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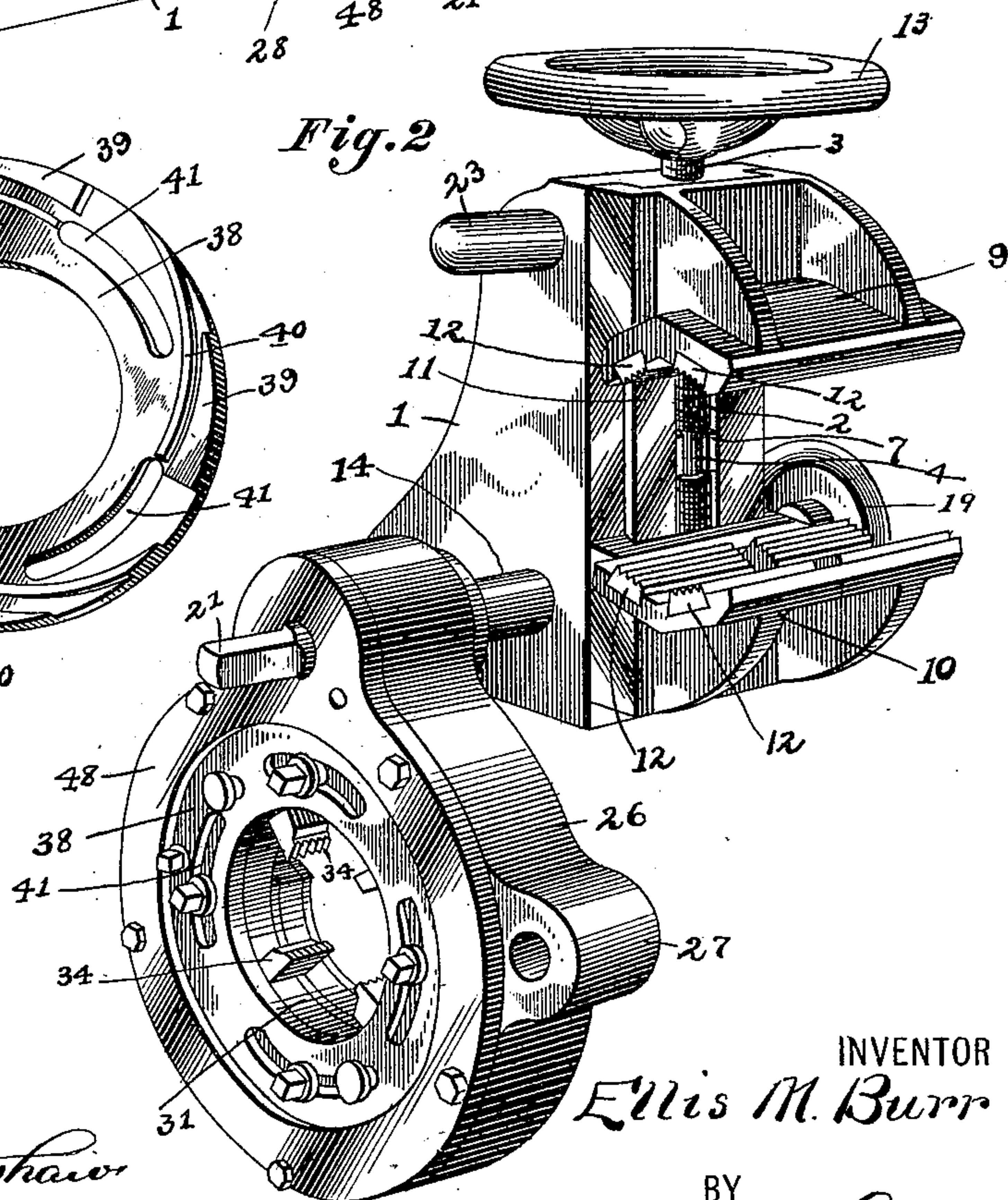
