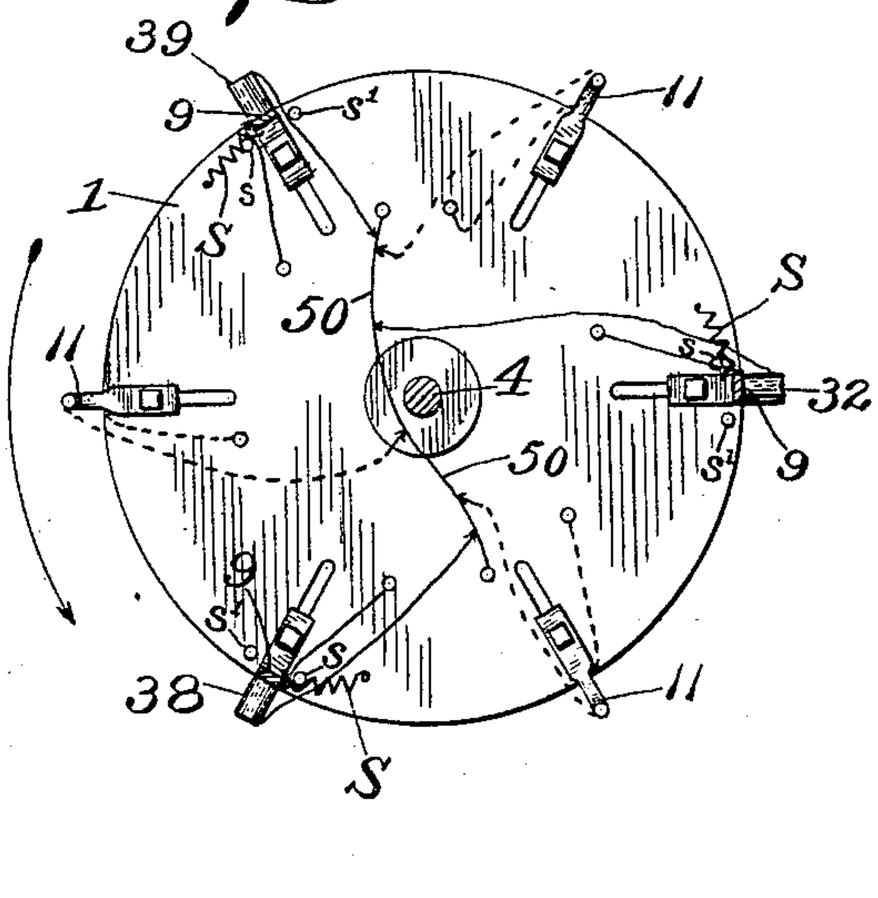

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