M. O. ANTHONY.

MACHINE FOR POINTING METALLIC ARTICLES BY ELECTROLYTIC ACTION.

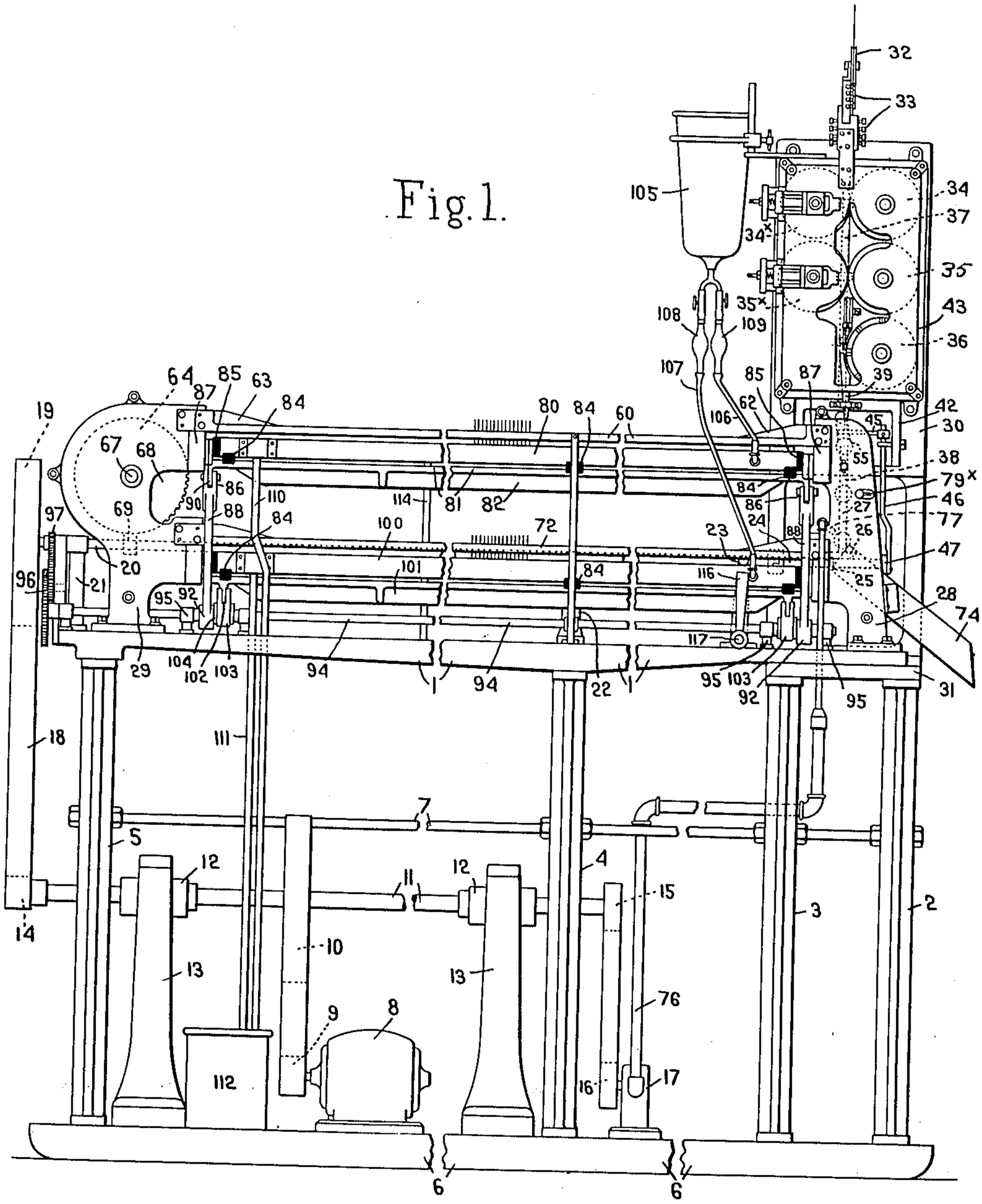
APPLICATION FILED AUG. 4, 1916.

1,298,155.

Patented Mar. 25, 1919.

4 SHEETS—SHEET 1.

Fig. 1.



Inventor.
Marcus O. Anthony
by *Heard Smith & Tennant.*
Attys.

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4 SHEETS—SHEET 2.

Fig. 2.

