A. L. HANSEN.

POINTING MACHINE.

APPLICATION FILED NOV. 25, 1918.

1,318,378.

Patented Oct. 14, 1919.

6 SHEETS—SHEET 1.

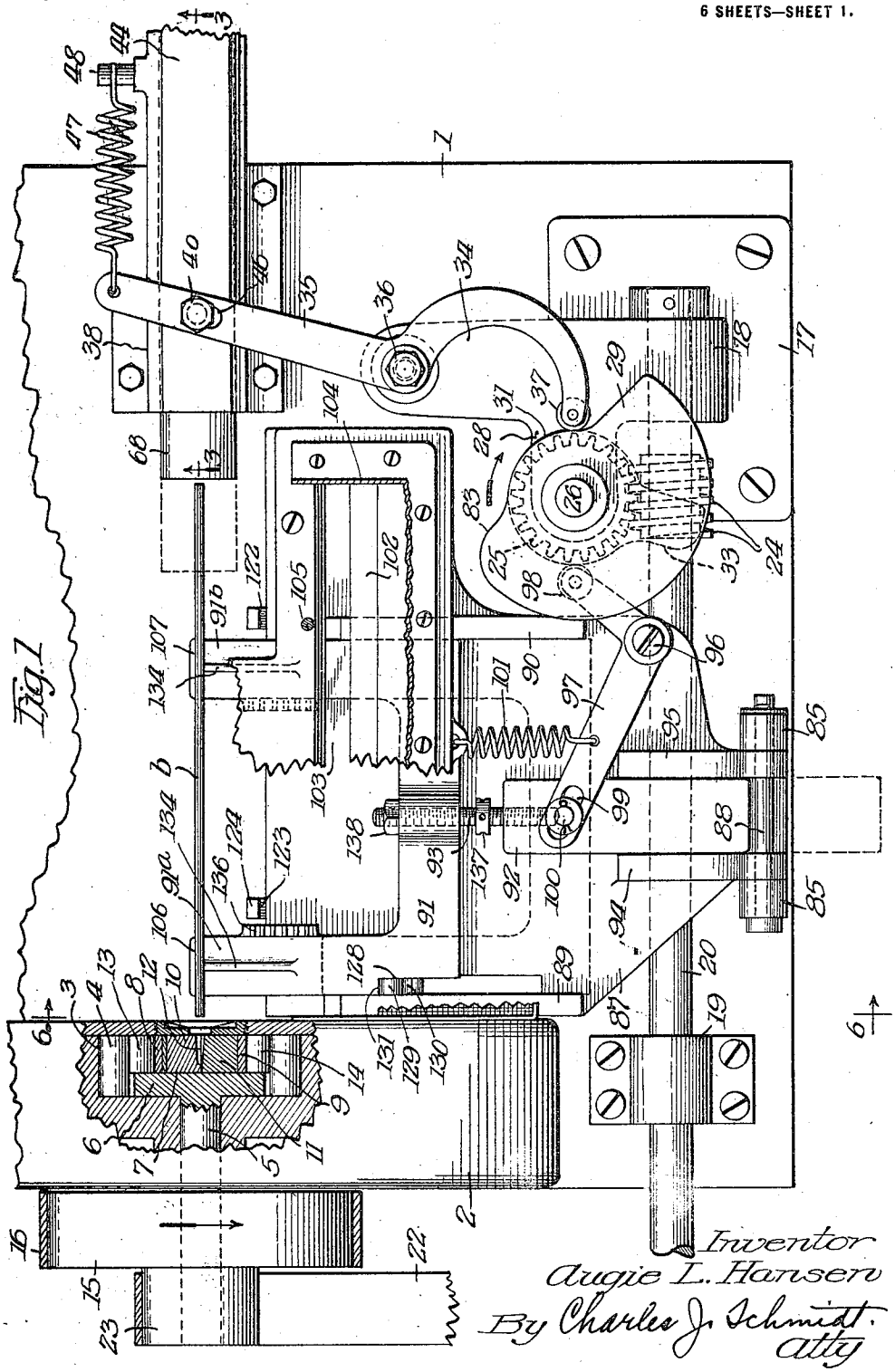


Fig. 1

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6 SHEETS—SHEET 2.

