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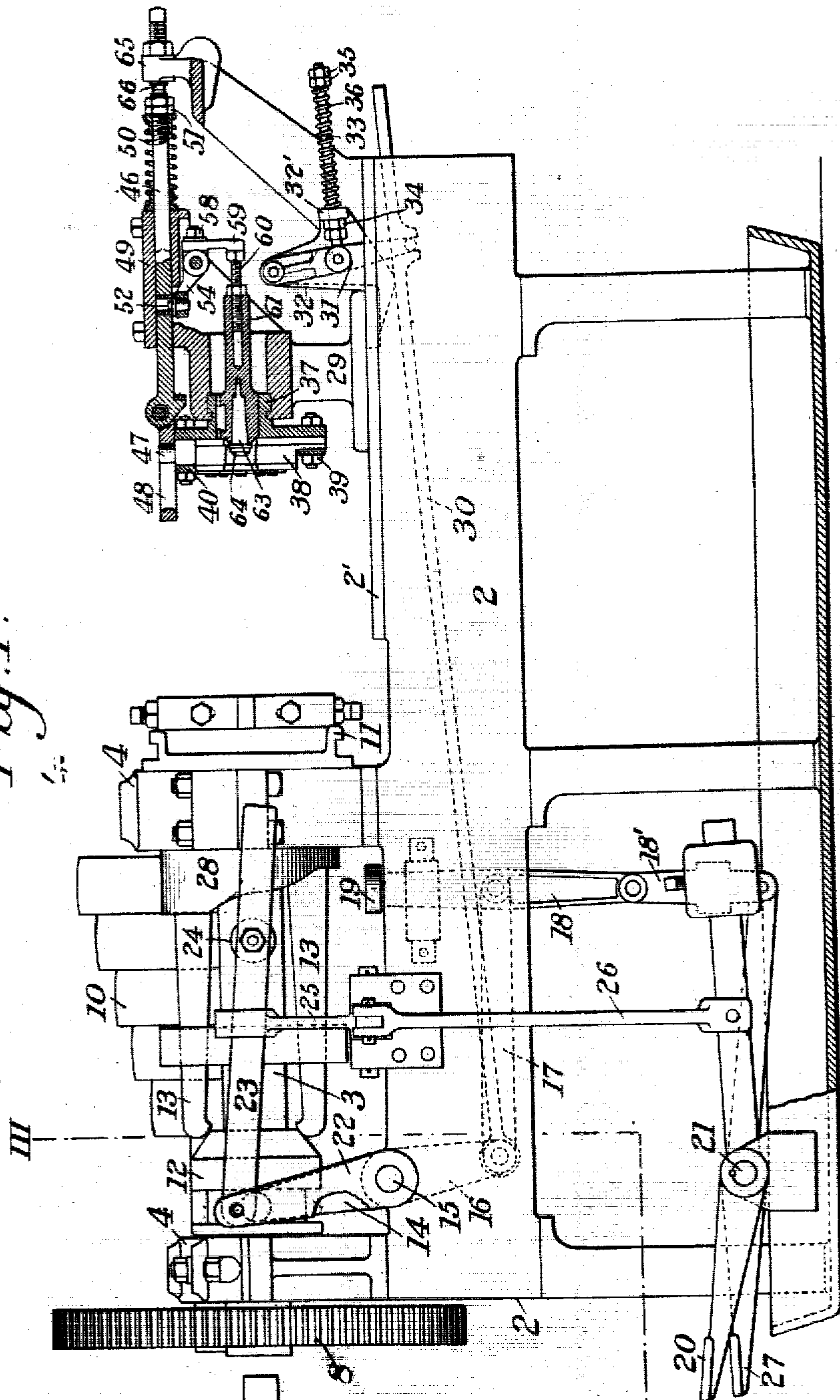
PATENTED MAY 8, 1906.