Fig. 7

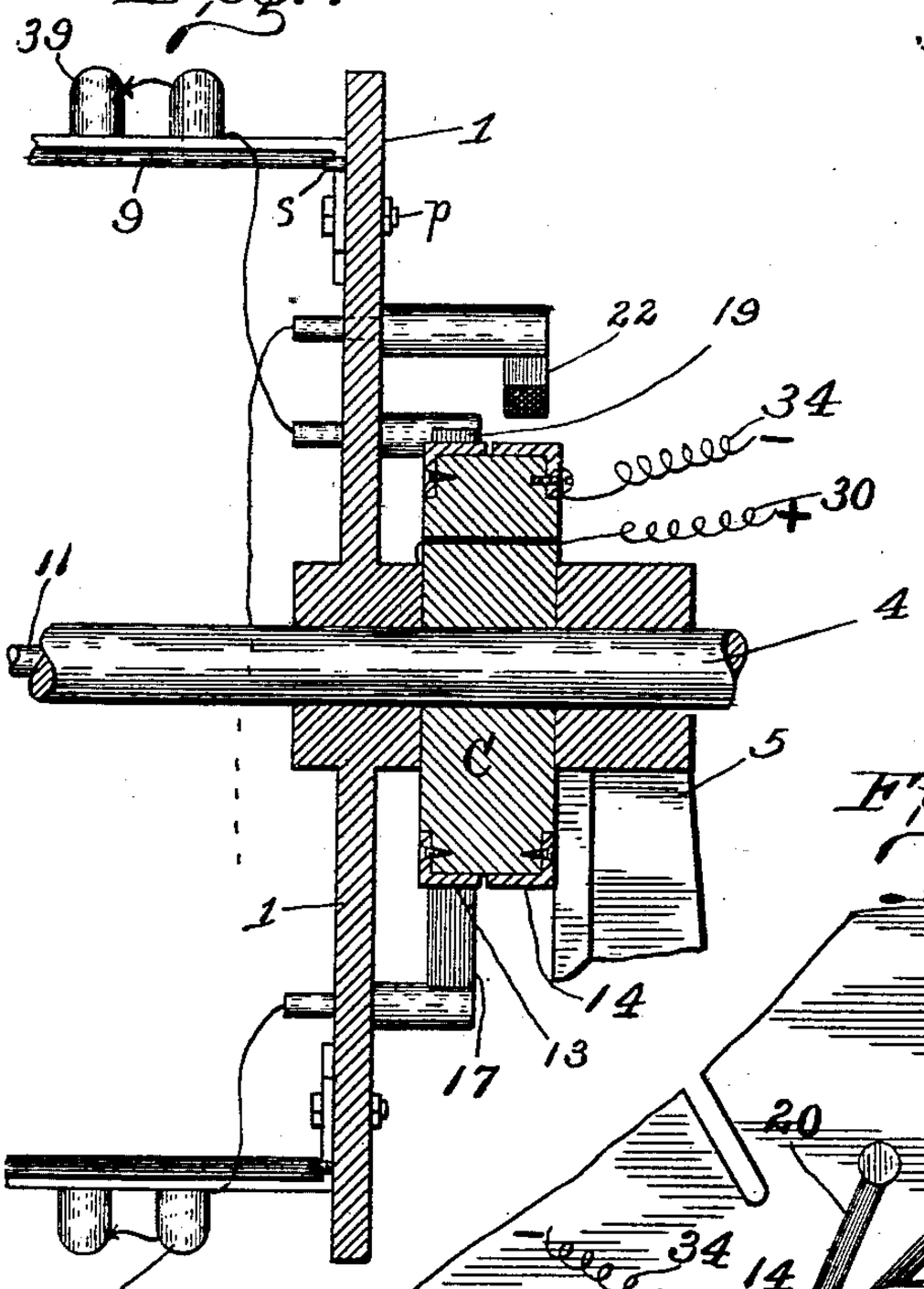


Fig. 8.

