A. W. BARTLETT.

PIN MACHINE.

APPLICATION FILED JAN. 11, 1909.

929,184.

Patented July 27, 1909.

2 SHEETS—SHEET 1.

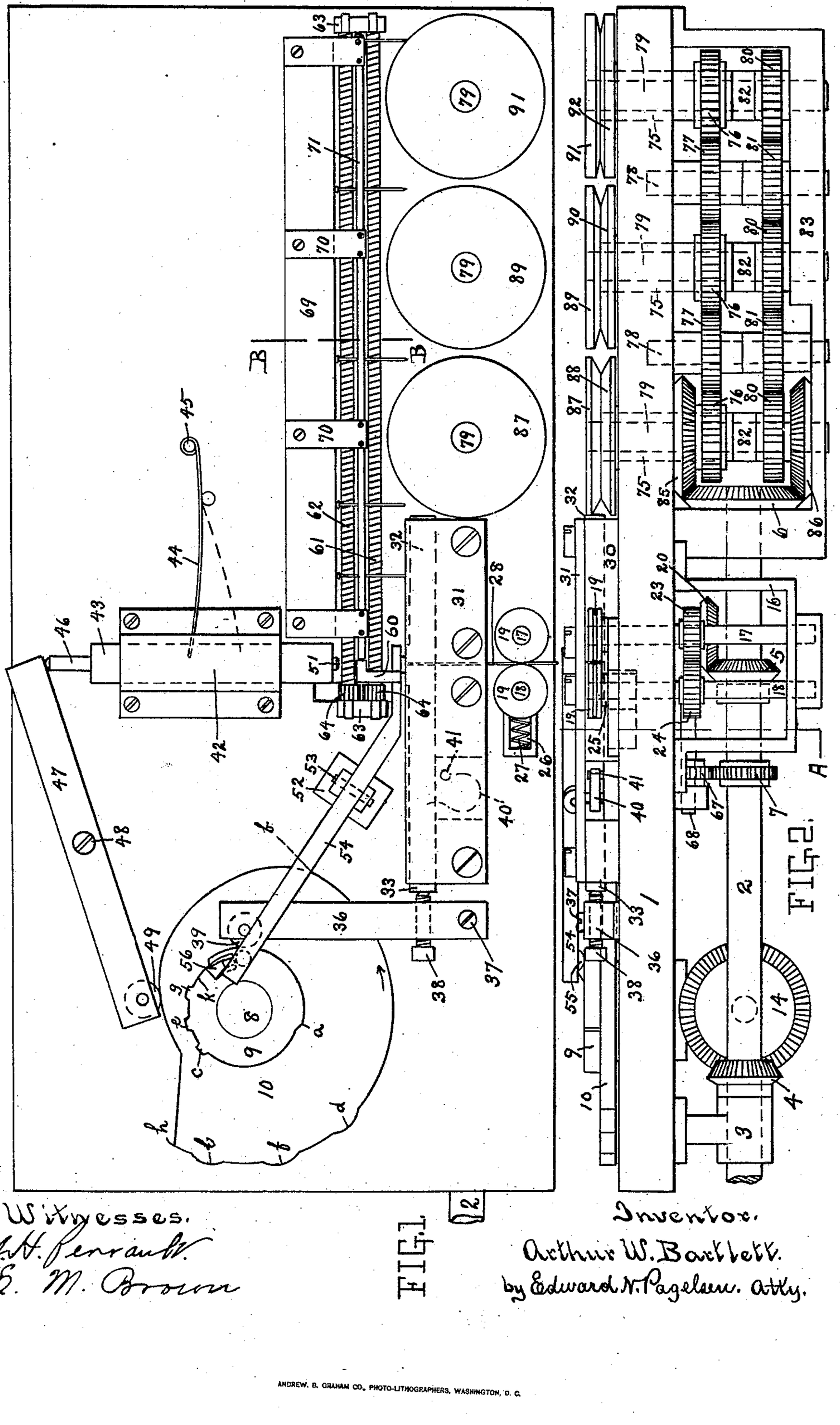

FIG. 2.

