

(No Model.)

3 Sheets—Sheet 1.

W. H. DAYTON.

MACHINE FOR GRINDING NEEDLE SHANKS.

No. 434,432.

Patented Aug. 19, 1890.

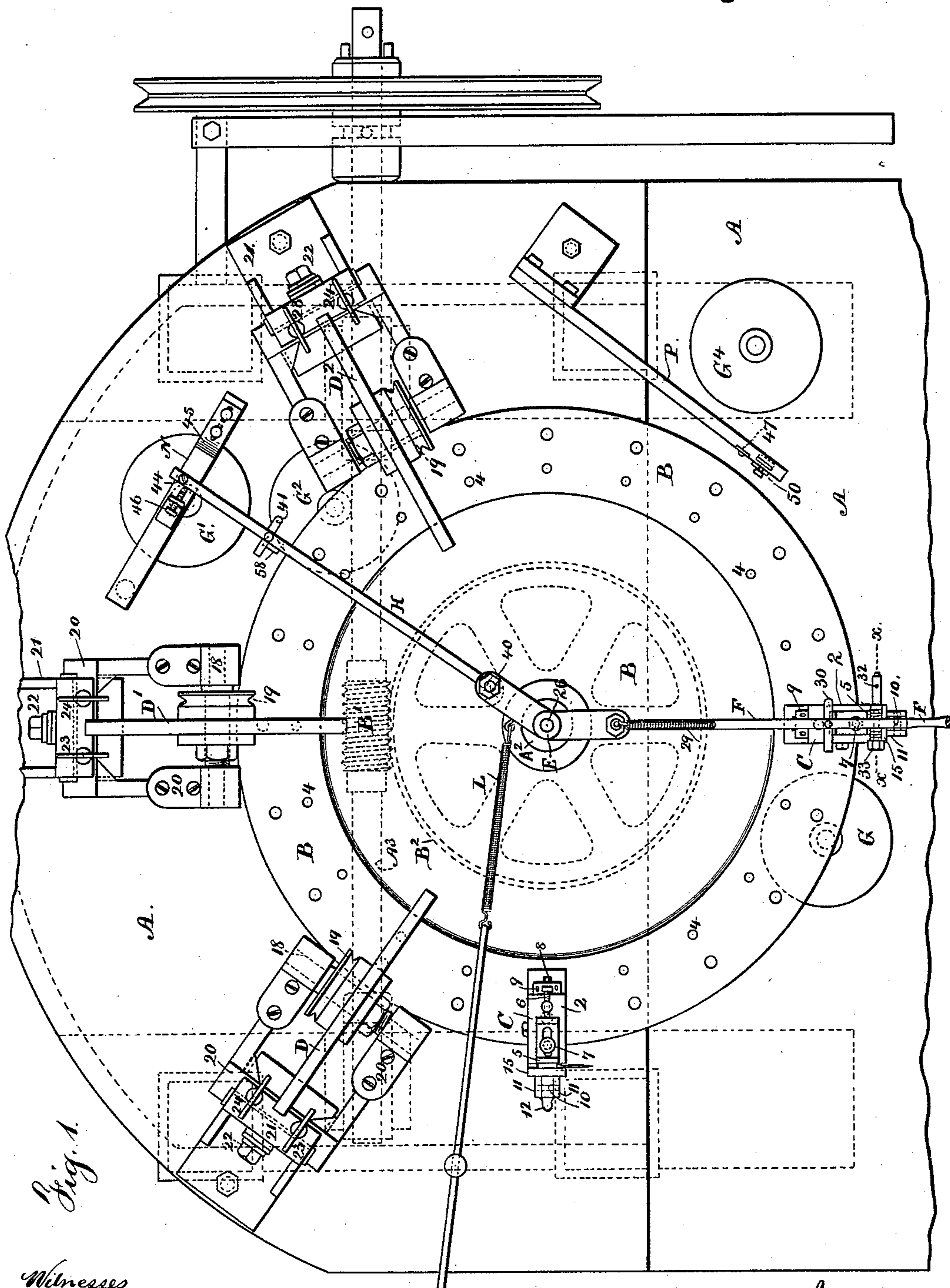


Fig. 1.

