D. M. DAVIS.

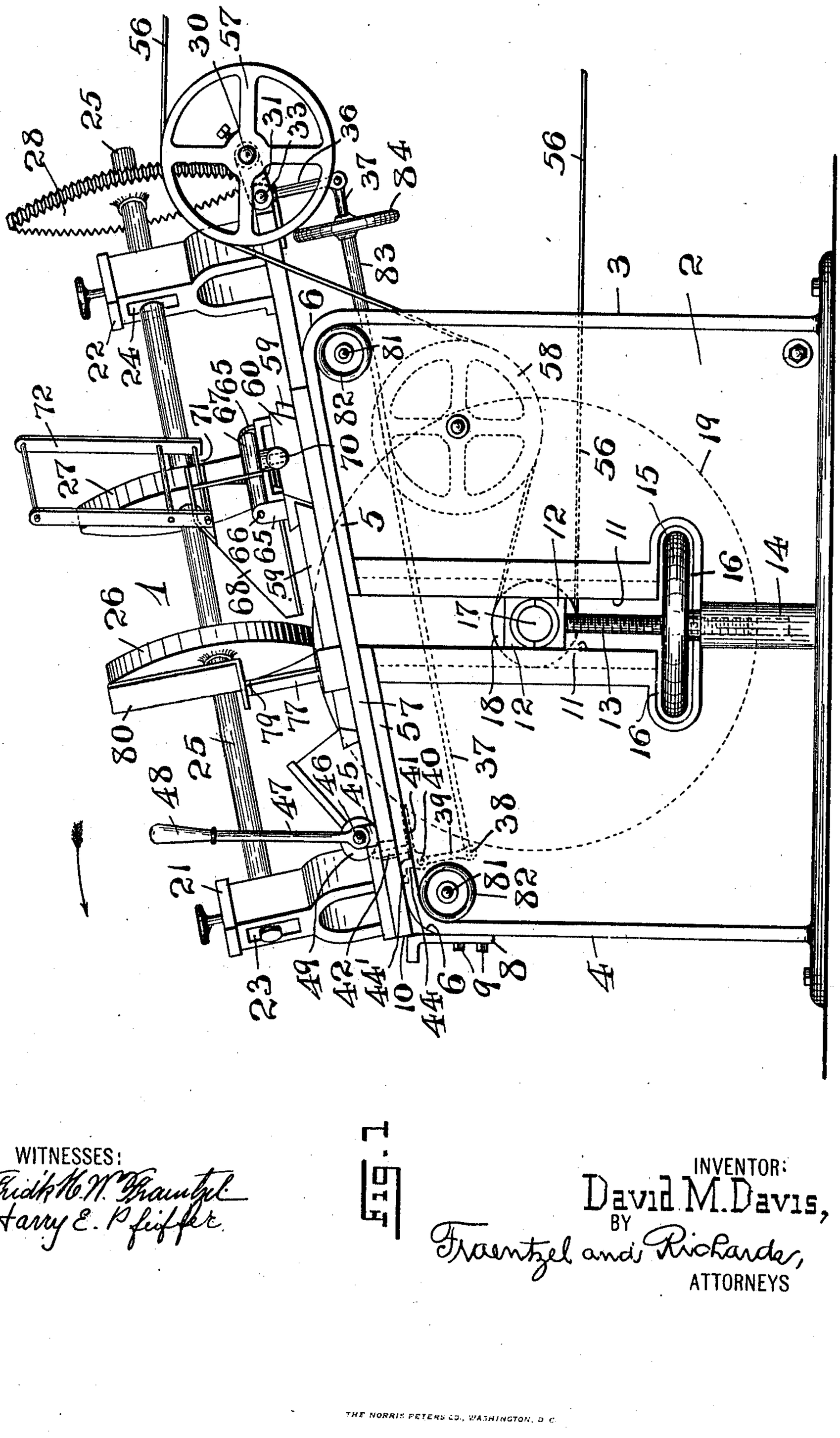
NEEDLE OR PIN POINT GRINDING MACHINE.

APPLICATION FILED SEPT. 12, 1910.

992,859.

Patented May 23, 1911.

6 SHEETS—SHEET 1.



WITNESSES:

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FIG. 1.

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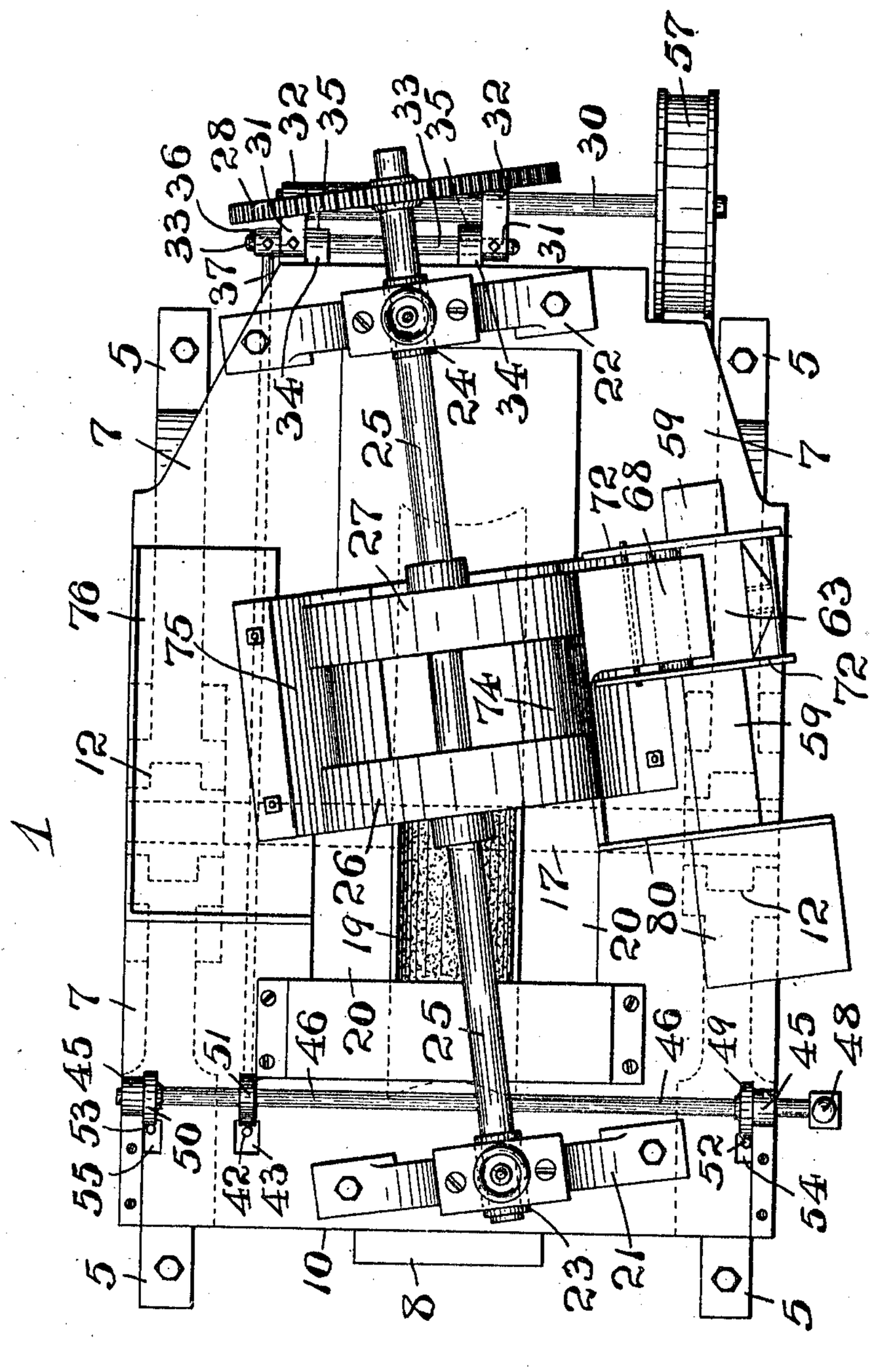

