

No. 685,819.

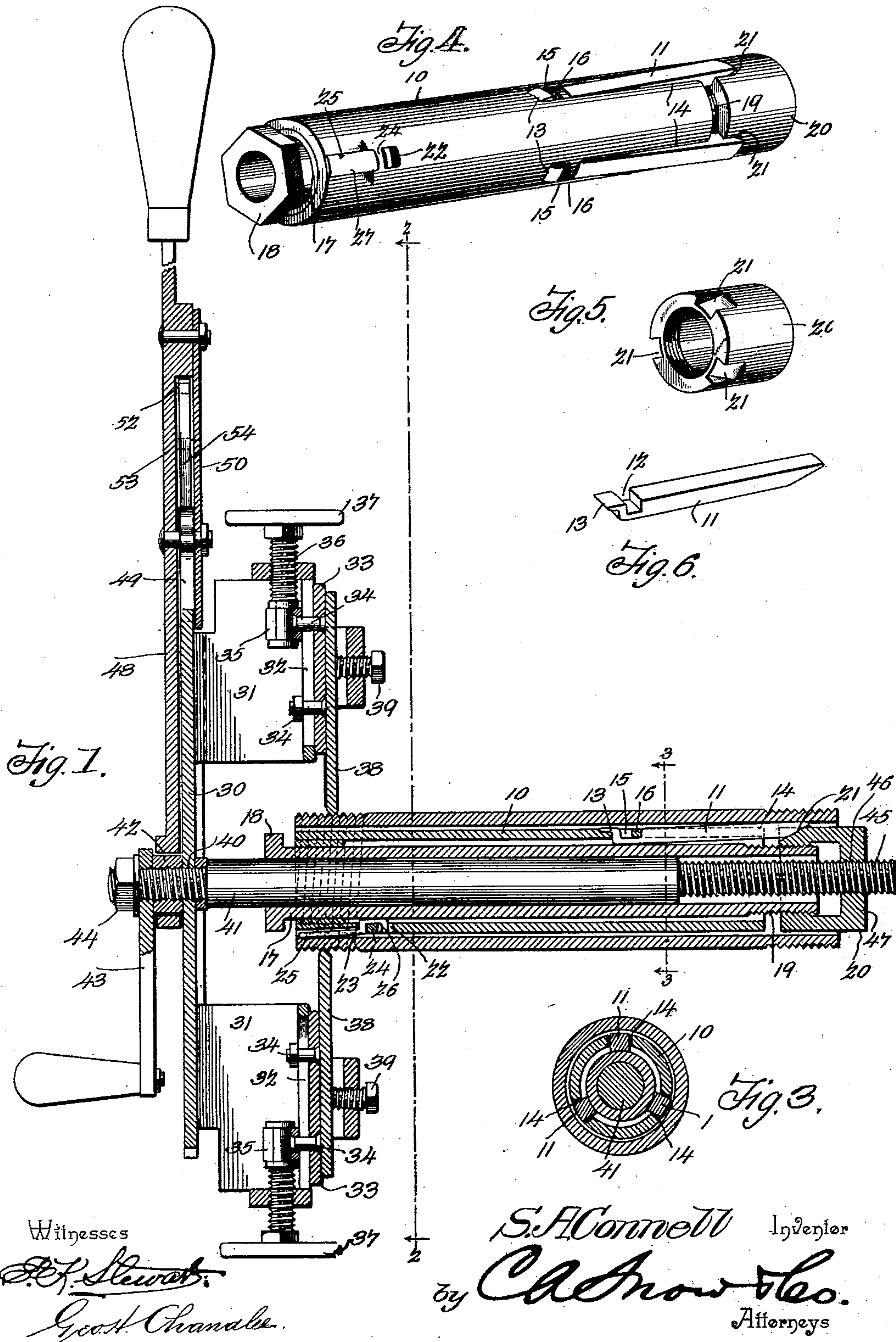
Patented Nov. 5, 1901.