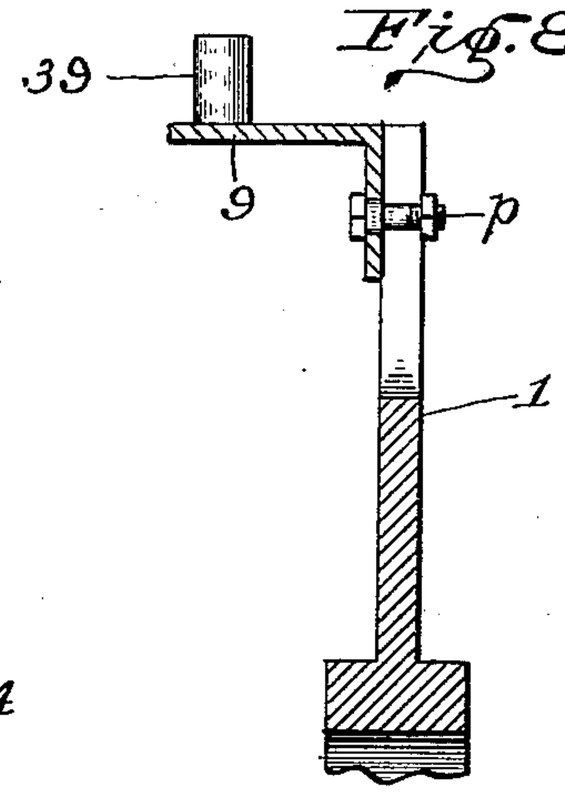
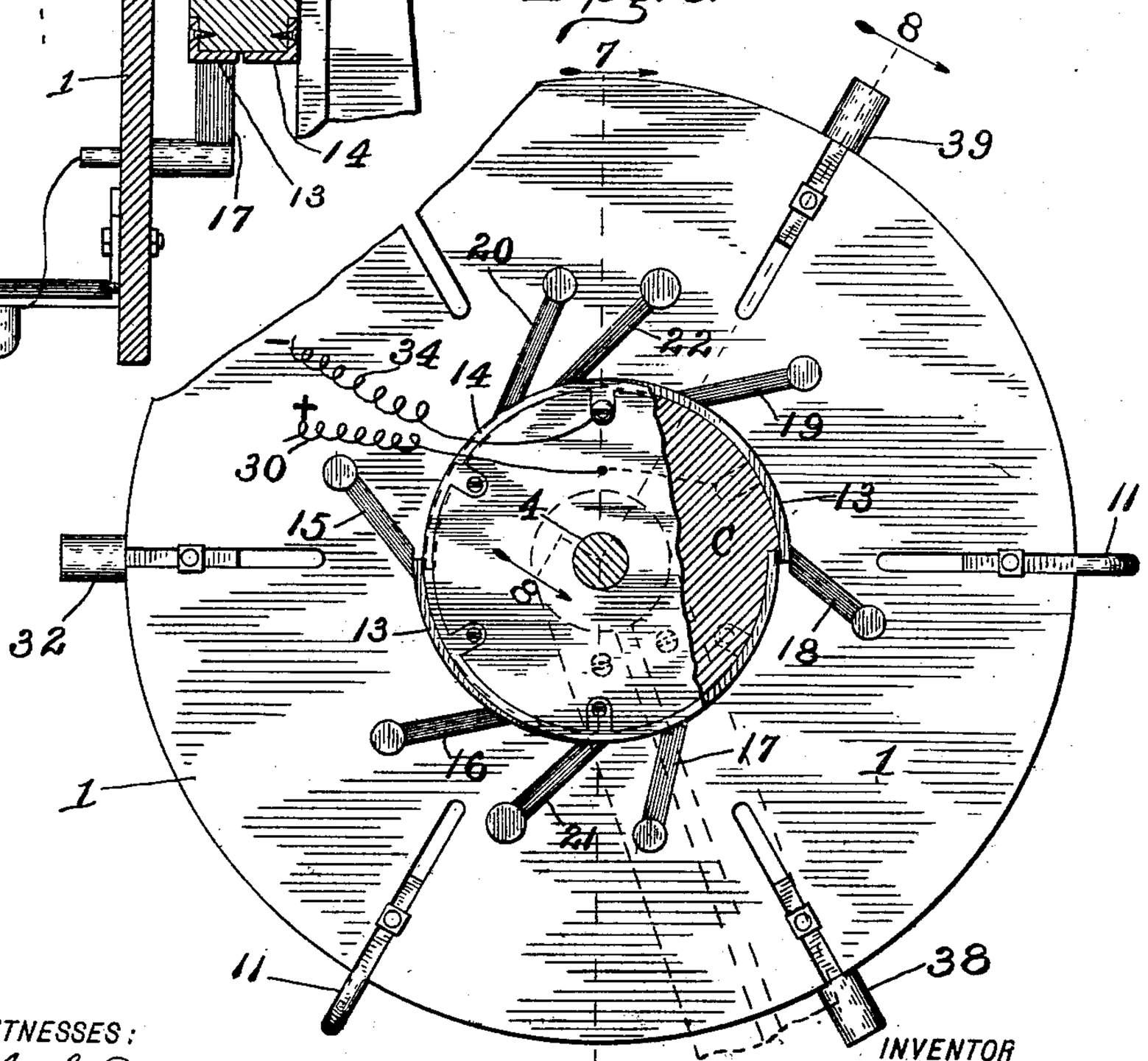


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES W. BENNETT, OF ELWOOD, INDIANA, ASSIGNOR TO THE AMERICAN TIN PLATE COMPANY, OF SAME PLACE AND NEW YORK, N. Y.

CATCHER FOR PLATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 677,055, dated June 25, 1901.

Application filed October 15, 1900. Serial No. 33,163. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BENNETT, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Catchers for Plating-Machines, of which the following is a specification.