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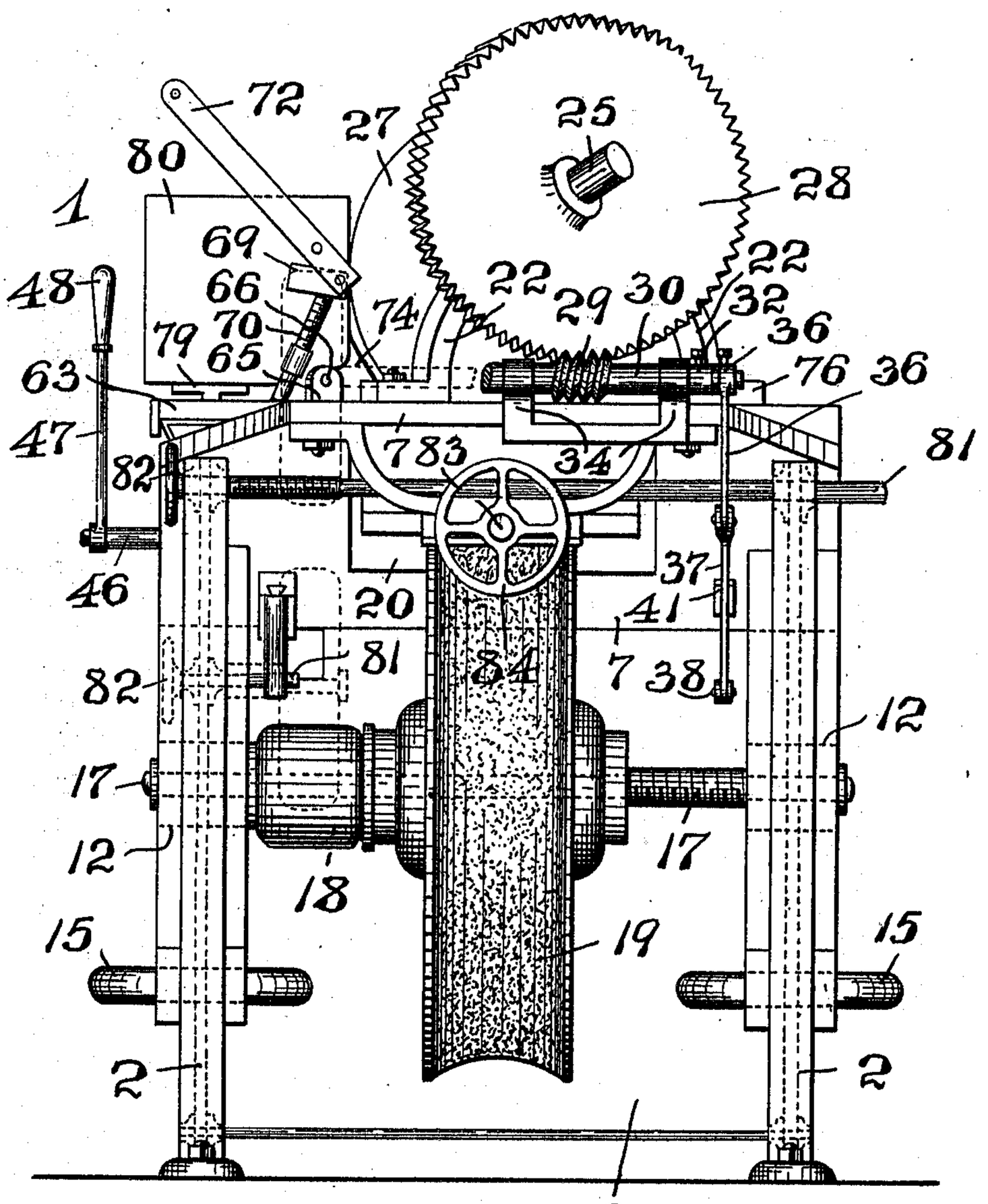

Fig. 3

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6 SHEETS—SHEET 4.