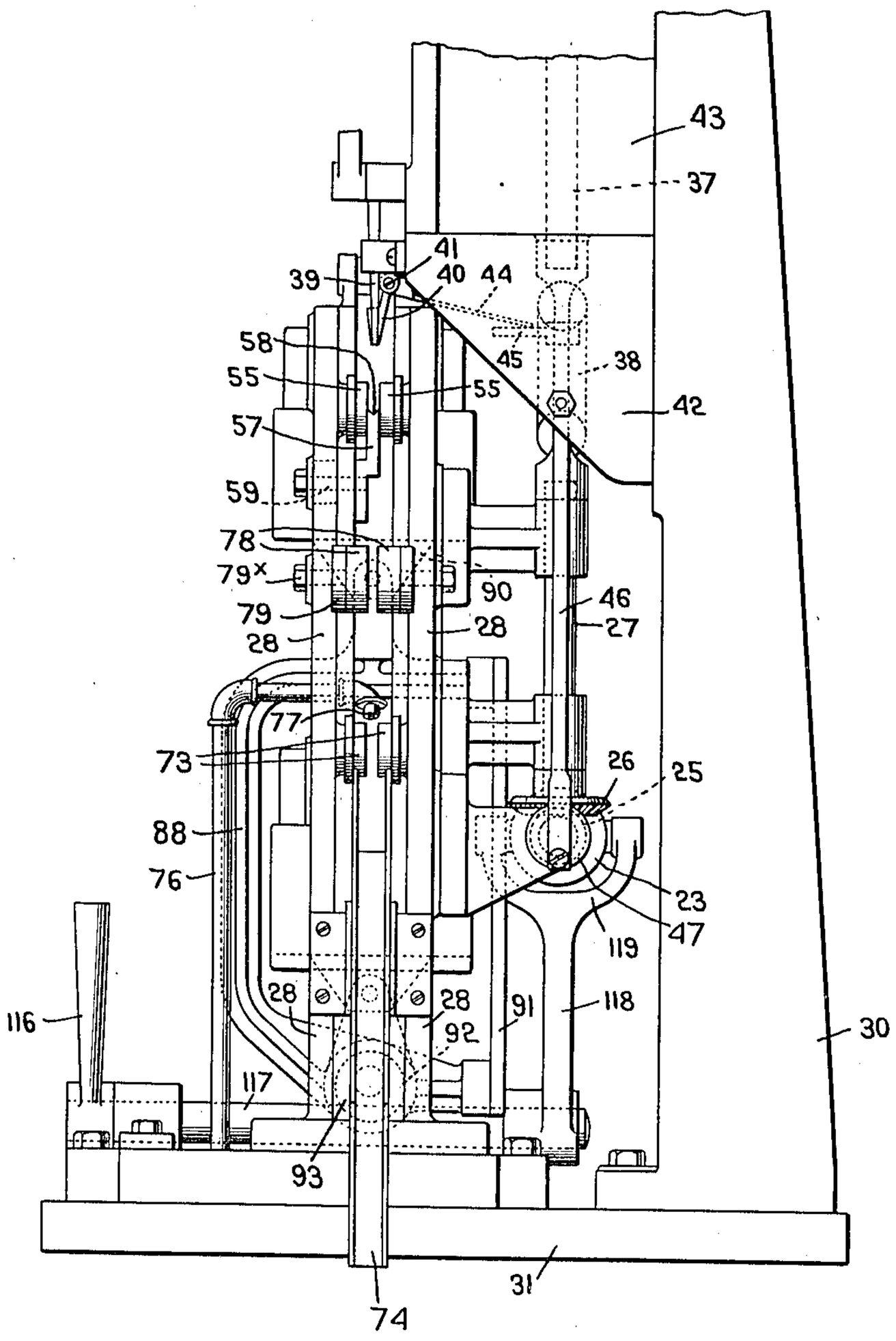

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Fig. 3.

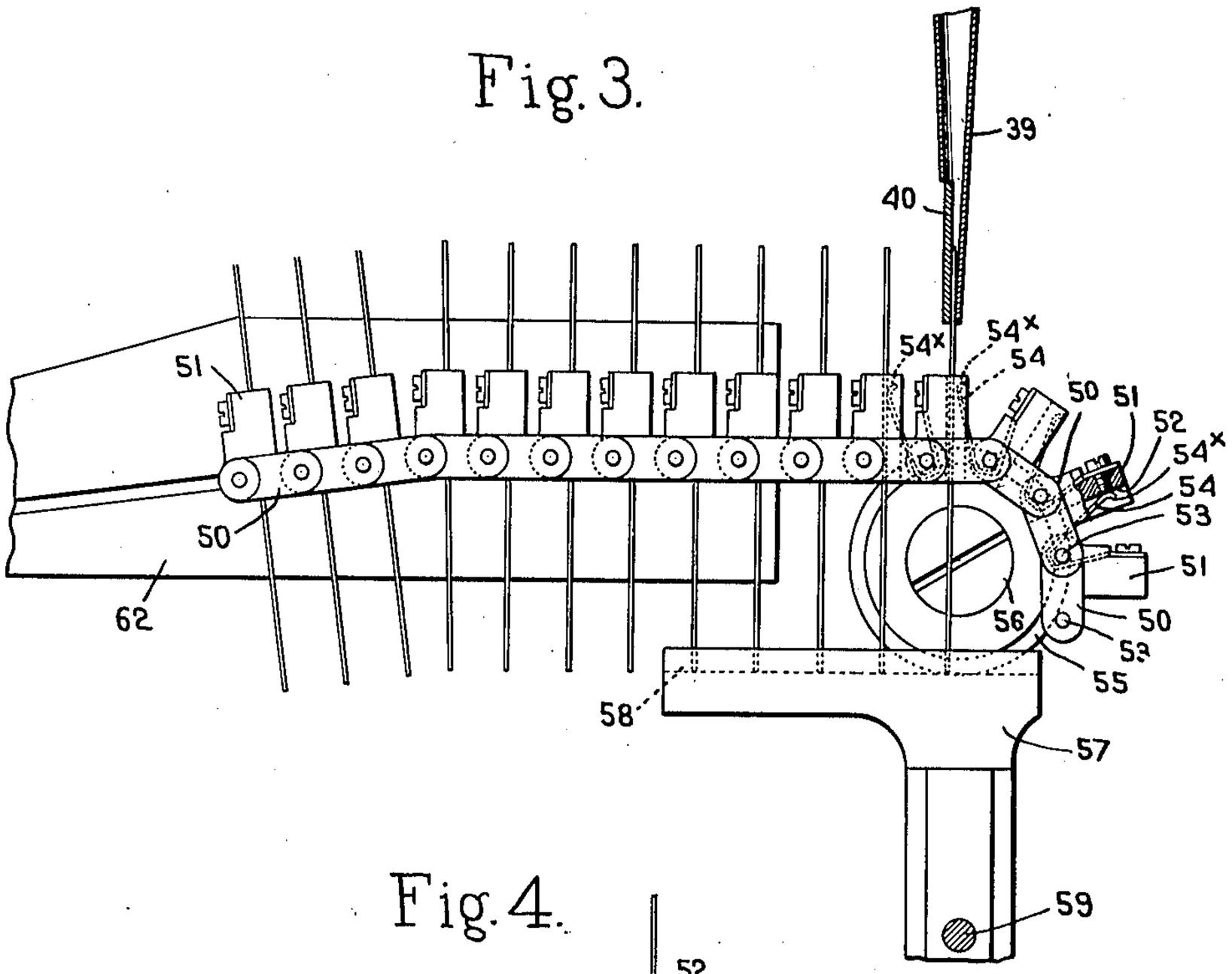

Fig. 4.