The object of my said invention is to provide an efficient means to catch plates, such as tin plates, as they emerge from the plating or tinning machine, carry them over to a carrying-off table, and there automatically release and discharge them onto such table; and in my preferred form it consists in a revolving structure carrying suitable magnets which are adapted to be energized as they respectively arrive at the point where the plates emerge from the rolls, and are thus enabled to attract and hold said plates by magnetic force and to be deënergized when the opposite side is reached, and thus release and discharge said plates. Other automatically-operating catching devices might, however, be substituted for the magnets without departing from my invention.

A machine embodying my said invention will be first fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a top or plan view of a plating or tinning machine and a carrying-off table therefor, with one of my automatic catchers positioned for use in connection therewith; Fig. 2, an end elevation of such a machine; Fig. 3, a side elevation of my automatic catcher and fragments of immediately-adjacent parts, on an enlarged scale, as seen from the dotted line 3 3 in Fig. 2; Fig. 4, an end elevation of the catcher separately, as seen when looking in the direction indicated by the arrows from the dotted line 4 4 in Fig. 3; Fig. 5, a transverse sectional view of the same as seen when looking in the direction indicated by the arrows from the dotted line 5 5 in Fig. 3. Fig. 6 is an end elevation, on a still further enlarged scale, similar in many respects to Fig. 4, but having some portions broken away to show the construction and arrangement more clearly; Fig. 7, a detail sectional view, on a similar scale, as seen when looking in the direction indicated by the arrows from the dotted line 7 7 in Figs. 4 and 6; and Fig. 8, a detail sectional view as seen when looking in the direction indicated by the arrows from the dotted line 8 8 in Fig. 6.

Neither the plating-machine proper nor the carrying-off table constitutes any part of my present invention, these being separate and distinct inventions which form the subject-matter of my other patents, Nos. 677,054 and 677,056, of same date with this. As will be readily understood, therefore, the machine and the table may be of any suitable or desired form, and so will not be further described herein except incidentally in describing my invention.

The operation, briefly stated, is that the sheets to be plated or tinned are passed through the tinning-machine M in the usual way, and as they emerge from the rolls R thereof are seized by the automatic catcher forming the subject-matter of my present invention, carried over, and delivered over the slides S to the carrying-off table T.

As is common in the manufacture of tin-plate, the tinning-machine is of a duplex character, (or, in other words, is double the width necessary to receive a single sheet of tin,) and tin sheets are therefore put through on both sides. For this reason my automatic catcher is likewise of a duplicate construction and has separate sets of catchers or magnets for catching the sheets coming from the two sides of the machine.

In detail the structure shown consists of three disks or spiders 1, 2, and 3, rigidly secured to a shaft 4, which is mounted in suitable bearings on standards or frame parts 5 and 6 and is driven by a chain belt 7, running to a sprocket-wheel 8 from a corresponding sprocket-wheel *w* on the shaft of the plating-machine. At suitable points around the periphery of the disk are secured bars carrying magnets. The bars 9 of one series are secured between the disks 1 and 2 and the bars 10 of the other series are secured between the disks 2 and 3. Arranged intermediately of the magnet-carrying bars 9 are plain bars

11, and between the magnet-carrying bars 10 are plain bars 12. The bars 11 and 12, while adapted to be adjusted radially, are when in position and ready for operation bolted firmly to the several spiders or disks 1 and 3 and are rigid therewith. The bars 9 and 10, carrying the magnets, are also adjustable radially, are pivotally mounted on the spiders or disks, as by pivot-bolts *p*, (see Fig. 8,) and are capable of swinging to one side or the other in case of necessity, their movement being limited by stops *s* and *s'*, as best shown in Fig. 5. This is so that the magnets may adjust themselves to take a fair hold of the sheets of tin as such sheets come in contact therewith, said magnets being thus capable of shifting a little one way or the other in order that they may better adapt themselves to their work.

