

No. 656,848.

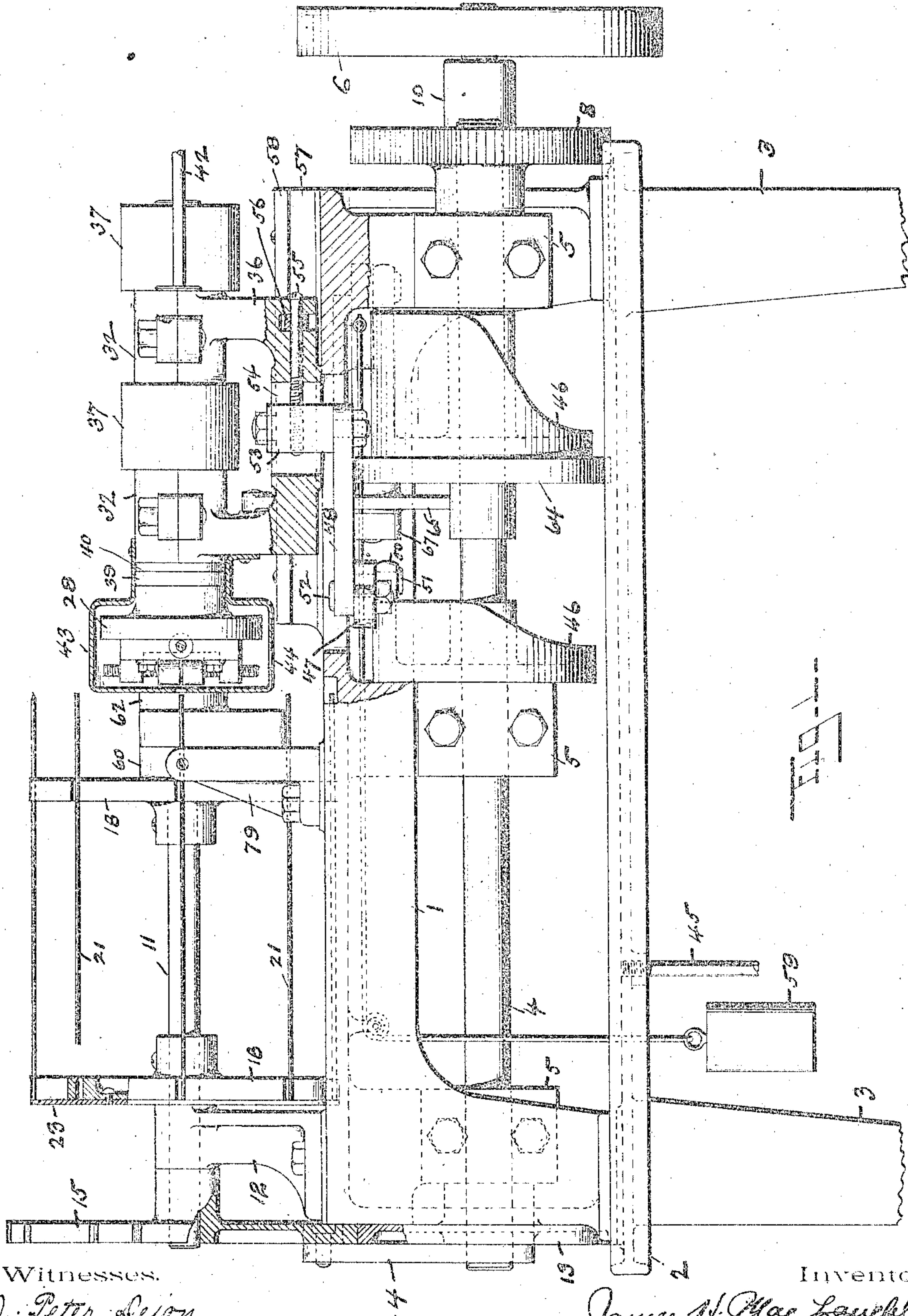
Patented Aug. 28, 1900.