J. A. HOOK & E. BERNHEIM.
PIPE THREADING MACHINE.

APPLICATION FILED JUNE 20, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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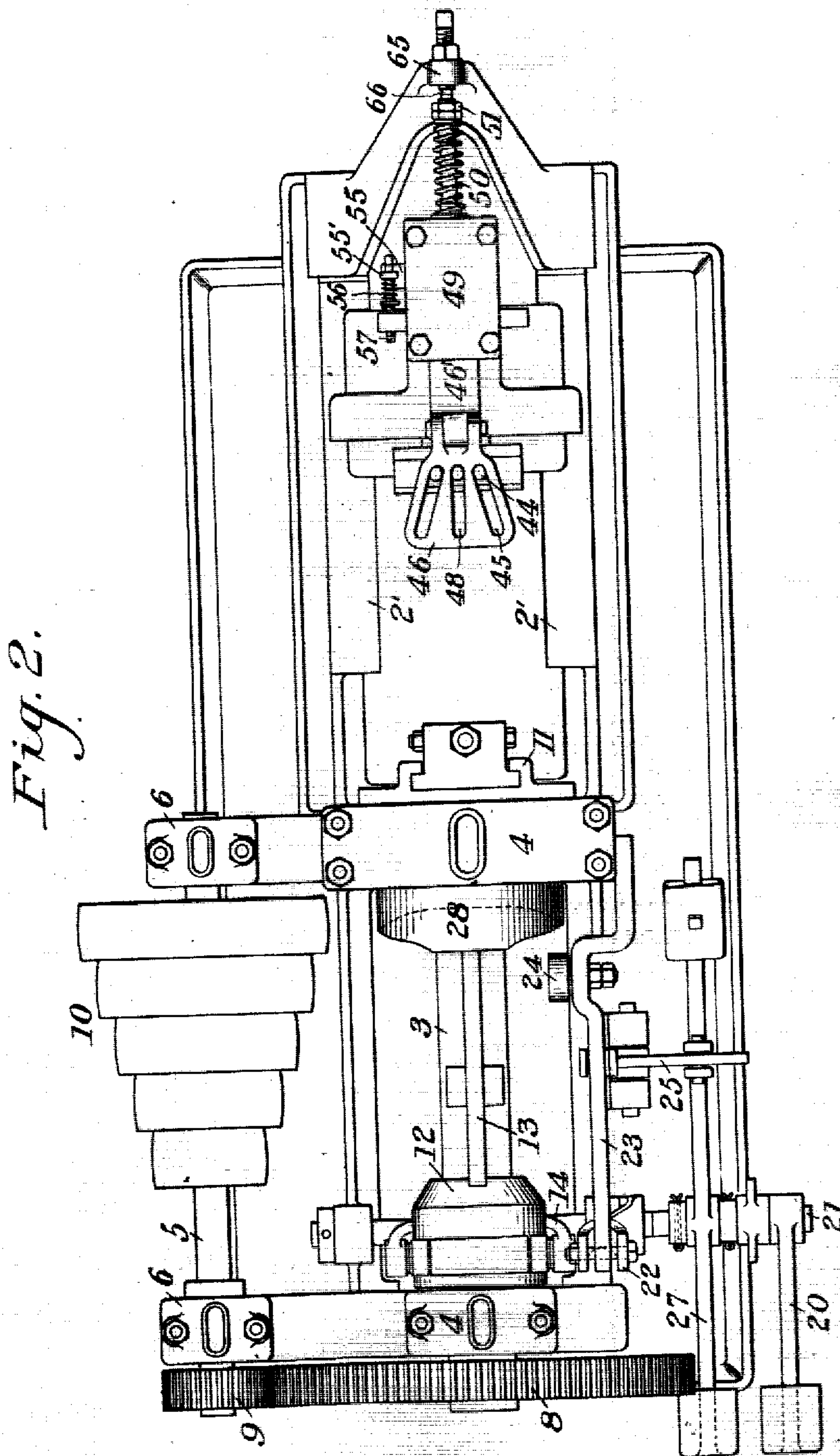
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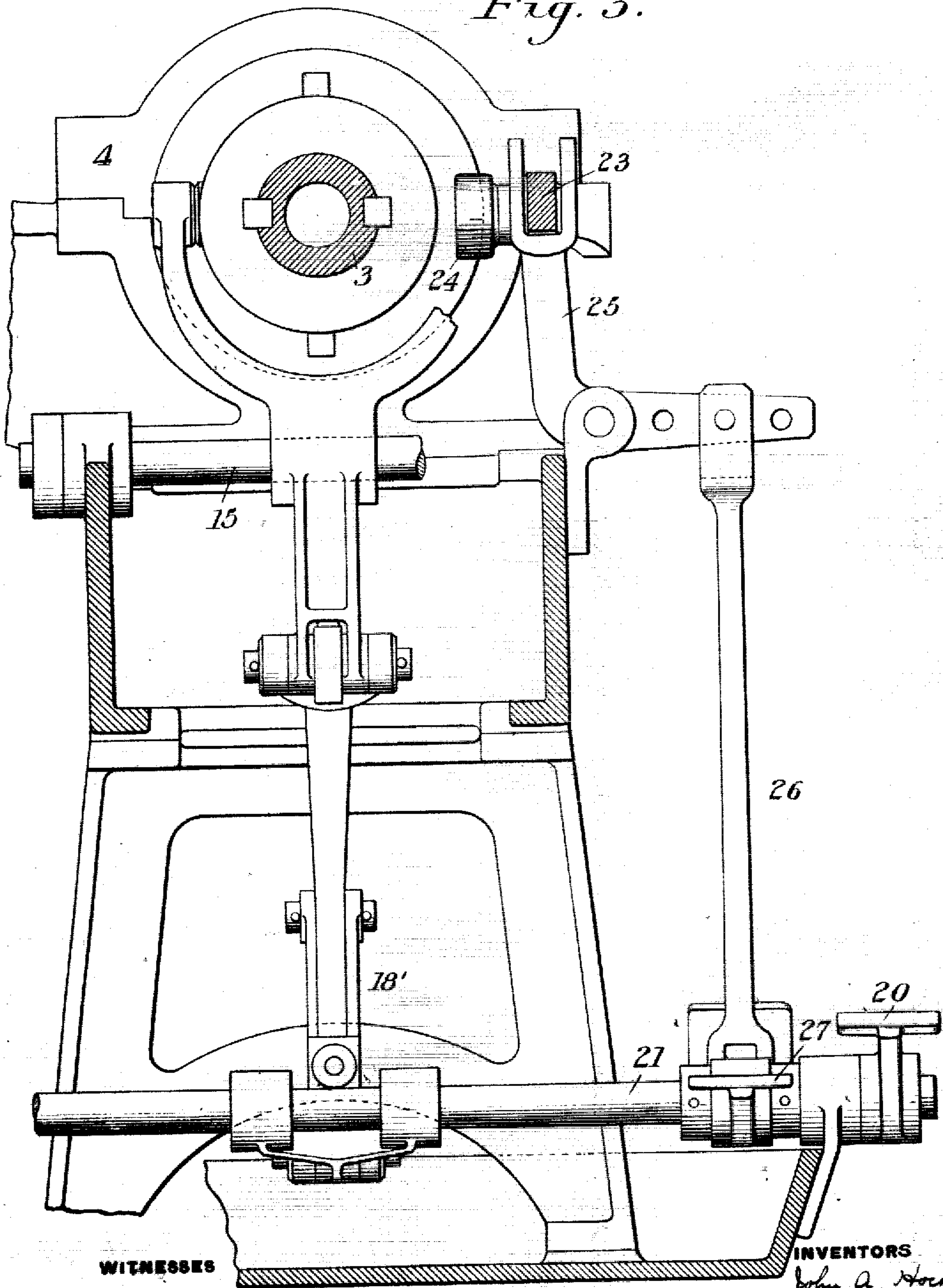
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Fig. 3.