FIG. 1.

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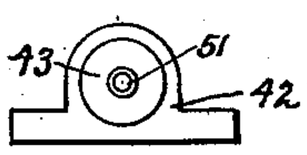


FIG.3.

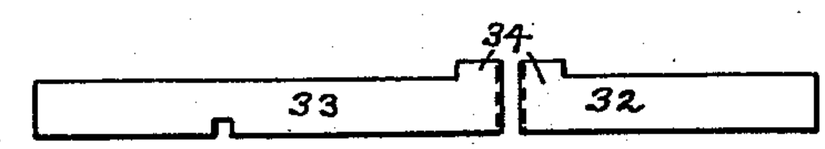


FIG.4.

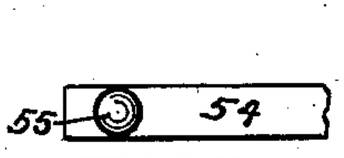
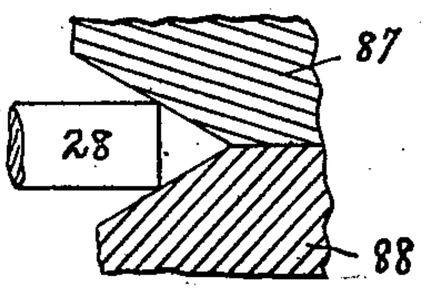
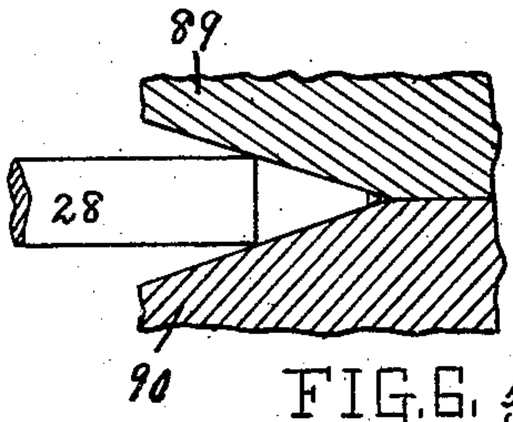
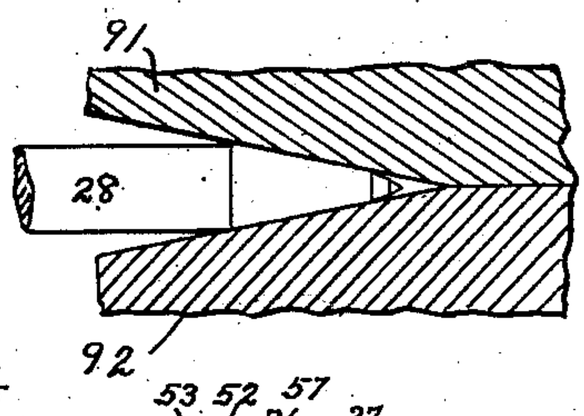


FIG.5.







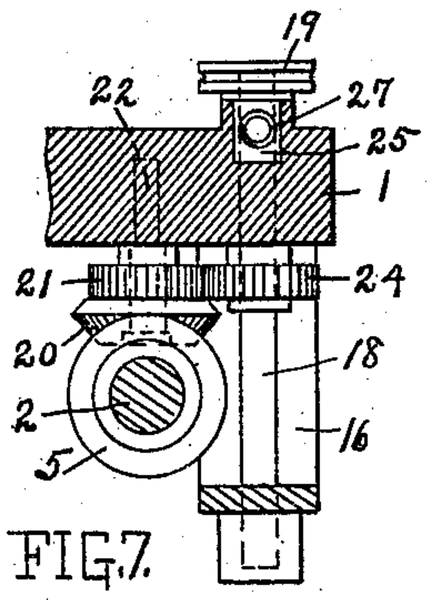


FIG.7.