Witnesses

Chas. H. Smith
J. Staib

Inventor

William H. Dayton
per Lemuel W. Perrell atty

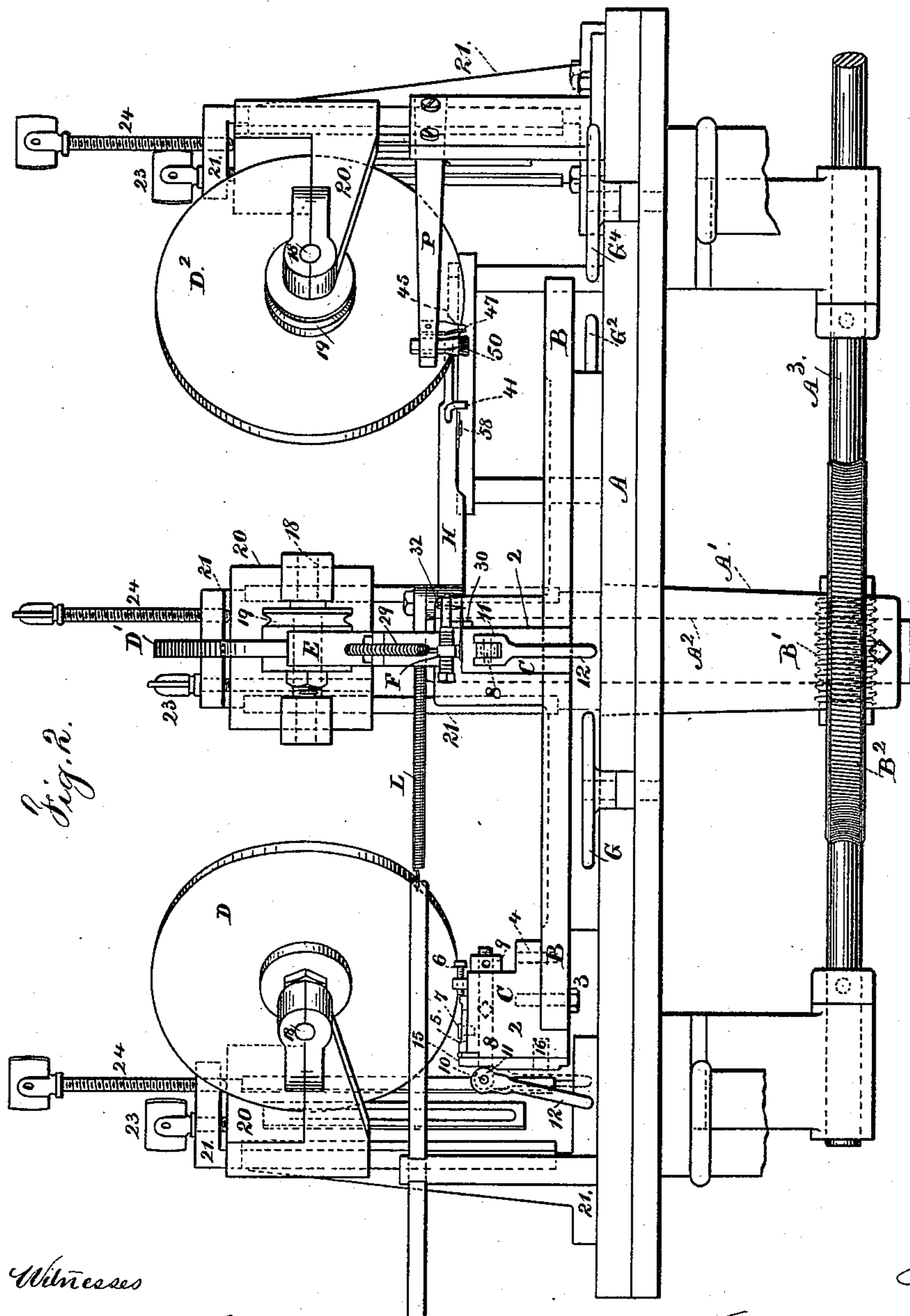
