

(No Model.)

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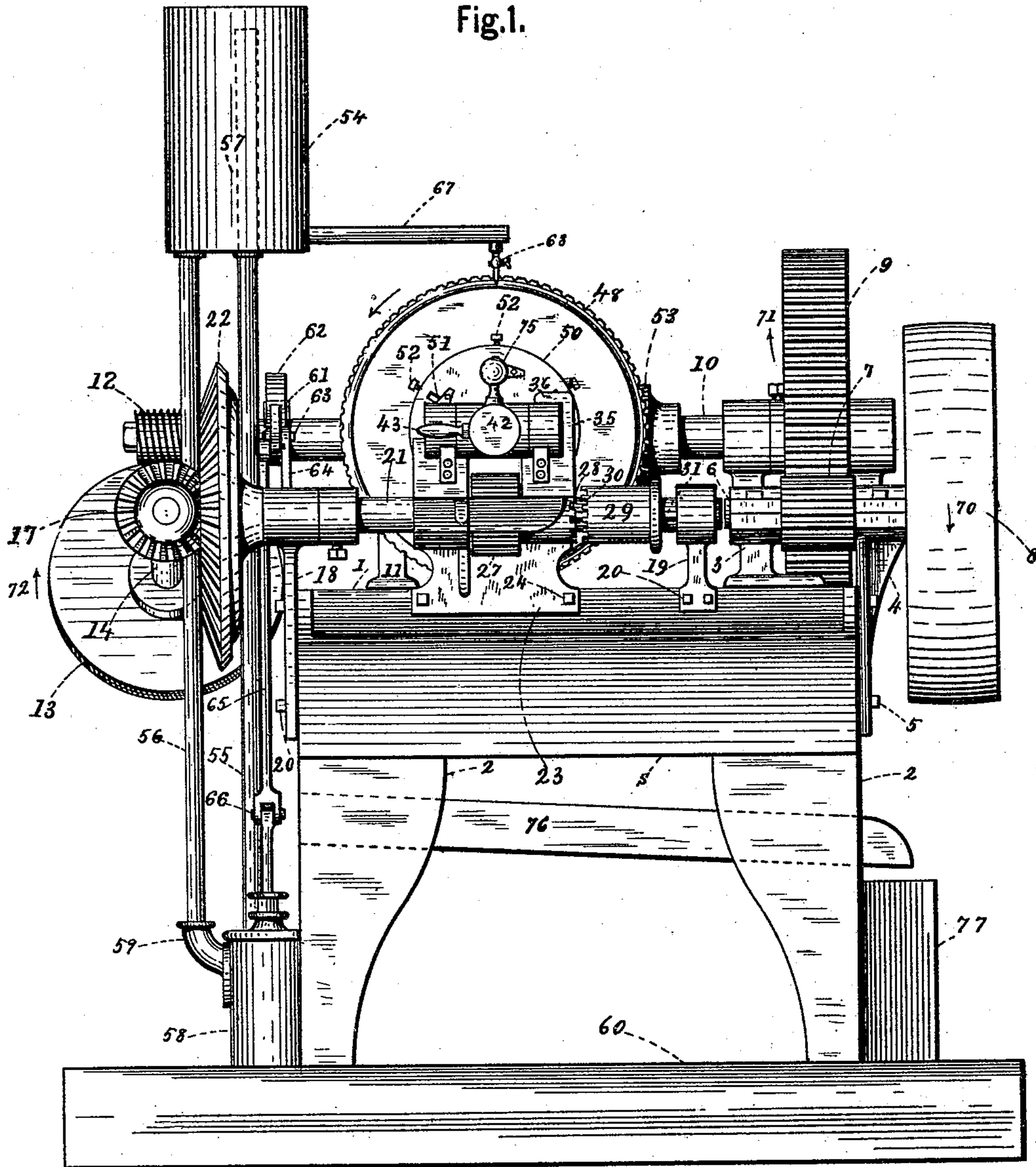
O. BRYANT.

MACHINE FOR CUTTING SCREW THREADS ON TUBES.

No. 459,389.

Patented Sept. 15, 1891.