J. H. MACLAUCHLAN.
THREADING MACHINE.

(Application filed Oct. 7, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.

J. Peter Lyon

Wallace S. Mayhew

Inventor.

James H. MacLauchlan
by George E. Mayhew
Attorney.

No. 656,848.

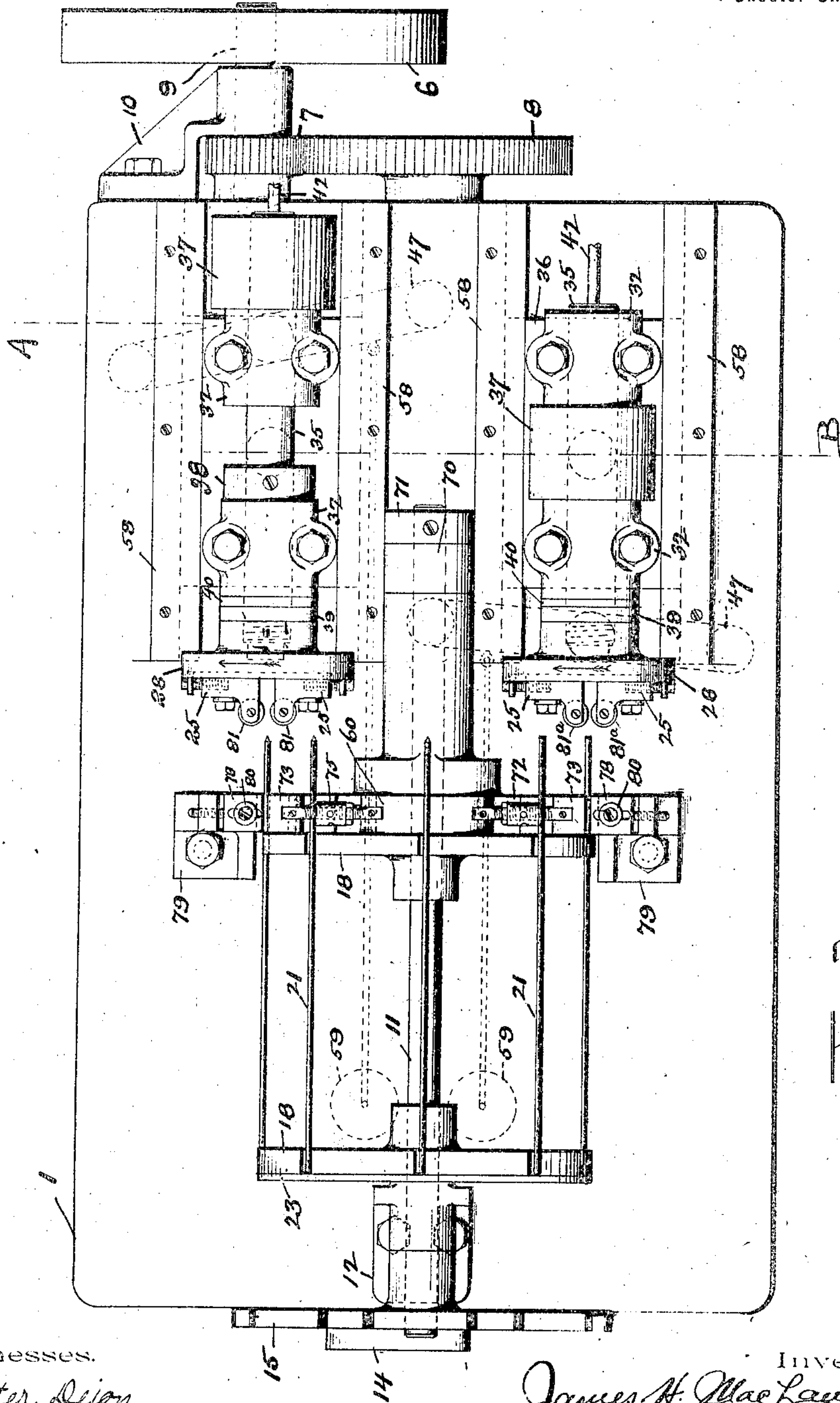
Patented Aug. 28, 1900.