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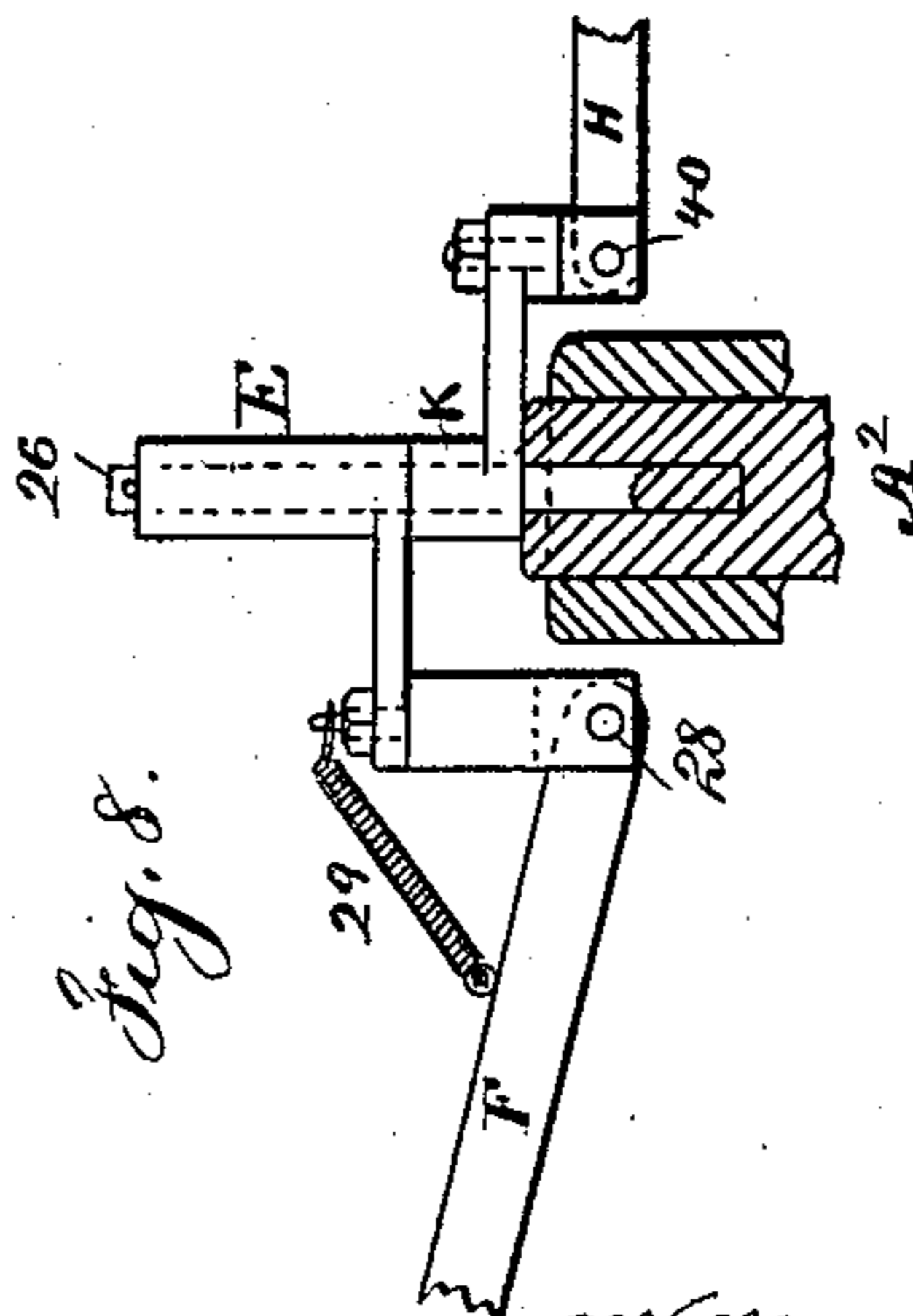
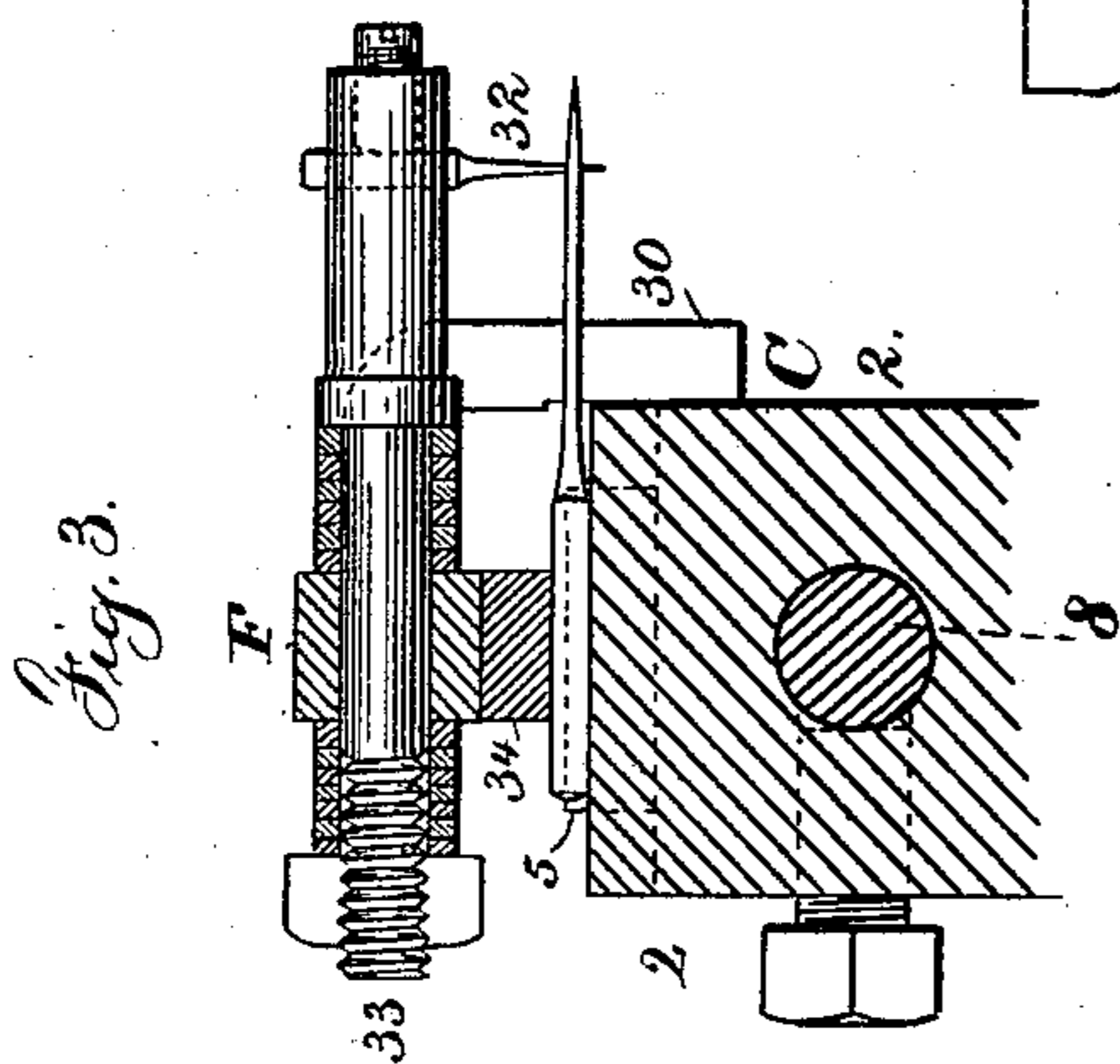
