

E. SCHMIDMER.
MACHINE FOR POLISHING DIAMOND DRAW PLATES.
APPLICATION FILED MAR. 2, 1909.

925,233.

Patented June 15, 1909.

2 SHEETS—SHEET 1.

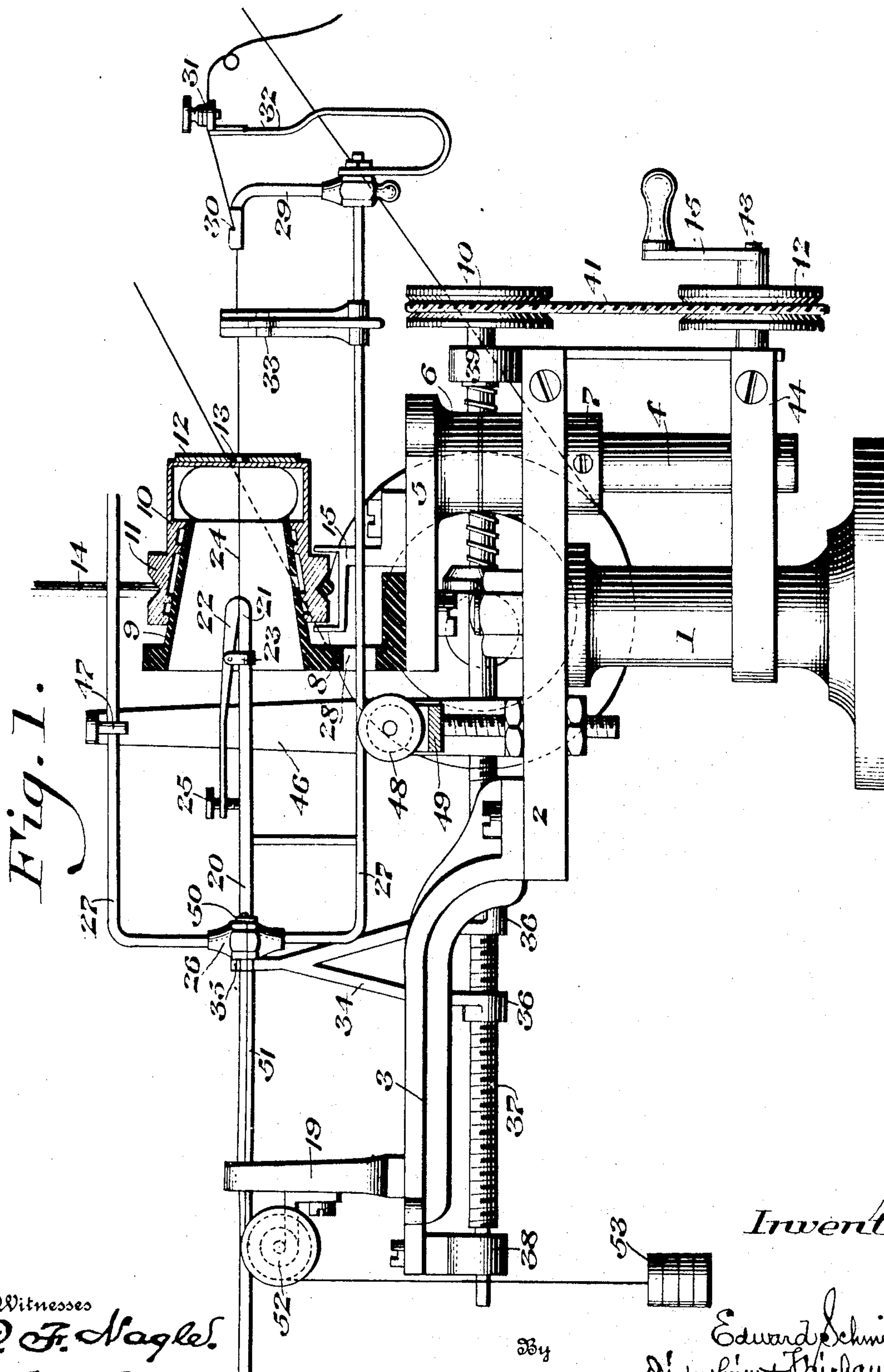


Fig. 1.