The radial adjustment of the various bars enables me to secure the proper relation between the peripheral speed of the rolls of the plating-machine and the peripheral speed of what may be termed the "operative surface" of my automatic catcher. These speeds should be practically the same; but it is obvious that the arrangement must be such that the plates will be instantly removed from contact with the rolls of the plating-machine when they emerge from such rolls, and for this reason in practice it is better to arrange the parts so that the operative peripheral speed of the catcher will be very slightly in excess of the peripheral speed of said rolls, so that the sheets will be put under something of a pulling strain just before they finally emerge. It is also obvious that there must be no perceptible movement of the magnet ends or other catching devices over the surfaces of the sheets, as this would scratch and mar them. As above stated, the magnet-carrying bars are pivotally mounted and are arranged between stops *s* and *s'*. Tensile springs S are also provided, as shown in Fig. 5, which normally hold the magnet-carrying bars toward or against the stops *s*. As will be readily understood, if the plates become attached thereto just before their lower edges emerge from the rolls of the plating-machine these springs may give way somewhat under the resultant pull and instantly after the lower edges of the plates have escaped from the rolls will operate to draw the plates out of contact therewith, with the advantages stated.

On the outside of the spider or disk 1 and secured rigidly to the standard or frame part 5 is a suitable commutator. For purposes of simplicity and cheapness I construct this commutator with a non-conducting center C, preferably of wood, upon which I secure two commutator-rings 13 and 14. The inner one of these rings 13, as shown in Figs. 4 and 6, is divided into two parts, insulated from each other, one part of which is "dead," while the other part is connected to the incoming line-wire. The other ring is continuous and is connected to the outgoing line-wire. Upon the spider or disk 1 are the "positive" commutator-brushes 15, 16, 17, 18, 19, and 20, through which in turn as the catcher revolves an electric current is transmitted to the several magnet-circuits. Said spider also carries two "negative" commutator-brushes 21 and 22, by which the current is carried away. The positive commutator-brushes contact with the divided commutator-ring 13, and the negative commutator-brushes contact with the continuous commutator-ring 14. It will thus be seen that the commutator is so constructed that the magnet-circuits above a central horizontal line taken therethrough are "live" or energized, while those below the line are dead or deënergized. As the commutator-disks are stationary and the structure carrying the sets of magnets and the brushes is rotary, this relative relation is easily maintained. By arranging the two parts of ring 13 eccentric or overlapping, as shown, a quick, sharp break in the circuit is secured and also a quick contact with the live section and closing of the circuit, as the brushes pass over these joints with a spring and snap that makes and breaks the circuit instantaneously. This is important, as otherwise there would be danger of the brush being in contact with both the live and the dead section of the ring for a short period and form a ground or short circuit, which would be destructive of both commutator and brushes.

In detail the current is supplied from any suitable source of electrical energy coming in over the incoming line-wire 30, which is connected to one-half of the ring 13. The connected half of this disk when the current is on is live, while the lower half is dead. The current passes thence through such of the brushes (15 to 20, inclusive) as are in contact with the live half of the ring 13 to the sets of magnets, to which the wires leading from said brushes, respectively, run through said magnets, and thence out through the brushes 21 or 22 and the ring 14 to the outgoing line-wire 34. The wires leading back from the several sets of magnets to the outgoing line-wire brushes are all connected together by means of a loop or bridge wire 50, as shown in Fig. 5.

I will now proceed to trace certain of the electrical current in detail. Beginning, for example, with the circuit including the positive brush 15, the current (as in all cases) comes in through the incoming line-wire 30 to the live half of the commutator-ring 13, thence to the brush 15, thence by way of the wire 31 to the sets of magnets 32, thence by way of the return-wire 33 and the common or bridge wire 50 to the brushes 21 and 22, thence to the commutator-ring 14, and out through the outgoing line-wire 34. When the positive brush 16 reaches the point where it is in contact with the live half of the ring 13, the current comes in as before through the incoming line-wire 30 thereto, and thence by the said brush 16, thence by the wire 35 to

the set of magnets 36, and back by way of the return-wire 37 to the common or bridge wire 50, and thence out as before. When the positive brush 17 has reached the proper point, the course is in through the wire 30, live half of ring 13, and brush 17 to wire 47, set of magnets 38, through the return-wire 40 to the common or bridge wire 50 as before, and thence out through the negative brushes 21 and 22 and commutator-ring 14 to the outgoing line-wire 34.

The electrical connections embodying the sets of magnets 32, 36, and 38 having been described it will be readily understood that the connections to the sets of magnets 39, 41, and 42 are similar, and a description thereof becomes unnecessary.