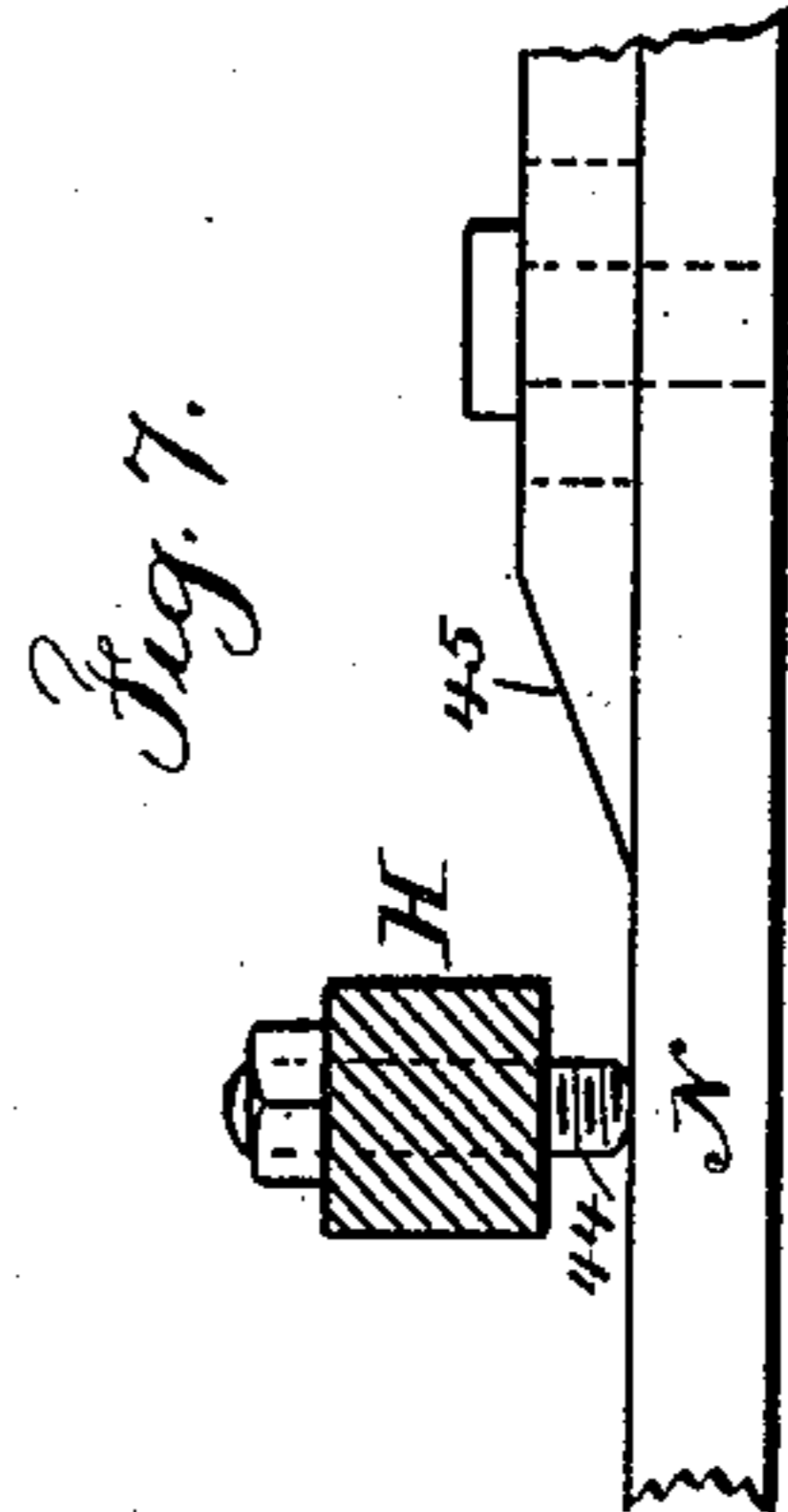
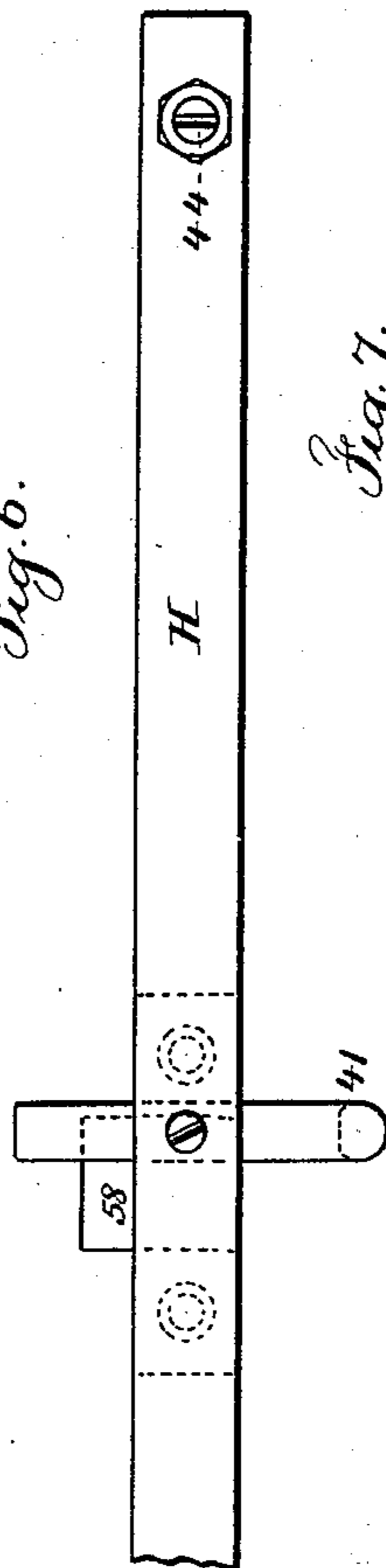
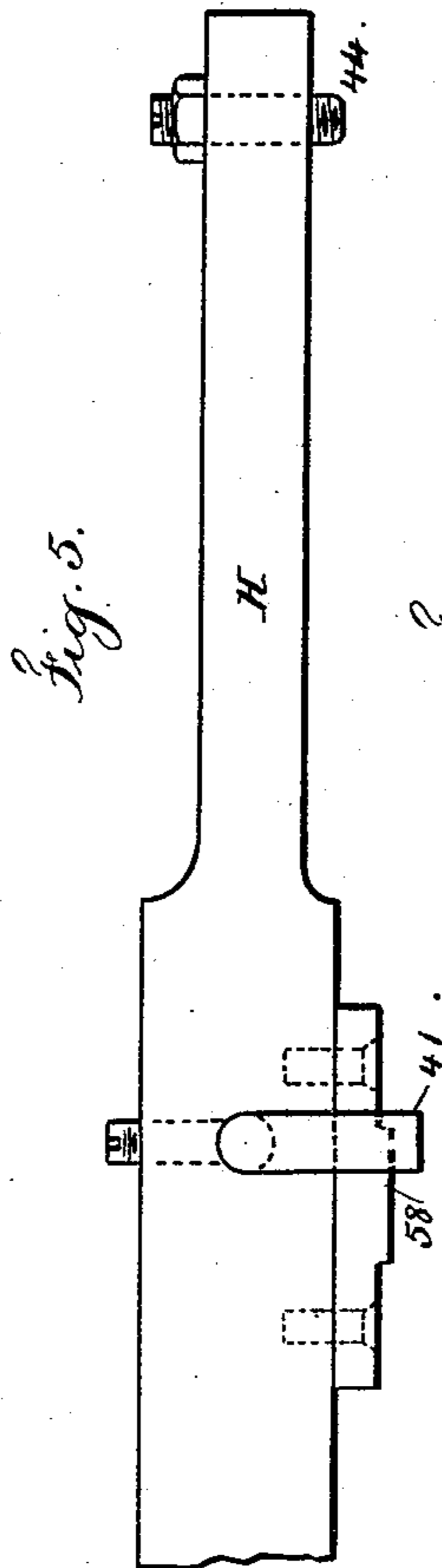