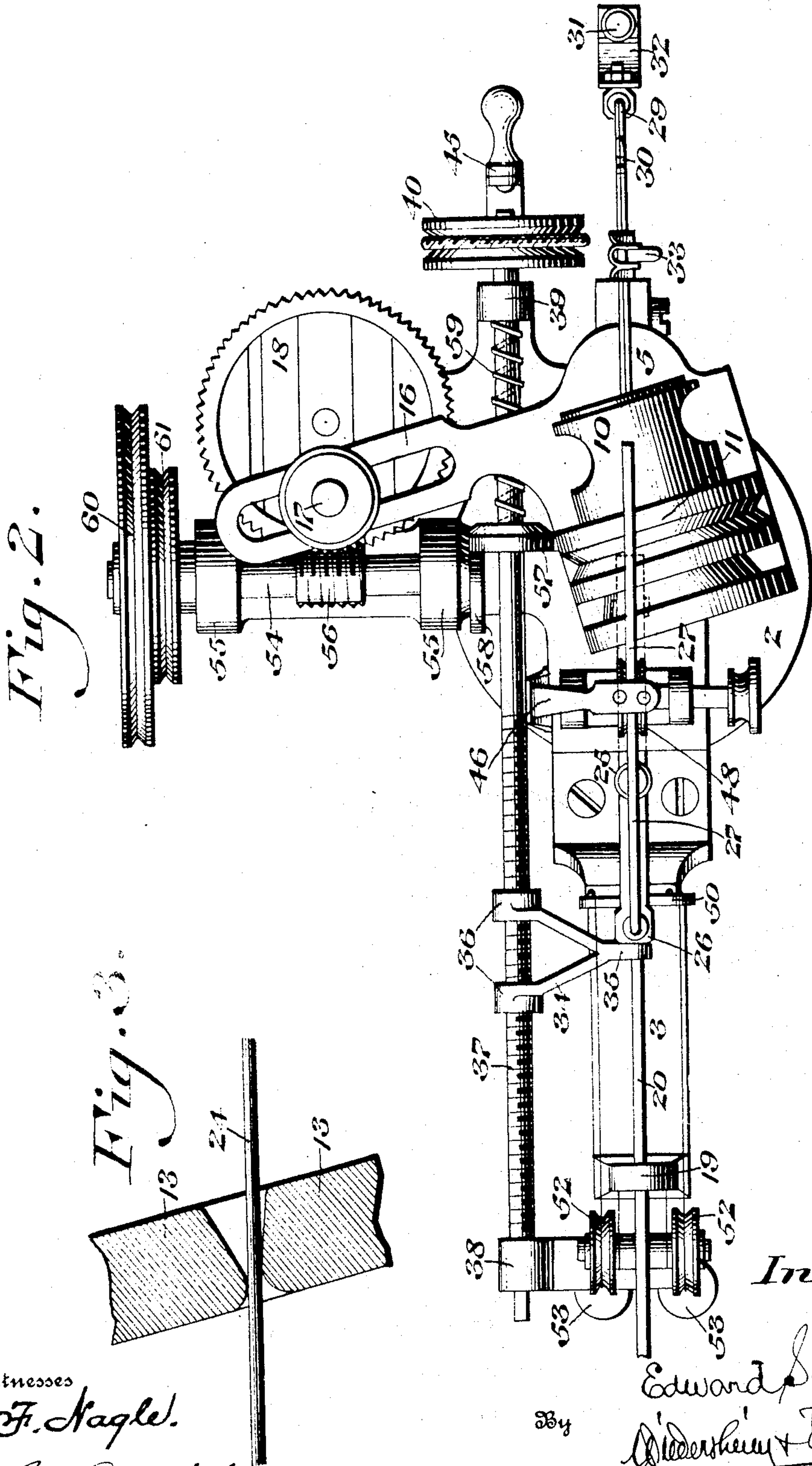
Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD SCHMIDMER, OF NUREMBERG, GERMANY.

MACHINE FOR POLISHING DIAMOND DRAW-PLATES.

No. 925,233.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD SCHMIDMER, a subject of the Emperor of Germany, residing at Nuremberg, Germany, have invented a new and useful Machine for Polishing Diamond Draw-Plates, of which the following is a specification.