The three sets of magnets 32, 38, and 39 are shown in Figs. 4 and 5. The sets of magnets 36, 41, and 42 are only shown in Fig. 3. The course of the wires (or electrical connections) to the magnets 36, 41, and 42 are, however, indicated by the dotted lines in Fig. 5. That these lead to a position near the bars 11 has no significance, save that the magnets of one set are opposite the bars of the other set, and that therefore the wires necessarily lead under the bars of the first set to the magets of the second set.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a plating-machine, of an automatic catcher having sets of electromagnets thereon, and suitable electrical connections for energizing and deënergizing said magnets, said catcher comprising a single cylindrical frame mounted on a shaft to revolve and bring the sets of magnets successively near the sheets of tin as they emerge from the rolls of the plating-machine, and said electrical connections being arranged to cause the magnets to become energized as they approach these sheets, and to be deënergized when the sheets carried thereby reach the point where they are to be delivered, and thus release said sheets at that point.

2. The combination, in an automatic catcher, of a revolving cylindrical structure, electromagnets carried thereby, positive and negative brushes also carried thereby, a stationary commutator comprising two rings surrounding a suitable base alongside said structure, with one of which the incoming line-wire and the positive brushes connect, which ring is formed in two parts one of which is "live" and the other "dead" with an abrupt offset between them, and with the other of which the outgoing line-wire and the negative brushes connect, and suitable connections running through the several sets of magnets from the positive brushes to the negative brushes, substantially as set forth.

3. The combination, in an automatic catcher for plating-machines, of a cylindrical revoluble structure, a series of electromagnets carried by the said structure, a series of brushes also carried by the said structure a part of which are connected to the incoming line-wire and a part to the outgoing line-wire, a stationary commutator positioned alongside the revoluble structure comprising two rings with one of which the incoming line-wire connects and upon which the corresponding brushes bear, and with the other of which the outgoing line-wire connects and upon which the corresponding brushes bear, said commutator being adapted to alternatively make and break electrical connections whereby the magnets are energized during a portion of the revolution of the structure and deënergized during another portion of the revolution and thus adapted to attract and hold the sheets from the time they emerge from the rolls of the plating-machine until they reach the delivery-point and there release them.

4. In an automatic catcher, the combination, of a rotary structure carrying electromagnets, brushes mounted on said structure to travel in a circular path, a commutator alongside said structure comprising rings, one of which is in two parts one "live" and one "dead," a sharp offset being provided between them, and suitable electrical connections, substantially as set forth.

5. The combination, in an automatic catcher, of a revoluble structure, catcher-carrying bars pivotally secured in said structure and provided with stops whereby they are permitted a limited movement, and springs attached thereto and which normally hold said bars toward or against the stops on one side, whereby said catcher-carrying bars are permitted to yield somewhat when the sheets are seized by the catchers just before the lower edges of said sheets escape from the rolls of the plating-machine, and to operate under the force of the springs to withdraw said sheets instantly from contact with said rolls as they escape therefrom, substantially as set forth.

6. The combination, in an automatic catcher, of a revolving structure, bars pivotally secured in said structure and provided with stops whereby they are permitted a limited movement, catching devices mounted on said bars, means for actuating said catching devices and thus seizing the sheets at a certain point in the revolution of the structure, and means for actuating said catching devices and releasing said sheets at another point in the revolution of the structure, whereby the sheets are taken from one point around and delivered at another point by the automatic operation of the device, the catching devices being also adapted to automatically shift position somewhat and thus better attach themselves to the sheets.

7. The combination, in a plating apparatus, of the means for discharging the plates from the plating-machine, a catcher arranged to receive them as they are discharged and to move at a slightly-increased speed over that

of the discharging device, substantially as set forth.

8. The combination, in a plating apparatus, of the means for discharging the plates from the plating-machine, a catcher carrying catching devices to catch said plates as they are discharged, said catcher being arranged to move at somewhat greater speed than the discharging means, and the catching devices being mounted to yield or give somewhat, substantially as described and for the purposes set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 11th day of October, A. D. 1900.

CHARLES W. BENNETT. [L. S.]

Witnesses:
CHESTER BRADFORD,
JAMES A. WALSH.