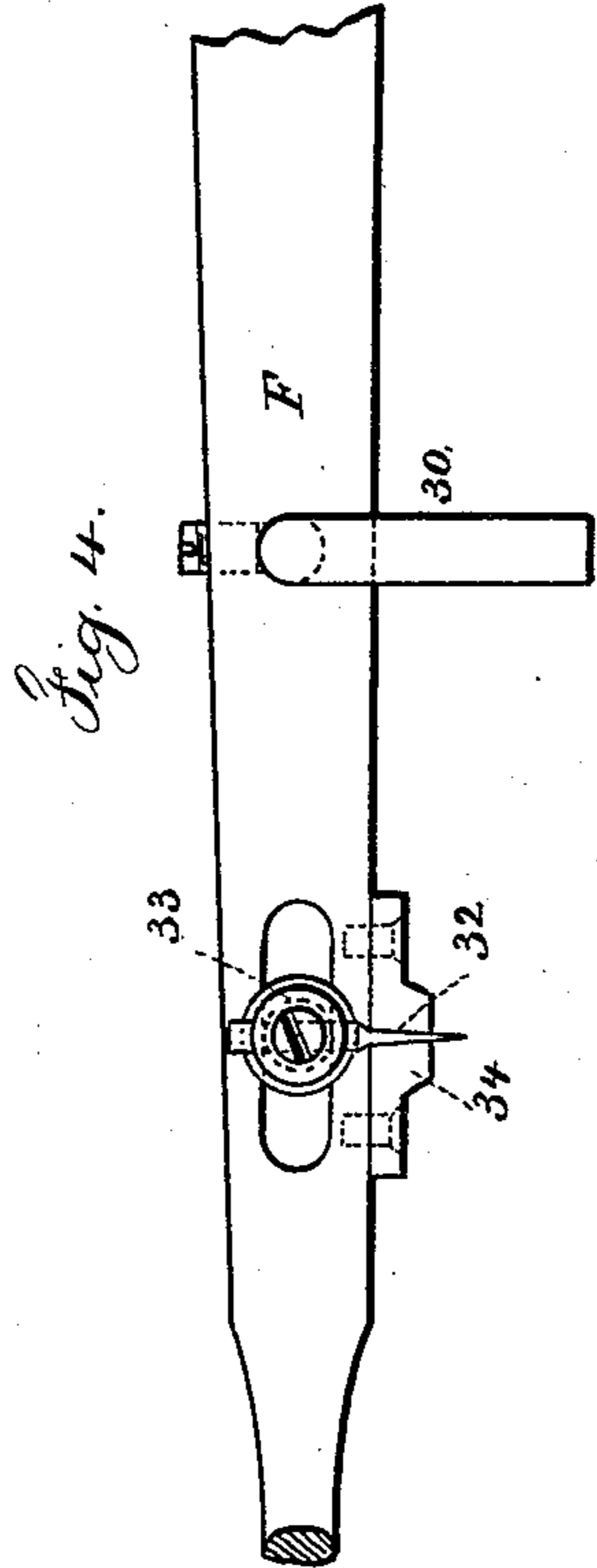
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UNITED STATES PATENT OFFICE.