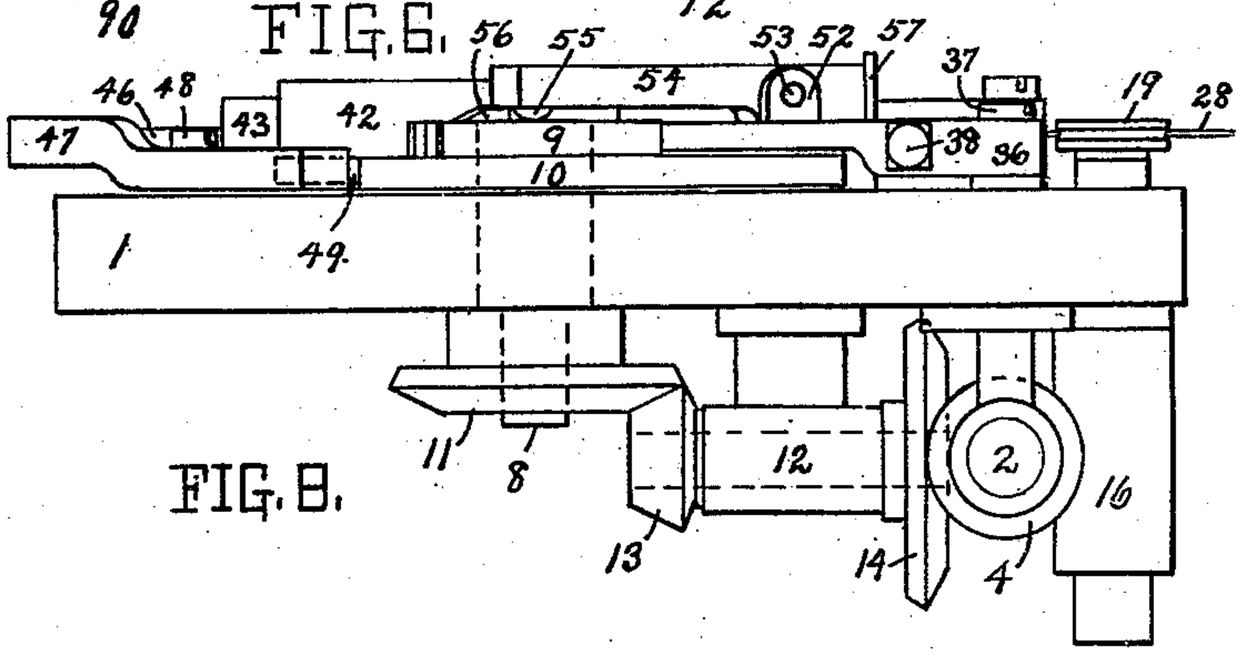


FIG.8.

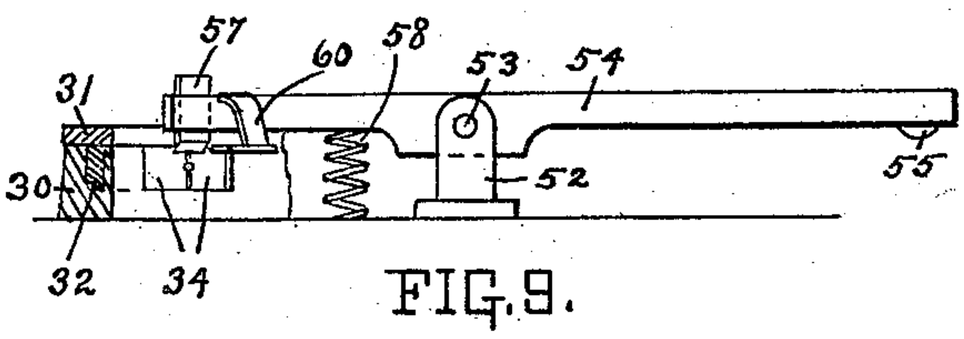


FIG.9.