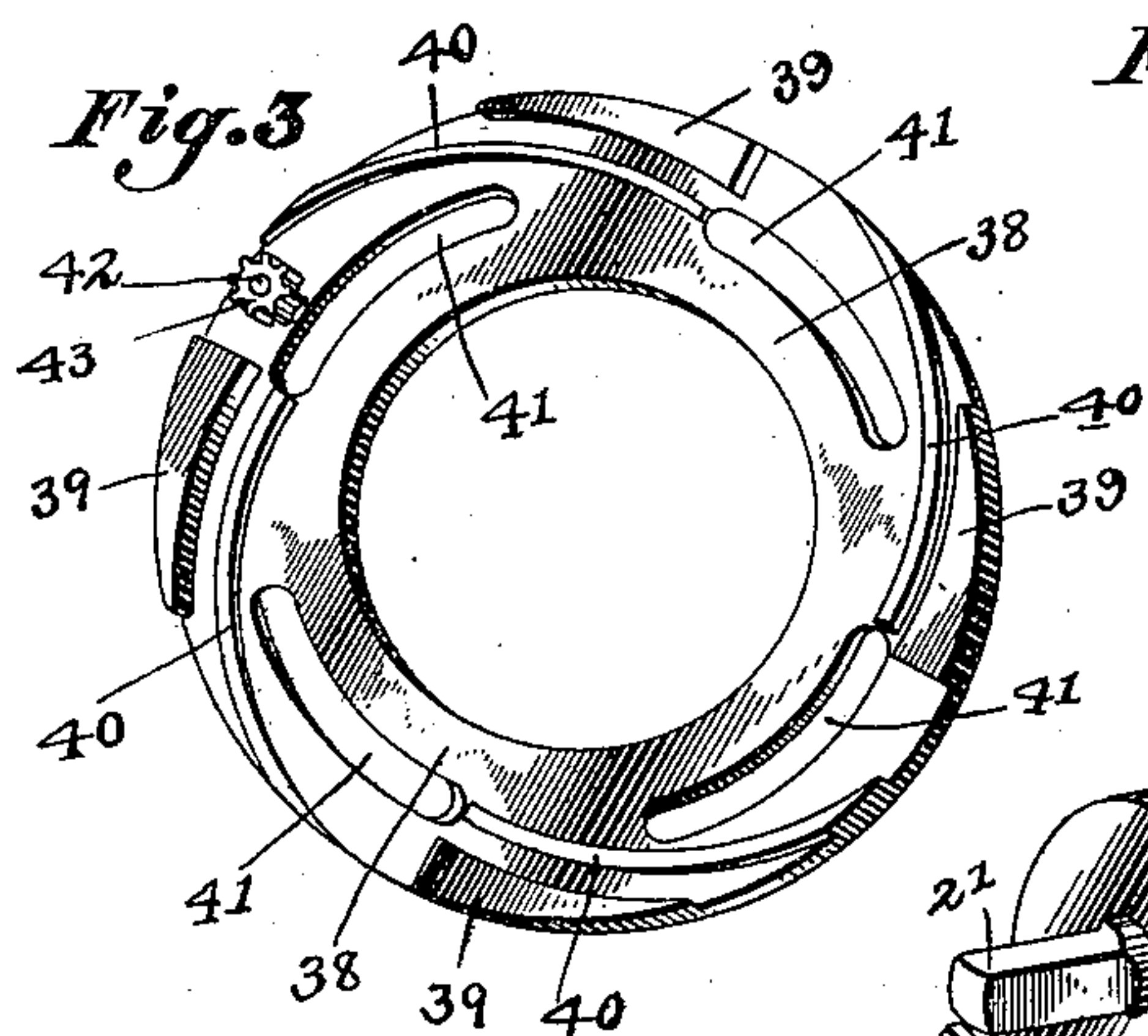
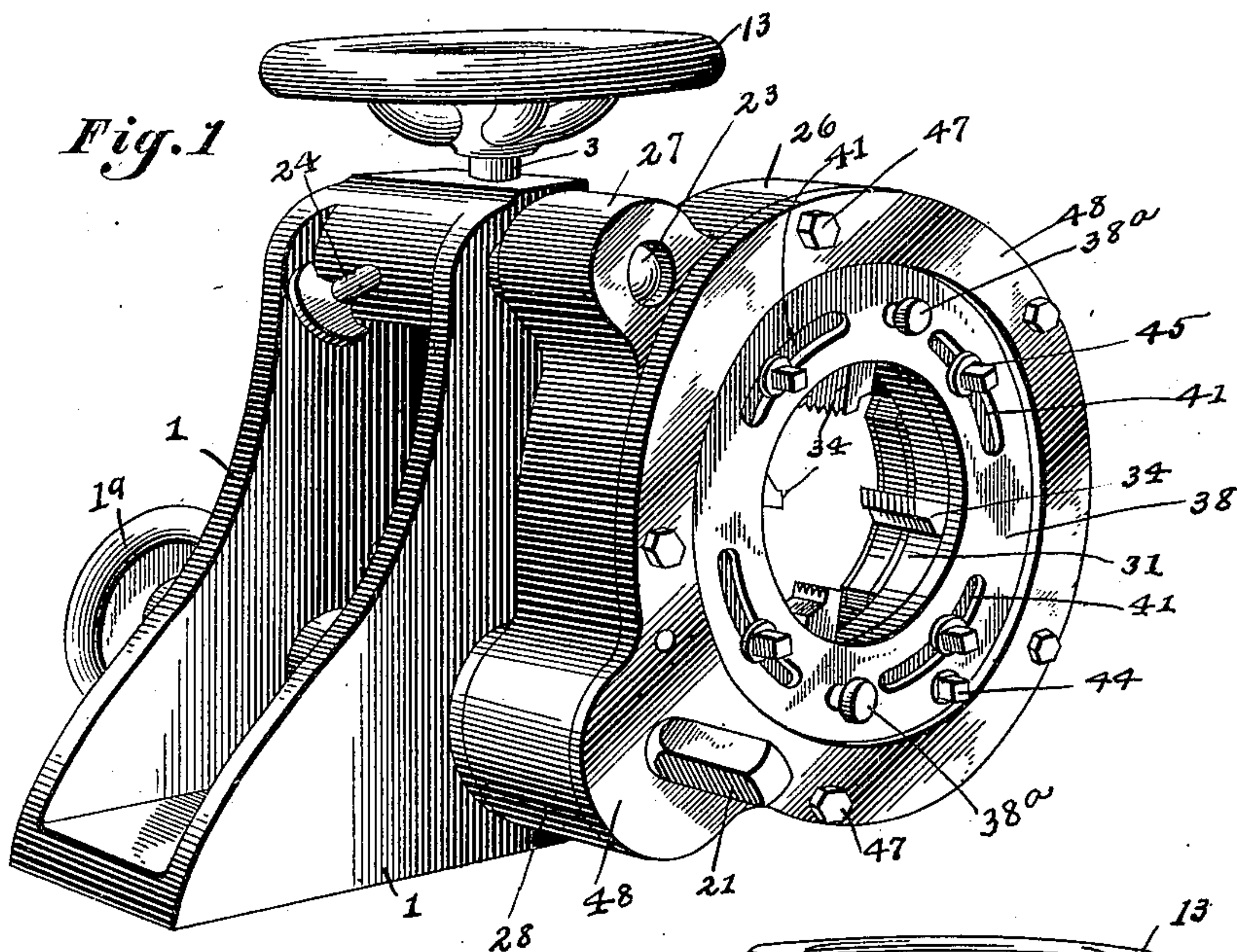
Patented July 10, 1900.