WILLIAM H. DAYTON, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO THE
EXCELSIOR NEEDLE COMPANY, OF SAME PLACE.

MACHINE FOR GRINDING NEEDLE-SHANKS.

SPECIFICATION forming part of Letters Patent No. 434,432, dated August 19, 1890.

Application filed March 11, 1890. Serial No. 343,546. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DAYTON, a citizen of the United States, residing at Torrington, in the county of Litchfield and State of Connecticut, have invented an Improvement in Machines for Grinding Needle-Shanks, of which the following is a specification.

In the manufacture of sewing-machine needles it is usual to employ a wire that is much larger than the needle and of a size corresponding to the shank and to reduce this wire by swaging or grinding to the size of the needle itself, and the reduced portion of the needle is then grooved and the eye formed therein and the needle finished by grinding the point and tempering, after which the shank of the needle is ground off flat on one side, so that when the needle is inserted into the sewing-machine the flat side of the shank may bring the eye in the proper position relatively to the other parts of the sewing-machine.

In grinding off the side of the shank it is found in practice that an inaccuracy arises in consequence of removing the exterior hardened portion of the steel, which is of a different temper or condition from the interior or core of the shank; hence if the shank is held firmly during the entire grinding operation the ground side of the shank is liable to be concave instead of flat in consequence of the expansion of the steel at the unground side of such shank.

My present invention relates to the means for holding the needle while ground, so that the side of the needle which is ground off is rendered perfectly true. With this object in view the needle is adjusted and its shank grasped by the vise, and it is exposed to the action of one or more grinders, which remove almost all of the metal that is to be ground off at the side of the shank, and then the jaw of the vise is opened, which allows the steel of the shank to assume its normal position previous to the last grinding operation, which is effected after the vise has again been closed, and this last grinding operation is comparatively small and principally for the purpose of rendering the flat side of the needle-shank positively true.