Fig.1.



Witnesses.

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(No Model.)

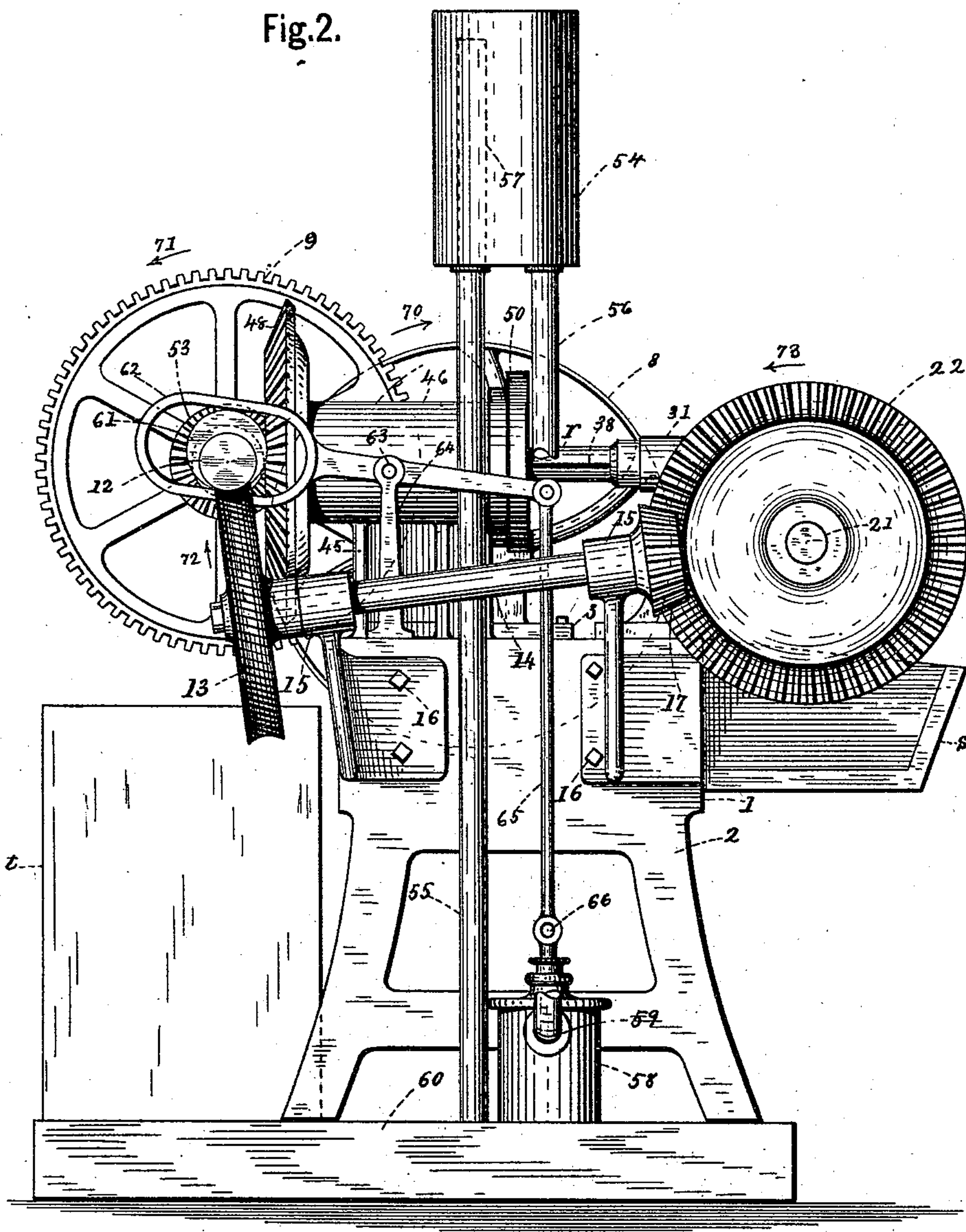