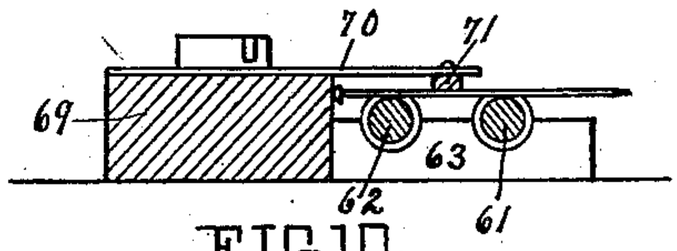


FIG.10.

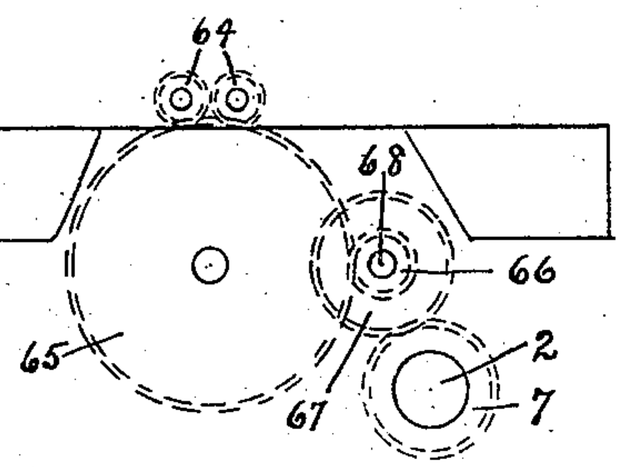


FIG.11.

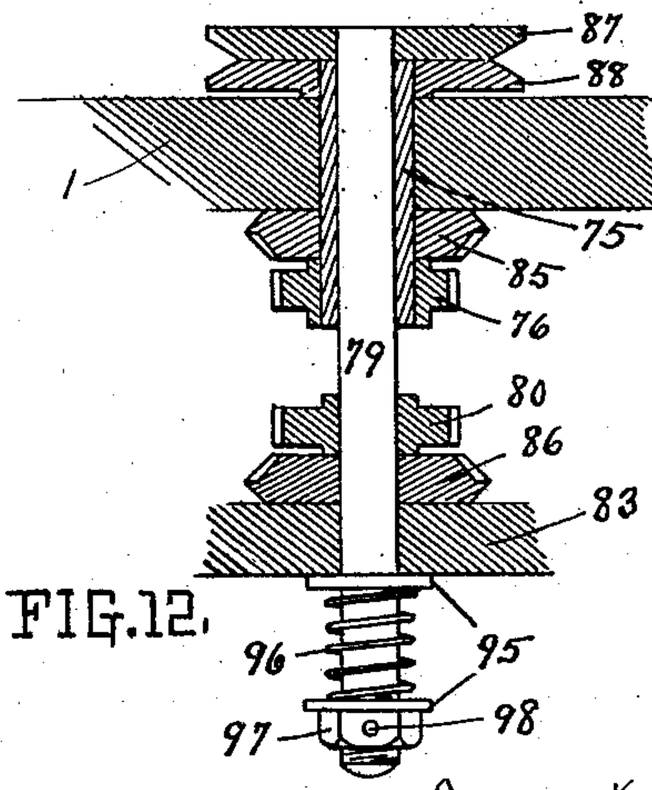


FIG.12.

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UNITED STATES PATENT OFFICE.

ARTHUR W. BARTLETT, OF DETROIT, MICHIGAN.

PIN-MACHINE.

No. 929,184. Specification of Letters Patent. Patented July 27, 1909.

Application filed January 11, 1909. Serial No. 471,587.

To all whom it may concern:

Be it known that I, ARTHUR W. BARTLETT, a subject of the King of Great Britain, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Pin-Machine, of which the following is a specification.