E. M. BURR.
THREAD CUTTING MACHINE.

(Application filed May 15, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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J. H. Fravel

INVENTOR

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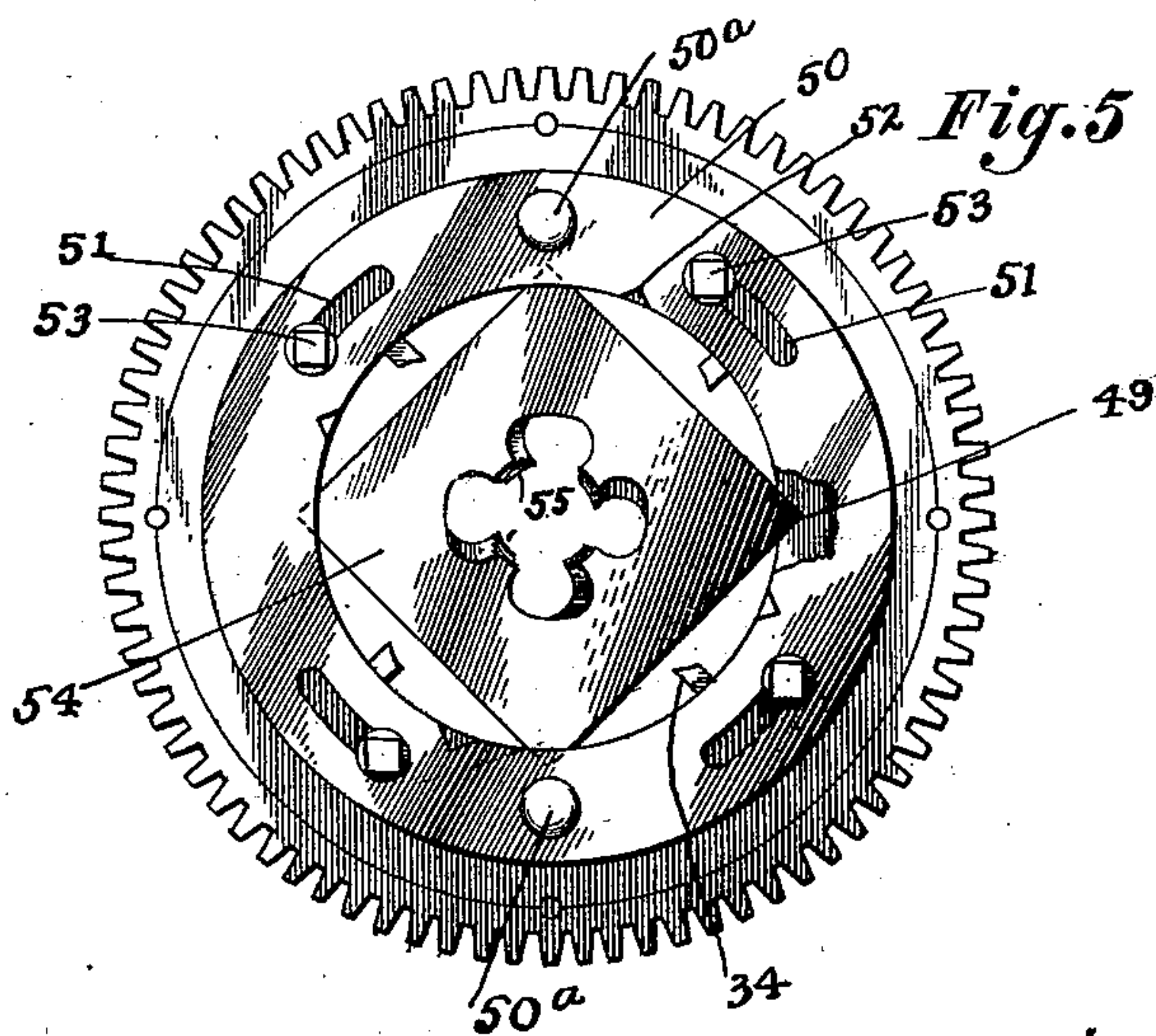
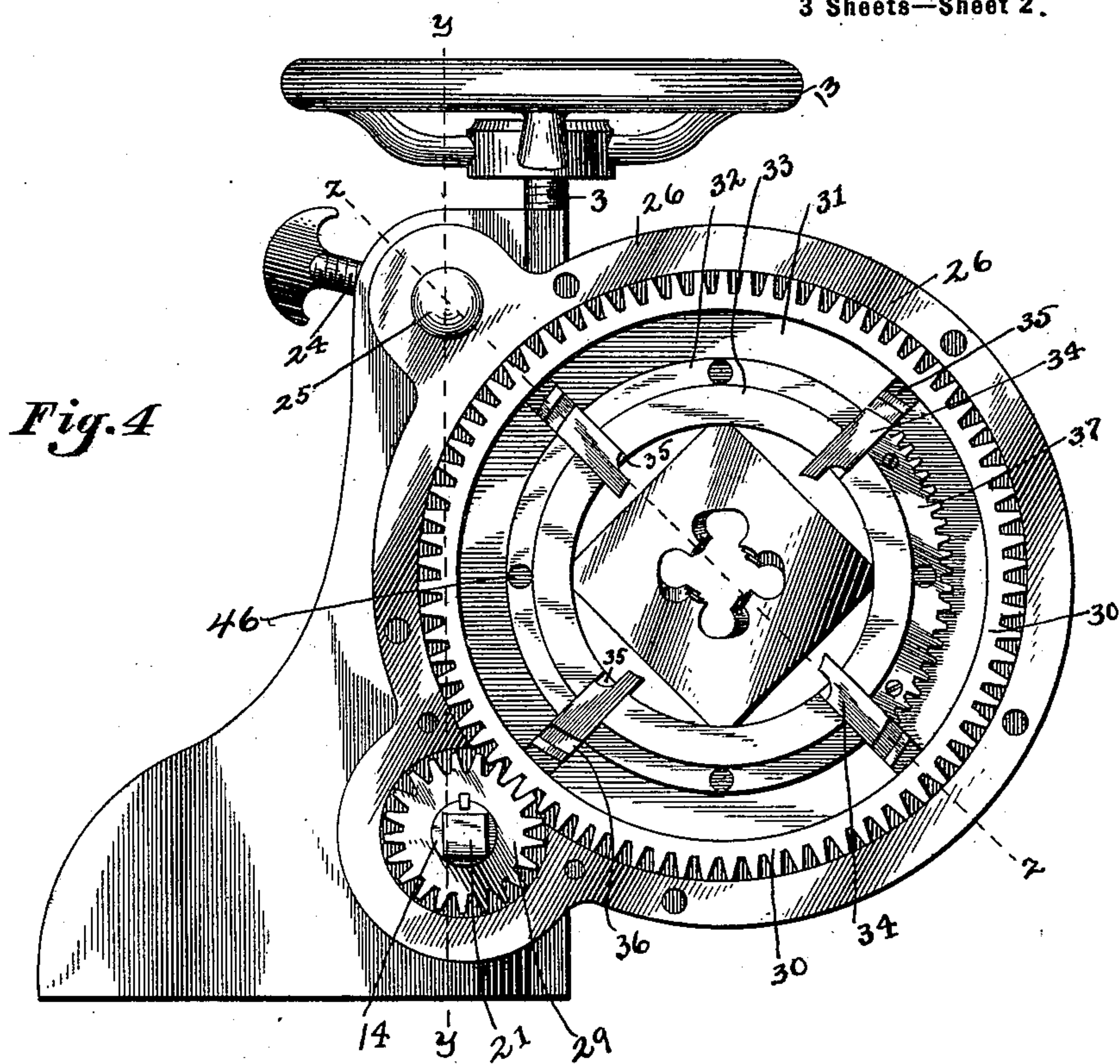
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