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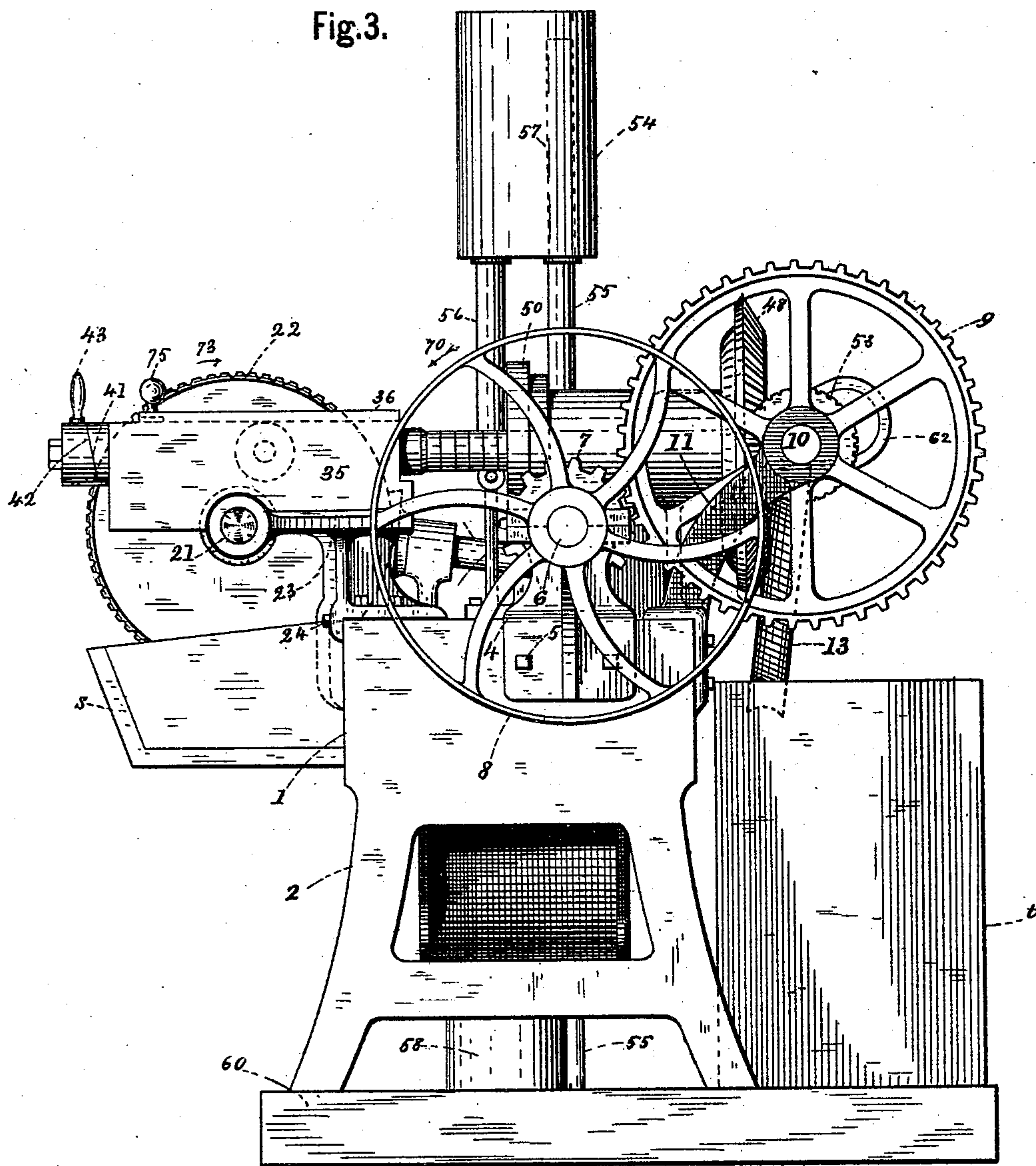
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Fig.3.