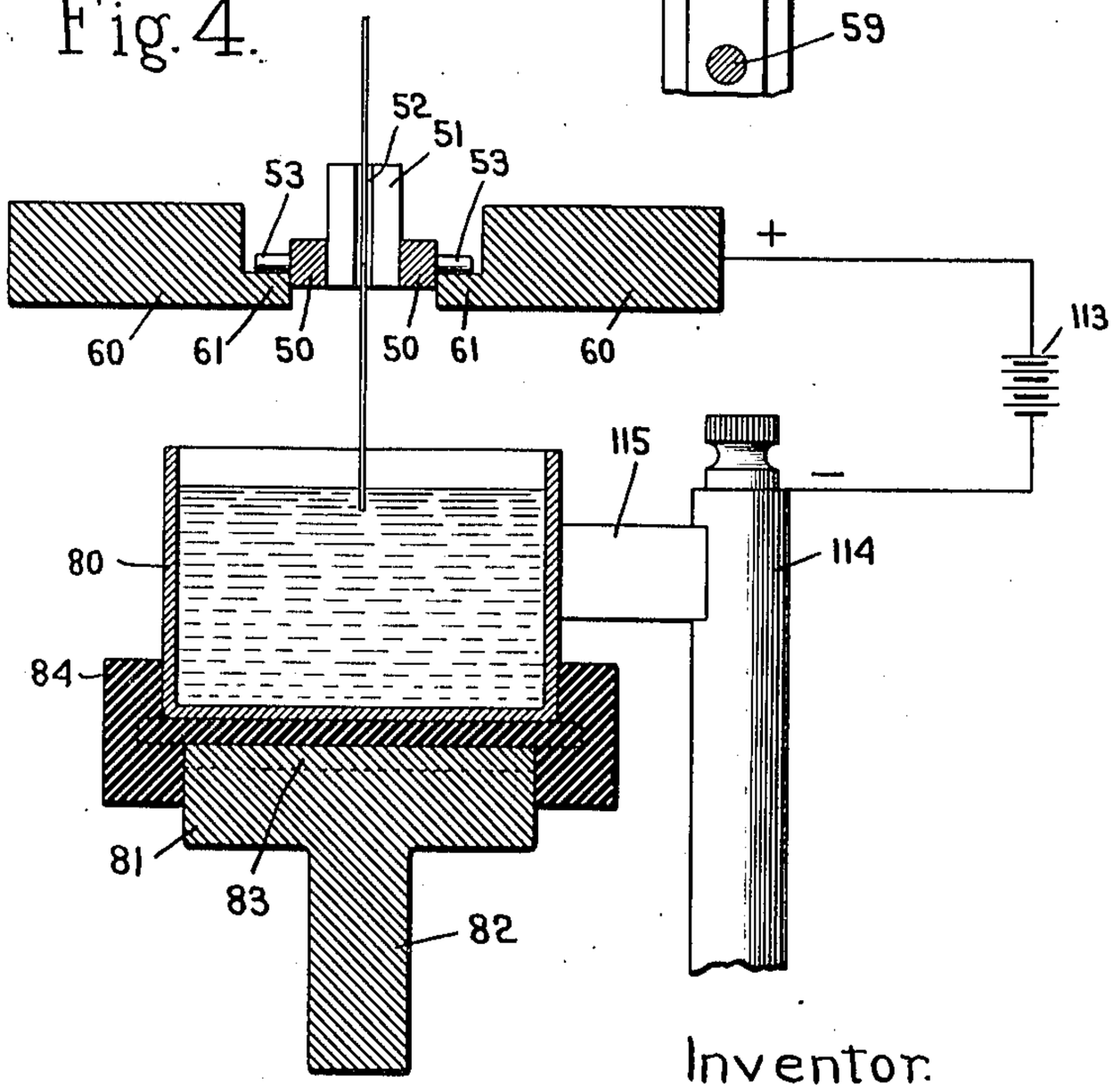

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Fig. 5.

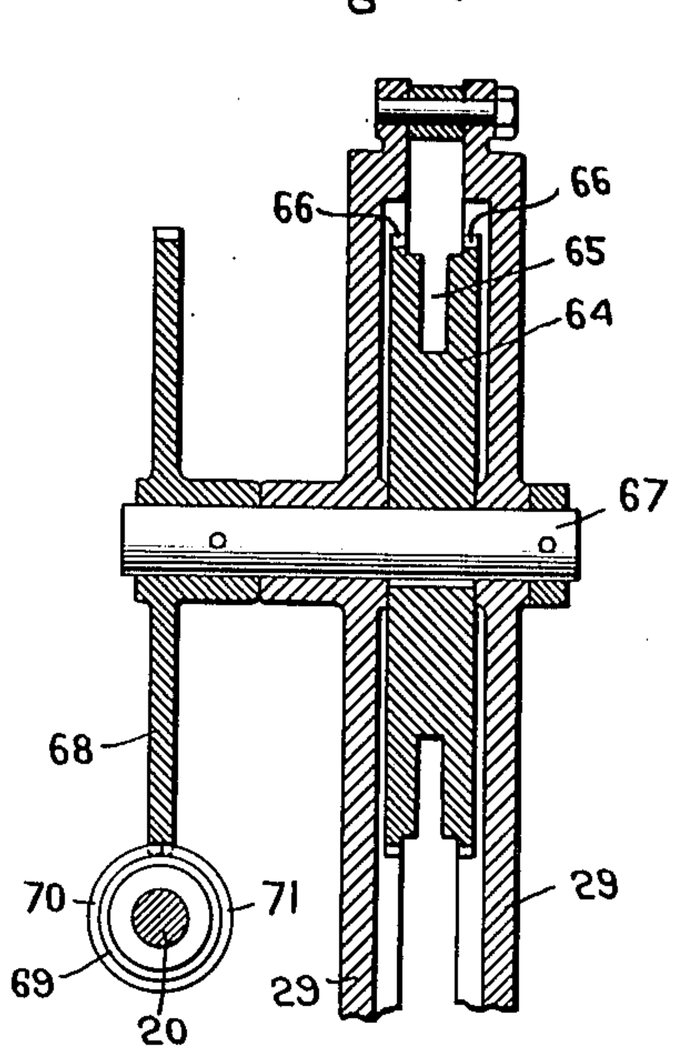
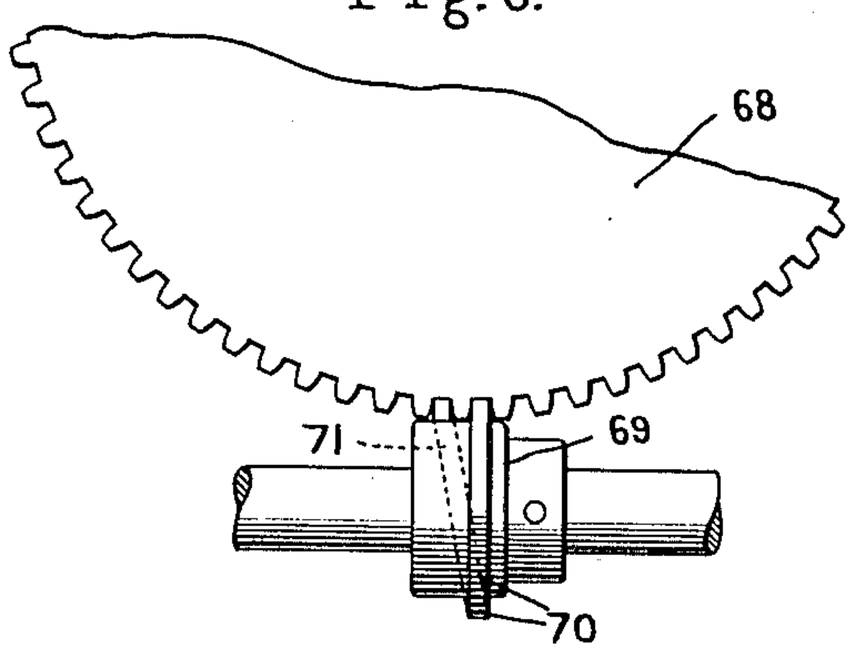


Fig. 6.



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UNITED STATES PATENT OFFICE.

MARCUS O. ANTHONY, OF ENGLEWOOD, NEW JERSEY, ASSIGNOR TO A. KIMBALL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MACHINE FOR POINTING METALLIC ARTICLES BY ELECTROLYTIC ACTION.

1,298,155. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed August 4, 1916. Serial No. 113,053.

To all whom it may concern:

Be it known that I, MARCUS O. ANTHONY, a citizen of the United States, and resident of Englewood, county of Bergen, State of New Jersey, have invented an Improvement in Machines for Pointing Metallic Articles by Electrolytic Action, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in machines for shaping the ends of metallic articles, such for example as pointing the ends of pins, needles and the like.