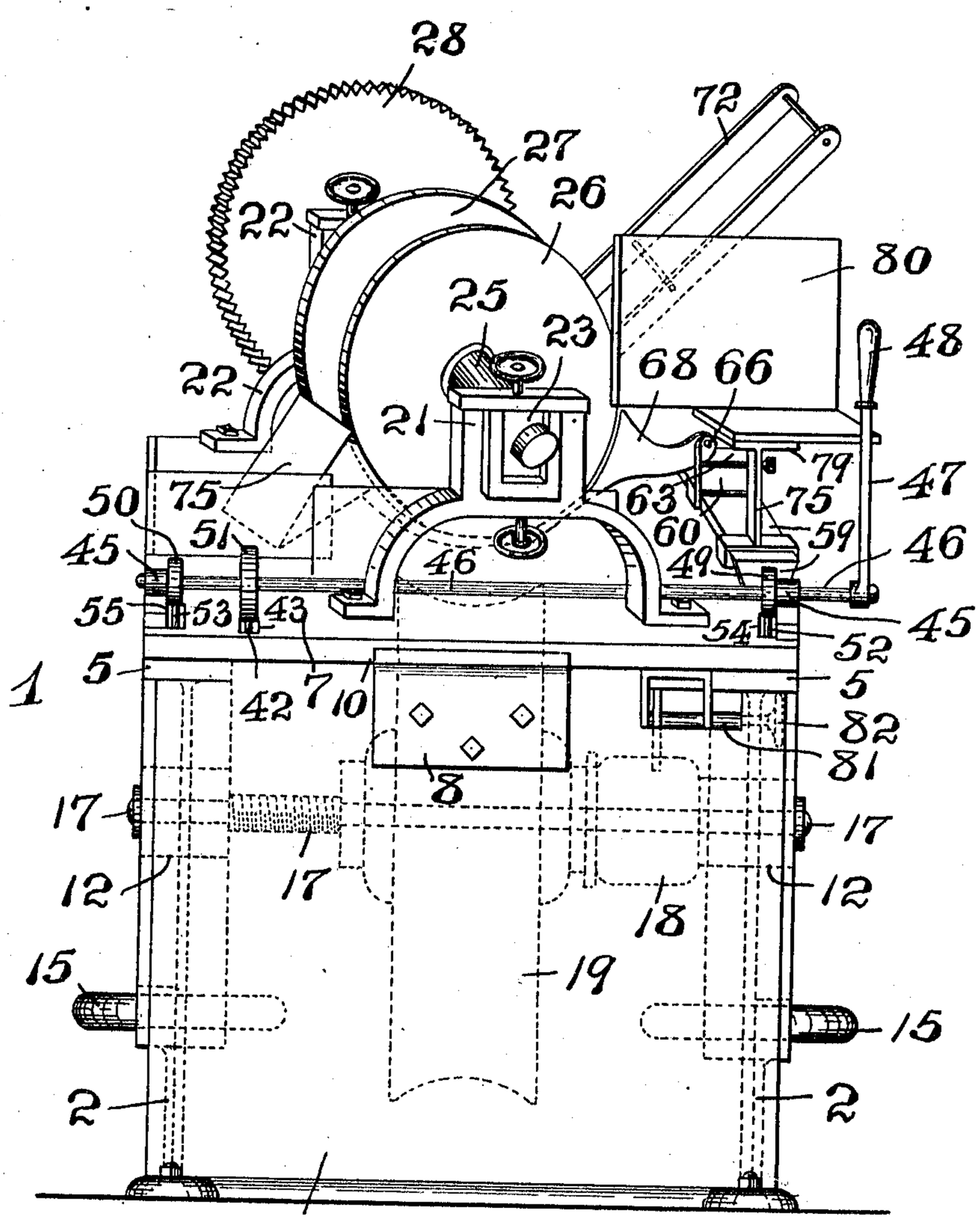

Fig. 4

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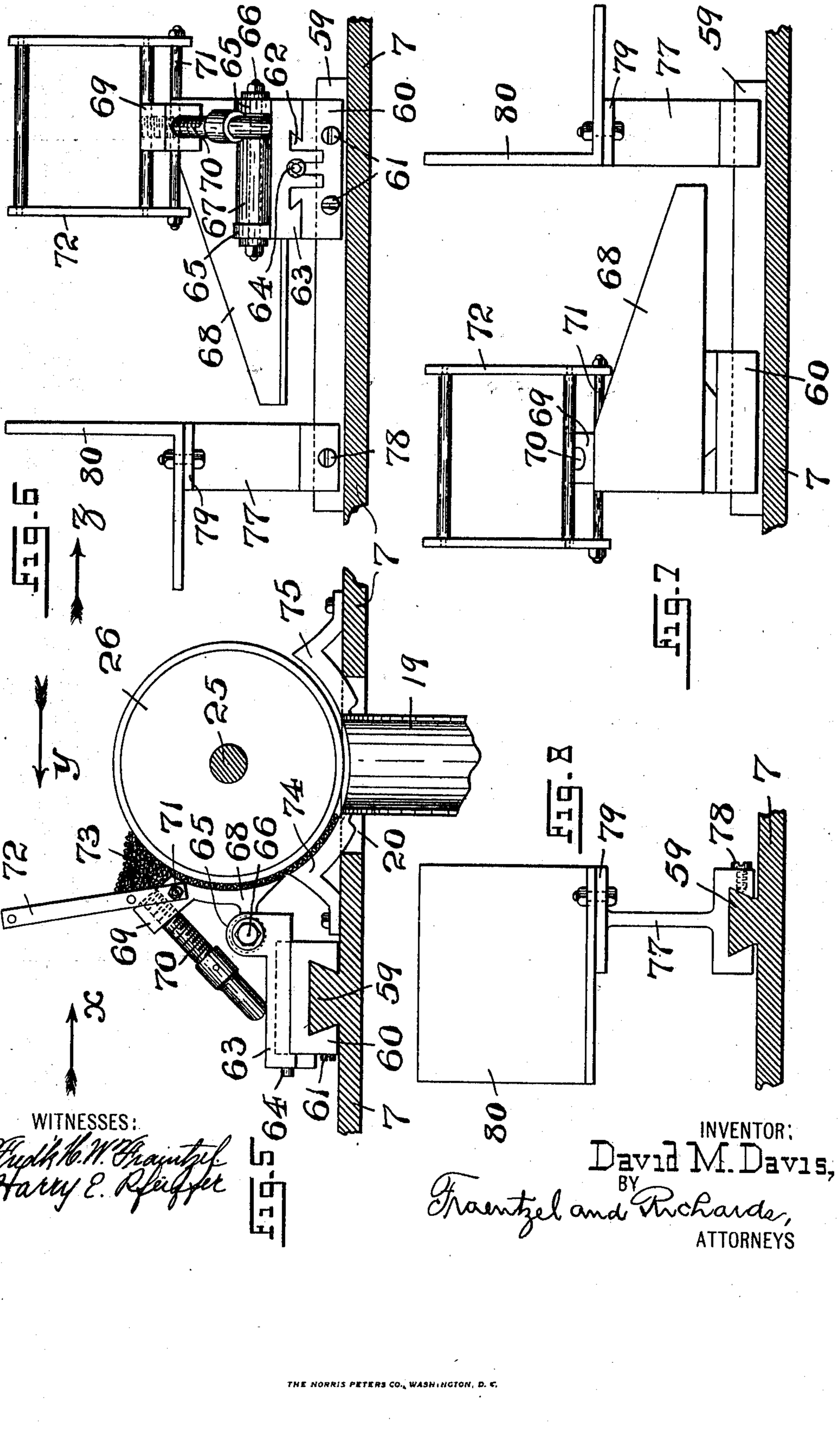
6 SHEETS—SHEET 5.