J. H. MACLAUCHLAN.
THREADING MACHINE.

(Application filed Oct. 7, 1899.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses.

J. Peter Dejon

Wallace S. Moyle

Inventor.

James H. MacLauchlan
by George O'Hall

Attorney.

No. 656,848.

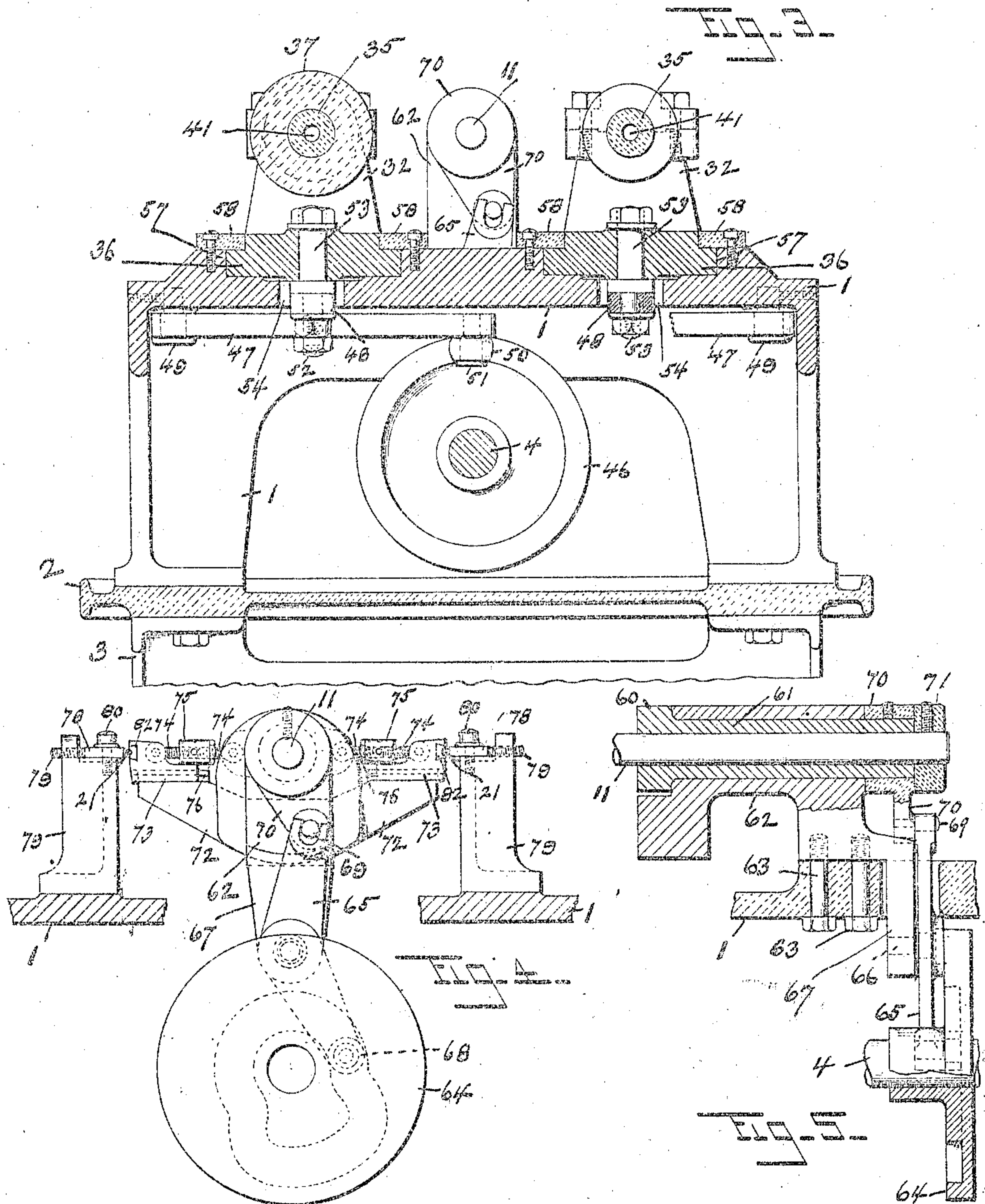
Patented Aug. 28, 1900.