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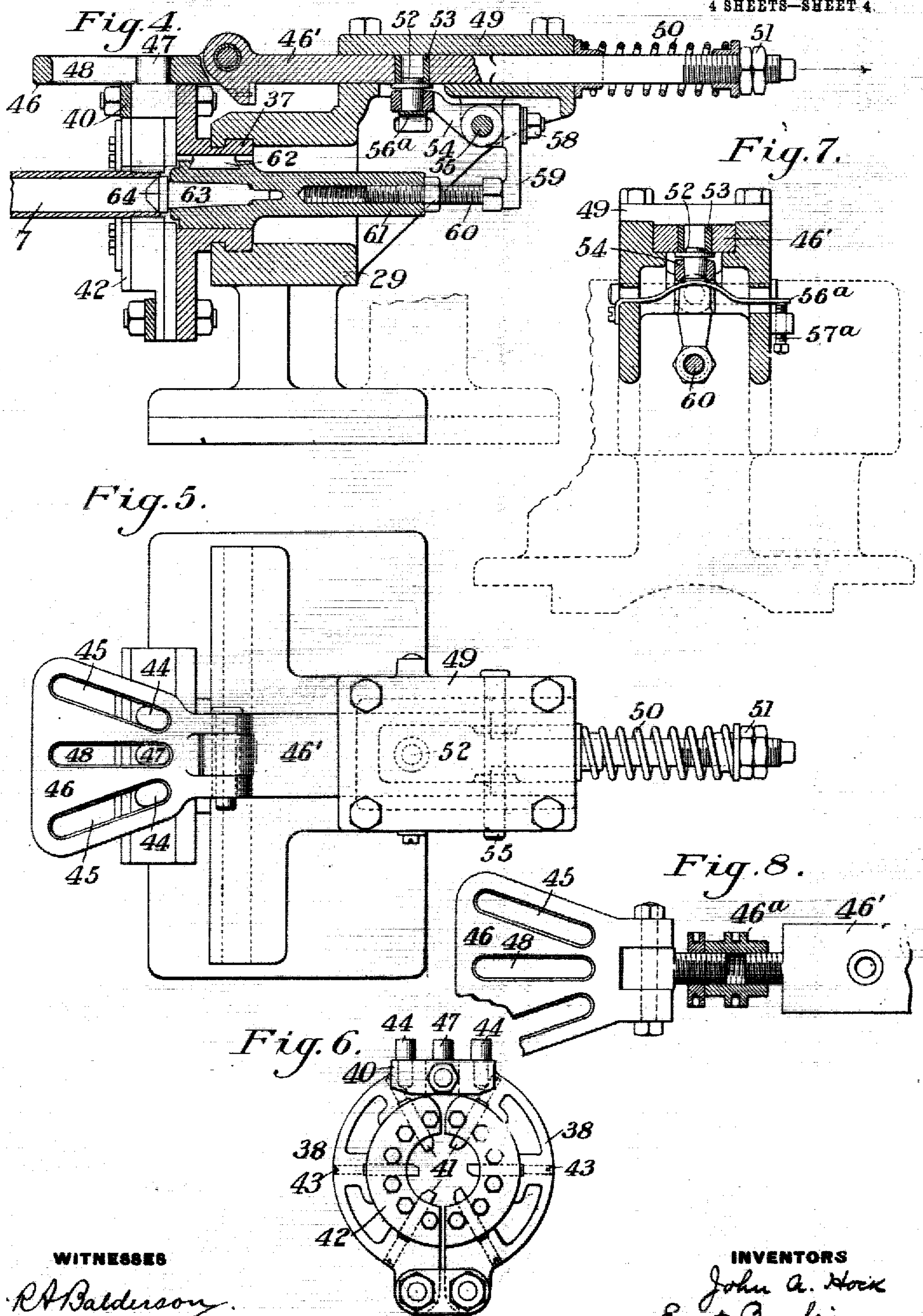
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UNITED STATES PATENT OFFICE.