THE NORRIS PETERS CO., WASHINGTON, D. C.

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6 SHEETS—SHEET 6.

Fig. 9

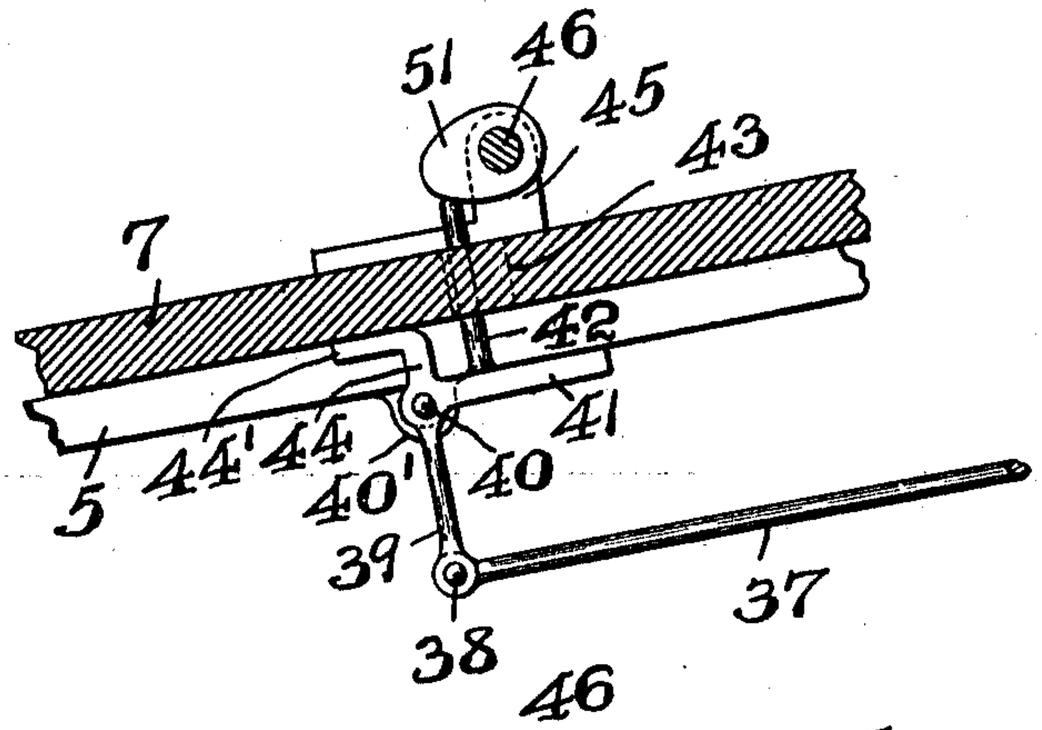


Fig. 10

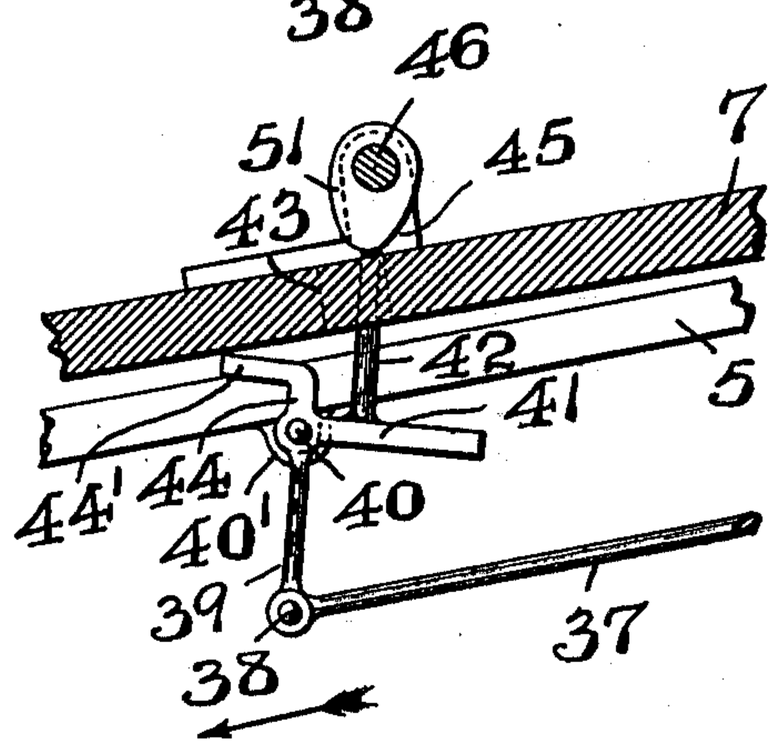


Fig. 11

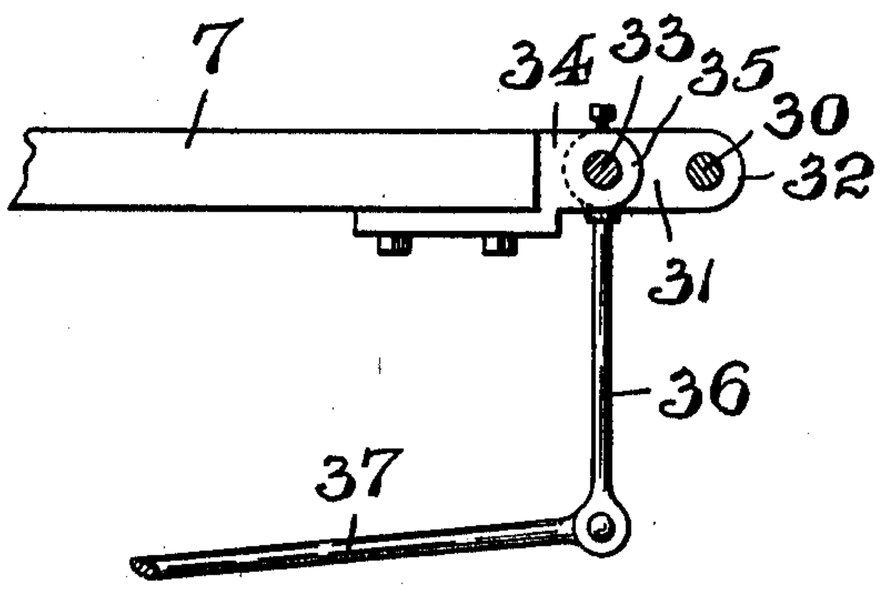
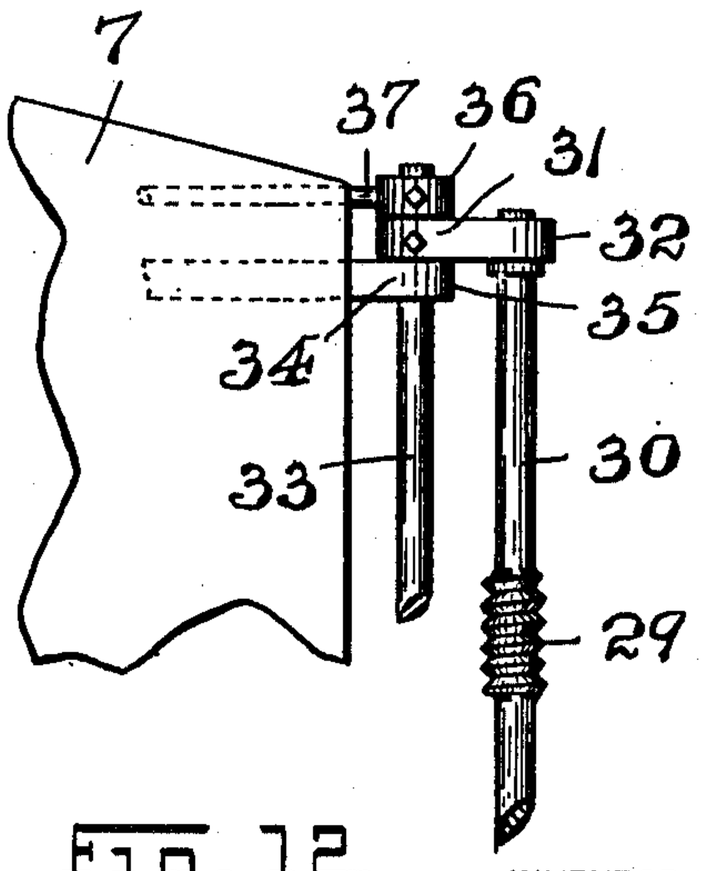