The principal object of the invention is to provide an automatic machine which will successfully taper or point the ends of wire blanks to form penetrating articles such as pins or needles.

Another object of the invention is to provide a machine of this character which will automatically point both ends of a wire blank to produce a double pointed pin adapted to be formed into a staple for use in marking tags such as pin tickets and like articles.

The staples which are used in pin tickets are necessarily formed of a very soft and flexible wire which when passed through the goods to which the ticket is to be affixed may be readily bent down by the fingers of the person applying the same to the goods and conversely may easily be straightened to remove the tag from the merchandise.

By reason of the extreme softness and flexibility of this wire the pins cannot be formed upon the usual pin making machines or pointed by grinding by any method heretofore known as the usual grinding operation either produces a blunt unsymmetrical and imperfect point or produces a fine wiry extension or bur which will snag the goods when the point is passed through them and pin makers throughout the United States have uniformly announced their inability to produce a double pointed pin having conoidal points adapted for use in the commercial manufacture of pin tickets.

Heretofore practically all pin tickets having double pointed staples for affixing the same to the goods have been produced by machines having means for cutting the wire obliquely to the longitudinal axis of the wire, thus forming points which lie in the circumference of the wire. These pins are not conoidal and have sharp edges and frequently are burred so that when the pin tickets are affixed to delicate fabric these imperfect points will cut the threads of the fabric or snag the fibers thereof and thus damage the article. The main purpose of the present invention is to provide a machine which will produce double pointed pins having conoidal, substantially perfect points without burs or other objectional features and which will deliver such pins with a sufficient rapidity to enable the same to be used in the commercial manufacture of pin tickets.

This is accomplished in the present invention by providing means for cutting a wire into desired lengths, delivering the blanks thus cut off successively to gripping mechanisms which are adapted first to pass the tips of one end of the blanks through a bath in which the submerged ends of the blanks are subject to the action of electrolysis, then to pass the opposite ends of the blanks through a similar bath and finally to wash and deliver the pins to a suitable receptacle.

Another feature of the invention resides in providing means for causing relative movement axially of the pins between the bath and the pins so as to vary the period during which the portions of the end of the blank is treated thereby insuring a more perfect conoidal surface than might be made in the absence of such movement.

Another feature of the invention consists in providing a flexible chain having links formed with clamping members adapted to grasp the central portion of the blanks and present first one end of said blanks to an electrolytic bath underlying one lead of the chain and the opposite ends of the blanks through a similar bath underlying the other lead of the chain.

These links preferably are so constructed as to receive the blanks when passing over a guide, as the links approach the upper lead of the belt and to deliver the pointed pins when the links pass over a complementary guide or pulley for the lower horizontal lead of the belt.

A further feature of the invention resides in providing a special intermittent driving

mechanism which will permit the links of the belt successively to rest in blank receiving position and which will thereafter advance the links at a substantially uniform speed, thereby causing the pins to pass through the solution without unduly agitating the same.

Another feature of the invention consists in providing a clutch mechanism which is adapted to interrupt the blank cutting and feeding mechanism without arresting the movement of the pin pointing mechanism, which clutch mechanism when again engaged will properly coordinate the movement of the blank cutting and the pin pointing mechanisms.

Other features of the invention will more fully appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

The drawings illustrate a preferred embodiment of my invention adapted for pointing both ends of metallic wire blanks to form pins to be made into staples for pin tickets.

In the drawings:

Figure 1 is a side elevation of the machine, central portions being broken away in order to illustrate the machine in a single figure,

Fig. 2 is an enlarged end view of the blank receiving end of the machine, the supporting table being omitted.

Fig. 3 is a detail view of an endless chain having links provided with blank gripping members illustrating also the blank being delivered to said gripping means.

Fig. 4 is a detail vertical sectional view of the blank supporting chain, its guide, the electrolytic tank, the end of the blank immersed in the electrolytic solution and illustrating diagrammatically the course of the electric circuit,

Fig. 5 is a vertical sectional view of the drum and gearing for moving the blank carrying chain, and,

Fig. 6 is a detail view of the interrupted worm for intermittently moving said chain.

As illustrated in the accompanying drawings the pin pointing mechanism and wire feeding mechanism are supported upon a table 1, having suitable legs 2, 3, 4 and 5, preferably mounted upon a base plate 6 or secured to the floor in any suitable manner. These legs may be secured rigidly in vertical position by rods 7 extending through webs in said legs and having check nuts applied against opposite sides of said legs.

The mechanism for pointing the pins and for actuating the wire feeding and cutting mechanism may be driven by an electric motor 8 mounted upon the base 6 having its pulley 9 belted to a suitable pulley 10 upon a countershaft 11 mounted in suitable bearings 12 in standards 13 supported by the base or by the floor, said countershaft having at one end a pulley 14 for driving the main shaft of the machine and at its opposite end a pulley 15 belted to the pulley 16 of a pump 17 the purpose of which will hereinafter be more fully described.

The pulley 14 is connected by a belt 18 to a pulley 19 upon the end of the main shaft 20 which extends longitudinally of the machine and is journaled at one end in a suitable bracket 21, at the middle in a bracket 22 and is provided at its free end with a clutch member 23 adapted to coöperate with a complementary clutch member upon a short shaft 24 in axial alinement with said main shaft which has at its end a beveled gear 25 meshing with a complementary beveled gear 26 secured upon a vertical shaft 27 which is connected at its opposite end to the shaft for actuating the wire feeding and cutting mechanisms.

The shafts 24 and 27 are journaled in brackets carried by a standard 28 which rests upon and is secured to the table 1. This standard also serves to support the means for guiding the endless chains which carry the blanks through the electrolytic solution, said chains being driven by a sprocket wheel carried by a stand 29 supported by and secured to the opposite end of the table 1. The wire feeding and blank cutting mechanism may be of any suitable character and may be supported by a stand 30 which is connected to a plate 31 underlying the end of the table 1 and resting upon the legs 2 and 3, the stand 30 projecting sufficiently above and over the top of the blank pointing mechanism to enable the blanks cut from the wire to be delivered directly to the links of the blank carrying chain. The particular form of blank cutting mechanism illustrated herein is substantially the same as that shown in my prior Patent No. 1,163,121 granted Dec. 7, 1915 and which comprises a guide wheel 32 which directs the wire from a suitable reel to a straightening device 33 from which the wire is fed by one or preferably two pairs of rolls 34,—34×, 35,—35× to a rotary cutter 36.

This rotary cutter preferably is provided with a peripheral series of pivoted cutters coöperating with suitable ledger blades, said cutter being so designed that when the blades reach a horizontal position they will embrace the wire which has been fed forward. The pivoted blade is actuated in the manner disclosed in said patent by cam mechanism, not shown, to sever quickly a blank from the end of the wire, when in said horizontal position. The rotary cutter 36 and the pairs of feeding rolls 35,—35×, 34—34×, are driven by suitable gearing from a vertical shaft 37 which is connected to the shaft 27 by a universal coupling 38. This coupling is necessitated herein by reason of the fact that the shafts 27 and 37 are slightly out of

vertical alinement, but it will readily be understood that other means for driving the cutter actuating shaft may be utilized.