Witnesses.

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(No Model.)

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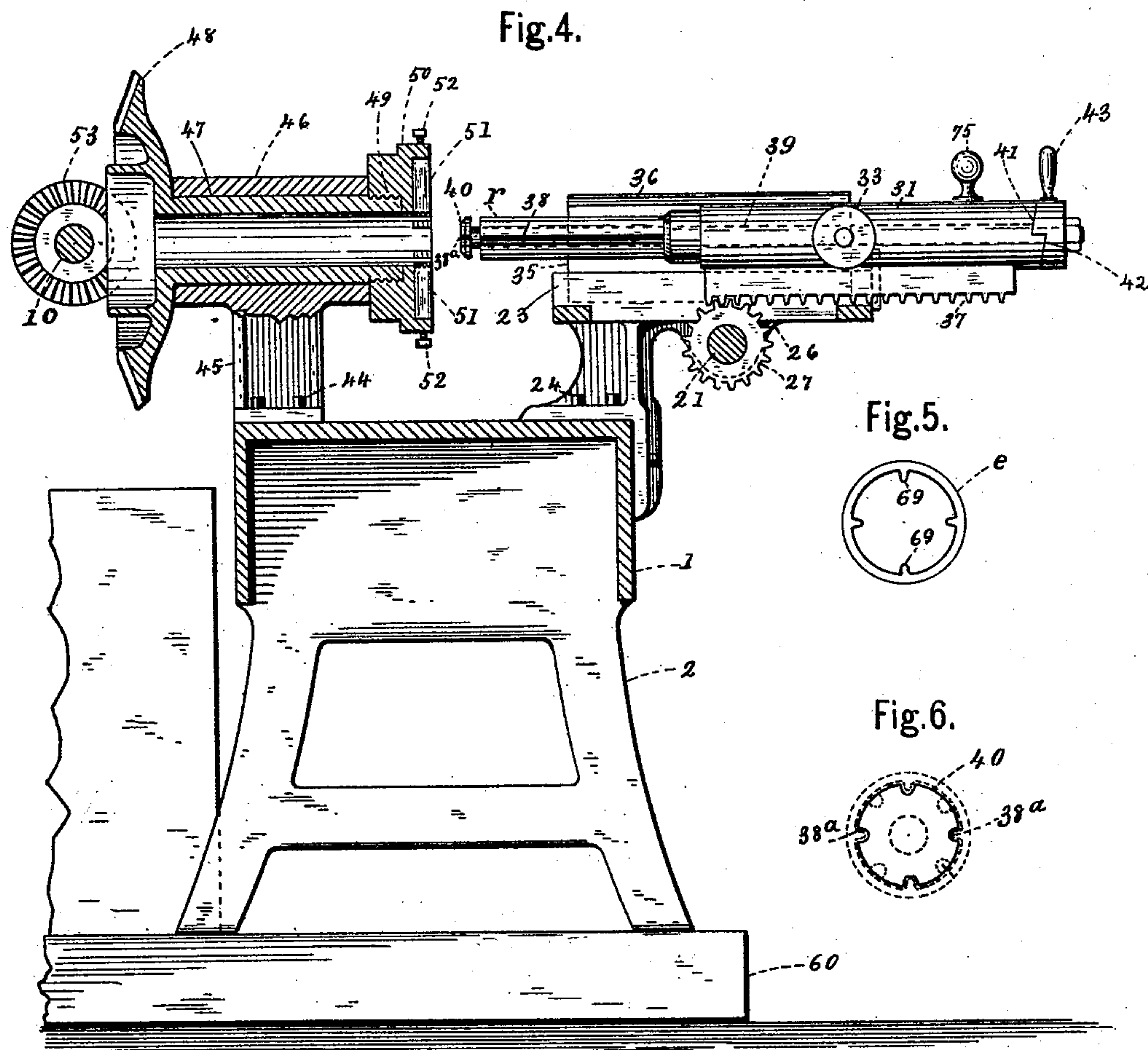


Fig. 5.