J. H. MACLAUCHLAN.
THREADING MACHINE.

(Application filed Oct. 7, 1899.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses.

J. Peter Lejon

Wallace S. Moyle

Inventor.

James H. MacLauchlan

By George O. Hall

Attorney.

No. 656,848.

Patented Aug. 28, 1900.

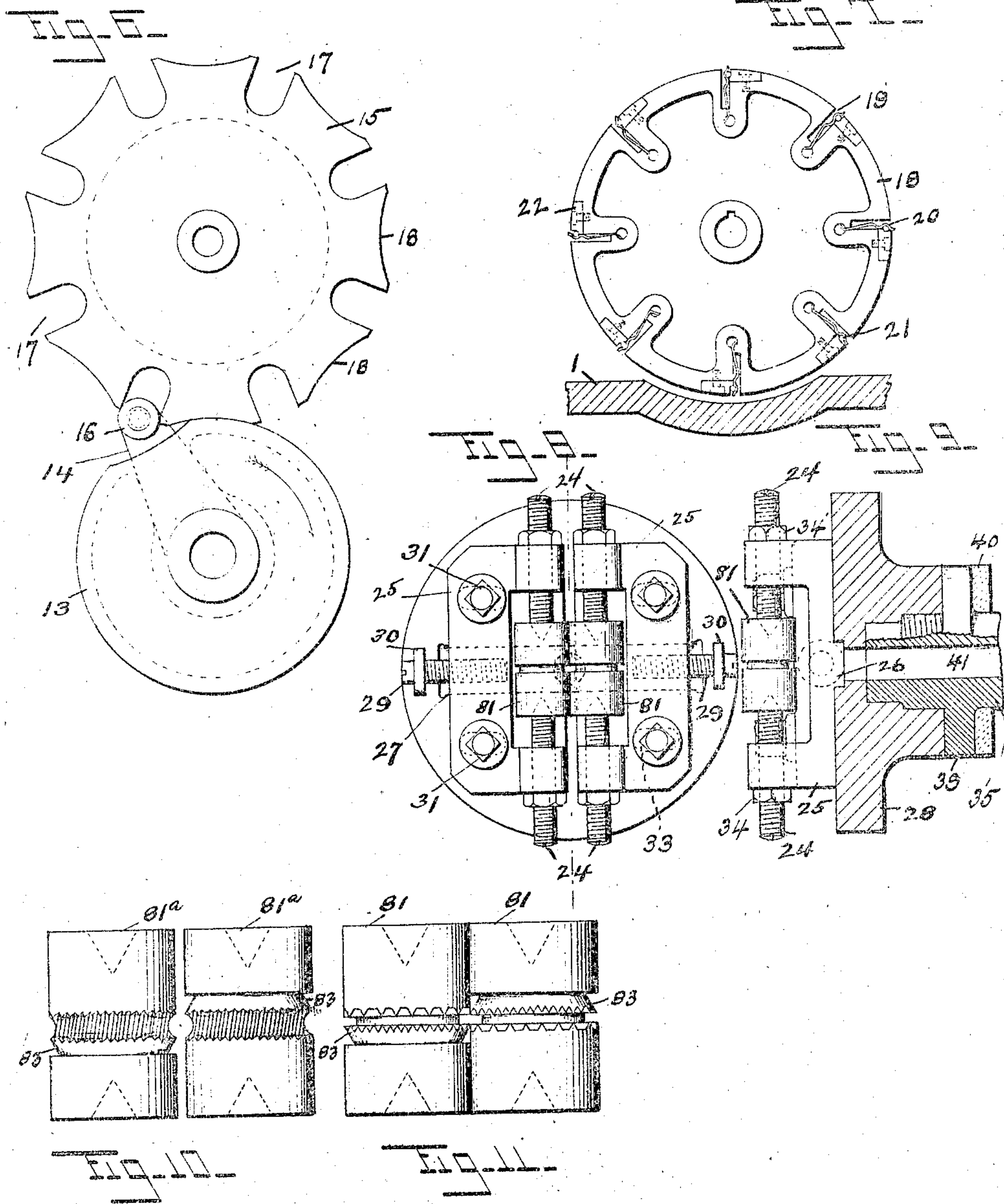
J. H. MacLAUCHLAN.