This invention relates to machines for making pins from metal wire, and its object is to provide a machine which shall be simple and effective, and in the operation of which there shall be no loss of pin material.

My invention consists in a head forming device and a shear to cut off the wire after the head has been formed on one end of it, in combination with a series of pairs of disks for forming points on the pin blanks, the disk of each pair revolving in opposite directions, and a conveying apparatus to carry the pin blanks to the pairs of disks in succession.

It further consists in combination with a shear, a heading device and a conveyer, of a series of pairs of disks, the disks of each pair revolving in opposite directions, each pair of disks being beveled along their adjacent edges, and the angle between these edges being less in each succeeding pair of disks.

In the accompanying drawings, Figure 1 is a plan and Fig. 2 a side view of the pin forming mechanism. Fig. 3 is an end view of the heading-plunger and its guide. Fig. 4 is a view of the heading dies. Fig. 5 is a view of the bottom of one end of the shear lever. Fig. 6 is an illustrative view on a large scale, showing the operation of the different rolling disks. Fig. 7 is a vertical cross section of the wire feeding device on the line A of Fig. 2. Fig. 8 is an end view of the device taken from the left in Figs. 1 and 2. Fig. 9 is a view of the shear lever. Fig. 10 is a vertical cross section of the feeding device on the line B—B of Fig. 1 on a larger scale. Fig. 11 is a diagrammatic view of the driving mechanism for the conveyer. Fig. 12 is a vertical cross section of a pair of pin rolling disks and the driving mechanism therefor, showing a modified construction in the form of a tension device.

Similar reference characters refer to like parts throughout the several views.

Pins are usually made by first forming the head on the end of a piece of wire, then cutting off the wire to a proper length thus forming a pin blank, and then forming a point thereon by a series of cutting tools, each tool forming a more acute angle with the body of the pin blank than the preceding. These cutting tools require great care and attention as they become dull and get out of adjustment. In my present invention I have substituted a device for rolling the point of the pin instead of cutting it, thus saving the material thus wasted. I have also produced a novel heading device and feeding means between the header and point rolling devices.

In the drawings 1 is a flat table in the form of a rectangular plate on which all the other parts of the machine are mounted. Any desirable means may be employed to support this table. A driving shaft 2 extends beneath the table and is supported by any desirable bearings, such as 3, and has secured to it the beveled gears 4, 5 and 6 and a spur gear 7 to drive the various parts. Vertically mounted in the table is a short revoluble shaft 8 which has secured to it at its upper end the cams 9 and 10, and on its lower end of a gear 11 (see Fig. 8). A bearing 12 carries a short shaft, upon the ends of which are secured the bevel gear 13, which meshes with the gear 11, and the gear 14 which meshes with the gear 4 on the main shaft.

Vertically mounted in the table and the bracket 16 are two revoluble shafts 17 and 18, having at the upper ends the grooved feed rolls 19. The bevel gear 5 on the shaft 2 meshes with the bevel gear 20 which, together with the spur gear 21 rigid therewith, is loosely mounted upon a pin 22 carried by the table 1, as shown in Fig. 7. The spur gear 23 which is secured to the shaft 17 meshes with the spur gear 21 and with the spur gear 24 upon the shaft 18. The shaft 17 is mounted in stationary bearings. The upper end of the shaft 18 is revoluble in the bearing 25 which is mounted on the groove 26 in the table where a spring 27 presses the upper end of the shaft 18 toward the upper end of the shaft 17. The movement is but a few thousandths of an inch which has no effect on the lower bearing of the shaft. As a result these grooved rollers 19 will grip the pin wire 28 sufficiently to feed it forward to the heading device at sufficient rate, but will not grip sufficiently firm to bend the wire when its movement is obstructed.