Fig. 12



WITNESSES:

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UNITED STATES PATENT OFFICE.

DAVID M. DAVIS, OF HARRISON, NEW JERSEY.

NEEDLE OR PIN POINT GRINDING MACHINE.

992,859. Specification of Letters Patent. Patented May 23, 1911.

Application filed September 12, 1910. Serial No. 581,715.

To all whom it may concern:

Be it known that I, DAVID M. DAVIS, a citizen of the United States, residing at Harrison, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Needle or Pin Point Grinding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in machines for pointing one or both ends of pieces of wire; and, the present invention relates, more particularly, to a novel machine or apparatus for automatically providing a large number of wire rods or pieces of any lengths upon one or both of their ends with points, so as to produce graphophone pins, carding pins, hat pins, and pins and needles of the various kinds.

The present invention has for its principal object to provide a novel and simply constructed, as well as an efficiently operating needle or pin-point grinding machine or apparatus adapted to receive a large number of wire-rods or pieces of any lengths which are automatically fed to a revolving grinding wheel and are pointed at one or both ends, so as to produce graphophone pins, carding pins, hat-pins, and pins and needles of the various kinds.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of this invention in view, the said invention consists, primarily, in the novel needle or pin-point grinding machine or apparatus hereinafter more fully set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, all of which will be more particularly described in the following specification and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of a machine or apparatus showing one embodiment of the principles of the present invention; Fig. 2 is a top or plan view of the same; and Figs. 3 and 4 are the two end elevations of the machine or apparatus. Fig. 5 is a detail transverse vertical section of a portion of supporting bed of the machine and an elevation of the means for holding and feeding the wire rods or pieces to the grinding wheel, a part of said grinding wheel being also represented. Fig. 6 is a face view of the said holding and feeding means, looking in the direction of the arrow *x* in said Fig. 5; and Fig. 7 is a similar view of said holding and feeding means, looking in the direction of the arrow *y* in said Fig. 5, the feeding wheel or disk and the grinding wheel being omitted from both views, and the supporting bed of the machine being represented in section. Fig. 8 is an end view of a portion of the said holding and feeding means, looking in the direction of the arrow *z* in said Fig. 6. Figs. 9 and 10 are longitudinal vertical sectional representations of portions of the supporting bed of the machine and a cam-operated mechanism, the parts of the cam-mechanism in said Fig. 9 being shown in their normal initial positions, and in said Fig. 10 being represented in their actuated positions; and Fig. 11 is a detail side elevation and Fig. 12 a detail top view of the parts of the machine which are actuated by the said cam-operated mechanism.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now to the several figures of the drawings, the reference-character 1 indicates the complete needle or pin-point grinding machine or apparatus made according to and embodying the principles of the present invention, the machine or apparatus embodying a suitably formed frame-work which comprises the closed and longitudinally extending sides 2, the open end 3, and the closed end 4. As shown, the open end-portion 3 of the said frame-work 2 is much higher than the closed end-portion 4 thereof, so that the upper supporting flanges 5 of the said frame-work will be angularly inclined from the one end of the machine