THREADING MACHINE.

(Application filed Oct. 7, 1899.)

4 Sheets—Sheet 4.

(No Model.)



Witnesses.

J. Peter Lejon

Wallace S. Moyle

Inventor. . .

James H. Mac Lane

by George Otis

Attorney.

UNITED STATES PATENT OFFICE.

JAMES H. MACLAUCHLAN, OF WATERBURY, CONNECTICUT, ASSIGNOR TO
THE WATERBURY MACHINE COMPANY, OF SAME PLACE.

THREADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 656,848, dated August 28, 1900.

Application filed October 7, 1899. Serial No. 732,853. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MACLAUCHLAN, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Threading-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in threading-machines; and it is the object of my invention to make the thread by means of threading-rolls which rotate upon their own axes and at the same time travel continuously in a circular path about a common center.

It is the further object of my invention to provide means for conveying the blank rods to the threading-rolls and means for holding said rods against rotation while the thread is being cut thereon.

The embodiment of my invention in machines for cutting screws with a pointed end, as wood-screws, consists of two pairs of threading-rolls, each pair being fastened upon the face of a rotatable plate and one pair of which are pointing and the other threading rolls. The face-plates rotate continuously in the same direction, thereby obviating the use of reverse mechanisms commonly used in threading-machines. An intermittently-rotatable carrier conveys the rods to the rolls, and during the threading operation a gripping mechanism holds the rod against rotation. In cutting threads upon rods having a square end it is only necessary to use a single pair of threading-rolls, omitting the pointing-rolls.

To these ends my invention consists of the threading-machine having certain details of construction and combination of parts, as will be hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts of the several views, Figure 1 is a fragmentary side elevation of a threading-machine embodying my invention. Fig. 2 is a plan view thereof. Fig. 3 is a transverse section upon the line A B of Fig. 2. Fig. 4 is an elevation of the gripping mechanism. Fig. 5 is a fragmentary side elevation thereof; Fig. 6, an elevation

of the device for intermittently rotating the carrier mechanism. Fig. 7 is a detail view of one of the carrier-disks. Fig. 8 is a front view of the rolls and the adjacent mechanism. Fig. 9 is a fragmentary side view thereof. Fig. 10 is a front view of the threading-rolls. Fig. 11 is a front view of the pointing-rolls, and Fig. 12 is a plan view thereof.

In the drawings the numeral 1 designates the bed-plate, 2 the drip-pan, and 3 the legs. Suspended beneath the bed-plate is a shaft 4, journaled in the hangers 5 5 5, and upon which is a fixed gear 8, which meshes into a pinion 7, fixed upon one end of a short shaft 9, which is journaled in bracket 10 and carrying a pulley 6 upon its opposite end. Above the base-plate is the carrier-shaft 11, journaled at the outer end in the stand 12 and at the inner end within the gripping mechanism, hereinafter to be described. An intermittent motion is imparted to said carrier-shaft 11 and the notched disk 13, fixed upon said shaft, from the shaft 4. The disk 13 and arm 14 upon shaft 4 rotate continuously, the arm 14 carrying upon its outer end a loosely-mounted roll 16 of the same diameter as the width of the notches 17 in the plate 13. As the arm 14 rotates the roll 16 is carried into one of these notches and imparts a rotary motion to the disk 15, while the roll remains therein. The periphery of the plate 13 bears against the concaved recesses 18 in the periphery of the disk 15 soon after it begins to rotate, so that the friction between the two surfaces prevents the disk 15 from being carried by momentum after the roll 16 has left the notch 17.