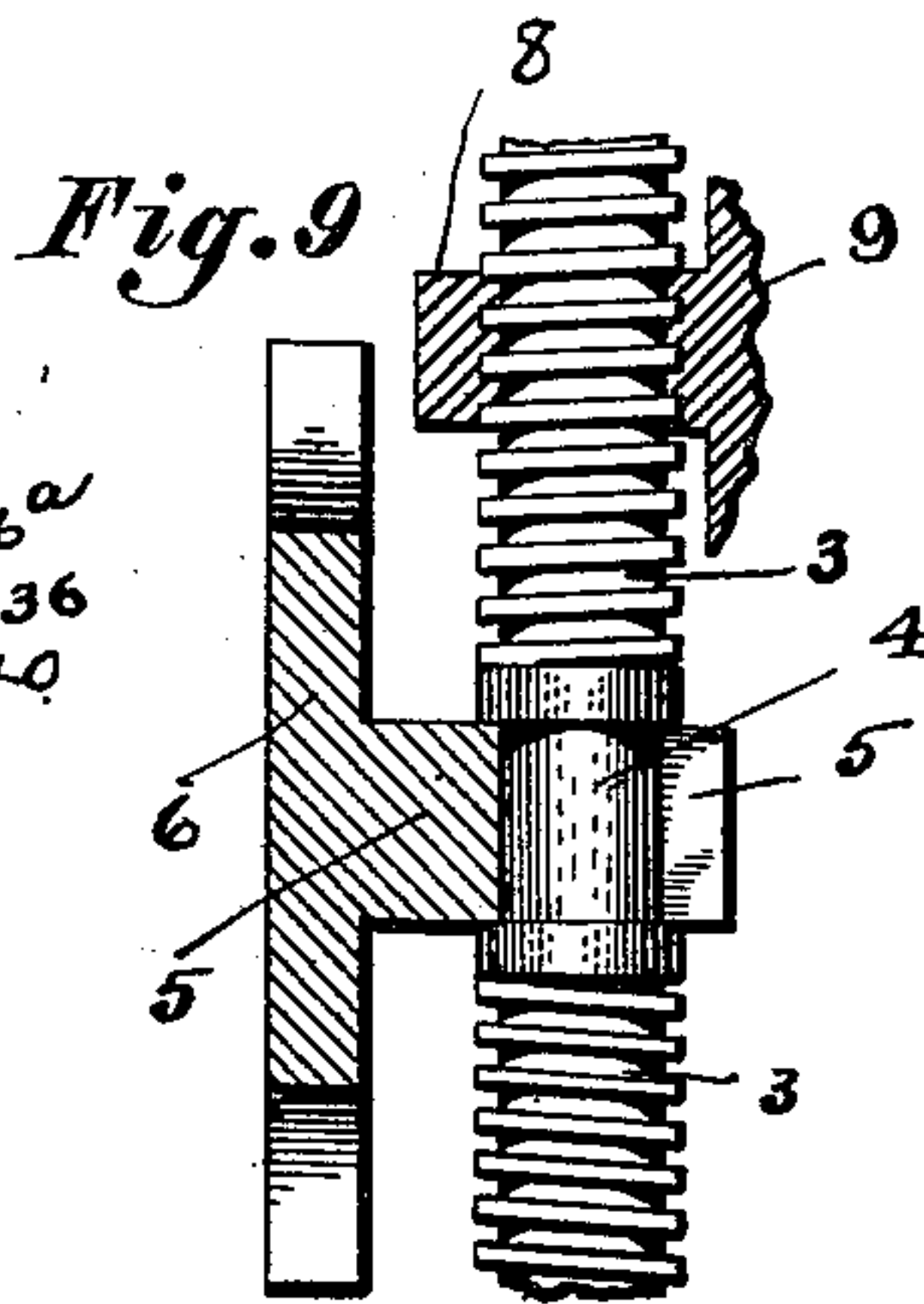
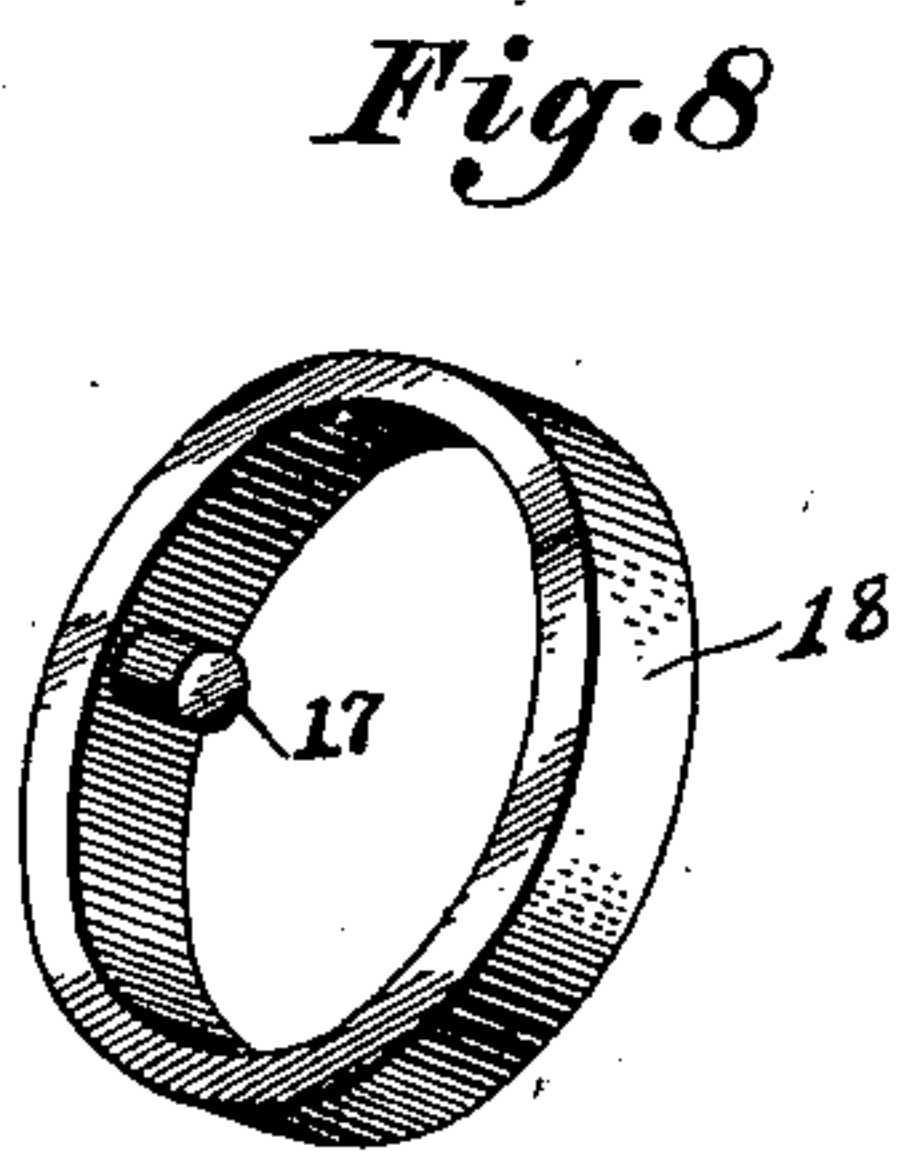
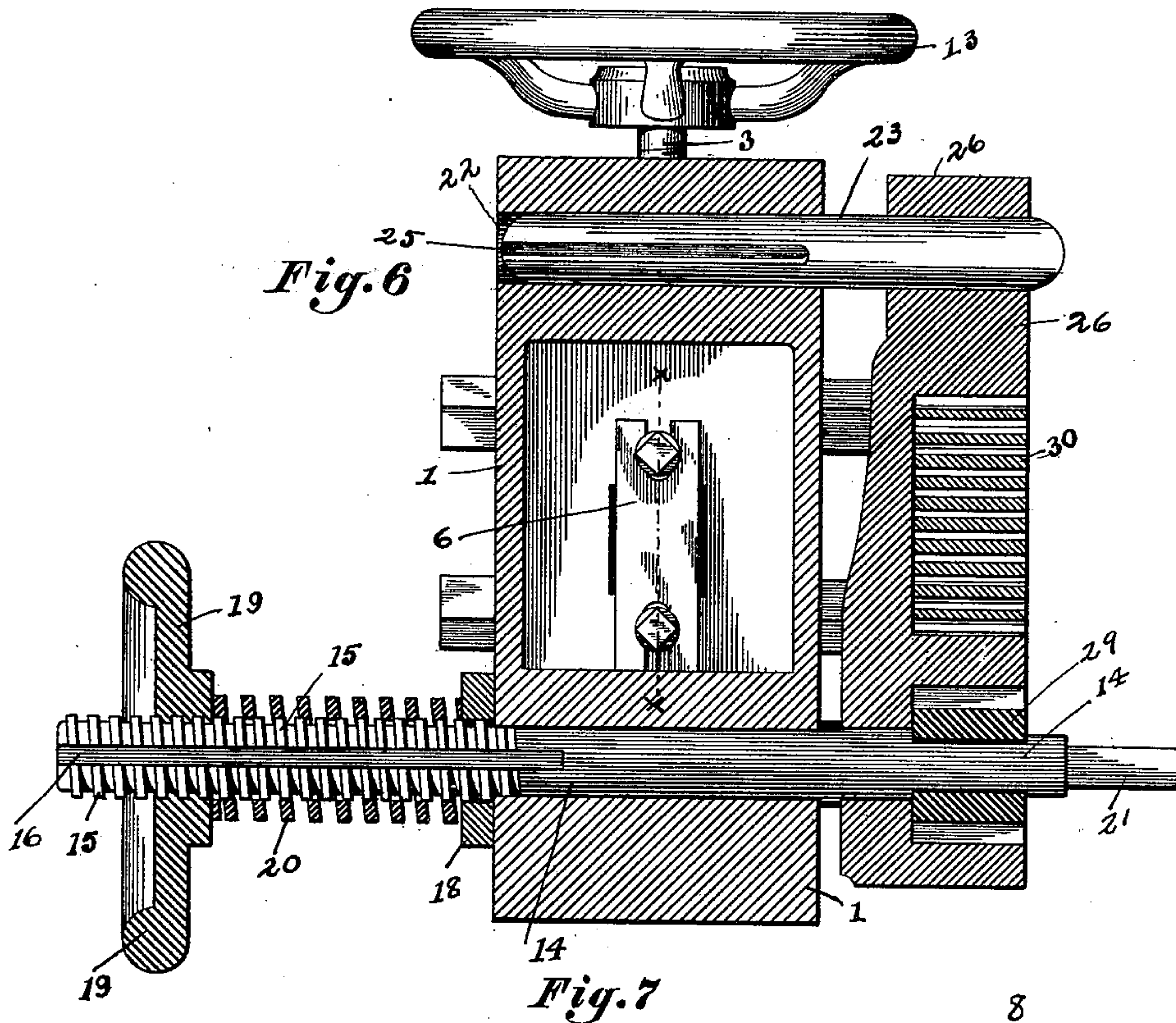
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UNITED STATES PATENT OFFICE.