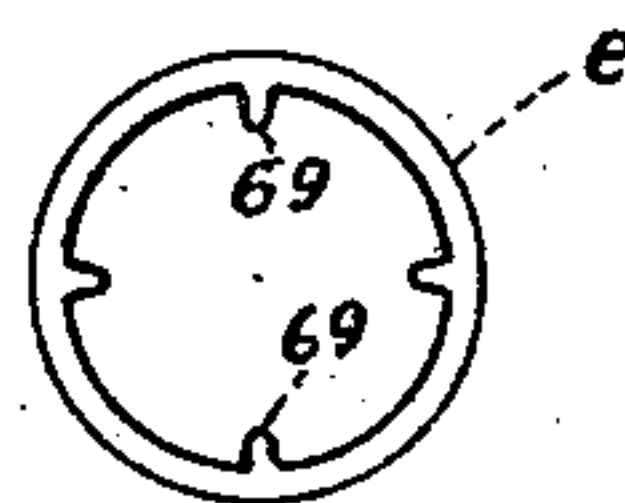


Fig. 6.

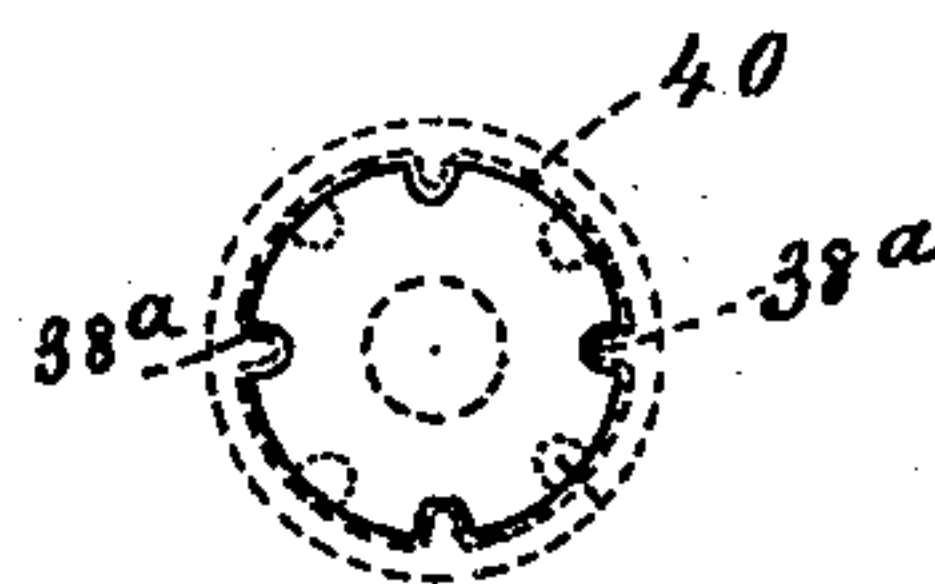


Fig. 7.