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PIPE-THREADING MACHINE.

No. 820,114.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed June 20, 1905. Serial No. 286,095.

To all whom it may concern:

Be it known that we, JOHN A. HOCK and ERNST BERNHEIM, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Pipe-Threading Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, and Fig. 2 is a plan view, of our improved machine. Fig. 3 is a sectional end view on the line III III of Fig. 1. Figs. 4, 5, 6, and 7 are detail views of the die-head, showing the removable shoe and cutting-dies and showing the mechanism for moving and holding the die-head in position to cut the thread on the pipe and for releasing the dies when the required length of thread has been cut. Fig. 8 is a detail view showing the means for adjusting the degree to which the dies are closed by the die-holder.

The object of our invention is to provide improved means for cutting threads on pipes and reaming their ends, in which the operation of the machine is made more nearly automatic and by which the manual labor and time required for performing the operations are reduced and the capacity of the machine thereby increased.

Our invention provides improved mechanism by which the dies are automatically released from their cutting position when the required length of thread has been cut upon the pipe more certainly and accurately than has been possible heretofore.

Our invention also provides means by which the dies are yieldingly held in contact with the end of the pipe being threaded.

The invention also provides a novel die-opener and means by which the end of the pipe is reamed during the threading operation.

It also provides a hinged die-opener for facilitating the removal of the shoe containing the die-holders and dies and means for permitting the easy removal of the reamer from the die-head.

In the drawings, 2 represents the frame of the pipe-threading machine, having a hollow spindle 3, mounted in bearings 4 4, and having a counter-shaft 5, also mounted in bearings 6 6. The spindle 3 is hollow and allows the pipes 7 to be inserted and held in it, with the

end of the pipe on which the thread is to be cut projecting through the spindle toward the die-head. The spindle is rotated by spur-gears 8 9 on the outer ends of the spindle and of the counter-shaft, the counter-shaft being provided with a step-pulley 10, which is connected by a belt with a motor or other source of power. (Not shown.)

11 is a gripping-jaw head mounted on the inner end of the hollow spindle 3 and having gripping-jaws to hold the pipe in the machine while the threads are being cut.

12 is a laterally-movable cone mounted on the rotary hollow spindle, which by engagement with gripping-jaw levers 13 13 grip and hold the pipe while being threaded. The jaw-levers 13 13 are pivoted on the jaw-head 11. The laterally-movable cone 12 is connected by a yoke 14 with the pivot-shaft 15, which is carried in bearings on the bed of the machine. The pivot-shaft 15 is connected by an arm 16 and links 17 with a vertical arm 18, having an antifriction-roller 19 mounted on its upper end. The lower end of the arm 18 is connected by a link 18' with the end of the treadle 20 which is pivoted on the shaft 21 beneath the machine. The pivot-shaft 15 is also connected by the arm 22 with a horizontal arm 23, which is also provided with an antifriction-roller 24. The horizontal arm 23 is connected by a bell-crank 25 and link 26 with a treadle 27, also pivoted on the shaft 21.

28 is a cam mounted on the rotary spindle and adapted to move the cone 12 longitudinally on the spindle when the antifriction-rollers 19 or 24 are moved into the path of the face of the cam by the treadles and connecting mechanism. A die-head 29 is movably mounted on the guides 2' of the frame 2 and is yieldingly connected to the arm 16 on the pivot-shaft 15 by a connecting-rod 30. The outer end of the connecting-rod 30 is carried on the lower end of an arm 31, which is pivoted on the bracket 32, fixed to the die-head 29. The bracket 32 is provided with a stop 32', and the arm 31 is connected about the middle of its length by a rod 33, provided with stop-nuts 34 and 35 and a spring 36.

The die-head 29 is provided with a shoe 37, and die-holders 38 38 are fixed to the face of the shoe, their lower ends being pivoted on the bolts 39 and their upper ends being kept in place on the shoe by a guide 40. Remov-

able cutters 41 are adjustably mounted in the die-holders by means of the face-plates 42 and set-screws 43. The shoe 37 can be easily and quickly removed and replaced in the die-head 29, and in this way by providing two or more shoes, with their die-holders and cutting-dies, the loss of time resulting from changing or adjusting the cutters while in the machine is avoided.