ELLIS M. BURR, OF CHAMPAIGN, ILLINOIS.

THREAD-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 653,543, dated July 10, 1900.

Application filed May 15, 1899. Serial No. 716,906. (No model.)

To all whom it may concern:

Be it known that I, ELLIS M. BURR, a citizen of the United States, residing at Champaign, in the county of Champaign and State of Illinois, have invented a certain new and useful Improvement in Thread-Cutting Machines, of which the following is a specification.

My invention relates to pipe-threading machines; and the objects of my invention are to provide a machine of this class of superior construction, to provide improved means in connection therewith for drawing the thread-cutting dies onto the work, to provide an improved construction whereby the die-carrying head may be dropped down from the work to expose the threaded or partially-threaded pipe for the purpose of trying fittings thereon and to accomplish this object without changing the position of the pipe, to provide improved means for holding and imparting a uniform adjustment to the thread-cutting dies, to combine with the die-supporting head means for firmly holding an ordinary die-plate, and to produce other improvements the details of construction and arrangement of parts of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a view in perspective of my improved thread-cutting machine, showing the die-carrying head or ring in position for operation. Fig. 2 is a perspective view of said machine, showing said die-carrying head dropped downward for exposing the threaded or partially-threaded pipe-surface. Fig. 3 is a detail view in perspective of a die-adjusting ring which I employ in the manner hereinafter described. Fig. 4 is an end elevation showing the outer side of the die-carrying head or ring with the die-adjusting ring removed. Fig. 5 is a view in elevation of the gear-ring and inclosed parts, taken from the side or end opposite that shown in Fig. 4. Fig. 6 is a vertical section on line *y y* of Fig. 4. Fig. 7 is a sectional view of the die-carrying head or ring casing, taken on line *z z* of Fig. 4. Fig. 8 is a detail view in perspective of a washer-ring which I employ in the manner hereinafter described, and Fig. 9 is a sectional view taken on line *x x* of Fig. 6

and omitting for the sake of clearness certain parts cut by said section-line.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ an upright clamp-holding body 1, which may be secured in the position shown in the drawings to any suitable base or support. The vertical face of the body 1 is provided with a vertical channel or recess 2.

3 represents a threaded jaw-adjusting screw or rod which passes downward through an opening in the upper side of the body 1 and thence through the channel 2. The clamp-adjusting screw-rod is, as indicated more clearly in Fig. 9 of the drawings, provided at the center of its length with a smooth or journal portion 4, the latter having a rotating bearing, as shown, in the forwardly-projecting arm 5 of a vertical bracket-bar 6, which, as indicated in Fig. 6 of the drawings, is secured within a recess of the body 1 in rear of the channel portion 2. The bracket-arm 5, however, projects within said channel portion, the forward ends of these bracket-arms being disclosed in Fig. 2 at 7. The screw-rod 3 has its portions above and below the journal portion 4 provided, respectively, with right and left hand threads, these threaded portions engaging the threads of screw-holes formed in rearwardly-projecting arms 8 of upper and lower clamping-bodies 9 and 10, these clamping-body arms 8 projecting within the channel 2 and the upper one of said arms being indicated in Fig. 9 of the drawings. The inner and sliding portion of each of the clamp-bodies is channeled, said channeled portions loosely embracing, as indicated in Fig. 2 of the drawings, a vertical guide projection 11 of the face of the body 1. The lower portion of the upper clamp-body 9 and the upper side of the lower clamp-body 10 is preferably in the form of an angular plate, in the inclined wings of each of which is supported corrugated or toothed clamping-blocks 12 of suitable construction. The upper end of the screw-rod 3 is provided with a hand-wheel 13 or other suitable means for aiding the rotation of the screw-rod.