S. A. CONNELL.
PIPE THREADING MACHINE.

(Application filed Mar. 1, 1901.)

(No Model.)

2 Sheets—Sheet I.



Witnesses
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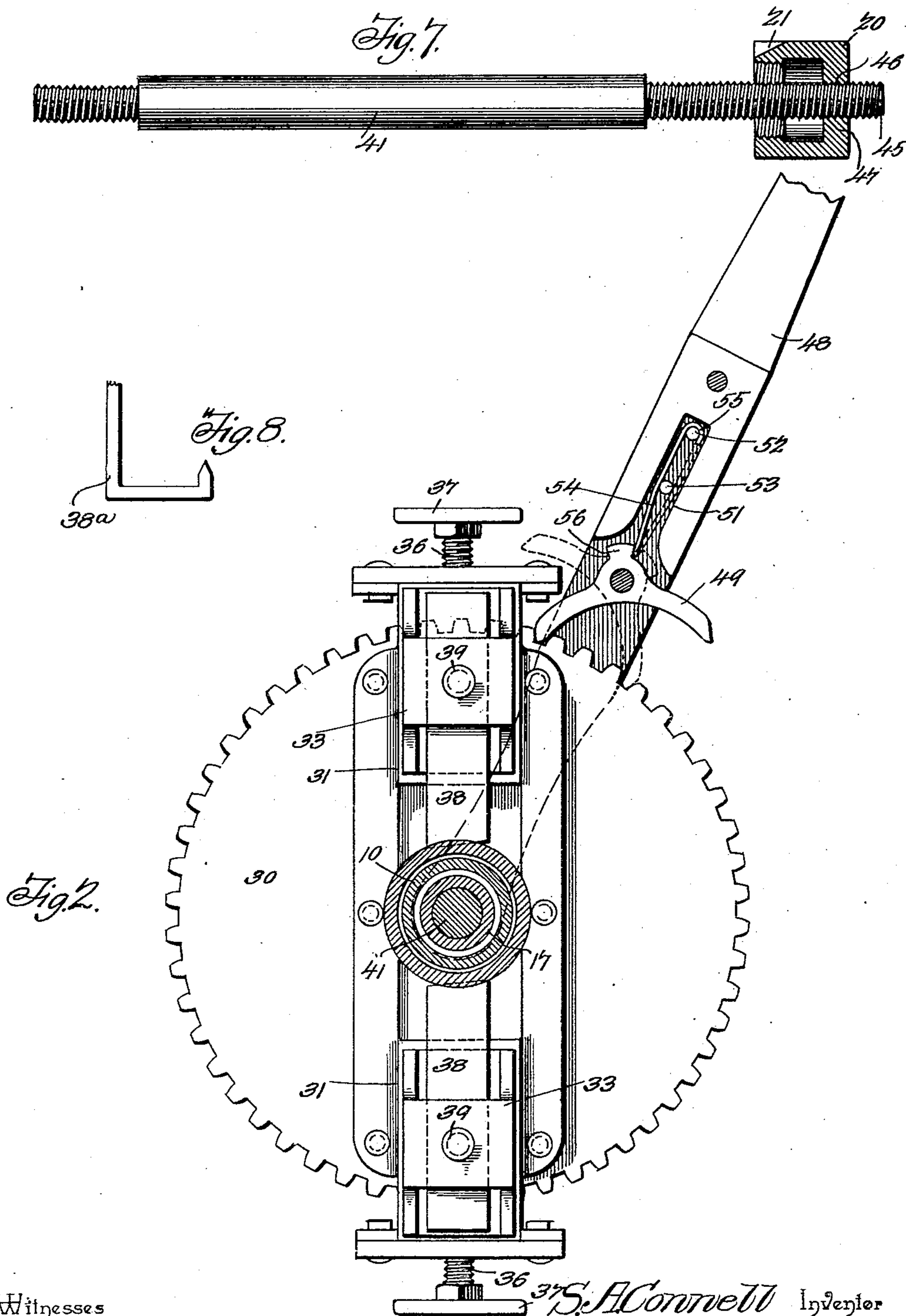
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Geo. H. Chandler.