The blanks severed from the wire drop into a chute 39 which guides them successively into the gripping mechanism of the blank carrying chain, the side of the chute desirably being provided with a movable section 40 which conveniently is pivoted upon an ear 41 secured to a bracket 42 extending from the vertical stand 30, which bracket 42 may also conveniently support the frame 43 of the wire feeding and cutting mechanisms.

The movable section 40 of the chute 39 has an arm 44 which is engaged by an arm 45 upon a vertically reciprocating rod 46 which is actuated by a crank disk 47 upon the end of the shaft 24. The raising of the rod 46 oscillates the pivoted section 40 of the chute out of the path of the blank so that the blank may be moved forward toward the electrolytic bath without interference, and the descent of the rod 46 permits the section 47 to be oscillated to its original position and to form a portion of the chute which guides the blank into the gripping members of the blank carrying chain.

Any suitable form of conveyer with gripping means may be provided to receive the blanks and carry the same along in such a manner that the desired amount of the end portion or end portions of the blank will be immersed in the electrolytic solution. The preferred form of conveyer which is illustrated herein comprises a series of links 50 substantially U-shaped in cross section and having vertical extensions 51 provided with recesses 52 adapted to receive the blanks. The links are connected by studs 53 which project a sufficient distance beyond the sides of the links to ride upon suitable guideways located above the electrolytic tanks. The links are connected by studs 53 which project a sufficient distance beyond the sides of the links to ride upon suitable guideways located above the electrolytic tanks. The blanks are retained in the recesses by leaf springs 54 which are secured at one end to one side of the vertical portions 51 of said links and extended beneath and around the stud 53, the free end 54× of the springs being curved backwardly and resting against the wall of the bottom of the vertical recess 52. The conveyer is guided at its pin receiving end by two pairs of guides, preferably rollers 55 mounted upon studs 56 which desirably are located in the same vertical plane. The guiding rollers are of relatively small radius so that the extensions 51 of the links which normally are parallel will assume a wide angle relatively to one another as they pass over the guiding rollers. By this means the free end 54× of the spring will be sufficiently removed from the wall of the recess 52 to permit the blank to drop from the chute 39 through the link. Upon the advancement of the link into horizontal position the extensions will be returned to substantial parallelism and said spring will be caused to clamp the blank firmly against the bottom of said recess. A suitable adjustable guide or block 57 is provided to limit the downward movement of the blanks as they are dropped from the chute into the links of the blank carrying chain. This block is illustrated herein as substantially L-shaped in form and has a groove 58 in its upper face. It is secured to the vertical stand 28 by a bolt 59 vertically adjustable in a slot in the frame, thus adapting the machine for the use of blanks of different lengths. The leads of the conveyer are directed by suitable guides in parallelism with the upper surface of the tank and the contents thereof. The horizontal portion of the guides comprises plates 60 suitably secured to the standards 28 and 29 and having ledges 61 for the ends of the studs 53 to ride upon.

The guides are provided with upwardly inclined end portions 62—63 which raise the blanks to a sufficient height to remove them from contact with the fluid in the electrolytic tank. At the opposite end the blank conveyer passes over a driving drum or sprocket 64 having a central peripheral groove 65 to permit the ends of the blanks to pass freely therethrough and radially extending sprocket teeth 66 to engage the pins 53 of the links of the conveyer, (see Fig. 5). The sprocket wheel 64 is mounted upon a shaft 67 journaled in suitable bearings in the end bracket 29, said shaft being rotated by a gear 68 engaged by an interrupted worm 69 carried by the main shaft 20 which extends longitudinally of the machine. The interrupted worm preferably consists of a substantially semi-circular portion 70 lying in a plane at right angles to the axis of the shaft 20 and of an inclined or screw-thread portion 71. By this construction a dwell is provided while the portion 70 engages a tooth of the gear 68 and progressive movement is produced as said tooth rides upon the portion 71 of said interrupted worm. In the operation of the machine the dwell is sufficient to permit blanks to drop successively from the chute into the opened grippers of the links and the gradual movement of the gear caused by the inclined or screw thread portion 71 advances the chain and closes the grippers successively upon the blanks then serves to advance them smoothly through the electrolyte so that there is no undue agitation of the liquid in the tank by the intermittent movement of the ends of the pins therethrough.

The sprocket wheel 64 is of such large di-

ameter that the vertical portions 51 of the links are not given sufficient angularity relatively to one another as they pass around the same to release the leaf springs from their engagement with the blanks so that the blanks are retained in the links of the chain throughout the lower lead of the belt of the conveyer as well as the upper. The opposite ends therefore of the blanks are adapted to be immersed in a body of electrolyte supported beneath the lower lead or guide 72 of the conveyer, which desirably is substantially identical in form with the upper guide 61 of the conveyer. The lower lead of the conveyer terminates adjacent to the guide wheels 73 which are similar in all respects to the guide wheels 55 for the upper lead of the conveyer and are secured to the stand 28 in like manner so that the links of the chain will be bent sharply relatively to one another as they pass around said guide rollers, thereby releasing the clamping spring 54× from its engagement with the blanks and permitting the blanks to drop into a chute 74 from which they are delivered to any suitable receptacle.

In order to facilitate the discharge of the blanks from the gripping members of the links of the conveyer chain and also to remove the electrolytic solution from the blanks, a jet of fluid preferably air is caused to play upon the blanks at the time they are released from the clamps of the chain. This jet of air is supplied by the pump 17 through a suitable pipe 76 having a nozzle directed downwardly and laterally between the guide rolls 73 into a chute 74.

In order to adjust properly the tightness of the blank conveyer chain a belt tightener is provided for the portion of the chain intermediate of the guide rollers 55 and 73. This belt tightener may conveniently be in the form of a pair of anti-friction rolls 78 carried upon brackets 79 secured to the stand 28 by slot and bolt connections 79×. A tank for the electrolyte may be provided under either of the horizontal leads of the blank carrying chain or conveyer. Where both ends of the blanks are to be pointed, as in forming staples for pin tickets a tank is located under each lead of the conveyer so that both ends of the blanks are treated in like manner. The tanks for the electrolyte are electrically insulated from the remainder of the machine and are provided with means connecting the same electrically to the negative terminal or pole of a battery or other generator. The other or positive terminal of the generator is connected preferably to the guideways which support the blank carrying conveyer.

A preferred form of electrolytic tank 80 which is illustrated herein comprises a receptacle formed of copper or brass preferably substantially rectangular in form extending throughout the whole or substantially the whole of the horizontal portion of the lead of the conveyer.

The tank is supported upon a holder having a flat upper portion 81 substantially the width of the bottom of the tank and a strengthening rib 82 extending downwardly therefrom.