Through the lower portion of the body 1 passes horizontally a sliding shaft 14, said shaft having one of its outer portions thread-

ed, as indicated at 15, and said threaded portion being provided with a longitudinal keyway 16, into which is adapted to extend the projecting key-pin 17 of a washer-ring 18, which surrounds the inner threaded portion of the shaft 14 and abuts against the side of the body 1. Upon the outer threaded end portion of the shaft 14 is adapted to turn a nut-wheel 19, and between the latter and the outer face of the washer-ring 18 is interposed a coiled spring 20. The projecting end portion of the shaft 14, which is opposed to the threaded portion, is preferably squared, as indicated at 21, to receive a crank-handle, belt-wheel, or other means for rotating said shaft. Through the upper end portion of the body 1 I provide a horizontal pin-opening 22, within which is adjustably supported a horizontal pin 23, which projects, as indicated in the drawings, beyond that end of the body 1 which we shall term the "forward" end or side. The pin 23 is adapted, however, to be adjusted with reference to its extent of projection through the medium of a set-screw 24, which enters a screw-hole in the body 1, and the inner end of which is adapted to engage a keyway 25 in said pin.

26 is a ring frame or casing which, in the manner hereinafter described, is adapted to support the thread-cutting dies and the operating mechanism therefor. In constructing the ring frame or casing 26 I form the same with two peripheral projections or bosses 27 and 28, the latter forming a boxing for the forwardly-projecting portion of the shaft 14, which passes therethrough, and being recessed on its outer side to receive a pinion-wheel 29, which is mounted and carried on said shaft 14. The remaining lug 27, which is arranged above the lug 28 when the ring-casing 26 is in its normal position, is provided with a pin-opening therethrough, which is adapted to detachably receive the outwardly-projecting portion of the pin 23, the body of the frame-ring being thus supported in a position which causes it to project beyond the side of the body 1 and opposite the ends of the jaws 9 and 10. As shown in the drawings, particularly in Fig. 7, the ring-casing 26 is provided on its rear side, or that side which is toward the clamping-jaws, with an inwardly-projecting flange 26^a, said casing being thus angular in cross-section.

Within the ring-casing 26 is loosely or rotatably supported a gear or toothed ring 30, the teeth of the latter engaging those of the pinion 29, as shown more clearly in Fig. 4 of the drawings. The gear-ring thus formed carries therein a ring-plate 31, the latter being provided on its forward face with forwardly-projecting circular shoulders 32 and 33, said shoulder 33 framing the central opening of said ring-plate 31.

34 represents thread-cutting tools or dies, the latter being adapted to be inserted, as indicated more clearly in Figs. 4 and 7 of the drawings, within radially-arranged recesses

35, which are formed in the ring-plate 31 and its circular shoulders 32 and 33. The thread-cutting dies or tools thus inserted have their thread-cutting ends projecting on radial lines slightly within the opening which is bounded by the central shoulder 33 of said ring-plate. In constructing each of the thread-cutting dies 34 I form its inner or shank portion with a cross groove or channel 36, the latter being formed on a slight curve or arc, as indicated, resulting in the formation of a transverse key projection 36^a. On the periphery of the ring-shoulder 32 I provide a gear-segment 37.

38 represents a die-adjusting ring, the inner face of which is shown more clearly in Fig. 3 of the drawings, while the outer face thereof is indicated clearly in Figs. 1 and 2. On the inner face of said adjusting-ring I form adjacent to the periphery thereof and at desirable intervals cam projections 39, there preferably being four of said projections, and the inner faces or sides of said cam projections, which are toward the center of the ring 38, are formed on tangential or spirally-curved lines. On the inner sides of the cam-lugs 39 and running approximately parallel to the curved inner faces of said cam-lugs are correspondingly-curved ribs 40, the latter, however, being of greater length than the cam-lugs 39. The adjusting-ring 38 is further formed at intervals with curved slotted openings or mortises 41. Passing through the ring 38 and journaled therein at a point near its outer side is a pin 42, on which is carried, on the inner side of the ring, a pinion 43, the outer projecting end of said pin 42 being squared, as indicated at 44, to receive a suitable operating-key. I also provide the outer face of the ring 38 at suitable points with projecting handpieces or knobs 38^a. The ring 38, formed as above described, is secured in its position in front of the ring-plate 31 through the medium of connecting-bolts 45, which pass through the slotted openings 41 and enter threaded openings 46 in the ring-plate 31. When supported in this position, the transverse key projections 36^a of the thread-cutting dies extend within the grooves or ways formed between the spiral segments 39 and 40 of the ring 38. On the outer side of the ring-frame 26 I secure, through the medium of bolts 47, a face-ring 48.

In forming the ring-plate 31 I produce therein at four equidistant points transverse notches, one of which is shown in full lines in Fig. 5 of the drawings at 49, and on the inner side or face of the ring-plate 31 I provide a ring 50, said ring being provided at intervals with curved slotted openings 51 and having formed on its inner edge at equidistant points four notches 52. The ring 50 is adapted to be held in connection with the ring-plate 31 through the medium of bolts 53, which pass through the slotted openings 51.