Mounted on the table in the slotted block

30 and held in place by the plate 31 is a rigid die 32 and a movable die 33. These parts are provided with laterally projecting portions 34 that extend flush with the face to the block 30 as shown in Figs. 1 and 9. The adjacent ends of the two dies 32 and 33 are grooved as shown in Figs. 4 and 9 so that they may firmly grip the pin wire. A spring 40 on a pin 41 in a slot in the block 30 as shown in Figs. 1 and 2 tends to separate the dies to release the pin wire. A lever 36 is mounted at one end on the pin 37 and carries a screw 38 which contacts with the die 33 as shown in Fig. 1. The opposite end of this lever carries a roller 39 which contacts with the cam 9 and is held against the cam by the spring 40.

The heading device is formed by a guide 42 in which a plunger 43 is freely slidable. A spring 44 mounted on the pin 45 is adapted to move the plunger to the rear. A pin 46 at the rear end of the plunger contacts with the lever 47, which is mounted on the pin 48. A roller 49 on the lever 47 engages the edge of the cam 10. A hard steel, cupped, heading-tool 51 is mounted in the front end of the plunger 43.

After the wire has been formed with a head it is cut off by means of the following device. A bracket 52 carries a pin 53, upon which is mounted the lever 54, on the rear end of which is a rounded projection 55 adapted to be engaged by the cam shoulder 56 on the upper side of the cam 9. On the opposite end of the lever, as shown in Fig. 9, is a shear blade 57 which passes down in close contact with the projecting portions 34 of the dies. A spring 58 is adapted to return the lever. The action of these parts is as follows, referring to Fig. 1.

With the parts in the position shown, the dies grip the wire and continue to do so until the point *a* on the cam 9 passes the roller 39. During this time the cam 10 has moved along until the point *p* passes the roller 49 which brings the header tool 51 to about one thirty-second of an inch from the face of the dies. As the point *a* of the cam 9 passes the roller 39, the dies release the wire, permitting the rolls 19 to feed it forward against the header. When the projection *c* reaches the roller 39, the dies again grip the wire to prevent it from slipping back and at the same time the projection *d* on the cam 10 forces the header against the dies, upsetting the end of the wire into a small head. After the projections *c*, and *d* pass the rollers 39 and 49, the header 51 retreats one thirty-second of an inch and the wire is released by the dies so that the rollers 19 can feed the wire that distance. Immediately afterward the projection *e* on the cam 9 causes the dies to grip the wire and at the same time the projection *f* on the cam 10 forces the heading tool against it thus causing the pin head to grow. The projections *g* and *l* complete this process and the head is of the proper size. By these means a head of any desirable size may be formed. The distances the projections *d*, *f*, and *l* extend beyond the normal periphery of the cam 10 determining the amount of metal in the head. The number of blows by the header can be varied as desired by varying the number of projections on the cams 9 and 10.

After the last blow of the header, the corner *h* passes the wheel 49 and the header retreats. At the same time the low portion *k* of the cam 9 permits the dies to release the wire whereupon the rollers 19 move the wire to follow the heading tool 51. At about the time that the header has reached its rearward position the cam lug 56 on the cam 9 forces the shear member 57 down which cuts off the wire. Secured to the lever 54 near the cutter is an arm 60, shown in Figs. 1 and 9. As the pin blank is sheared off this arm presses the blank down onto the feed screws 61 and 62.

Mounted in the bearings 63 are two screws each of which is driven by a gear 64 which meshes with the gear 65 as shown in Fig. 11. This gear 65 meshes with the gear 66, which together with the gear 67 is secured to a counter-shaft 68. The gear 67 meshes with the gear 7 on the main shaft 2. A support 69 on the plate 1 carries brackets 70, which brackets support the guide rod 71, as shown in Fig. 10, which guide rod extends between the screws 61 and 62. When the arm 60 presses down the pin blank after it has been sheared, the blank will lie in the screw grooves of the screws 61 and 62 as shown in Fig. 10. The screws will pull the pin blanks to the right (Fig. 1) and immediately they will pass under the guide rod 71 and be held in position by the same, the head ends contacting with the support 69, being held there by the friction between the blanks and the screws 61 and 62, in which position the blanks will pass the forming disks.