This improvement, although primarily intended for grinding needle-shanks, may be employed for grinding any other article in which the like conditions and necessities arise.

In the drawings, Figure 1 is a general plan view of my machine. Fig. 2 is an elevation of the same. Fig. 3 is a section at the line xx , Fig. 1, and Fig. 4 is a detached view of the needle-adjuster. Figs. 5 and 6 are separate views of the equalizer. Fig. 7 is a section of the equalizer-lever and elevation of a portion of the track and incline that acts upon said lever; and Fig. 8 is a sectional elevation, representing the support for needle-adjuster and equalizer-levers.

The bed A is supported on any suitable frame-work, and it contains a central hub A', through which passes a vertical shaft A², carrying the revolving table B, and upon the top of this table and around the edges are placed at equal distances apart the shank-holding vises C. Any desired number of these may be made use of. I usually employ twenty at equal distances apart around the edge of the table, and the table B receives a regular progressive movement by suitable gearing, such as the worm-pinion B' on the shaft A³, acting upon the worm-wheel B², that is keyed or attached to the lower end of the shaft A². Each of the shank-holding vises is made with a base 2, secured to the revolving table B by a screw 3, passing up through the table, and a steady-pin 4, and upon the top of this base 2 is a stationary jaw 5 held by a screw 7 and adjusted by a set-screw 6, and passing through the upper part of the base 2 is the screw-bolt 8 with an adjusting-nut 9 at one end and a pivot 10 at the other end for the cam-fork 11 of the closing-lever 12, and there is a jaw 15, that is perforated, for the bolt 8 to pass through, and it is guided by a steady-pin 16. The end of the stationary jaw 5 is recessed, so that the shank of the needle may rest in the recesses and between the stationary jaw 5 and the moving jaw 15, and when the closing-lever 12 is swung outwardly the cam-fork 11 causes the jaw 15 to firmly grasp the shank of the needle as it is inserted between the two jaws. By adjusting the nut 9 the vise is adapted to

different sizes of shanks, and any slight wear in the parts of the shank-holding vise are easily compensated by the construction before described.

5 It is to be understood that the shank of the jaw projects sufficiently above the top surface of the jaws 5 and 15 for the necessary amount to be ground off the side of the shank as the shank-holding vise moves
10 around progressively with the table and parts beneath the revolving grinding-wheels $D D'$ D^2 , and it is also to be understood that the grinding-wheels D and D' remove the principal portion of the metal from the shank and
15 the wheel D^2 finishes the surfaces and renders the same true. Each of the wheels $D D' D^2$ is similarly made and mounted, and usually these wheels are of emery. Each grinding-wheel is provided with an arbor 18 and a driving-pulley 19, and the arbor is held in the head
20 upon the vertical stand 21, and the head 20 can be moved vertically upon the stand 21 and clamped by a screw 22, and I prefer to use a screw 23, passing through the head of
25 the stand and through the threaded hole in the head 20, so as to draw the head 20 upwardly against an adjusting-screw 24; hence by these screws and adjustments the grinding-wheel can be raised or lowered to bring
30 its grinding-surface to the proper place, and this can be done from time to time, as may be necessary, as the grinding-wheel wears away.

In placing the needle in the shank-holding
35 vise it is necessary to adjust the same with reference to the eye of the needle. With this object in view, I provide a central stud 26 at the center upper end of the vertical shaft A^2 , and around this stud is a cylinder E , that is
40 free to revolve upon the stud, and it is provided with an arm extending outwardly and downwardly to the pivot 28 of the lever F , and there is a spring 29, tending to lift this lever F , and upon the lever F is a finger 30, that is
45 adapted to being brought down against one side of the base 2 of the vises C and held against the same while the needle is being properly placed in position, and this finger allows the attendant to keep the lever F in
50 its proper position while the table B continues to revolve, and upon this lever F is a needle-adjuster having a pin 32 held by a screw 33 in a slot in the lever F , so that this pin can be turned into a more or less inclined position and placed in the line of the needle as
55 it lies between the jaws 5 and 15, and there is a presser 34, that rests upon the shank to hold the same down between the jaws 5 and 15 until such jaws are closed by swinging the
60 clamping-lever 12 outwardly. This might be effected by hand; but I prefer to make use of the jaw-closing wheel G upon the bed A adjacent to the place where the needles are supplied, and it is to be understood that the finger 30 may be moved transversely of the lever F , so that it will form a stop against one
65 side of the base 2 when the shank of the

needle is in the proper position between the jaws of the shank-holding vise, and it is advantageous to be able to attach the pin 32 in
70 a more or less inclined position, because in many machines the flat of the shank is not in a plane perpendicular to the axis of the eye, but at a slight inclination, in order that the loop of needle-thread passing out from the
75 eye may be slightly inclined toward the shuttle or hook that passes into the same.