S. A. Connell Inventor
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UNITED STATES PATENT OFFICE.

SMITH A. CONNELL, OF LAS VEGAS, TERRITORY OF NEW MEXICO, ASSIGNOR
OF ONE-HALF TO JAMES E. SULLIVAN, OF DENVER, COLORADO.

PIPE-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,819, dated November 5, 1901.

Application filed March 1, 1901. Serial No. 49,464. (No model.)

To all whom it may concern:

Be it known that I, SMITH A. CONNELL, a citizen of the United States, residing at Las Vegas, in the county of San Miguel and Territory of New Mexico, have invented a new and useful Pipe-Threading Machine, of which the following is a specification.

This invention relates to pipe-threading machines; and it has for its object to provide a portable device which may be applied to a pipe held in a vise or other support and may be operated to cut either a right or a left hand thread thereon, in accordance with the adjustment of the machine.

Further objects of the invention relate to the specific construction for properly centering the machine and for feeding it, all of which are clearly set forth in the following specification.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a longitudinal vertical section through the machine and showing its application to a pipe-section. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a perspective view of the mandrel, which is engaged in the pipe to be threaded. Fig. 5 is a detail perspective view of the clutch-operating head of the mandrel. Fig. 6 is a detail perspective view of one of the clutch-jaws of the mandrel. Fig. 7 is an elevation of the feed-spindle with the mandrel-head or feed-nut thereon, said head or nut being in section. Fig. 8 is an elevation showing a tool to be used when an interior thread is to be cut.

Referring now to the drawings, the present machine comprises a tool-carrier which is rotatable and a mandrel which is engaged in the pipe to be threaded and from which the carrier is supported and in connection with which it is fed longitudinally of the pipe to give the pitch to the thread.

The pipe to be threaded is held in a common form of vise during the threading operation and has the mandrel engaged therewith. This mandrel consists of a tubular bushing 10, the exterior diameter of which is such as to permit it to fit the interior of the pipe rather loosely, said bushing or sleeve

having outwardly-movable clutch-jaws at its ends, which engage the interior of the pipe and not only act to center the bushing or sleeve, but prevent rotation of it within the pipe. The jaws of one set are shown at 11, and each of these jaws is cross-sectionally rectangular in its body portion, and at the rear end of this body portion is a transverse recess 12, while at the extreme end of the body and beyond this recess is a finger 13. For each of the jaws 11 there is formed a longitudinal slot 14 in the bushing or sleeve and a detached perforation or opening 15 in the rear of and in line with the slot, the opening being separated from the base of the slot by a web 16. In placing the jaw the finger 13 is passed outwardly through the opening 15 and lies in a recess in the face of the sleeve, and the body of the jaw lies in the slot 14 with its outer end projecting beyond the end of the sleeve and having its inner face beveled. The web 16 lies in the transverse recess or slot 12 of the jaw, and thus total outward displacement of the jaw from slot 14 is prevented, while the slot or recess 12 is of sufficient depth to permit of projection of the jaw beyond the surface of the sleeve or bushing. In the present instance three of these jaws are provided.

In order that the free or outer ends of the jaws may be moved simultaneously outwardly into engagement with the inner surface of the pipe, a bushing 17 is provided for the sleeve 10, said bushing 17 having a cross-sectionally-angular end 18 for engagement of a wrench for adjusting said bushing, while the opposite end thereof is threaded, as shown at 19, for engagement with a nut 20, said threaded end projecting entirely through the sleeve and the nut having its outer face at the end adjacent to the sleeve beveled, as shown at 21, to engage the beveled ends of the jaws, so that when the bushing is screwed into the nut the latter will be drawn into the sleeve, owing to the engagement of the enlarged end of the bushing with the end of the sleeve, and the beveled portions of the nut in their engagement with the beveled ends of the jaws will expand the latter to cause them to impinge against the inner surface of the pipe in which the sleeve is disposed. It will be

noted that the nut is not beveled continuously, but instead that the beveled portions (shown at 21) are in the form of grooves, in which the projecting ends of the jaws are engaged, so that said jaws prevent rotation of the nut with the bushing and permit of screwing the bushing into the nut.