Revolubly mounted in the table 1 are a series of vertical sleeves 75. At the lower ends of these sleeves are gears 76 which connect to each other by means of gears 77 loosely mounted on pins 78. Within these sleeves 75 are the shafts 79 on which are mounted the gears 80, which gears in turn are again connected by the gears 81 on the pins 78. The gears 76 and 80 are separated by collars 82. A bracket 83 supports the lower ends of these shafts and pins, and also furnishes a bearing for one end of the driving shaft 2. On this end of the driving shaft is the bevel gear 6 which meshes with the bevel gear 85 secured to one sleeve 75, and with the bevel gear 86 secured to a shaft 79, all as shown in Fig. 2. To the shafts 79 are attached the disks 87, 89 and 91 while to the sleeves 75

are attached the disks 88, 90 and 92. These disks are preferably of hardened steel. These disks contact with each other with the exception of at the edges. These edges are beveled as shown in Figs. 2 and 6 and the angle between these edges decreases with each successive pair that the pin blanks pass. By means of the gears shown in Fig. 2 the disks of each pair revolve in opposite directions. As the pin blanks pass between the edges of the successive pairs points are rolled onto the same as illustrated in Fig. 6. The cones formed by the disks 87 and 88 are comparatively blunt but are as sharp as practicable for the pin material employed. Attempts to form the sharp cones resulted in the splitting of the points of the pins. The angle between the edges of the disks 89 and 90 is more acute and the action of these disks it to form a sharper cone on the pin. It was also found that the action of the disks formed a better point when a small portion of the original cone was retained, as shown in the second portion of Fig. 6. The edges of the pair of disks are again at a more acute angle and the point of the pin is thereby completed. The number of these pairs of disks may be varied as desired, it being apparent that steel wire will require a larger number than soft brass wire for the pointing operations. It will also require a larger number of pairs of disks where the point is to be very finely finshed and of great length. But disks of the same type will be employed and whatever style of gear used to drive them, the disks should always run in opposite directions.

In order to provide the proper adjustment between the disks of each pair the device shown in Fig. 12 may be employed. The shafts 79 are made of sufficient length to pass through the bracket 83 to receive washers 95, springs 96 and nuts 97 which are held from turning by the pins 98. As the disks 88 rest on the table 1, they are practically stationary and therefore the pressure between the disks will be that exerted by the springs 96. Any other desirable means for providing a tension between the disks may be substituted for that shown. When this construction is employed the collar 82 may be omitted.

The details of this construction may all be radically changed by those skilled in the art without departing from the spirit of my invention. What I claim and desire to secure by Letters Patent is:—

1. In a machine for pointing pins, the combination of elements for pointing by rolling the pin blanks and having their operating surfaces at an angle to each other, and a second set of elements for pointing by rolling having their operating surfaces at a more acute angle to each other.

2. In a machine for pointing pins, the combination of elements for pointing by rolling the pin blanks and having their operating surfaces at an angle to each other, a second set of elements for pointing by rolling having their operating surfaces at a more acute angle to each other, and means for conveying the pin blanks to the first forming devices and thence to the second forming devices.

3. In a pin machine, the combination of a pair of disks having their adjacent edges beveled, and revolving in opposite directions, and a conveyer for so carrying pin blanks that their points will enter the groove between the edges of the disks.

4. In a pin machine, the combination of a series of pairs of disks having their adjacent edges beveled, the disks of each pair revolving in opposite directions, the angle of the groove between the edges of one pair being more acute than that of the preceding pair, and a conveyer for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of disks in succession.

5. In a pin machine, the combination of a pair of disks having their adjacent edges beveled, means for revolving the disks in opposite directions, and a pair of screws for so carrying pin blanks that their points will enter the groove between the edges of the disks.

6. In a machine for pointing pins, the combination of elements for pointing by rolling the pin and having their operating surfaces at an angle to each other, a second set of elements for pointing by rolling having their operating surfaces at a more acute angle to each other, and means for maintaining the pin blanks in proper relationship with the forming elements.