Fig. 2

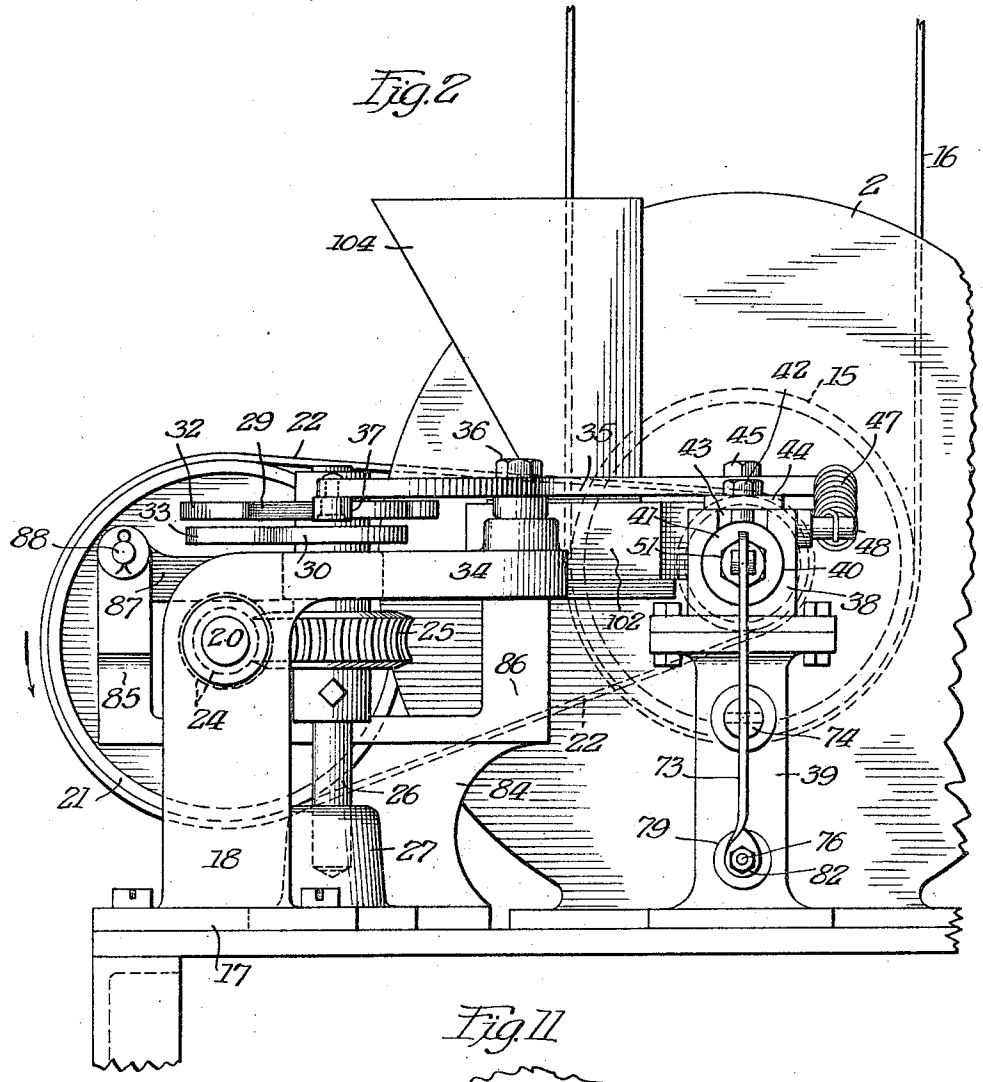
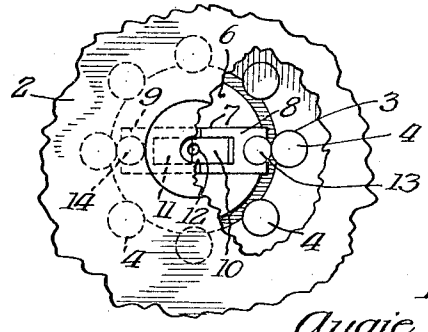


Fig. 11



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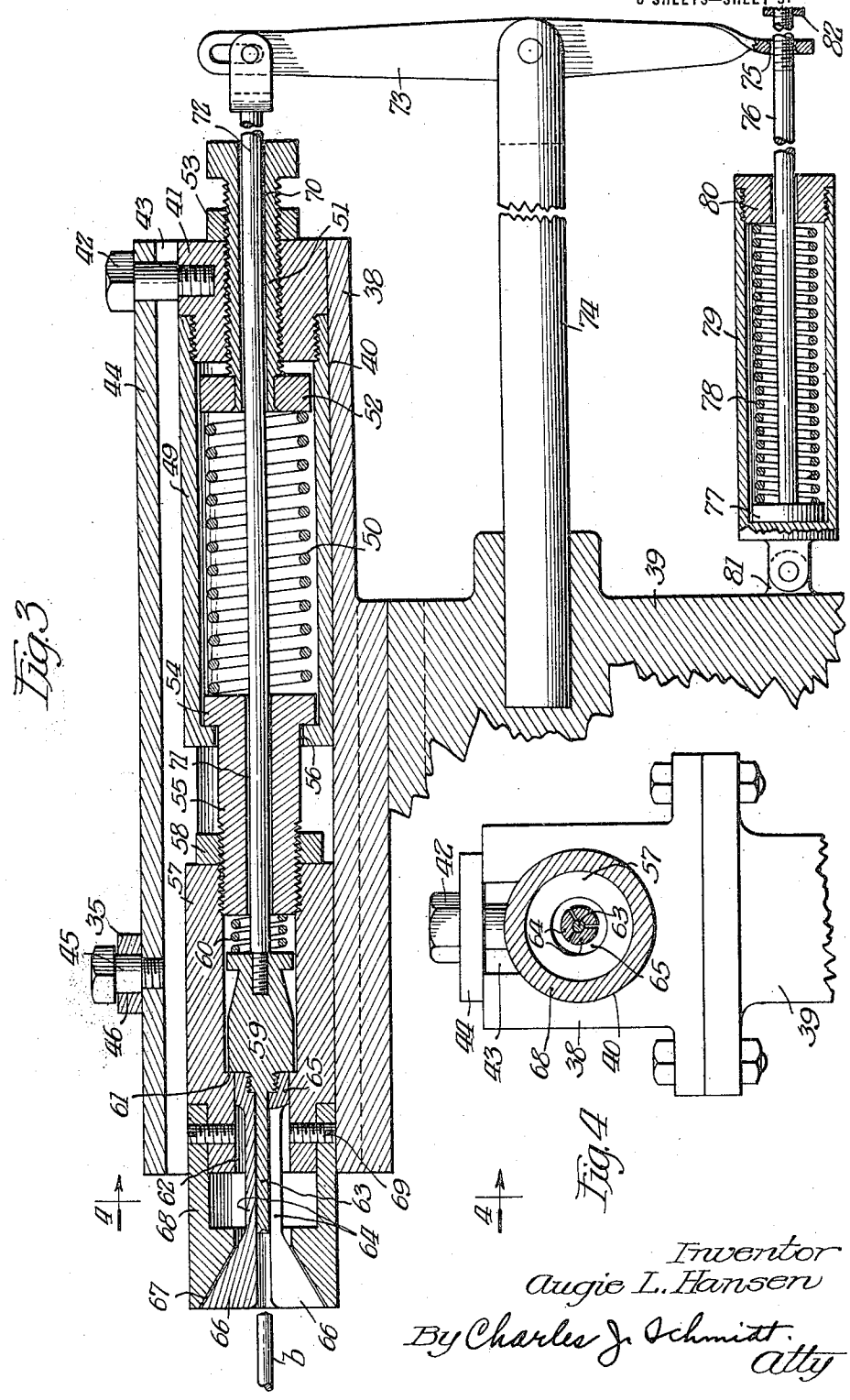


Fig. 3

Fig. 4

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6 SHEETS—SHEET 4.