The upper ends of the die-holders 38 are provided with projections 44 44, which fit into diverging slots 45 45, located in the longitudinally-reciprocating hinged die-adjusting die opener or slide 46 46', and a similar projection 47 on the shoe 37 fits into a central slot 48, also in the slide 46', and serves to keep the die-holders central on the shoe. The hinged slide 46' is held in its seat on the top of the die-head 29 by means of a plate 49, and the slide is moved longitudinally on its seat to open and close the die-holders into and out of their cutting position on the die-head. The slide 46' is made in two parts, which are adjustably connected together by means of the adjusting-screw 46^a, as is shown in Fig. 8, so that the degree of approach of the dies may be varied. The outer end of the slide 46' is provided with a coil-spring 50, by which the slide is moved to open the die-holders when the thread-cutting operation is completed. The compression on the spring is regulated by the adjusting-nuts 51 on the end of the slide 46. When the slide has been moved laterally to hold the dies in their closed cutting position, the slide 46 is held in this position by a hardened-steel pin 52, one end of which projects upwardly into a suitable hardened-steel bushing 53 in the slide. The pin and bushing are made on the arc of a circle whose center is the axis of the trigger-lever 54, so that the motion of the pin will not itself move the slide. The lower end of the pin 52 fits into the end of a trigger-lever 54, which is pivoted on a pin 55 on the die-head. The lever 54 and pin 52 are held in proper position to keep the slide 46 stationary and hold the dies in closed cutting position by means of a spring 56 on the end of the spring-adjusting screw 57, mounted on the side of the die-head, one end of the spring 56 engaging a lever 55' on the outer end of the pin 55, as shown in Fig. 2.

A modification of the slide-holding mechanism is shown in Figs. 4 and 7, in which the slide is held in place by means of a spring 56^a, one end of which is fixed to the die-head, the other end being carried on a spring-adjusting screw 57^a. Attached to the lever 54 by a bolt 58 is a trigger 59, one end of which engages with the adjusting-screw 60 in the end of the longitudinally-adjustable holder 61 of the reamer. The holder 61 extends through an opening in the die-head into the shoe 37 and is prevented from rotating by means of a feather-key 62. Fitted into the end of the

reamer-holder 61 is a reamer 63, by which the end of the pipe being threaded is reamed and any burs removed and which also serves as the means by which the dies are automatically released from the pipe when the desired length of thread has been cut. The reamer 63 is provided with a shoulder 64, which comes in contact with the end of the pipe in the machine as the thread is being cut. The reamer-holder is held in place by the bearing of its screw 60 with the trigger 59, which in turn is pressed against it by the spring. To remove the reamer, it is only necessary to swing to one side the arm of the trigger, which is hinged for this purpose. The reamer-holder 61 and reamer 63 are carried in and move with the sliding shoe 37, which carries the threading-dies. In this way the reamer is always kept central with the dies and pipe being threaded, and the reaming of the end of the pipe in a proper manner is insured. On the end of the frame 2 of the machine is a stop-bracket 65, having an adjustable stop 66, against which the end of the slide 46 strikes when the pin 52 is released. The stop 65 also holds the slide 46 stationary when the die-head 29 is retracted after a pipe has been threaded and in this way causes the die-holders to move into their cutting position.

The operation of the machine is as follows: The machine is set in motion, the parts being in the position shown in the drawings. The operator then places the pipe through the spindle of the machine with its end in engagement with the dies in the die-head. By means of the treadle 20 the arm 18 is raised until the roller 19 on its end is in the path of the face of the cam 28 on the spindle 3. The arm 18 is moved by the revolution of the cam and through the links 17 moves the arm 16 on the pivot-shaft 15 and causes the yoke 14 to shift the cone 12 on the spindle 3. This movement of the cone 12 spreads the ends of the jaw-levers 13 and causes the gripping-jaws to grasp and hold the pipe in the jaw-head 11. The operator then removes his foot from the treadle and permits the arm 18 to drop and remove the roller 19 from the path of the cam 28. When the vertical arm 18 is moved by the cam 28, the connecting-rod 30, and through it the lever-arm 31, is moved also, and the spring 36 is compressed on its rod 33. The die-head is not moved, as the dies are in contact with the end of the pipe in the machine, which prevents its movement. The spring 36 keeps the dies in engagement with the end of the pipe until the pipe has entered the threading-dies. As the pipe gradually advances in the dies, the die-head is moved on the guides toward the jaw-head and away from the adjustable stop 66, which is on the stop-bracket 65, fixed on the machine. The reamer 63 is provided with a shoulder 64, against which the end of