54 represents an ordinary square die-block, which is provided in the usual manner with a central opening, into which extend thread-

cutting projections of said block, as indicated at 55. This die-block 54, which is adapted to be employed only when it is desired to thread a smaller pipe than that adapted to be threaded by the dies 34, may have its corners seated in the notches 49 of the ring-plate 31 in the manner illustrated in Figs. 4 and 5 of the drawings, the insertion of said die-block being accomplished by turning the ring 50 until the notches 52 and 49 register with each other, said ring 50 being after the insertion of said die-block rotated until said notches are out of alinement. The ring 50 is also provided on its outer side with hand projections or knobs 50^a.

In utilizing the invention herein described for the purpose of cutting threads on a pipe, said pipe is clamped in the desired position between the clamping-bodies 9 and 10, the clamping action of the latter being controlled by the rotation of the screw-shaft 3. In this manner the pipe is firmly held with that end which is to be threaded adjacent to or in contact with the projecting ends of the thread-cutting dies 34. In order to draw the ring-frame 26 into proper position for the action of the dies on the pipe, the hand-nut 19 on the shaft 14 is turned inwardly on the screw-threaded portion of the shaft 14, this inward movement of said hand-nut resulting not only in bringing the dies into firm engagement with the pipe and in position for starting the thread thereon, but in compressing the spring 20 between said hand-nut and the washer or collar 18, whereby a tendency of the shaft 14 to work outward is attained. In starting the dies inward to the desired degree for cutting a proper depth of thread, the bolts 45 are sufficiently loosened to admit of the ring 38 being turned, which turning movement may be accomplished by engaging the pin-head 44 with a suitable key and turning the latter. Owing to the spiral curvature of the channels or recesses, which are formed between the curved ribs 40 and cam projections 39 of the plate 38 and the fact that the key projections 36^a of the dies are located within said channels, it is obvious that the rotary movement imparted, as above described, to the ring 38 may be such as to force the cutting ends of the dies inwardly toward the center of the ring-opening. The dies having thus been adjusted to their proper cutting position, the ring 38 may be firmly secured in its new position by the turning of the bolts 44 until their heads clamp firmly against the outer side of said ring. By now engaging the shaft extension 21 with the socket portion of a crank or other suitable device said shaft may be rotated in the proper direction to cause, through the engagement of the pinion 29 and gear-ring 30, a rotation of the die-carrying parts, which will result in a traveling of the cutting ends of said dies in the proper direction on the pipe. Owing to the compression of the spring 20, heretofore described, it is obvious that the tendency of the shaft 14 to work outward, which

is caused by said compression, must result in said shaft gradually feeding outward and in the thread-cutting action on the pipe being continued in the direction of the clamp, owing to the gradual movement of the ring-frame 26 toward the body 1.

From the construction herein shown and described it will be seen that an improved mechanism is provided for drawing the dies onto the work and automatically feeding said cutting-dies over the periphery of the latter. It will also be observed that the means which I employ for adjusting the dies inwardly or outwardly are simple and positive and that the movement which may be imparted to said dies thereby will be uniform.

In case it is desired to swing the ring-frame out of the way of the pipe end for the purpose of trying on fittings or other purposes, it will be seen that the dies may by proper rotation and setting of the ring 38 move out of engagement with the pipe. The spring-pressure on the shaft 14 may now be released and the hand-wheel 19 run out on the shaft 14 far enough to allow the latter to be moved to the position indicated in Fig. 2 of the drawings, in which position the ring-frame 26 becomes disengaged from the pin 23, said ring-frame being thus allowed to drop downward, as indicated in said Fig. 2.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a thread-cutting mechanism, the combination with a pipe-clamping body, of a ring-frame adjustably supported therefrom, a ring-plate mounted in said ring-frame, radially-arranged, threading-dies carried in said ring-plate, an adjusting-ring engaging projections of said dies and adapted to move the latter inward or outward, a sliding and rotating shaft connecting said clamping-body and frame-ring, said shaft having a threaded outer portion and a hand-nut thereon, a spring interposed between the nut and body and means on the shaft whereby the rotation of the latter produces a rotary movement of the die-carrying ring, substantially as specified.

2. In a thread-cutting mechanism, the combination with a pipe-clamping body having adjustable clamping-dies, a shaft 14 having a sliding and rotary bearing in said clamping-body and a sliding pin 23 also supported in said clamping-body, of a ring-frame 26, and a rotatable die-carrying ring-plate in said frame, said ring-frame adapted to be disengaged from said pin 23 and to swing on said shaft 14, substantially as specified.

3. In a thread-cutting mechanism, the combination with a pipe-clamping body, a shaft having a sliding and rotary support therein, said shaft having a threaded portion 15, a hand-nut on said threaded portion, and a spring interposed between said nut and said body, the compression of which imparts to said shaft and nut a tendency to move outward, of a ring-frame journaled on said shaft,

rotatable die - carrying rings in said ring-frame and a gear-ring connected therewith, and a pinion on said shaft 14 engaging the teeth of said gear-ring, substantially as specified.

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10 4. In a thread-cutting mechanism, the combination with a pipe-clamping body, of a ring-frame supported adjacent thereto, a ring-plate rotatably mounted in said frame, thread-
ing-dies carried in said ring-plate, notches 49
formed at intervals in said ring-plate and

adapted to receive the corners of a square die-plate and a ring 50 having a rotary adjustable connection with said ring-plate, said ring 50 also being provided at equidistant 15 points with notches 52 therein, substantially as specified.

ELLIS M. BURR.

In presence of—
FRED BAILEY,
W. W. MAXWELL.