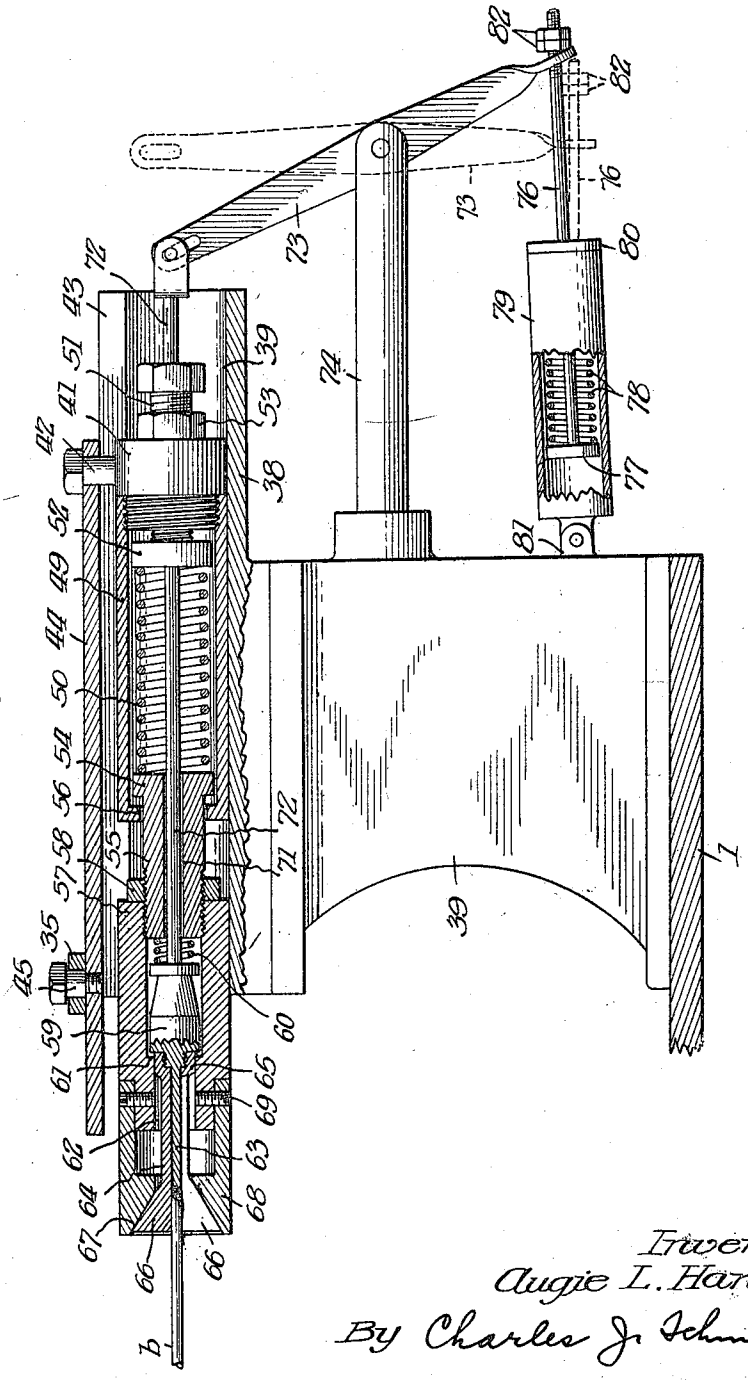


Fig. 5

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6 SHEETS—SHEET 5.