This invention relates to the grinding and polishing of diamond draw-plates and has for an object to provide an apparatus for this purpose which operates efficiently so that a draw-plate is accurately reground and polished at all points. In such devices as heretofore constructed it has been necessary on account of the small hole through the draw-plates, to use a needle for the purpose, which is either operated by hand, or fixed in a suitable form, and with which the plate coöperates and is turned from one point to another during the polishing process in order that all surfaces may be ground. This method has the disadvantage of sooner or later producing a very ragged shaped opening. Furthermore the needle is held at one end and is of such a length that certain portions of the plate farthest from the support are not properly polished owing to the flexibility of the needle and the vibration thereof. In consequence only a small portion of the needle comes into operation and that part is therefore soon worn out requiring the use of a new needle.

In my present invention the plate is ground and polished evenly and accurately at all portions of the opening and is accomplished by mechanism comprising a reciprocating member passing through the draw-plate while the latter at the same time is rotatably driven and at the same time subjected to an oscillating movement, whereby all the angular portions of the draw-plate opening are brought into position to be worked upon and ground by the reciprocating member.

It further consists of novel details of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings, one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that

my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a side elevation of a device embodying my invention. Fig. 2 represents a plan of the same. Fig. 3 represents a detail of the draw-plate and polishing member.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: 1 designates a pedestal forming a supporting base for my novel polishing mechanism the same having fastened thereon in any suitable manner, a table 2 provided with an extension arm 3 for a purpose to be presently described.

4 designates a shaft mounted for oscillatory movement in a suitable aperture in the table 2 and carrying thereon a plate 5, it being of course understood that a suitable hub 6 and collar 7 are provided to prevent vertical displacement of the aforesaid shaft. In the present instance the plate 5 carries thereon an angle plate 8 having a conical hollow bearing 9 integral therewith, the same forming a bearing surface adapted to receive a member 10, a portion of which coöperates with the conical bearing 9 and has an exterior pulley 11 formed thereon, while the remaining portion thereof has mounted thereon a holder 12 for securing the diamond 13 in position.

14 designates a belt adapted to encircle the pulley 11 to furnish means to rotate the same, as desired. In order to maintain the pulley 11 and member 10 in correct position at all times while rotating about the conical bearing 9, a forked bracket 15 is suitably secured to the plate 5 in position to prevent displacement of the pulley 11.

16 designates a slotted extension on the plate, the same being adapted for engagement with a lug 17 suitably mounted on a gear 18, which latter is rotatably carried on an extended portion of the table 2. It will thus be apparent that as the gear 18 is rotated the plate 5 will receive an oscillating movement with the shaft 4 and thus produce a shifting of the diamond plate 13 for the proper grinding operation, it being noted, however, that the movement of the diamond plate is a very limited one since in the preferred construction the point at which the diamond plates are located is in substantial alinement with the center of the axis through the shaft 4.

19 designates a bearing bracket secured to the arm 3 adapted to carry for sliding movement thereon a rod 20, one end of which terminates in a jaw 21, cooperating with which is a second jaw 22 suitably pivoted in the present instance, to a U-shaped member 23, whereby a gripping device is formed adapted to hold one end of the polishing wire 24. In order to set the jaws 21 and 22 a screw 25 or like device passes in the preferred form through the long arm of pivoted jaw 22 and into the rod 20.

26 designates a head fixedly mounted on the rod 20 and having secured thereto, a frame 27, one side of which passes over the table 2 and through a slot 28 formed in the plate 8 and terminating in a wire tension device consisting, in the present instance, of a guide arm 29 fixedly mounted on frame 27 and provided with a guide 30 thereon through which the wire 24 passes and is secured to a binding post 31 carried, preferably by a spring arm 32 mounted on the frame 27 and normally tending to maintain the wire 24 taut.

33 designates a stop device mounted on the frame 27 and so positioned as to limit in one direction the movement of the frame 27 and wire 24. In the reverse direction the movement and control of the frame 27 is preferably had by means of a traveler 34 having an apertured lug 36 thereon cooperating with the rod 20 and the opposite end of said traveler having threaded hubs 36 carried on a feed screw 37 suitably mounted in bearings 38 and 39 respectively of the arm 3 and the table 2.

In order to vary the relation between the traveler 34 and the head 26 so that the engagement of these parts will take place at different times in order to bring into operation a different working portion of the polishing wire 24, I preferably mount on the feed screw 37 a driven pulley 40 with which a rope drive 41 or the like cooperates, the same being driven by a pulley 42 mounted on shaft 43, the latter being suitably carried in a bracket 44 on the pedestal 1 while the handle crank 45 is provided to produce proper movement of the parts. It will be apparent as the crank 45 is turned to produce rotation of the feed screw that the traveler 34 will be moved therealong in one direction or the other and thereupon shift the position of the head 26 to bring another portion of the polishing wire 24 into operative engagement with the draw-plates.