The upper portion 81 of the holder desirably is provided with two or preferably three upwardly extending flat bosses 83 and the bottom of the tank is supported upon these bosses by insulating pieces 84 preferably of red fiber or other insulating material so that the bottom of the tank is electrically insulated from the holder. At their ends the tanks are provided with similar insulating members 85 which protect the wall of the tank from contact with any metallic portion of the frame. The ends of the tank holder 81 are secured to suitable cross heads 86 which are vertically movable in guideways 87 in the stands 28 and 29 at the ends of the machine and means preferably are provided for moving the tanks vertically relatively to the blank carrying chains.

The relative movement between the electrolytic tank and the blank conveyer is such as to remove the ends of the blanks intermittently from the solution, preferably the upper tank being raised simultaneously with the lowering of the lower tank and vice versa. By this means the electrolytic action of the current upon the blanks will produce a perfect conoidal point.

Any suitable means may be provided for causing relative movement between the electrolytic tank and the conveyer. As illustrated the tanks are supported upon brackets which are carried by eccentrics actuated from a suitable shaft extending longitudinally of the machine. The brackets for supporting the upper tank 80 in this particular embodiment of the invention comprise substantially U-shaped members 88 located at the opposite ends of the tank holder and having upwardly extending bifurcated ends embracing and pivotally connected to ears 90 extending downwardly from the ends of the tank holder 81. The horizontal arms of the U-shaped bracket are connected by a plate or strap 91 thus providing a rigid structure. At their lower ends the brackets have bosses 92 which are apertured to receive eccentrics 93 carried by a shaft 94 extending longitudinally of the machine and mounted in suitable bearings in brackets 95 secured to the table 1. A shaft 94 is rotated through a train of gears 96 from a pinion 97 on the main shaft 20.

The lower tank 100 is supported upon a holder 101 similar to the holder 80. The holder 101 is provided at its ends with downwardly extending ears 102 which are

pivotally connected to brackets 103 forming the straps of eccentrics 104 upon the shaft 94, the eccentrics 104 being located at right angles to the eccentrics 93 which actuate the upper tank although the position of these eccentrics is not material to the operation of the machine.

The electrolyte in the tanks 80 and 100 preferably is constantly replenished from a suitable reservoir which conveniently is in the form of a heavy glass percolating jar 105 having tubes 106 and 107 leading respectively to the upper tank 80 and to the lower tank 100 and provided with regulating means such as adjustable drop forming attachments 108 and 109. Flexible conduits 110 and 111 leading from the opposite end of the tanks to a receptacle 112 are provided to maintain the fluid in the tanks at a constant level.

The electric current is supplied from a battery or other generator 113, the positive lead being connected to the frame of the machine or preferably to the plates 60 and 72 which support respectively the upper and lower leads of the blank carrying chain. The negative pole of the battery or generator is connected to a binding post 114 carried by and insulated from the frame 1. The binding post 114 is provided with suitable contact members 115, preferably brass spring plates, which engage the side walls of the electrolytic tanks 80 and 100. Any convenient number of said conductors may be provided. By this means a constant current is maintained through the blanks and the electrolytic solution and serves to reduce the end portions of the blanks in the manner aforesaid. The tank is so constructed and located that the ends of the blanks are carried in substantially the longitudinal vertical medium plane of the tank so that the electrolytic action upon each side is substantially the same and uniform conoidal points are produced.

It will be readily understood that in the operation of the machine the blanks are delivered successively to the links of the blank carrying conveyer or chain and are carried progressively by this chain along the upper guideway from the tank 80. The level of electrolyte in the tank is maintained so as to submerge the points of the pins at all times and the reciprocation of the tanks as above described serves to raise and lower the electrolyte upon the ends of the blanks the desired amount to give a proper taper to the ends of the pins.

As the blanks are carried along the upper lead of the conveyer one end of each blank is treated and as they pass along the lower lead of the conveyer the opposite end of the blank is treated in the lower tank 100. When the blanks reach the end of the lower lead of the conveyer and pass around the guide rolls the clamps are separated and the blanks discharged into the chute 74.

When the machine is to be stopped for any reason it is necessary that the blank carrying conveyer shall continue to move until the blanks carried thereby are discharged, otherwise the ends of the blanks will remain too long in the solution and would be eaten away. Such action is prevented however by disengaging the clutch member 23 from the companion clutch member, a suitable lever 116 secured to a rock shaft 117 having an arm 118 provided with a yoke 119 connected to the clutch member 23 serving to accomplish this purpose.

Any suitable electrolytic solution such as that described in my prior Patent No. 1,140,935 granted May 25, 1915, may be provided. In practice it is found that different electrolytic solutions should be used in treating articles of different materials, such electrolytes being well known to those skilled in the art of electrolysis.

It will be understood that the embodiment of the invention disclosed herein is of an illustrative character and that various other means may be provided for causing the ends of the blanks to pass progressively through one or more electrolytic tanks and that other means may be provided for pointing both ends of the blanks.

It will also be understood that various other constructions may be utilized to cause relative movement between the blank supporting means and the electrolytic tank or container and that other details of construction may be modified or equivalent structures may be substituted within the meaning and scope of the following claims.

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

1. A machine for shaping metallic articles comprising a tank of electrolyte, means for conveying successively a series of articles across said tank with portions of said articles depending into said electrolyte, means for passing an electric current through said articles and said electrolyte to cause a reduction of the material in said articles, means for varying the area of submersion of said articles in said electrolyte during their progress therethrough to effect the reduction of the ends of said articles to conoidal form, means for automatically supplying said articles successively to said conveying means and means for discharging the shaped articles therefrom.

2. A machine for shaping metallic articles comprising a tank of electrolyte, means for suspending and conveying metallic articles across said tank with portions of said articles depending into the electrolyte, means for causing a vertical relative movement between said tank and said conveying

means whereby the area of submersion of said articles will be varied during their progress through the electrolyte, means for passing an electric current through said articles and said electrolyte to cause a reduction of the material in said articles, and means for automatically supplying said articles successively to the conveying means and means for discharging the shaped articles therefrom.

3. A machine for shaping metallic articles comprising a tank of electrolyte, a traveling conveyer located above and in proximity to said tank, gripping means on said conveyer positioned to engage the central portions of a series of articles and to present the end portions thereof to the electrolyte, means for passing an electric current through said articles and said electrolyte, automatically operating means for successively opening and closing said gripping means to receive said articles and means for discharging said articles from said gripping means.

4. A machine for shaping metallic articles comprising a tank of electrolyte, an endless chain conveyer located above said tank and comprising a series of links having coöperating pivotally movable gripping members positioned to engage the central portions of said articles and to suspend said articles with the end portions thereof submerged in said electrolyte, means for passing an electric current through said articles and said electrolyte, means for actuating said conveyer, means for bending said conveyer sharply to move gripping members about their pivots and cause the separation of said members, whereby the articles may be introduced therein and means for passing an electric current through said articles and said electrolyte.