Fig. 8

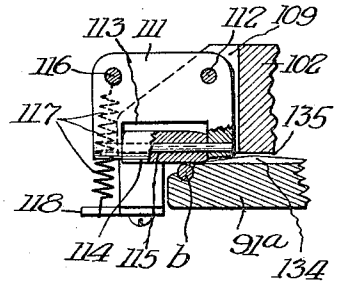


Fig. 6

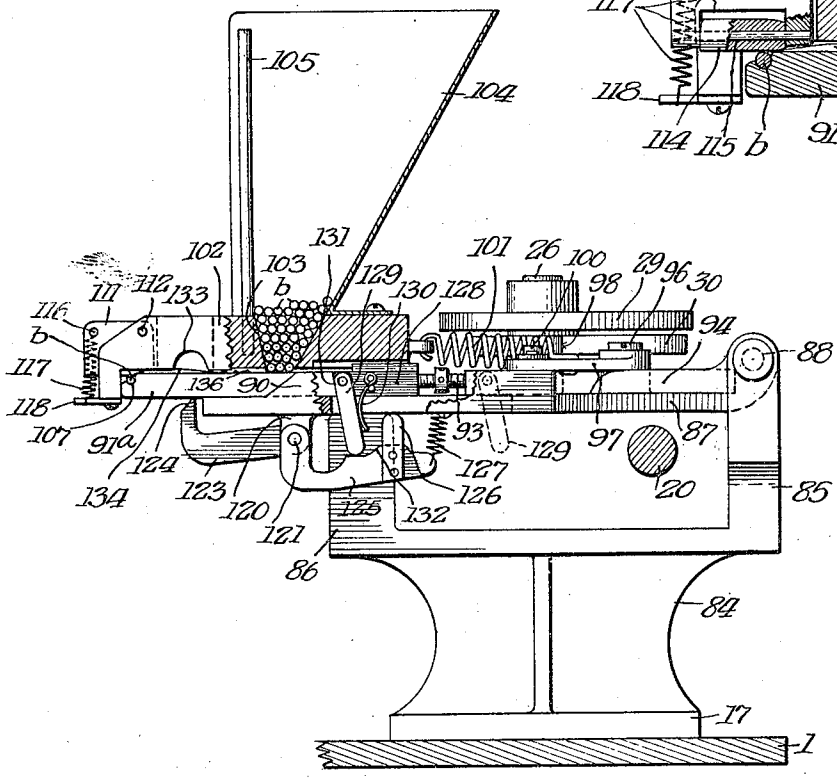
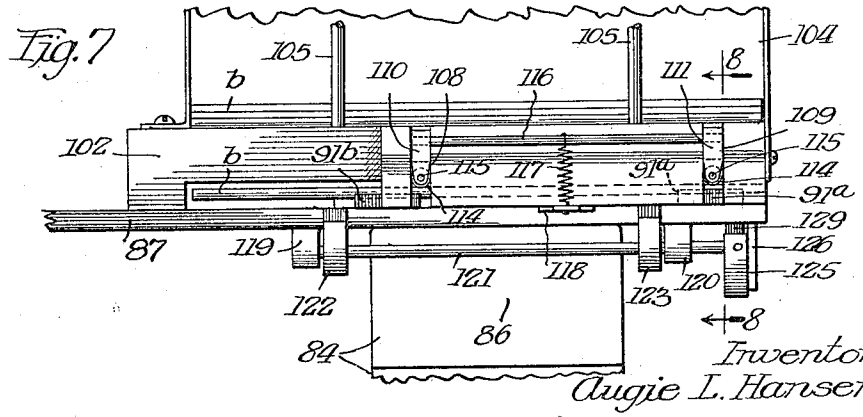


Fig. 7



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6 SHEETS—SHEET 6.

Fig. 9

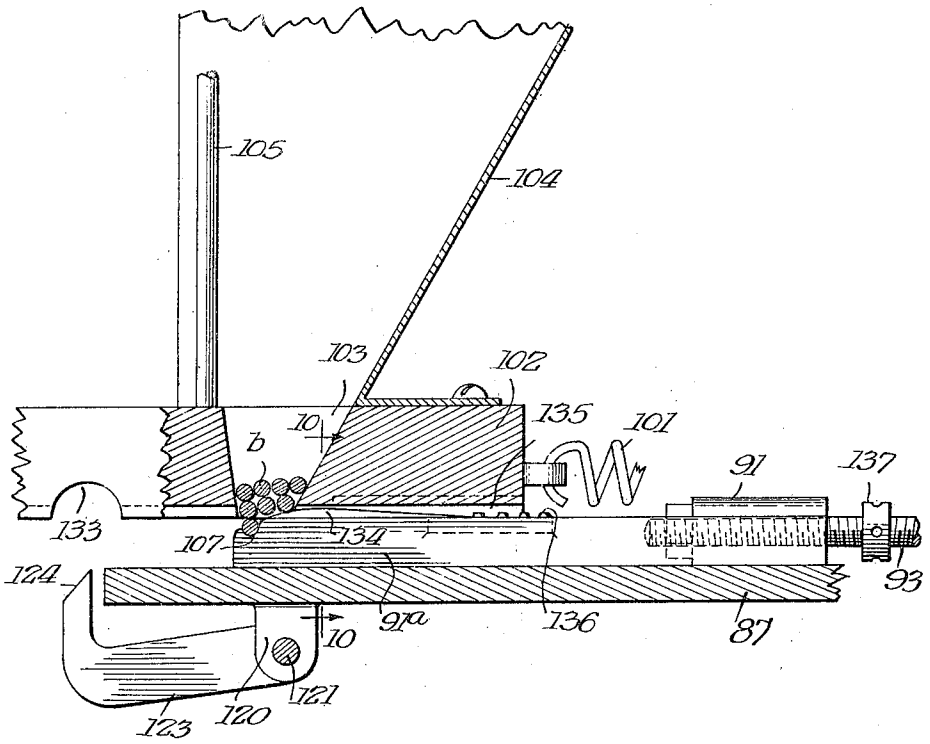
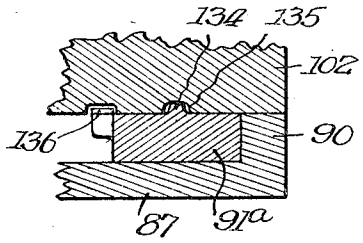


Fig. 10



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UNITED STATES PATENT OFFICE.

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POINTING-MACHINE.

1,318,378. Specification of Letters Patent. Patented Oct. 14, 1919.

Application filed November 25, 1918. Serial No. 263,970.

To all whom it may concern:

Be it known that I, AUGIE L. HANSEN, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pointing-Machines, of which the following is a specification.

My invention relates to pointing machines, particularly to that class in which the ends of wire lengths are tapered, pointed, or otherwise formed by swaging.

The object of my invention is to provide a simple, very efficient attachment for swaging machines which entirely automatically accurately feeds the wires one at a time to the swaging tool, holds the wires rigidly and with uniform pressure during the swaging operation, and then withdraws and delivers the wires. All that is necessary for the operation of the machine is to keep the supply hopper filled with blanks to be pointed.

The various features of my invention are fully disclosed in the following specification and illustrated on the accompanying drawings, in which—

Figure 1 is a plan view with parts broken away to more clearly show the construction and operation,

Fig. 2 is an end elevational view,

Fig. 3 is an enlarged sectional view on plane 3—3, Fig. 1,

Fig. 4 is a sectional view on plane 4—4, Fig. 3,

Fig. 5 is an enlarged sectional view on plane 3—3, Fig. 1, showing another position of the working parts from that shown in Fig. 3,

Fig. 6 is a sectional view on plane 6—6, Fig. 1,

Fig. 7 is a view from the left end of Fig. 6,

Fig. 8 is a sectional view on plane 8—8, Fig. 7,

Fig. 9 is an enlarged sectional view similar to Fig. 6 showing the inner position of the wire blank feeding frame,

Fig. 10 is a sectional view on plane 10—10, Fig. 9, and

Fig. 11 is a front view of the swaging tool with parts broken away.