Upon the shaft 11 are two carrier-disks 18, having a plurality of radial slots 19 around the outer edge thereof, within which are secured spring-fingers 20, the lower ends of which are held rigid, while the upper ends are free. The rods 21 to be threaded are held at either end in the slots 19 against the blocks 22 by the spring-fingers, as shown in Fig. 7. A stop-plate 23 of the same diameter as the carrier-disks is fastened upon the rear carrier-disk as a stop to insure a proper and uniform location of the rod ends. These carrier-disks are adjustable along the said shaft to accommodate any length of rod desired. The

rolls 81 81^a are mounted loosely upon the pointed ends of the adjustable screws 24, threaded in the roll-frames 25. A lip 26 upon the frame 25 is fitted within a radial slot 27 in the plate 28, and said frames are adjusted radially upon said plate by means of screws 29, provided with collars 30, which are embedded in recesses in the face of the said plate. The frames are held rigid in their adjusted positions by the screws 31, which pass through the elongated slots 33 into the face of the plate 28. By turning screws 29 the distance between the rolls can be varied and the frames may be held rigidly in any adjusted position. The rolls themselves are shifted lengthwise by the adjusting-screws 24 and jam-nuts 34. The plates 28 are threaded on the ends of the shafts 35 with the hub brought up squarely against the collar 39, and to prevent wear and reduce friction I prefer to insert fiber washers 40 back of said collar. The shafts 35 are journaled in the movable heads 36, and each shaft is provided with a driving-pulley 37. The pulley upon one shaft is between the journal-boxes 32 32, and upon the other shaft is near the end thereof, this construction being designed to simplify the counter-shaft mechanism overhead, and to prevent endwise movement of the shaft having its driving-pulley near the end a collar 38 is fixed upon said shaft, as shown in Fig. 2.

Throughout the length of each of the shafts 35 is a bore 41, which bore also passes through the center of disk 28, and attached to the rear ends of said shafts in the end of the bore is a pipe 42. Soda-water, oil, or other thread-cutting liquid from any conveniently-located source of supply is conveyed through said pipe and the center bores of the shafts 35 to the threading-rolls. I prefer to incase the plate 28 and the rolls within a shell or hood, as 43, (shown in Fig. 1,) to gather the liquid as it is thrown outward by centrifugal force. In the bottom of shell 43 is a hole 44, through which the liquid is discharged therefrom, after which it drops through a hole in the bed-plate 1 into the drip-pan 2, escaping therefrom through a pipe 45, whence it is conveyed to the original source of supply.

The heads 36 are movable lengthwise upon the top of the bed-plate 1 in the ways 57, which are covered by the caps 58 and are actuated by the cams 46, levers 47, and links 48. The levers 47 are secured to the bed-plate by the studs 49, and attached to the free inner ends thereof are the studs 51, carrying the cam-rolls 50, which have a permanent contact with the cams 46. The links 48 are pivotally secured at one end to the levers 47 by the studs 52 and at the other end to the heads 36 by the studs 53, which studs are adjustable lengthwise within a slot 54 by the screw 55, having collar 56 thereon for preventing endwise movement thereof, while not preventing its rotation. Both of the cams 46 are of substantially the same shape, the only difference being the length of feed, which is greater in

the cam for the threading-rolls than in the cam for the pointing-rolls. As the cams rotate a longitudinal movement is imparted to the heads 36 from the mechanism above described, the rolls 50 always being in contact with the cam-faces. The weights 59, which are connected with the heads by a flexible connection, draw the heads forward while the threads are being made, so that the rolls are held with a yielding pressure against the blank rod, while the cam mechanism before described positively returns the heads to their original positions.