5. A machine for shaping metallic articles comprising a tank of electrolyte, an endless chain conveyer consisting of a series of pivotally connected links, adjacent links having coöperating lateral extensions forming jaws adapted to be closed when the chain is straightened to grip the articles to be shaped and pivotally separable by bending the chain, a horizontal guide for said chain overlying said electrolyte and adapted to cause each article suspended by the gripping means to be partially submerged in the electrolyte, means for passing an electric current through said articles and said electrolyte, means for actuating said conveyer and means for bending the same sharply at predetermined points whereby the gripping jaws on said links will be separated to permit the articles to be inserted there and discharged therefrom.

6. A machine for shaping metallic articles comprising a tank of electrolyte, an endless chain conveyer consisting of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism normal to the path of the lead of said chain and when said chain is bent to be pivotally separated, said extensions each having a resilient member adapted to coöperate with the extension of an adjacent link to grip the central portion of an article, a horizontal guide for said conveyer overlying said electrolyte and adapted to cause the end portion of each article suspended by said gripping members to be submerged in said electrolyte, means for passing an electric current through said articles and said electrolyte, means for actuating said conveyer, and means for bending the same sharply whereby the gripping members of said links will be separated to permit the articles to be inserted therein.

7. A machine for shaping metallic articles comprising a tank of electrolyte, an endless chain conveyer consisting of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism normal to the path of the lead of said chain and when said chain is bent to be pivotally separated, said extensions each having a resilient member adapted to coöperate with the extension of an adjacent link to grip the central portion of an article, a horizontal guide for said conveyer overlying said electrolyte and adapted to cause the end portion of each article suspended by said gripping members to be submerged in said electrolyte, means for passing an electric current through said articles and said electrolyte, means for actuating said conveyer, and a plurality of means for bending the same sharply and adapted respectively to separate said gripping members to permit the insertion of articles therebetween and to cause the discharge of the shaped articles therefrom.

8. A machine for shaping metallic articles comprising a tank of electrolyte, a traveling conveyer having means for gripping the article to be shaped, means for guiding said conveyer adapted to cause the same to present different portions of said article to said electrolyte and means for intermittently varying the depth of submergence of the article in said electrolyte, and means for passing an electric current through said articles and said electrolyte.

9. A machine for shaping the ends of metallic wire blanks comprising a traveling endless conveyer, a series of means on said conveyer for gripping said blanks intermediate of their ends, tanks of electrolyte beneath the upper and lower leads of said conveyer, means for guiding said conveyer to cause the opposite ends of said blanks alternately to be submerged in the electrolyte, and means for passing an electric current through said blanks and said electrolyte.

10. A machine for shaping the ends of metallic wire blanks comprising a traveling endless conveyer, a series of means on said conveyer for gripping said blanks intermediate of their ends, means for automatically introducing said wire blanks into the gripping means, tanks of electrolyte located beneath the upper and lower leads of said conveyer, means for guiding said conveyer to cause the opposite ends of said blanks alternately to be submerged in said electrolyte, means for passing an electric current through said blanks and said electrolyte and means for automatically delivering the shaped blanks from said gripping means.

11. A machine for shaping the ends of metallic wire blanks comprising a traveling endless conveyer, a series of means on said conveyer for gripping said blanks intermediate of their ends, tanks of electrolyte beneath the upper and lower leads of said conveyer, means for guiding said conveyer to cause the opposite ends of said blanks alternately to be submerged in the electrolyte, and means for causing vertical relative movement between said tanks and the respective leads of said conveyer whereby the area of submergence of the ends of the blanks will be varied.

12. A machine for shaping the ends of wire blanks comprising a traveling endless conveyer, a series of means on said conveyer for gripping said blanks intermediate of their ends, means for opening or closing said gripping means, means for cutting the blanks in predetermined lengths from a supply of wire, means for delivering said blanks to said gripping means when the latter are in open position, a tank containing an electrolyte below said conveyer, means for guiding said conveyer to cause the end portions of said blanks to be partially submerged in said electrolyte, means for passing an electric current through said blank and said electrolyte, and means for releasing the shaped blanks from said gripping means.

13. A machine for shaping the ends of wire blanks comprising an endless chain conveyer having links provided with extensions adapted when the links of the conveyer are straightened to extend normal to the path of the lead of said chain to grasp the blanks intermediate of the ends thereof and pivotally separable when said chain is bent to permit the introduction of said blanks therebetween, means for supporting said conveyer including a drum having teeth engaging said links and a pair of relatively small guiding rollers adapted sharply to bend said conveyer and thereby cause the gripping means to open, means for supplying blanks to said gripping means when in open position, electrolyte tanks underlying the leads of said conveyer, means for rotating said drum to advance said articles successively through said electrolyte and means for supplying an electric current through said blanks and said electrolyte.

14. A machine for shaping the ends of wire blanks comprising an endless conveyer chain consisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism normal to the path of the lead of said chain and when said chain is bent to be pivotally separated, each extension having a leaf spring adapted to cooperate with the extension of an adjacent link to grip an article intermediate of its length, a driving drum for said conveyer having teeth to engage said links and of sufficient diameter to avoid releasing the blanks from said gripping means, a pair of guiding rollers for supporting the opposite ends of the leads of said conveyer and adapted to bend the conveyer sharply to separate said gripping members, means for intermittently rotating said drum and means operating in timed relation with the movement of said conveyer to deliver said blanks to said conveyer, electrolytic tanks beneath the conveyer positioned to cause the submergence of the ends of said blanks and means for reciprocating said tanks relatively to said conveyer whereby the area of submergence of said blanks will be varied during their passage through the electrolyte.

15. A machine for pointing soft wire blanks for pin tickets comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each extension having a resilient member adapted to coöperate with the extension of an adjacent link to grip an article intermediate of its length, a driving drum for said conveyer having teeth to engage said links and of sufficient diameter to avoid releasing the blanks from said gripping means, a pair of guiding rollers for supporting the opposite ends of the leads of said conveyer and adapted to bend the conveyer sharply to separate said gripping members, means for intermittently rotating said drum and means operating in timed relation with the movement of said conveyer for dropping vertically positioned blanks into the separated gripping members of said conveyer, electrolytic tanks beneath said conveyer positioned to cause the submergence of the ends of said blanks and means for reciprocating said tanks relatively to said conveyer whereby the area of submergence of said blanks will be varied during their passage through the electrolyte.

16. A machine for pointing soft wire blanks for pin tickets comprising a tank of electrolyte, an endless chain conveyer con-

sisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each extension having a resilient member adapted to cooperate with the extension of an adjacent link to grasp a blank intermediate of its ends, means for guiding the upper lead of said conveyer horizontally, a driving drum for said conveyer located at one end of said lead, a guide roller at the opposite end of said lead of relatively small diameter adapted to bend sharply said conveyer and separate the gripping members thereof, means for intermittently rotating said drum, means located above said guiding and bending roller operating in timed relation with the movement of said conveyer for dropping blanks endwise into the separated gripping members, an electrolytic tank located beneath said conveyer and positioned to cause the submergence of the ends of the blanks therein as the same are advanced by said conveyer and means for passing an electric current through said blanks and said electrolyte.