1 represents the supporting bed of the machine at one side of which is mounted the stationary cylindrical frame 2 of the swaging tool, this frame having the cylindrical central pocket 3 in its front side around which the abutment rollers 4 are journaled parallel with the frame axis. Journaled in the frame axially thereof is the shaft 5 whose inner end supports the head 6 having the diametral slot 7 in whose opposite ends the die frames 8 and 9 are slidably carried, the frame supporting the dies 10 and 11 which form the aperture 12 conforming to the shape of the end desired on the wires, the dies shown being adapted to point wire blanks for forming knitting needles. In the ends of the dies the rollers 13 and 14 are journaled in pockets and extend a distance beyond the die frame outer ends. When the head 6 is rotated the rollers 13 and 14 successively strike the rollers 4 in the frame 2 so that the die frames and dies are rapidly subjected to successive blows which transmitted to the wire end will swage the end to the desired form. At the outer end the shaft 5 has the pulley 15 which is connected by belt 16 with a suitable driving shaft. The mechanism thus far described is well known in the art, and my invention covers an attachment in the form of mechanism for automatically feeding wire blanks, holding them during swaging, and withdrawing and delivering them.

On one side of the bed 1 the framework 17 is secured which affords support and bearing for the various attachment parts. In the standard 18 on frame 17 and in the bearing standard 19 separately attached to the bed 1 is journaled the countershaft 20 which is parallel with the shaft 5 and has at one end the pulley 21 connected by belt 22 with the pulley 23 of the shaft 5. Near the bearing standard 18 a worm 24 is secured to the shaft 20 and meshes with the worm wheel 25 secured to the vertical shaft 26 which is journaled in the step bearing lug 27 and the bearing arm 28 extending from the standard 18. Above the arm 28 the shaft 26 has secured thereto the upper and lower cam disks 29 and 30 respectively. The disk 29 has the cylindrical section 31 extending practically ninety degrees and the spiral section 32. The cam disk 30 has the cylindrical outer surface except for the radial arm 33. At the end of the arm 34 extending forwardly from the top of standard 18 the rock lever 35 is pivoted intermediate its ends by the pin 36. The front section of the

lever is curved as shown and at its end journals the cam roller 37 which coöperates with the surfaces of the cam disk 29. The inner section of the lever 35 is connected with the wire blank gripping and shifting mechanism which will now be described.

At one side of the table 1 and in alinement with the axis of the swaging tool a horizontal guide frame 38 is secured on the top of the supporting standard 39 which is secured on the table 1. As shown in Fig. 2, this guide frame is of rectangular cross section and has the cylindrical passageway 40 extending full length therethrough. Slidable within this passageway is the wire gripping and supporting mechanism whose end block 41 has the stud 42 extending upwardly therefrom through the longitudinal slot 43 in the top of the frame 38, the bar 44 engaging the top of the frame being received at its outer end by the stud 42 and at its inner end has secured to it the stud 45 which engages in the slot 46 in the inner section of the cam lever 35 so that as this cam lever is rocked the head 41 with all parts connected therewith will be reciprocated in the frame 38. A spring 47 connecting between the inner end of the lever 35 and the stud 48 on the frame 38 serves to resist swing of the lever and to hold its cam roller against the cam surfaces.

Secured to the block 41 is the spring barrel 49 for the compression spring 50. Threading axially through the block is the stem 51 whose inner end carries the abutment 52 for one end of the spring, the lock nut 53 locking the stem in any adjusted position. At the other end of the barrel is the abutment head 54 from which the neck 55 extends outwardly through the opening 56 and has its inner end threadedly secured in the outer end of the chuck frame 57, the lock nut 58 securing the connection. Within the chuck frame is the clutch head 59 which normally is held by the compression spring 60 against the shoulder 61 at the inner end of the reduced passageway 62. Extending through this passageway to the outside of the chuck frame is the axial abutment stem 63 which is surrounded by the clutch fingers 64 extending from the base 65 which is threadedly secured to the clutch head 59. The outer ends of the fingers have the conical radial wings 66 which are within the conical mouth 67 of the frame 68 secured to the inner end of the chuck frame by the set screws 69. Normally when the spring 60 holds the clutch head 59 against the shoulder 61 the wing ends of the fingers are clear of the conical walls of the mouth 67 and the fingers are free to spring apart for the entrance of the wire ends, as shown in Fig. 3. When the clutch head is drawn outwardly away from the shoulder the wings engage with the conical mouth sides and the fingers are drawn together to securely clutch the received end of the wire. The stem 51 and the plunger member 55 have axial passageways 70 and 71 respectively through which extends the rod 72 which is secured at its inner end to the clutch head 59. The outer end of the rod is pivoted to the upper end of a lever 73 pivoted at an intermediate point to the end of the post 74 projecting from the standard 39. The lower end of the lever has an eye 75 which receives the rod 76. This rod terminates at its inner end in the abutment head 77 for the compression spring 78 within the barrel 79, the head 80 of the barrel forming the other abutment for the spring. The barrel is pivoted at its inner end on the lug 81 extending from the standard 39. At its outer end the rod 76 has an adjustable abutment 82 for the lever 73. As shown, this abutment is formed by two nuts threading onto the stem.