The grinding operations are to be performed by the wheels $D D'$ while the shank of the needle is held firmly in the vise C , and
80 it is to be understood that one, two, or more grinders or grinding-wheels may be made to act upon the shank of the needle before it is liberated, as next described.

Before the needle-shank reaches the last
85 grinding-wheel D^2 the lever 12 is acted upon by the opening-roll G' , which swings the lever 12 into the position shown by dotted lines in Fig. 2, and the pressure against the shank is sufficiently relieved for the equalizing device
90 next described to act upon the shank of the needle, after which the closing-roll G^2 acts upon the lever 12 to again clamp the needle-shank previous to the same passing beneath the last grinding-wheel D^2 , which renders the
95 shank perfectly true, the object in opening the shank-holding vise previous to the last grinding operation being to allow the metal of the shank to assume its normal position, and should the expansion of the metal vary
100 the shape of the shank in any particular this expansion takes place before the last clamping operation, and when the needle-shank is finished it will not be out of true, because the expansion of the metal has been permitted
105 previous to the last grinding operation.

The equalizing device, which acts upon the needle-shank as it lies within the shank-holding vise and after the pressure of the vise has been relieved, consists of a flat presser
110 58 upon the under side of the lever H , which lever H is pivoted at 40 to the stock K , which sets upon the central stud 26 below the cylinder E , and there is a finger 41 projecting outwardly and downwardly at one side of the
115 lever H , so that as the shank-holding vise passes along beneath the lever H the finger 41 is taken by the base of the vise, and the lever and vise move along together against the action of the spring L , which spring tends
120 to return the lever H to its normal position, and the weight of the lever resting by its presser 58 upon the flat portion of the needle-shank causes such flat portion to remain in its proper position while the vise is opened
125 by the roll G' and closed again by the roll G^2 , and beneath the outer or moving end of the lever H is a track N , upon which rests a screw 44, that passes through the outer end of the lever H , and this screw 44 usually will
130 not come into contact with the flat portion of the track N ; but toward the end of such track N is an incline 45, against which the screw 44 comes into contact after the closing-roll G^2

has caused the vise to again hold the shank of the needle, and this incline 45 lifts the lever H until the finger 41 is clear of the base of the vise, and then the spring L returns the lever H to its normal position with the end against the stop 46 ready for the equalizer to act upon the next needle as it is brought around, to hold down and equalize the same as the vise is opened and again closed previous to the last grinding operation.

The opening-roll G^4 upon the bed A acts upon the levers 12 in succession to open the shank-holding vises as they come around in succession, and there is an arm P, having at the end thereof a discharging-blade 47, which is in line with the groove between the jaws of the shank-holding vise, and against this blade 47 the end of the shank is pressed, and the blade causes the needle to be discharged as the vise continues its movement, and there is an adjustable brush 50 upon the same arm P to brush out from the shank-holding vise any particles of metal that may remain therein from the action of the grinders. Thereby the needles are automatically discharged from the vises and the vises cleaned ready for the reception of needles, as aforesaid.

I claim as my invention—

1. The combination, with the grinders in a machine for grinding needle-blanks or similar articles, of a clamping-jaw for holding the blank while the principal portion is being ground off, automatic mechanism for releasing the jaw for allowing the metal to assume a normal condition, means for closing the jaw, and a grinder for finishing the operation and rendering the surface true, substantially as specified.

2. The combination, with suitable grinding-wheels acting in succession, of a revolving table, shank-holding vises upon such re-

volving table, each vise being provided with a lever for opening or closing the same, and mechanism for moving the levers and opening and closing each vise in succession previous to the last grinding operation, for the purpose and substantially as set forth.

3. The combination, with grinding-wheels and a revolving table, of a circular range of vises upon such table, each vise having a stationary and a moving jaw, a lever for closing the moving jaw, a closing-roll acting upon the lever after the needle has been placed in a vise, an opening-roll acting upon the lever after the grinding operation has been principally performed, and a closing-roll acting to grasp the needle and hold the same previous to the last grinding operation for truing the surface of the needle-shank or similar article, substantially as set forth.

4. The combination, with the grinding-wheels and a revolving table, of a circular range of vises upon such table, each having opening and closing devices, and an equalizer acting upon the flat portion of the needle-shank or other device after the vise has been opened and before it is closed for the final grinding and truing operation, substantially as set forth.

5. The lever H, having a flat presser 58 and a finger 41, in combination with the vise for holding the shank, the stock to which the lever is pivoted, the opening and closing rolls G' and G^2 , and the track N, having an incline for disengaging the finger, and the spring L for returning the parts to their normal position, substantially as set forth.

Signed by me this 14th day of February, 1890.

WILLIAM H. DAYTON.

Witnesses:

GEO. T. PINCKNEY,
HAROLD SERRELL.