At the opposite end of the bushing or sleeve 10 there are formed openings 22 and 23, spaced longitudinally of the sleeve, and there are three equidistant pairs of these openings, the openings of each pair being separated by a web 24. Additional clutch-jaws 25 are provided, each having a transversely-slotted head 26 of substantially U shape, the legs of the U engaging the openings 22 and 23 and receiving the web 24 between them. The body portion of the jaw lies in or upon the flattened portion 27 of the sleeve for engagement with the inner surface of the pipe to be threaded and are moved outwardly under the influence of the bushing 17, the portion of which adjacent to its head is tapered to wedge between the heads of the several jaws.

In connection with the internal or inside pipe-clutch described there is employed a cutter-head comprising a disk 30, on the face of which and at diametrically opposite points thereof are disposed tool-posts. Each post comprises a hollow supporting-casing 31, having a slot 32 extending longitudinally of its outer face and lying radially of the disk, this slot forming a guide for the block 33, which is disposed against the slotted face of the supporting-casing and has bolts 34 engaged therewith and passed through the slot of the casing to hold the post from displacement outwardly from the casing, while permitting of sliding movement thereof. One of the bolts 34 has a tubular head 35 lying within the casing and with which is rotatably engaged the end of a screw 36, engaged with a threaded perforation in the end of the casing and provided with a hand-wheel 37, whereby as the hand-wheel is rotated in either direction the block 33 will be moved either inwardly or outwardly and radially of the supporting-disk.

The block 33 is of the usual slotted form to receive a cutting-tool 38, which latter is clamped in place by a screw 39, as usual. With this construction it will be seen that the tools may be engaged with the blocks, and the hand-wheels may be then manipulated to adjust the tools to the proper positions.

Centrally of the disk 30 is a perforation 40, through which is passed one end of a spindle 41, held in place by an annular nut 42, which impinges against the face of the disk opposite to the cutters. Against this nut is disposed a crank 43, held in place by means of a second nut 44 and which crank projects beyond the annular nut for a purpose that will be presently described.

The spindle is of a size to fit snugly and rotatably in the bushing 17, and its free end is

provided with threads 45, having the pitch of the threads to be cut upon the pipe. This threaded outer end of the spindle is adapted for engagement with a threaded perforation 46, formed centrally of the inwardly-directed web 47 at the outer end of the nut 20, whereby as the spindle is rotated the nut, and therewith the pipe-clutch, will be moved along the spindle, or if the pipe be held in a vise the spindle will feed through the nut 20 to carry the cutter-head longitudinally of the pipe.

To rotate the disk 30, and therewith the cutters carried thereby, a lever 48 is mounted rotatably upon the nut 42 and between the disk and the projecting portions of the crank 43, said lever projecting beyond the periphery of the disk and having a double pawl 49 pivoted thereon and adapted for engagement of its ends alternately with the ratchet periphery of the disk. The pawl is held between the lever and the plate 50, secured thereto and spaced therefrom at its end portion, that portion of the lever to which the plate is secured being somewhat thicker than the remaining portion to secure this spaced result. In the thicker portion of the lever is a longitudinal slot 51, having pins 52 and 53 therein, a spring-leaf 54, having a hook 55 at one end, being engaged with the innermost pin and resting against the outermost pin, the free end of the spring projecting from the slot and lying against the lug 56 of the pawl to hold it yieldably in either of its positions, depending upon the side of the pawl with which the spring is engaged and the specific position of the spring, as will be understood upon reference to the full-line and the dotted-line position of this spring in Fig. 2 of the drawings.