The gripping mechanism consists of an oscillating toggle-block 60 upon the end of a sleeve 61, which is mounted in a stand 62, secured to the bed-plates by the bolts 63, a cam 64, and crank-arm 65, fulcrumed midway of its length upon a stud 66 in the lower end of a downwardly-projecting arm 67 upon the stand 62 and carrying at its lower end the cam-roll 68 and the yoke-shaped upper end having engagement with a stud 69, fixed in a crank-arm 70, which is rigidly secured to the sleeve 61. Supported within the sleeve 61 is the inner end of the shaft 11, a collar 71 preventing endwise movement thereof. Two wings 72 72 are upon the front end of the stand 62 and mounted upon the top side of the said wings are the gripper-slides 73 73, which slides are joined with the toggle-block 60 by adjustable connections consisting of the four threaded rods 74, turnbuckles 75, and jam-nuts 76, two of said rods 74 being secured to the gripper-slides 73 and the others to the toggle-block 60. Gripper-stands 79 are secured to the bed-plate, and upon their upper surfaces are the gripper-blocks 78, which are adjusted by means of the screws 79^a and held rigid in any of their adjusted positions by the screws 80. I prefer to harden these blocks 78 and to insert hardened blocks 82 in the gripper-slides. Each of the rolls 81 81^a is provided with an angular groove having teeth cut thereon of the same pitch as the thread to be formed upon the rod. The grooves in the pointing-rolls 81, Fig. 11, have teeth only in the edges thereof, while in the threading-rolls 81^a, Fig. 10, I prefer to have the groove semicircular and of the same radius as the blank rod, the threads being cut in the bottom of the groove as well as the sides. For clearance and to permit the cuttings or chips to free themselves every other tooth is cut away in one side of the pointing-rolls 81, and a cutting edge is formed on the said rolls by means of the groove 83, having an angular side. The grooves and surfaces of both pairs of rolls can be the same within my invention; but I prefer to form the threading-rolls as shown, for I find from practice that this style of roll not only forms the thread, but burnishes it at the same time.

The operation of my machine is as follows: The operator places in the carrier-disks the blank rods, with the rear ends against the stop-plate, which rods are held by means of

the spring-fingers, as before described. The rods are first carried to the pointing-rolls by means of the intermittent motion given the said carrier-disks and are there presented in front of the center of shaft 35 between the face of the gripper-slide 73 and the gripper-block 78, as seen in Fig. 4. Toggle-block 60 is now oscillated from the cam 64 through the mechanism before described, and the said gripper-slides shoot outward and hold the rods rigid against rotation until the threading operation is completed. The heads 36 are now advanced by means of the weight 59, the cams 40 being in such position as to permit the weight to draw the heads forward, and as the rolls come into contact with the end of the rod they begin to rotate upon their own axis and by means of the teeth in the groove therein point the end of the rod and form a thread thereon. The adjustment of the pointing-head is such that the end of the blank is only permitted to feed to substantially the center of the rolls, as seen in Fig. 12. When the rod has been pointed and threaded, the cams 46 draw the heads backward and the rolls 81 away from the rod. As the head is drawn backward the rolls rotate upon their own axis in the reverse direction from that in which they were rotating during the threading operation, which motion is caused by the thread upon the rod unwinding itself from the rolls. After the head is withdrawn the gripper-slides through their toggle connections are drawn inward and the rod is released. The carrier-disks are now rotated again and the blank is carried step by step to the threading-rolls 81^a, where the same operations are repeated with the gripper and the roll mechanisms, excepting that the feed of the head carrying the threading-rolls is longer than that of the pointing-heads, permitting the rods to pass between the roll-faces. After the rod has been threaded it is removed from the carrier-disks and a new rod inserted.