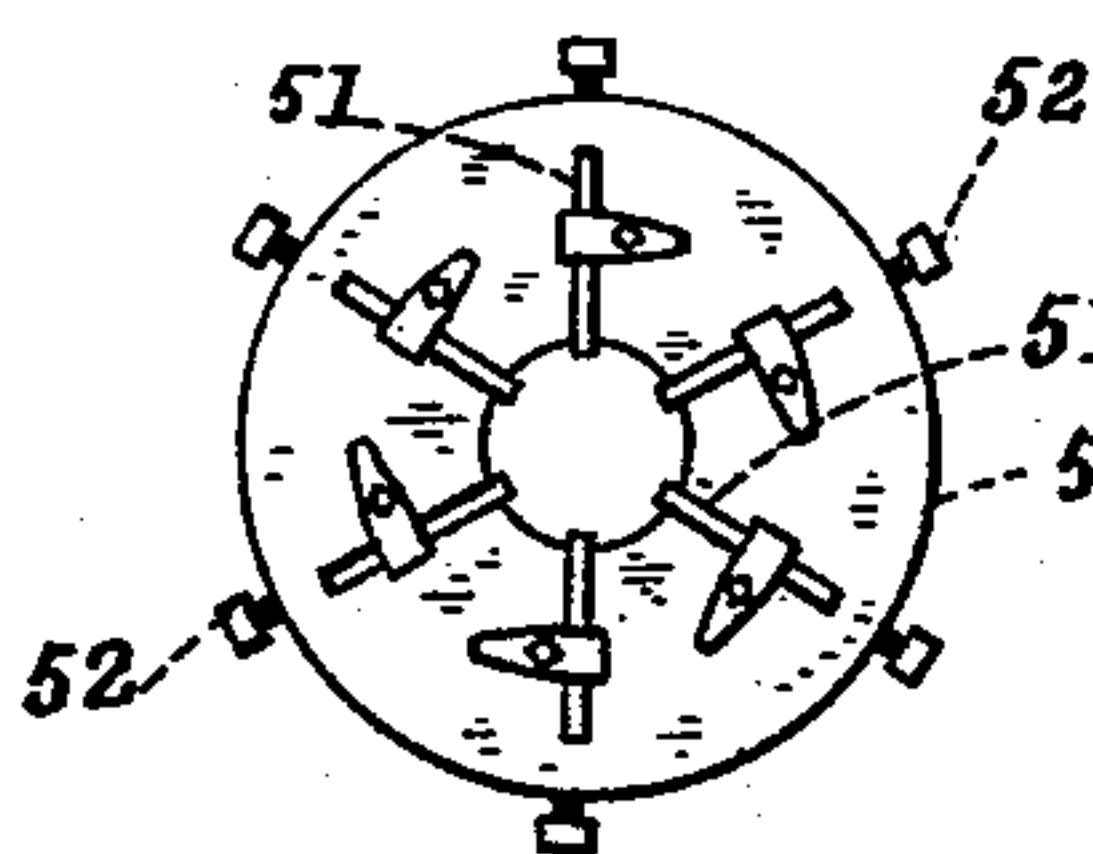
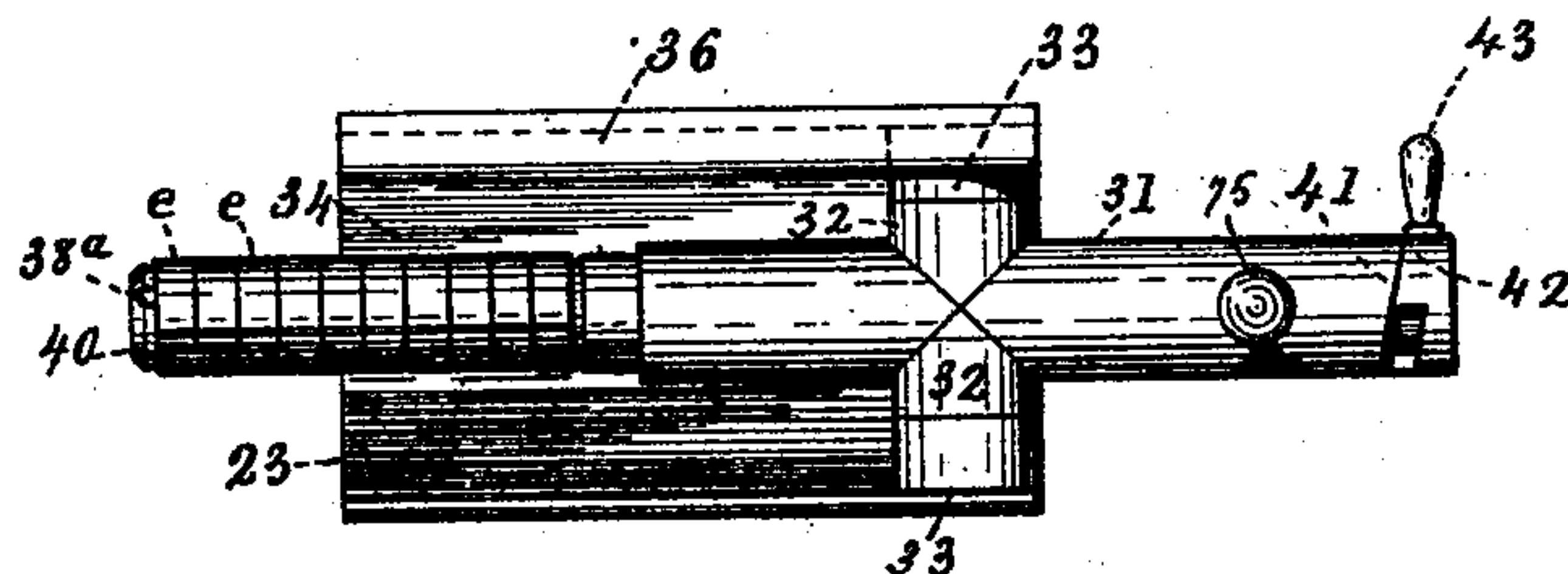


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

ORRIN BRYANT, OF BUFFALO, NEW YORK, ASSIGNOR TO THE PIERCE
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MACHINE FOR CUTTING SCREW-THREADS ON TUBES.