Figs. 1 and 3 show the normal position of the feeding and holding mechanism, that is, the position just before a wire is to be received, and fed to the swaging mechanism. The wires are fed one at a time into position in axial alinement with the chuck mechanism and the swaging mechanism by feeding mechanism which will be described later. As shown in Figs. 1 and 3, a wire blank *b* is held in such position. The cam 29 rotates in the direction indicated by the arrow, Fig. 1, and while the cylindrical surface 31 is in engagement with the cam roller 37 the lever 35 will not move. However, as soon as the comparatively abrupt approach 83 to the spiral surface 32 encounters the cam roller the lever will be quickly swung and the bar 44 will be drawn inwardly to shift the head 41 inwardly. There being no resistance to the movement of the chuck-frame, the spring 50 will cause the plunger member 55 and the chuck frame 57 to travel with the head 41. As the chuck frame is shifted inwardly the chuck fingers receive between them the adjacent end of the wire *b*, the end of the abutment stem 63 then engaging with the wire end. Up to this time the lever 73 is swung but not sufficiently far to engage with the abutment 82. However, as soon as the end of the stem 63 reaches the wire end the lever 73 will engage the abutment 82 and then during further bodily inward movement of the chuck members swing of the lever 73 will be resisted by the springs 78, the result being that tension is applied to the rod 72 which overcomes the compression of spring 60 and causes the head 59 to be shifted inwardly so that the wing ends of the clutch fingers encounter the conical walls of the mouth 67 and the fingers are forced radially inwardly to securely clutch the wire. As the clutch mechanism moves inwardly the resistance by the

spring 78 is increased and the clutch fingers are drawn more strongly against the wire. Until the other end of the wire enters the die pocket 12 of the swaging mechanism and encounters resistance the spring 50 will not be compressed. Immediately, however, when movement of the wire is resisted, the spring gives and as the movement of the head 41 continues gradually and powerfully while the spiral cam surface 32 is engaged by the cam roller, the spring exerts increasing pressure against the plunger neck 55 and the chuck frame and the wire is gradually but yieldingly forced to the base of the die opening 12, and during its travel through the die opening the end of the wire is quickly swaged into form, the increasing force of the spring 78 during such travel of the wire through the die opening causing the wire to be firmly held against displacement. The wire is not positively forced into the die opening but the spring 50 causes it to be yieldingly but powerfully shifted during the swaging operation until its end has been fully and accurately swaged to form. The clutch fingers are also yieldingly though powerfully held against the wire. This yielding support and shifting of the wire will prevent injury to the working parts should any obstruction be encountered.

After the wire has been fully shifted into the die pocket the cam surface 32 will abruptly leave the cam roller 37 so that the spring 47 acting on the release lever 35 will swing the lever to its normal position and shift the chuck mechanism parts out to their normal position in the frame 38. During the fore part of such outward movement the lever 73 will still be engaged by the abutment 82 and the clutch fingers will maintain their grasp on the wire and the wire will be withdrawn from the swaging mechanism and placed in discharge position on the feeding mechanism. After this is accomplished the lever 73 will leave the abutment 82 and spring 60 will then be free to shift the clutch head inwardly to permit the clutch fingers to spread apart and release the wire. When the clutch mechanism then has been fully returned to its outer normal position the wire will be entirely out of the clutch fingers and the mechanism will be in normal position ready to receive another wire.

The wire blank feeding and supporting mechanism is best shown in Figs. 1, 6, 7 and 9. The standard 84 mounted on the table 1 has the front and rear walls 85 and 86. Supported on the standard 84 is the platform 87. This platform is hinged at its outer end on the pin 88 supported by the wall 85, the platform extending horizontally and normally resting at its front end on top of the wall 86. On its sides the platform has the guide ribs 89 and 90 for guiding the reciprocation of the U-shaped feeding frame 91 on the platform. The U-frame is connected at its yoke with the inner end of the slider plate 92 by means of a threaded rod 93, the slider plate being guided by ribs 94 and 95 on the outer end of the platform. Pivoted at its elbow on the pin 96 on the platform is the L-shaped lever 97. One arm of this lever journals at its end the cam roller 98 which coöperates with the cam 30 on shaft 26. The other end of the lever has the longitudinal slot 99 receiving the pin 100 extending up from the slider plate 92. The slider plate and U-frame 91 are shiftable in a direction at right angles to the axis of the swaging tool. When the cam arm 33 reaches the cam roller 98 the lever 97 is swung to shift the slider plate and U-frame outwardly, and the spring 101 shifts the frames outwardly.

Secured to the platform and bridging over the U-frame 91 is the block 102. This block has the V-shaped slot 103 therethrough over which the hopper 104 is mounted, the wire blanks *b* to be ended being charged into this hopper. Upright posts 105 form the front abutments for the blanks. At their outer ends the arms 91ª and 91ᵇ have their upper corners beveled and there provided with transverse grooves 106 and 107 respectively. As the U-frame 91 is shifted outwardly these grooves will travel below the outlet of the hopper and a wire blank will fall into the grooves and will be carried outwardly into the axial line of the swaging tool and the chuck mechanism. At its inner end the block 102 has the vertical slots 108 and 109 over the path of the arms 91ª and 91ᵇ and in these slots the rectangular plates 110 and 111 are pivoted on pins 112 extending through the inner corners thereof. In the lower end of each plate is the rectangular notch 113 in which a roller 114 is journaled on a pin 115. The inner end of the roller is slightly tapered so that a blank on the end of the U-frame arms can readily be carried under the rollers (Fig. 8). A rod 116 extends through the upper outer corners of the blocks and a spring 117 connects between this rod and the bracket 118 stationarily secured to the outer end of the block. When the U-frame 91 is at the inner end of its path preparatory to picking up a blank, the blocks 110 and 111 are swung downwardly a short distance by the spring 117 with their inner lower corners abutting against the rear walls of the slots 108 and 109. When the frame 91 is shifted outwardly its arms carry the received blank underneath the rollers 115 and raise the roller supporting blocks against the tension of spring 117, the pressure exerted on the blank causing it to be securely held in the axial line of the swaging tool and in position to be accu-