The reason for the double pawl is to permit of rotating the disk in either direction to correspondingly move the cutters, and, furthermore, to permit of use of the machine for cutting either right or left hand threads. With the pawl in one position the disk will be turned to the right, and a right-hand-threaded spindle is then used for engagement with a nut 20, having a right-hand-threaded perforation for engagement by the spindle. When a left-hand thread is to be cut, the pawl is reversed and a spindle is substituted having a left-hand thread at its outer end, and with this spindle there is used a nut 20, having a left-hand thread in its minor perforation for engagement by the spindle. When the left-hand thread is to be cut, the cutting-tools are of course correspondingly adjusted.

For different sizes of pipes different-sized clutches are used, and by the use of different spindles different threads may be cut.

In Fig. 8 of the drawings there is shown a cutting-tool to be used when an interior thread is to be cut, at which time two of these tools are used, the shanks 38^a thereof being engaged with the tool-posts, while the feet thereof are disposed for movement into the end of the pipe. In the use of these inside tools the

clutch is disposed inwardly of the end of the pipe, so as not to be engaged by the tools.

What is claimed is—

1. A pipe-threading machine comprising a clutch for engagement with a pipe, a spindle having threaded engagement with the clutch and operably connected therewith to actuate the clutch, and a cutter-head carried by the spindle and having cutters for engagement with the pipe with which the clutch is engaged, said head having means for rotating it to rotate the spindle and feed the head.

2. A threading - machine comprising a clutch, a cutter-head adapted to receive cutting-tools, and feed mechanism between the clutch and cutter-head, said mechanism including a nut and a spindle for engagement with the nut, said nut and spindle being adapted for removal from their respective members for attachment of other spindles and nuts, and the spindle having operable connection with the clutch for actuating it.

3. A threading - machine comprising a clutch having a feed-nut removably engaged therewith, a spindle engaged with the nut and adapted for movement therethrough and operably connected with the clutch for actuating it, and a cutter-head removably engaged with the spindle, said cutter-head having means for rotating it reversely.

4. A threading - machine comprising a clutch having a combined feed and clutch-operating nut, a spindle engaged with the nut for effecting feeding of the mechanism, and a cutter-head attached to the spindle and having means for rotating it to rotate the spindle through the nut.

5. A threading - machine comprising a clutch including a sleeve having clutching-jaws, a nut in operative relation to the jaws, a bushing engaged with the nut to move it to operate the jaws, and a cutter-head having a spindle engaged with the nut for movement therethrough to feed the head in the direction of the clutch.

6. A threading - machine comprising a clutch including a sleeve having jaws adapted for outward movement to engage the interior

of a pipe to be threaded, a nut in operative relation to the jaws, a spindle engaged with the nut for movement therethrough, and a cutter-head carried by the spindle for movement therewith.

7. A threading - machine comprising a clutch adapted for engagement with the interior of a pipe and including an operating-nut, a spindle having threaded engagement with the nut for movement therethrough, and a cutter-head carried by the spindle for movement therewith, said nut and spindle being removable from the clutch and head for substitution of other similar elements.

8. A threading-machine comprising an inside clutch including jaws and a nut for expanding them, a spindle engaged with the nut for movement therethrough, a disk removably engaged with the spindle, said disk having a ratchet periphery, a lever pivoted concentric with the disk, a reversible pawl carried by the lever in operative relation to the ratchet, and tool-holding devices carried by the disk.

9. In a device of the class described, an inside pipe-clutch comprising a sleeve having radially-movable jaws, a bushing mounted rotatably in the sleeve and adapted to receive rotating means, and a nut in operative relation to the jaws and having threaded engagement with the bushing for operation thereby.

10. In a device of the class described, an inside pipe clamp or clutch comprising a sleeve having longitudinal slots, jaws disposed for movement in the slots into and out of clutching position, a nut having beveled slots in which the jaws are received, and a bushing within the sleeve and having threaded engagement with the nut to operate it, said bushing being adapted for engagement of rotating means.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SMITH A. CONNELL.

Witnesses:

J. S. DUNCAN,
F. O. BLOOD.