There are many minor changes and alterations that can be made within my invention, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a screw-cutting machine, pointing-rolls, threading-rolls, each of said rolls being adjustably fixed to a rotary shaft, which shafts are parallel with each other and journaled in movable heads; means for imparting a reciprocating movement to said heads, the said means comprising rotary cams and lever mechanism actuated by said cams and having a connection with said heads; carrier mechanism for presenting the rod-blanks to the said rolls, and means for holding said blanks rigid during the threading operation, the said means comprising rigid gripper-blocks,

and toggle-actuated gripper-slides movable toward and away from the said gripper-blocks, substantially as described.

2. In a gripping mechanism, the combination of the rigid gripper-block 78; gripper-slide 73 movable upon a rigid member; oscillating toggle-block 60; adjustable connections between said gripper-slide and said toggle-block; rotary cam 64; and connections between said cam and said toggle-block whereby an oscillatory movement is imparted to said toggle-block from said cam, substantially as described.

3. In a machine of the character described, the combination with an intermittently-rotatable carrier mechanism, comprising disks having radial slots therein, within which the rod-blanks are held by spring-fingers; and a stop-plate fixed to one of said disks whereby the several rod-blanks will project outward from said disks a uniform distance; pointing and threading rolls rotatably mounted in roll-frames fixed to rotary shafts and adjustable in a plane at right angles to the axis thereof; movable heads within which the said rotary shafts are journaled, means, as independently-actuated cam and lever mechanism, for imparting a longitudinal movement to both of the said movable heads toward and away from the said carrier mechanism at one and the same time; a gripper mechanism for holding the rod-blanks rigid when the carrier mechanism is at rest and comprising a cam-actuated toggle located midway between the lines of said rotary shafts; gripper-slides actuated by said toggle and movable in a horizontal plane toward and away from the lines of said shafts, and rigid gripper-blocks opposite the said gripper-slides, substantially as described.

4. In a machine of the character described, having rotary threading-tools, the combination therewith of a carrier mechanism for presenting the rod-blanks to the said threading-tools, the said mechanism comprising carrier-disks fixed upon an intermittently-rotatable shaft, and having radial slots in the periphery thereof, and means, as a spring-finger fixed within each of said radial slots, for retaining the said rod-blanks therein, substantially as described.

5. In a machine of the character described, having rotary threading-tools, the combination therewith of a carrier mechanism for presenting the rod-blanks to the said threading-tools, the said mechanism comprising carrier-disks fixed upon an intermittently-rotatable shaft, and having radial slots in the periphery thereof, and means, as a spring-finger fixed within each of said radial slots, for retaining the said rod-blanks therein, and means, as a stop fixed to said carrier mechanism, for holding the said rod-blanks against endwise movement within the said carrier-disks, substantially as described.

6. In a machine of the character described, in combination with the intermittently-rotatable

table shaft 11; of the carrier-disks 18, secured thereto and having radial slots 19 therein; of spring-fingers 20 fixed at one end within said slots and engaging with one of the
5 sides of the said radial slots at the opposite end; and means, as the stop-plate 23, for preventing endwise movement of the rod-blanks within the carrier-disks, all constructed and operating substantially as described.

10 7. In a machine of the character described, the combination with the rotary and longitudinally-movable shaft 35, of the roll-plate 28 secured thereon; roll-frames 25 25 adjustable radially upon the face of said roll-plate;

screws 30 30 threaded into said roll-frames 15 and held against endwise movement; a pair of rolls having toothed annular grooves therein; and screws 24 24 threaded into said roll-frames and rotatably supporting the said rolls, all constructed and operating substantially as described. 20

In testimony whereof I affix my signature in presence of two witnesses.

JAMES H. MACLAUCHLAN.

Witnesses:

GEORGE E. HALL,
R. LESTER WILCOX.