to the other end of the same, substantially in the manner illustrated in said Fig. 1 of the drawings. As shown, the laterally extending edge-portions of the said frame-work are rounded, as at 6. Movably and oscillatorily mounted upon the upper inclined portion of said frame-work is a supporting bed or table 7, the said bed or table being retained against sliding in a downward direction upon said frame-work by a suitable holding or retaining means, such as a plate 8, which is secured upon the closed end 4 by means of screws or bolts 9 and has its upper edge-portion arranged against the marginal edge 10 of the said bed or table 7. As shown in said Fig. 1 of the drawings, the said sides 2 of the frame-work are made with oppositely located and vertically extending open parts, as 11, which provide suitable guides for bearing or journal boxes 12 which are slidably arranged in said guides. Each journal-box 12 is adjustably mounted upon the upper end-portion of an adjusting screw 13, the lower screw-threaded portion of each screw working in a screw-threaded socket 14 forming part of each side 2 of said frame-work. The upward and downward movement of each screw 13 is produced by a hand-wheel, as 15, rotatably arranged upon each screw, and being retained in its fixed position against any upward or downward movement upon the screw, by being arranged and rotating in the laterally extending and open parts 16 of the sides 2, substantially as shown, and as will be clearly understood from an inspection of said Fig. 1 of the drawings. Rotatably mounted in the said journal-boxes or bearings 12 is a main shaft 17, said shaft extending laterally across the main frame-work, upon which are suitably mounted a pulley-wheel 18 and a grinding wheel 19, said grinding wheel being preferably made with a concave peripheral grinding surface, substantially as illustrated. The upper peripheral guiding surface of the wheel 19 extends upwardly through an open part, as 20, in the table or bed-plate 7. Suitably secured at the respective end-portions and upon the upper surface of said table or bed-plate 7 are a pair of pedestals 21 and 22, the pedestal 21 being provided with a journal-box or bearing 23, and the pedestal 22 being similarly provided with a journal-box or bearing 24; and, rotatably mounted in said journal boxes or bearings 23 and 24 is a shaft 25. The longitudinal central axis of this shaft, with relation to the plane of the angularly disposed face of said table or bed-plate 7, is preferably parallel to the plane of said face, but with relation to a vertical plane extending centrally and longitudinally to the said table or bed-plate, the said shaft is angularly arranged, so that it extends from near one side of the machine at one end of the table or bed-plate, to near the opposite side of the machine at the other end of the said table or bed-plate. Suitably secured upon said angularly disposed shaft 25 are a pair of wire-rod feed rollers, wheels or disks, as 26 and 27, the disk, wheel or roller 26 extending, approximately, at right angles across the peripheral face of the grinding-wheel 19, and being located above said wheel 19, substantially in the manner shown in the several figures of the drawings. Upon its upper free end-portion, the said shaft 25 is provided with a suitably toothed or worm-wheel 28, which is in mesh with a worm 29 of a shaft or spindle 30. The shaft or spindle 30 is rotatably mounted in suitably constructed bearing-portions 32 of arms 31 which are secured to and extend rearwardly from a rod or shaft 33 which is oscillatorily mounted in the bearing-portions 35 of lugs or bearing-members 34 which extend from the end of the table or bed-plate 7. Normally, the said shaft or spindle 30, and the rod or shaft 33 are held in their operative positions, with the worm 29 in engagement or mesh with the worm-wheel 28, by means of a crank-arm 36 which is secured at its upper end-portion to the said rod or shaft 33. The said crank-arm 36 extends in a downward direction, and pivotally connected with the lower end of said crank-arm 36 is a link 37, in the form of a long rod which extends forwardly beneath the table or bed-plate 7. The forward and opposite end-portion of this long rod or link-portion 37 is pivotally connected, as at 38, with a post or finger 39, the purpose of which will be presently set forth.

As shown, more especially, in Figs. 9 and 10 of the drawings, there is arranged upon a rod 40 which extends laterally beneath the said table or bed-plate 7 and has its end-portions suitably secured in the perforated lugs or ears 40′ extending downwardly from the supporting flanges 5 of the frame-work of the machine, upon which it is mounted, so as to oscillate thereon, a suitably formed swing-plate 41. This plate is also provided with an upwardly extending post 42 which projects into an opening 43 in the table or bed-plate 7 and projects slightly above the upper surface of the said table or bed-plate. The said plate 41 is also made with an upwardly projecting part or element 44 from which extends, approximately at right angles therefrom, a member 44′, which, under normal conditions, rests directly against the under surface of the table or bed-plate 7, substantially as shown in said Fig. 9 of the drawings. Suitably secured upon the upper face of the said table or bed-plate are a pair of bearings 45, in which is rotatably mounted a rod or spindle 46, said rod or spindle having its one end-portion extending beyond the side of the frame-work of the ma-

chine and having secured thereto an upwardly extending lever or arm 47 provided with a handle-member 48. The said rod or spindle 46 has suitably secured thereon a series of cam-shaped elements 49, 50 and 51, the cam-surfaces of the said cams 49 and 50, by the manipulation of handle 48 and arm 47 in the direction of the arrow shown in said Fig. 1 of the drawings being adapted to be brought, respectively, in engagement with the upper end-portions of a pair of posts, as 52 and 53, said posts extending upwardly from the supporting flanges 5, and through suitably formed openings 54 and 55 in the said table or bed-plate 7. It will be evident, that this movement of the said cams 49 and 50, when the arm 47 and its handle are pulled in a forward direction, will cause the table or bed-plate 7 to be slightly raised so as to be angularly disposed above the supporting flanges 5 of the frame-work of the machine, from the position indicated in Fig. 9 of the drawings to that represented in Fig. 10. At the same time, the cam 51 moves against the upper and free end-portion of the upwardly extending post 42 of the swing-plate 41, with the result that the various parts shown in said Fig. 9 of the drawings will be moved into their actuated positions represented in Fig. 10 of the drawings. The forward movement of the post or finger 39 thus produced in the direction of the arrow shown in said Fig. 10, causes the link or rod 37 to produce a corresponding movement of the previously mentioned crank-arm 36, whereby the rod or shaft 33 is suitably oscillated in its bearings. At the same time the arms 31 which are fixed upon and extend from the said rod or shaft 33 are caused to move slightly in a downward direction, thereby carrying the shaft or spindle 30, with said arms 31, downwardly and disengaging the worm 29 from its operative mesh with the toothed or worm-wheel 28 from the shaft 25. When the arm 47 and its handle 48 are again forced back into their normal initial position, the several cams are withdrawn from their operative engagement with the several posts or pins, just mentioned, whereby the downwardly moving table or bed-plate 7, having its lower surface in engagement with the member 44 of the swing-plate 41 causes the said plate to be brought from the position shown in Fig. 1 of the drawings to that indicated in Fig. 9. The result will be that the rod or link 37, and the parts connected with and actuated from its opposite end-portion, will again throw the worm 39 into its operative engagement with the worm-wheel 28 for causing the revolutions of the shaft 25. Rotary motions of the shaft or spindle 30, and of the shaft 17 upon which the grinding wheel 19 is mounted, are produced by means of a belt 56, said belt being passed over a pulley 57 which is mounted upon the shaft 30, said belt then passing downwardly and beneath an idler 58 which is mounted between the sides 2 of the frame-work of the machine, and over the pulley-wheel 18 of the main shaft 17, all of which is clearly indicated in Fig. 1 of the drawings. The operative engagement of the member or element 44 of the swing-plate 41, at all times, with the under surfaces of the table or bed-plate 7, will maintain the operative relation of the belt 56 with the pulley-wheel 57, so that when the bed-plate or table 7 rests directly upon the supporting flanges 5 of the frame-work, the operative engagement of the worm 29 with the worm-wheel 28 is maintained, so that the shaft 25 will also revolve, until such time, when the arm 47 and handle 48 are operated to cause the disengagement of the worm with the worm-wheel in the manner as has been set forth hereinabove.