rately received by the chuck mechanism and shifted into the swaging mechanism thereby. After the finished blank is withdrawn from the swaging mechanism it is still held on the U-frame 91 and when the cam 30 coöperates with the lever 97 the frame is shifted inwardly. During such inward shift the finished blank is discharged from the frame 91. This discharging mechanism is clearly shown in Figs. 6, 7 and 9. The lugs 119 and 120 extending downwardly near the outer end of the platform 87 journal a shaft 121 on which are secured the dogs or discharge levers 122 and 123. The dogs have the beveled ends 124 which are adapted to be projected into the path of the finished blanks during inward movement of the frame 91. At one end of the shaft 121 is secured the L-shaped lever 125 whose stop extension 126 is normally held by spring 127 against the under side of the platform 87. The frame 91 has the notch 128 at one side thereof in which a cam arm 129 is pivoted at its upper end to extend downwardly above the lever 125, the spring 130 tending to swing the lever against the outer wall 131 of the slot. When the U-frame 91 is at the inner end of its path the cam arm 129 will be in advance of the lever 125, as shown in dotted lines Fig. 6. The lever 125 has the cam projection or bump 132 on its upper edge and as the frame 91 is shifted outwardly the cam arm will drag over this cam projection and the lever 125 will not be rotated. However, during inward movement of the frame 91 the cam arm 129 will be prevented from rotating by the abutment 131, and when it engages with the cam projection 132 the lever 125 will be rotated and with it the shaft 121 to swing the dogs 122 and 123 upwardly to project their beveled ends 124 into the path of the blank so that the blank is lifted out of the grooves 106 and 107 and discharged into a suitable receptacle. To permit the blanks to be lifted out of the grooves the block 102 has the channel 133 in its under side over the path of the discharging dogs, as clearly shown in Figs. 6 and 9.

When a handful of wire blanks is charged into the hopper the wires will not always assume parallel positions and may become wedged together at the hopper outlet. Provision is therefore made to loosen up, agitate and accurately arrange the blanks at the lower end of the hopper so that proper feeding of blanks to the frame 91 will result. As best shown in Figs. 9 and 10, the arms 91^a and 91^b have the gradually inclined longitudinal ridges 134 at their ends just behind the blank receiving grooves, and the block 102 has transverse grooves 135 in its lower side for accommodating these ridges. As the blank supporting arms travel below the hopper outlet one of the blanks falls into the arm grooves and then the ridges 134 engage with the lowermost blanks in the hopper and slightly raise them and also prevent the escape of more than one blank to the supporting arm grooves. Each blank supporting arm has also a row of agitating projections 136 which are located a distance inwardly from the arm end and project a short distance above the arm top. These agitating projections travel below the hopper after passage of the ridges 134 thereunder, the projections engaging with the blanks and shaking and agitating them. Engagement of the ridges and projections on the blank supporting arms will therefore cause the blanks within the hoppers to become well loosened from each other and arranged in parallelism so that they can accurately escape one at a time from the hopper to the notches in the supporting arms. The blanks are shifted and agitated both during the outer and inner movements of the frame 91.

As the outward movement of the frame 91 is caused by the spring 101 such outward movement is yielding and should there be any obstruction to the outward movement of the frame and to the wire blank receiving operation, no injury will result. In order to assure outward movement of the frame 91 into position to accurately fit around a received blank in the axis of the swaging tool and the chuck mechanism, the rod 93 has preferably left and right threads engaging respectively with the frame 91 and the slider plate 92, the nut 137 enabling the rod to be readily turned. After adjustment the lock nut 138 secures the rod against turning.

I thus provide simple and very efficient mechanism for entirely automatically feeding wire blanks into swaging mechanism. Practically all the attendance the machine requires is keeping the hopper filled with wire blanks. Where the blanks are to have both ends formed, as for knitting needles, the blanks after formation of one end are again charged into the hopper to have the other ends formed. By referring to Fig. 3 it will be noted that the outer end of the chuck stem 63 is concaved to receive and protect the first point formed on the blanks.

Having described my invention, I claim as follows:

1. The combination with point forming mechanism, of a hopper for blanks to be formed, feed mechanism for successively receiving blanks from the hopper and feeding and supporting them in position in front of said forming mechanism, chuck mechanism and means for shifting it, means controlled after part movement of said chuck mechanism to cause a blank to be received and grasped at one end, further movement of said chuck mechanism causing said blank

to be shifted along said feed mechanism and inserted at its other end in said forming mechanism.

2. In a machine of the class described, the combination of point forming mechanism, feed mechanism for feeding wire blanks one at a time and supporting them in position in front of said forming mechanism, and chuck mechanism operated to grasp a blank at one end and shift it along the feed mechanism with its other end in the forming mechanism and to withdraw the formed blank and return it to normal position on said feeding mechanism, and means for discharging the finished blanks from the feeding mechanism.

3. In a machine of the class described, the combination of point forming mechanism, a guide frame in axial alinement with said forming mechanism, means for feeding a wire blank between said forming mechanism and guide frame in axial alinement therewith, a head in said frame, means for shifting said head, a chuck frame in advance of said head, yielding means connecting said chuck frame and head, chuck jaws in said chuck frame, said chuck jaws being normally open to receive one end of the wire blank when said head is shifted a distance in said guide frame, means for closing said jaws to grasp the wire after such primary movement of the head, further movement of said head causing the grasped wire to be yieldingly shifted toward and into said forming mechanism.