the pipes makes contact, and when the required length of thread has been cut on the pipe the pipe has moved the reamer and its holder sufficiently to release the pin 52 and permit the slide 46 to be retracted by the spring 50 and in this way separate the die-holders and allow the pipe to be drawn from the dies. The travel of the slide 46 is regulated by means of the adjusting-screw 46^a, which permits the position of the slide 46' to be lengthened or shortened and the opened and closed position of the projections 44 on the slots 45 to be changed. The operator then, by means of the treadle 27, moves the horizontal arm 23 until the roller 24 is in the path of the face of the cam on the rotating spindle 3. The cam by contact with the roller 24 then shifts the cone on the spindle and releases the gripping-jaws, and the operator then removes the threaded pipe from the machine, replaces it with another pipe to be threaded, and repeats the operation.

The advantages of our invention are many. The length of the thread successively cut on any number of pipes is automatically regulated, and by operating the trigger of the die-opener by means of the reamer great accuracy of length of thread is secured, for the burs on the ends of the pipes being cut away by the reamer before the trigger is released all danger of premature operation of the die-opener by the action of such burs is prevented. Furthermore, by locating the trigger or releasing device wholly back of the position of the pipe the dies and reamer are unobstructed in their operation and no vertical adjustment of the trigger to suit pipes of different diameters need be made. The lateral movability of the trigger-arm out of the path of the reamer is of value, because the reamer being ordinarily held in place solely by the trigger the lateral removal of the trigger leaves the reamer free to be withdrawn for replacement or repair.

By means of the rotating cam and connecting mechanism the pipe-gripping jaws are positively opened and closed to grip and release the pipe in the machine. The time required in changing the dies in the machine is reduced. The dies are yieldingly held in contact with the pipe until the thread-cutting operation has begun, and the necessity for doing this work by the operator is thus avoided.

Many variations in the arrangement and in the construction of the parts may be made

without departing from our invention, since What we claim is—

1. In a pipe-threading machine, the combination of a reciprocable die-carrying carriage, non-rotatable threading-dies carried thereby, a reciprocating die-opener mounted on the carriage, a spring for actuating the die-opener, a reamer-controlled holding device for the die-opener, and means on the frame for preventing movement of the die-opener when the carriage is retracted; substantially as described.

2. In a pipe-threading machine, the combination with a reciprocable die-carrying head or carriage, of a die-opening member mounted to slide thereon, a spring for actuating said member in one direction to open the dies, and a fixed stop on the machine-frame adapted for contact with said member when the head or carriage is retracted, to thereby hold said member against movement and close the dies; substantially as described.

3. A pipe-threading machine having a reamer, a die-opener, a trigger against which the reamer presses, and a spring by which the reamer and trigger are yieldingly held; substantially as described.

4. A pipe-threading machine having a reamer, a spring for holding it against the pipe and an arm between the reamer and spring, said arm being removable from the path of the reamer to permit removal thereof; substantially as described.

5. In a pipe-threading machine the combination with pipe-gripping jaw-levers and a cam by which the levers are operated, of mechanism connected with said levers and adapted to be moved into the path of the cam to be actuated thereby to actuate the gripping-jaws; substantially as described.

6. In a pipe-threading machine, the combination with pipe-grips, an actuating-cam for said grips, means connected with said grips and arranged to be moved into the path of the cam to open and close the grips, a movable die-head, and a connection between the said head and the grip-operating means; substantially as described.

In testimony whereof we have hereunto set our hands June 15, 1905.

JOHN A. HOCK.
ERNST BERNHEIM.

Witnesses:

JOHN MILLER,
H. M. CORWIN.