Referring now more particularly to Figs. 1, 2, 4, 5, 6, 7 and 8 of the drawings, it will be seen that the table or bed-plate 7 of the machine is made with a suitably formed guide 59, upon which is slidably and adjustably arranged a carrier 60, said carrier being secured in its adjusted position upon the said guide 59 by means of suitable screws 61 or other fastening means. The said carrier 60 may also be provided with suitably formed guides 62 for the slidable and adjustable arrangement of a second carrier, as 63, upon said carrier 60. This carrier 63 can be moved closer to or farther away from the feed-wheel or disk 26 by means of an adjusting screw 64, as will be clearly evident. The carrier 63 is also provided with upwardly extending and perforated ears or lugs 65 in which is mounted a suitable pin 66. This pin 66 carries a sleeve-like member 67, arranged upon said pin 66 between the ears or lugs 65, and suitably connected with the said sleeve-like member 67 is an arc-shaped guide-plate or element as 68, the purpose of which will be clearly evident more particularly from an inspection of Fig. 5 of the drawings. The said guide-plate or element 68 is also provided at its highest point with an internally screw-threaded portion as 69, in which is arranged a screw-threaded end-portion of an adjusting screw 70. Extending laterally through the said screw-threaded portions 69 and guide-plate or element 68, and being in oscillatorily frictional retaining engagement with the said portions 69 is a rod 71, said rod having mounted thereon a suitably formed holding or supporting frame 72. This frame 72 can be tilted into any suitable angular relation to the pivotally and adjustably arranged guide-plate or element 68, all of which will be clearly evident from an inspection of Figs. 5 and 6 of the drawings.

The wire rods or pieces, indicated by the reference-character 73 in Fig. 5 of the drawings, are arranged upon and against the peripheral surface of the feed-wheel or disk 26, and the said frame 72, so that the rotary movement of the said disk will cause a series of single rods or pieces to be fed downwardly between the disk and the concave surface portion of the guide-plate or element 68, as clearly represented in said Fig. 5 of the drawings. The said table or bed-plate has also secured thereon a suitably formed guide-member or element 74, which is arranged in such a manner so that the single pieces of wire 73 are fed, successively, between the revolving surfaces of the wheel or disk 26 and the grinding wheel 19, the angular relation of the several parts being such, so that each piece of wire 73 as it is being revolved laterally across the peripheral surface of the grinding disk becomes suitably pointed. The pointed pieces of wire, after they pass from the opposite edge of the grinding disk 19 are taken up by another guide-member or element as 75, which is suitably secured upon the table or bed-plate 7 and finally deposited in a receiver, as 76, which may be placed upon the said table or bed-plate 7, as will be clearly evident.

That all the wire-rods or pieces 73 may be properly fed to the grinding wheel 19, I have adjustably mounted upon the previously mentioned guide 59 a supporting member 77, said member 77 being secured in its adjusted position upon the guide 59 by means of a suitable screw 78 or other fastening means. The said supporting member 77 is provided upon its upper edge with a right-angled flange or projection 79, upon which is suitably mounted and held in place by means of any suitably formed holding means, an L-shaped guide-plate 80, against which the end-portions of the wire rods or pieces 73 are arranged, so that the end-portions of all of the rods 73 will be properly fed to the grinding wheel there to be all alike provided with the pointed end-portions desired. Lateral adjustment of the table or bed-plate 7 upon the supporting flanges 5 of the frame-work may be had by means of adjusting rods 81 and hand-wheels 82, said adjusting rods being suitably and operatively mounted in the frame-work of the machine and being operatively connected with the said table or bed-plate 7. Longitudinal adjustment of the table or bed-plate 7 upon the supporting flanges 5 of the frame-work may also be had by means of an adjusting rod 83 which is provided with a hand-wheel 84, said rod 83 being suitably and operatively mounted in the frame-work of the machine and being operatively connected with the said table or bed-plate 7.

From the foregoing description of the several devices and parts of the machine comprising the principles of the present invention, the operation of pointing the wire rods or pieces is clearly obvious and need not be further described.

The machine or apparatus is simple and efficient in its operation, and the wire-rod retaining and feeding devices being adjustably disposed, the rods or pieces may be of different lengths, the rods being usually pointed upon one end, and then pointed, by repeating the process of pointing, upon their other ends, the double-pointed rods or pieces then being cut into by suitable severing or cutting means, as will be clearly evident.

I am aware that changes may be made in the general arrangements and combinations of the various devices and parts without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the claims which are appended thereto. Hence, I do not limit my invention to the exact arrangements and combinations of the said devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

I claim:

1. In a needle or pin-point grinding machine, the combination with a frame-work, said frame-work being higher at one end than at its other end, a table mounted upon said frame-work, said table being formed with an opening, a grinding wheel rotatably mounted in said frame-work, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal-boxes, said pedestals and shaft being angularly disposed with relation to the central longitudinal plane of the machine, wire-rod feeding disks upon said shaft, means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding wheel, and mechanism connected with the said frame-work and the table thereon for angularly raising or tilting the table and simultaneously arresting the rotary movements of the grinding wheel and of the said shaft upon which said feeding disks are mounted.

2. In a needle or pin-point grinding machine, the combination with a frame-work, said frame-work being higher at one end than at its other end, a table mounted upon said frame-work, said table being formed with an opening, a grinding-wheel rotatably mounted in said frame-work, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box con-

nected with each pedestal, a shaft rotatably mounted in said journal-boxes, said pedestals and shaft being angularly disposed with relation to the central longitudinal plane of the machine, wire-rod feeding disks upon said shaft, means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding-wheel, means also upon said table for receiving the pointed wire-rods from the grinding-wheel and feeding them into a receptacle, and mechanism connected with the said frame-work and the table thereon for angularly raising or tilting the table and simultaneously arresting the rotary movements of the grinding wheel and of the said shaft upon which said feeding disks are mounted.

3. In a needle or pin-point grinding machine, the combination with a frame-work, said frame-work being higher at one end than at its other end, a table mounted upon said frame-work, said table being formed with an opening, a grinding wheel rotatably mounted in said frame-work, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal-boxes, said pedestals and shaft being angularly disposed with relation to the central longitudinal plane of the machine, wire-rod feeding disks upon said shaft, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, and a supporting frame adjustably connected with said pivotal guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding-wheel, and mechanism connected with the said frame-work and the table thereon for angularly raising or tilting the table and simultaneously arresting the rotary movements of the grinding wheel and of the said shaft upon which said feeding disks are mounted.

4. In a needle or pin-point grinding machine, the combination with a frame-work, said frame-work being higher at one end than at its other end, a table mounted upon said frame-work, said table being formed with an opening, a grinding wheel rotatably mounted in said frame-work, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal-boxes, said pedestals and shaft being angularly disposed with relation to the central longitudinal plane of the machine, wire-rod feeding disks upon said shaft, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding wheel, means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle, and mechanism connected with the said frame-work and the table thereon for angularly raising or tilting the table and simultaneously arresting the rotary movements of the grinding wheel and of the said shaft upon which said feeding disks are mounted.

5. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, means connected with said crank-arm carrying rod for throwing said worm into and out of mesh with said worm-wheel, and means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding wheel.

6. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table,

a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, means connected with said crank-arm carrying rod for throwing said worm into and out of mesh with said worm-wheel, means upon said table for holding and feeding the wire-rods successively across the guiding surface of the grinding wheel, and means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle.

7. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, means connected with said crank-arm carrying rod for throwing said worm into and out of mesh with said worm-wheel, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, and a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding wheel.

8. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, means connected with said crank-arm carrying rod for throwing said worm into and out of mesh with said worm-wheel, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding-wheel, and means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle.

9. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuat-

ing said link for throwing said worm into and out of mesh with said worm-wheel, and means upon said table for holding and feeding the wire rods successively across the grinding surface of the grinding wheel.

10. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding-wheel, and means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle.

11. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, and a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding wheel.

12. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work, and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the

grinding wheel, and means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle.

13. A needle or pin-point grinding machine, comprising frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, consisting of a series of pins or posts extending upwardly from the frame-work through said table, a swing-plate pivotally connected with said frame-work, an arm extending downwardly from said swing-plate, said arm being pivotally connected with said previously mentioned link, a member extending from said swing-plate and in engagement with the under face of said table, a pin or post extending upwardly from said swing-plate and through said table, a cam-shaft located upon said table, and a series of cams upon said shaft adapted to be brought into operative engagement with said series of pins or posts, and means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding wheel.

14. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, consisting of a series of pins or posts extending upwardly from the frame-work through said table, a swing-plate pivotally connected with said frame-work, an arm extending downwardly from said swing-plate, said arm being pivotally connected with said previously mentioned link, a member extending from said swing-plate and in engagement with the under face of said table, a pin or post extending upwardly from said swing-plate and through said table, a cam-shaft located upon said table, and a series of cams upon said shaft adapted to be brought into operative engagement with said series of pins or posts, means upon said table for holding and feeding the wire-rods successively across the grinding surface of the grinding wheel, and means also upon said table for receiving the pointed wire-rods from the grinding wheel and feeding them into a receptacle.

15. A needle or pin-point grinding machine, comprising a frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-

arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, consisting of a series of pins or posts extending upwardly from the frame-work through said table, a swing-plate pivotally connected with said frame-work, an arm extending downwardly from said swing-plate, said arm being pivotally connected with said previously mentioned link, a member extending from said swing-plate and in engagement with the under face of said table, a pin or post extending upwardly from said swing-plate and through said table, a cam-shaft located upon said table, and a series of cams upon said shaft adapted to be brought into operative engagement with said series of pins or posts, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding wheel.

16. A needle or pin-point grinding machine, comprising frame-work, said frame-work being higher at one end than at the other end, a table mounted upon said frame-work, said table being formed with an opening, a main shaft extending laterally across said frame-work, a driving pulley upon said shaft, a grinding-wheel upon said shaft, said grinding wheel having its upper peripheral portion extending through the opening in said table so as to project above the same, pedestals mounted upon said table, a journal box connected with each pedestal, a shaft rotatably mounted in said journal boxes, wire-feeding disks and a worm-wheel upon said shaft, bearing lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-arm carrying rod, a link connected with said last-mentioned crank-arm, mechanism connected with said frame-work and the table for angularly raising or tilting the table and simultaneously actuating said link for throwing said worm into and out of mesh with said worm-wheel, consisting of a series of pins or posts extending upwardly from the frame-work through said table, a swing-plate pivotally connected with said frame-work, an arm extending downwardly from said swing-plate, said arm being pivotally connected with said previously mentioned link, a member extending from said swing-plate and in engagement with the under face of said table, a pin or post extending upwardly from said swing-plate and through said table, a cam-shaft adapted to be brought into operative engagement with said series of pins or posts, a guide upon said table, said guide extending in a longitudinal direction, a carrier slidably arranged upon said guide, a second carrier slidably arranged upon said first-mentioned carrier, and being adjustable with relation to said feeding disks, a guide-plate pivotally connected with said second-mentioned carrier, a supporting frame adjustably connected with said pivoted guide-plate, all arranged so as to hold and feed the wire rods successively across the grinding surface of the grinding wheel, and means also upon said table for receiving the pointed wire-rods from the grinding-wheel and feeding them into a receptacle.

17. In a needle or pin-grinding machine, the combination with a frame-work and a tilting table thereon, of a shaft provided with feeding disks, a driving means connected with said shaft, and mechanism in engagement with said tilting table for arresting the movement of said shaft driving means.

18. In a needle or pin-grinding machine, the combination with a frame-work and a tilting table thereon, of a shaft provided with feeding disks, a driving means connected with said shaft, and mechanism in engagement with said tilting table for arresting the movement of said shaft driving means, consisting of a swing-plate pivotally connected with said frame-work, a post extending from said swing-plate and through said table, a cam-shaft above said table, and a cam upon said shaft adapted to be brought into engagement with said post.

19. In a needle or pin-grinding machine, the combination with a frame-work and a tilting table thereon, of a shaft provided with feeding disks, a worm-wheel upon said shaft, bearing-lugs extending from said table, a rod or shaft oscillatorily mounted in said bearing-lugs, crank-arms secured to and extending from said rod, said crank-arms being formed with bearing-portions, a worm-shaft mounted in the bearing-portions of said crank-arms, a worm upon said shaft adapted to mesh with said worm-wheel, another crank-arm secured to and extending in a downward direction from said crank-

arm carrying rod, a link connected with said last-mentioned crank-arm, and mechanism in engagement with said tilting table for actuating said last-mentioned crank-arm to throw said worm into or out of mesh with said worm-wheel, consisting of a swing-plate pivotally connected with said frame-work, an arm extending downwardly from said swing-plate, a link pivotally connected at one end to said arm and at the other end to said last-mentioned crank-arm, a member extending from said swing-plate and in engagement with the under face of said tilting table, a post extending upwardly from said swing-plate and through said tilting table, a cam-shaft above said table, and a cam upon said shaft adapted to be brought into engagement with said post, substantially as and for the purposes set forth.

20. In a needle or pin-grinding machine, the combination with a frame-work and a tilting table thereon, of means for tilting said table consisting of a post connected with and extending upwardly through said table, a cam-shaft above said table, and a cam upon said shaft adapted to be brought into engagement with said post.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 7th day of September, 1910.

DAVID M. DAVIS.

Witnesses:

FREDK. C. FRAENTZEL,

FREDK. H. W. FRAENTZEL.

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