In order to properly guide the frame 27 in its reciprocating movement an arm 46 is suitably mounted on the table 2 and carries at its upper end a guide finger 47 to maintain the frame in correct alinement, while at its lower end a sheave 48 is rotatably mounted on an adjustable bearing block 49 and in such a position as to support at all times the

frame 27 and permit reciprocation thereof without displacement of any of the cooperating parts.

It will, of course, be understood that since the head 26 is engaged on one side only by the traveler 34 that some means must be provided for the return movement of the frame 27 and in the present instance I have provided a counterweight operating means consisting, as here shown, of a bar 50 fixedly secured to the head 26 and carrying on each end thereof a wire rope or equivalent device 51 passing over a pulley 52 suitably mounted, as here shown, on a bearing bracket 19, the ends of said wires each carrying a weight 53, which is sufficient to overbalance the weight of the moving parts 27 and their adjuncts.

In the present instance in order to drive the gear 18 to produce an oscillating movement of the pulley 11 I provide a shaft 54 rotatably mounted in brackets 55 secured to an extension of the table 2, the said shaft 54 carrying thereon a worm gear 56 adapted for engagement with the gear 18 whereby as the shaft 54 is rotated the gear 18 will be correspondingly driven.

In order to transmit motion from the shaft 54 to the screw shaft 37 to produce movement of the traveler, I preferably employ a friction drive mechanism consisting in the present instance of a friction wheel 57 mounted on the shaft 37 and adapted to be held in contact with a similar friction wheel 58 secured to shaft 54 by means of a spring 59 cooperating with a bearing 39.

In the present instance, the shaft 54 has mounted thereon, a pair of pulleys 60 and 61 in order that different speeds of movement of the traveler 34 may be accomplished and any suitable means such as a plate or the like may be provided to operate the said pulleys.

The operation of the device will now be apparent since as soon as the polishing wire is properly adjusted by manipulation of handle crank 45 to bring the traveler 34 into the desired engagement with head 26 the shaft 54 is thrown into operation and the device is ready for a polishing movement. The rotation of shaft 54 causes a simultaneous operation of the gear wheel 18 and friction wheel 57, the former through the crank connection 17 producing an oscillation of the draw-plate member 10 and the latter a rotation of screw shaft 37. The rotation of screw shaft 37 advances the traveler 34 a sufficient distance to draw a portion of the polishing wire 24 through the draw-plate 13 whereupon a reverse movement of the mechanism takes place and the parts return to normal position.

It will of course, be understood that the member 10 during its oscillation is receiving a suitable rotative movement through the

driving pulley 11 and therefore, it will be readily understood that the draw-plates are subjected an even contact at all points with the polishing wire and are accurately ground and polished.

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

1. In a device of the character described, a table, a member mounted thereon adapted to support diamond draw-plates, means to oscillate said member and polishing means for said draw-plates.

2. In a device of the character described, a table, a member rotatably mounted thereon and adapted to support diamond draw-plates, means to oscillate said member and polishing means for said draw-plates.

3. In a device of the character described, a table, a member mounted thereon adapted to support diamond draw-plates, a reciprocal device for polishing said draw-plates and means to oscillate and rotate said member during reciprocation of said polishing device.

4. In a device of the character described, a table, a member rotatably mounted thereon adapted to support diamond draw-plates, means to oscillate said member, a polishing device for said draw-plates and means to reciprocate said polishing device during movements of said member.

5. In a device of the character described, a table, a bracket mounted thereon for oscillatory movement, a member rotatably carried by said bracket and adapted to support diamond draw-plates, a polishing wire for said draw-plates means to reciprocate said wire and means to maintain said wire under tension.

6. In a device of the character described, a table, a bracket mounted thereon for oscillatory movement, a member rotatively carried by said bracket and adapted to support diamond draw-plates the said draw plates being positioned in substantial alignment with the axis of oscillation of said bracket, a polishing wire for said draw plates, means to reciprocate said wire, and means to maintain said wire under tension.

7. In a device of the character described, a table, a bracket mounted thereon for oscillatory movement, a member rotatively carried by said bracket and adapted to support diamond draw-plates the said draw-plates being positioned in substantial alignment with the axis of oscillation of said bracket, a polishing wire for said draw-plates, means to reciprocate said wire, and means to adjust the working position of said wire.

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