17. A machine for pointing soft wire blanks for pin tickets comprising a tank of electrolyte, an endless chain conveyer consisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each extension having a resilient member adapted to cooperate with the extension of an adjacent link to grasp a blank intermediate of its ends, means for guiding the upper lead of said conveyer horizontally, a driving drum for said conveyer located at one end of said lead, a guiding roller at the opposite end of said lead of relatively small diameter adapted to bend sharply said conveyer and separate the gripping members thereof, means for intermittently rotating said drum, means located above said guiding and bending roller operating in timed relation with the movement of said conveyer for dropping vertically positioned blanks into the separated gripping members, adjustable means for arresting and positioning the ends of said blanks, an electrolytic tank located beneath said conveyer and positioned to cause the submergence of the ends of the blanks therein as the same are advanced by said conveyer and means for passing an electric current through said blanks and said electrolyte.

18. A machine for forming double pointed wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each of said extensions having a resilient member adapted to coöperate with the extension of an adjacent link to grip a blank intermediate of the ends thereof when the chain is in straightened position, means for guiding the upper and lower leads of the conveyer horizontally, a driving drum at one end of said leads having teeth engaging said links, with an annular groove therebetween and a plurality of separated guiding rolls of small diameter at the opposite end of said leads adapted to bend the conveyer sharply and thereby to separate said gripping members, means for intermittently rotating said driving drum, means for successively delivering blanks to said gripping means when in open position, electrolytic tanks located beneath the leads of said conveyer and adapted to submerge a portion of the ends of said blanks, means for passing an electric current through said blanks and said electrolyte and means for discharging a jet of fluid upon the shaped blanks after they emerge from the electrolyte.

19. A machine for forming double pointed wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions adapted when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each of said extensions having a resilient member adapted to coöperate with an extension of an adjacent link to grip a blank intermediate of the ends thereof when the chain is in straightened position, means for guiding the upper and lower leads of the conveyer horizontally, a driving drum at one end of said leads having teeth engaging said links and a plurality of separated guiding rolls of small diameter at the opposite end of said leads adapted to bend the conveyer sharply and thereby to separate said gripping members, means for intermittently rotating said driving drum consisting of a gear and a cooperating interrupted worm having a portion lying in a plane at right angles to the axis of the drum and an inclined or screw threaded portion forming a continuation thereof, means for rotating the worm shaft, means for successively delivering blanks to said gripping means when in open position, electrolytic tanks located beneath the leads of said conveyer and adapted to submerge a portion of the ends of said blanks, means for passing an electric current through said blanks and said electrolyte and means for discharging a jet of fluid upon the shaped blanks after they emerge from the electrolyte.

20. A machine for forming double pointed wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions adapt-

ed when said chain is straightened to lie in substantial parallelism and when said chain is bent to be pivotally separated, each of said extensions having a resilient member adapted to coöperate with an extension of an adjacent link to grip a blank intermediate of the ends thereof when the chain is in straightened position, means for guiding the upper and lower leads of the conveyer horizontally, a driving drum at one end of said leads having teeth engaging said links and a plurality of separated guiding rolls of small diameter at the opposite end of said leads adapted to bend the conveyer sharply and thereby to separate said gripping members, means for intermittently rotating said driving drum consisting of a gear and a coöperating interrupted worm having a portion lying in a plane at right angles to the axis of the drum and an inclined or screw threaded portion forming a continuation thereof, means for rotating the worm shaft, means for successively delivering blanks to said gripping means when in open position, electrolytic tanks located beneath the leads of said conveyer and adapted to submerge a portion of the ends of said blanks, means for passing an electric current through said blanks and said electrolyte and means for discharging a jet of fluid upon the shaped blanks after they emerge from the electrolyte, means for raising and lowering said tank comprising a bracket secured to said tank, an eccentric rotatably mounted in said bracket and means actuated by said worm shaft for rotating the shaft of said eccentric.

21. A machine for double pointing wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions, the extensions of adjacent links being adapted when the chain is straightened to grip said blanks intermediate of their ends and when said chain is bent to be pivotally separated, means for advancing said conveyer, means for bending a portion of said conveyer sharply to separate successively the gripping members to receive said blanks and means for reducing and pointing each end of each blank located in coöperative relation to said conveyer.

22. A machine for double pointing wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions, the extensions of adjacent links being adapted when the chain is straightened to grip said blanks intermediate of their ends and when said chain is bent to be pivotally separated, means for advancing said conveyer, means for bending a portion of said conveyer sharply to separate successively the gripping members to receive said blanks, means for automatically delivering blanks successively to the opened gripping members and means for reducing and pointing each end of each blank located in coöperative relation to said conveyer.

23. A machine for double pointing wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions, the extensions of adjacent links being adapted when the chain is straightened to grip said blanks intermediate of their ends and when said chain is bent to be pivotally separated, means for intermittently advancing said conveyer, means for bending a portion of said conveyer sharply to separate successively the gripping members to receive said blanks, means for automatically delivering blanks successively to the opened gripping members comprising a chute having a gate located above said bending means, and means for actuating said gate in timed relation with the intermittent advancement of said conveyer to permit the blanks to drop from said chute into said gripping members and means for reducing and pointing each end of each blank located in coöperative relation to said conveyer.

24. A machine for double pointing wire blanks comprising an endless conveyer consisting of a series of pivotally connected links having lateral extensions, the extensions of adjacent links being adapted when the chain is straightened to grip said blanks intermediate of their ends and when said chain is bent to be pivotally separated, means for bending a portion of said conveyer sharply to separate successively the gripping members to receive said blanks, means for automatically delivering blanks successively to said gripping means, manually operable means for stopping the blank feeding means without arresting said conveyer, and means for reducing and pointing each end of each blank located in coöperative relation to said conveyer.

25. A machine for pointing wire blanks comprising an endless conveyer, blank gripping means on said conveyer, means for opening and closing said gripping means to receive and discharge said blanks, means for reducing and pointing the ends of said blanks located in coöperative relation to said conveyer and means for intermittently actuating said conveyer including means for causing the advancement of the conveyer to dwell and thereby permit the insertion of blanks in said gripping means and proper action of the reducing and pointing means.

26. A machine for pointing wire blanks comprising an endless conveyer, blank gripping means on said conveyer, means for opening and closing said gripping means to receive and discharge said blanks, means for reducing and pointing the ends of said blanks located in coöperative relation to said

conveyer and means for intermittently actuating said conveyer including a drum engaging said conveyer, a gear connected to said drum, an interrupted worm engaging said gear comprising a portion disposed in a plane normal to the axis of the worm shaft and a helical continuation of said portion whereby the conveyer is caused to dwell to permit the insertion of blanks in said gripping means and to allow proper action of the reducing and pointing means.

In testimony whereof, I have signed my name to this specification.

MARCUS O. ANTHONY.