7. In a pin machine, the combination of a pair of disks having their adjacent edges beveled, and revolving in opposite directions, and a pair of screws lying parallel to each other for so carrying pin blanks that their points will enter the groove between the edges of the disks.

8. In a pin machine, the combination of a series of pairs of disks having their adjacent edges beveled, the disks of each pair revolving in opposite directions, the angle of the grooves between the edges of the pair being more acute than that of the preceding pair, a pair of screws for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of disks in succession.

9. In a pin machine, the combination of a pair of disks having their adjacent edges beveled, means for revolving the disks in opposite directions, a pair of screws for so carrying pin blanks that their points will enter the grooves between the edges of the disks, and means to hold the blankets on the screws.

10. In a pin machine, the combination of a series of pairs of disks having their adjacent edges beveled, means to revolve the disks of each pair in opposite directions, the angle of the groove between the edges of one pair being more acute than that of the preceding pair, a pair of screws for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of disks in succession, and a longitudinally extending rod mounted between and above said screws to hold the pin blanks on the screws.

11. In a pin machine, the combination of a series of pairs of disks having their adjacent edges beveled, means to revolve the disks of each pair in opposite directions, the angle of the grooves between the edges of the pairs being more acute than that of the preceding pair, a pair of screws for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of the disks in succession, a support extending parallel to said screws on the opposite side of the same from the disks, a longitudinally extending rod carried by the support and mounted between and above said screws to hold the pin blank on the same, and means to drive both screws in the same direction so that the surface contacting with the pin blanks will travel away from the disk and so said pin blanks will be held with one end against said support.

12. In a pin machine, the combination of a series of pairs of disks having their adjacent edges beveled, means to revolve the disks of each pair in opposite directions, the angle of the grooves between the edges of each pair being more acute than that of the preceding pair, a conveyer for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of disks in succession, and means for guiding the opposite ends of the pin blanks.

13. In a machine for pointing pins by rolling pressure, the combination of a series of pairs of disks having their adjacent edges beveled, means to revolve the disks of each pair in opposite directions, the angle of the grooves between the edges of the pairs being more acute than that of the preceding pair, a pair of screws for so carrying pin blanks that their points will enter the grooves between the edges of the pairs of the disks in succession, a support extending parallel to said screws on the opposite side of the same from the disks, and means to drive both screws in the same direction so that the surface contacting with the pin blanks will travel away from the disk and said pin blanks will thereby be held with one end against said support.

14. In a machine for pointing pins by rolling pressure, the combination of a series of sets of engaging elements having their adjacent edges at an angle to each other, the elements of each set moving in opposite directions, the angle between the elements of each set being more acute than the angle between the elements of the next preceding set, screws for carrying pin blanks so that their points will enter the spaces between the elements of each set in succession, a support extending parallel to said screws on the opposite side of the same from the forming elements, and means to drive the screws so that the surfaces contacting with the pin blanks will travel away from the forming elements so that said pin blanks will be held with one end against said support during their travel from one set of forming elements to the next.

15. In a pin machine, the combination of a pair of disks for reducing by rolling having their adjacent edges beveled, and revolving in opposite directions, and a conveyer for so carrying pin blanks that their points will enter the groove between the edges of the disks.

16. In a pin machine, the combination of a pair of disks for reducing by rolling having their adjacent edges beveled, means for revolving the disks in opposite directions, and a pair of screws for so carrying pin blanks that their points will enter the groove between the edges of the disks.

17. In a pin machine, the combination of a pair of disks for reducing by rolling having their adjacent edges beveled, and revolving in opposite directions, and a pair of screws lying parallel to each other for so carrying pin blanks that their points will enter the groove between the edges of the disks.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ARTHUR W. BARTLETT.

Witnesses:

EDWARD N. PAGELSEN.

ELIZABETH M. BROWN.