4. In a machine of the class described, the combination of end forming mechanism, a guide frame, means for shifting a wire blank between said guide frame and forming mechanism, a head in said guide frame, means for reciprocating said head in said frame, a chuck frame in advance of said head, yielding mechanism connecting said head and chuck frame, chuck jaws in said chuck frame, means normally holding said jaws apart, said open jaws receiving one end of the wire blank during primary movement of said head within said guide frame, means for closing said jaws after such primary movement of the head, further movement of said head within said guide frame causing said chuck frame to be shifted to cause the clamped wire blank to be shifted along the feeding mechanism and with its other end into the forming mechanism, return movement of said head within said guide frame causing said wire blank to be withdrawn from the forming mechanism and restored to normal position on said feeding mechanism, said clutch jaws being released during the latter part of the return movement of said head whereby to release the formed blank.

5. In a machine of the class described, the combination of end forming mechanism, feeding mechanism for successively feeding wire blanks into position in front of said forming mechanism, a guide frame, a chuck frame shiftable in said guide frame, clutch fingers within said clutch frame having wedge ends, said clutch frame having a conical mouth receiving said wedge ends, means tending to hold the wedge ends of said clutch fingers away from said mouth to permit said fingers to open to receive a blank, means for yieldingly shifting said clutch frame toward said forming mechanism, said clutch fingers receiving the end of said wire blank during the primary movement of said clutch frame, means for drawing said fingers inwardly after primary movement of the clutch frame whereby the wedge ends of said fingers coöperate with said conical mouth to be closed to clamp the received blank, further movement of said clutch frame causing the grasped blank to be shifted on said feeding mechanism and inserted with its other end into the forming mechanism, return movement of the clutch frame causing the formed blank to be withdrawn from the forming mechanism and released from the clutch frame.

6. In a machine of the class described, the combination of end forming mechanism, means for successively feeding wire blanks into position in front of said forming mechanism, a guide frame, a clutch frame within said guide frame, means for reciprocating said clutch frame in said guide frame, said clutch frame having a conical mouth, clutch fingers within said clutch frame having wedge ends for coöperating with said conical mouth, yielding means tending to shift said clutch fingers outwardly with their ends away from said conical mouth to permit opening of the fingers to receive a wire blank when the clutch frame is shifted toward said forming mechanism, yielding means effective after primary movement of said clutch frame to resist the movement of the clutch fingers therewith whereby said finger ends coöperate with said conical mouth to clamp the received wire blank, continued movement of said clutch frame causing the clamped blank to be inserted at its other end into the forming mechanism.

7. In a machine of the class described, the combination of swaging mechanism, chuck mechanism in alinement with said swaging mechanism, feeding mechanism for feeding wire blanks one at a time into position between said chuck mechanism and swaging mechanism, means for shifting said chuck mechanism toward the swaging mechanism, means operative during initial movement of said chuck mechanism to receive and to clamp the adjacent end of a wire blank whereby said blank will then be shifted with its other end into said swaging mechanism, return movement of said

chuck mechanism causing the formed blank to be withdrawn to normal position on said feeding mechanism, and means for discharging the formed blank from said feeding mechanism.

8. In a machine of the class described, the combination of end forming mechanism, chuck mechanism, feeding mechanism for feeding wire blanks one at a time into position between said forming mechanism and chuck mechanism, means for actuating said chuck mechanism to receive and clamp the adjacent end of a blank and to shift it with its other end into the forming mechanism, and means on said feeding mechanism for guiding the blank during shifting thereof by the chuck mechanism.

9. In a machine of the class described, the combination of end forming mechanism, chuck mechanism, feeding mechanism for feeding wire blanks one at a time into position between said forming mechanism and chuck mechanism, means for operating said chuck mechanism to receive and clamp the adjacent end of a wire blank and to shift it with its other end into the forming mechanism and to withdraw and release it after the forming operation, said feeding mechanism forming a support and guide for the wire blank during shifting, forming and withdrawing thereof, and means for discharging the finished blank from the feeding mechanism.

10. In a machine of the class described the combination of swaging mechanism, chuck mechanism, supporting mechanism for supporting blanks between said swaging mechanism and chuck mechanism, means for operating said chuck mechanism to grasp a blank and shift it into the swaging mechanism, said supporting mechanism supporting said blank during the entire swaging operation.

11. In a machine of the class described, the combination of point forming mechanism, chuck mechanism, supporting mechanism having spring jaws, means for feeding blanks to be pointed to said jaws, and means for operating said clutch mechanism to grasp a blank and to shift it along said spring jaws and into said point forming mechanism.

12. In a machine of the class described, the combination of point forming mechanism, a chuck, means for operating said chuck to grasp a blank and shift it into said point forming mechanism and then to return it after the pointing operation, spring jaw members adapted to support a blank during the entire operation of said chuck, and means for discharging blank from said jaws.

13. In a machine of the class described, the combination of forming mechanism, means for feeding blanks in front of said forming mechanism, a guide frame, a head reciprocable in said guide frame, a clutch frame, a yielding connection between said clutch frame and head, clutch fingers in said frame for receiving blanks as the clutch frame is shifted outwardly, and means for holding back on said clutch fingers with increasing tension during outward movement of the clutch frame, whereby said blanks will be clutched with increasing force as the clutch frame is shifted outwardly.

14. In a machine of the class described, the combination of forming mechanism, means for feeding blanks in front of said forming mechanism, a clutch frame having a conical pocket in its front end, means for shifting said frame toward said forming mechanism, clutch fingers engaging in said conical end of the clutch frame, said clutch fingers receiving between them a blank as said clutch frame is shifted toward the forming mechanism, and means for increasingly resisting the movement of said clutch fingers as said clutch frame is shifted whereby a blank will be held with increasing pressure as the clutch frame is shifted.

15. In a machine of the class described, the combination of forming mechanism, means for supporting a blank in front of said forming mechanism, clutch mechanism for receiving and shifting said blank into said forming mechanism, and means for increasing the clutching engagement of said clutching mechanism with said blank as said blank is shifted into the forming mechanism.

In witness whereof, I hereunto subscribe my name this 20th day of November, A. D., 1918.

AUGIE L. HANSEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."