SPECIFICATION forming part of Letters Patent No. 459,389, dated September 15, 1891.

Application filed October 29, 1890. Serial No. 369,654. (No model.)

To all whom it may concern:

Be it known that I, ORRIN BRYANT, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Machines for Cutting Screw-Threads on Tubes, of which the following is a specification.

My invention consists in certain improvements in machines for cutting screw-threads on short tubes to be used for any purposes for which a screw-threaded tube is required, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine complete. Fig. 2 is a front end elevation of the machine, a portion of the force-pipe being omitted, so as to show the mechanism beyond it more clearly. Fig. 3 is a rear end view of the machine. Fig. 4 is a sectional elevation, the front hopper being omitted. Fig. 5 is an end view of one of the tubes upon which a screw-thread is to be cut. Fig. 6 is a detached end view of the tube-holder, an end view of one of the tubes to be cut being shown by dotted lines for illustrating the action of the device. Fig. 7 is a front elevation of the screw-cutting chuck. Fig. 8 is a detached top plan view of the movable carriage and its supporting-table.

In said drawings, 1 represents the frame of the machine; 2, the legs upon which it is supported. (See Figs. 1, 2, 3, and 4.) This frame is made heavy and solid and preferably of cast-iron.

Near the rear end of the top of the frame of the machine is a supporting-box 3, secured to the top of the frame by bolts in the usual way, (see Fig. 1,) and directly opposite at the end of the frame is another box 4. This box 4 is secured at the end of the frame by bolts 5. In these two boxes 3 and 4 is mounted a short horizontal shaft 6, to which is rigidly secured the pinion 7 and the driving-pulley 8. The pinion 7 gears in with the spur-gear 9, which is mounted and firmly secured on a shaft 10, supported in suitable boxes at the rear side of the machine, one of the boxes being shown at 11 in Fig. 3. A portion of the box is also shown in Fig. 1, both boxes being

alike and rigidly secured to the top of the frame by bolts in the usual way.

At the front end of the shaft 10 is a screw portion 12, which gears into the worm gear-wheel 13. This worm gear-wheel is secured on a shaft 14, mounted in boxes 15, which are secured to the frame of the machine by bolts 16. (See Fig. 2.) The shaft 14 at its opposite end is provided with a bevel gear-pinion 17, rigidly secured thereto by a key or in any well-known way.

On the front side of the machine are secured two boxes 18 and 19 by means of bolts 20 or in any well-known way. In these boxes is mounted a horizontal shaft 21. (See Figs. 1, 2, and 3.) To the forward end of the shaft 21 is secured a bevel gear-wheel 22, into which is engaged the bevel gear-pinion 17, which gears in with it.

At the front of the machine-frame is a supporting-bed 23, secured firmly to it by bolts 24. (See Figs. 1, 3, and 4, more especially Fig. 4, where this portion of the machine is more clearly shown.) In this supporting-bed is a roadway for the movable carriage, and on its under side is a bearing or box 26, through which the shaft 21 passes. Through the roadway is an opening through which partly projects a pinion 27, mounted loosely on the shaft 21. On one side of the pinion on a collar forming a part of it is a series of side teeth 28, (see Fig. 1,) and on the shaft 21 is mounted a collar 29, having a corresponding series of side projecting teeth 30. This collar 29 is fitted so as to be moved easily longitudinally back and forth by the hand, but is prevented from turning on the shaft by means of the usual feather 36. (Shown in Fig. 1.) From this construction it will be seen that the pinion 27 will not turn while the shaft 21 is in motion until the collar or sleeve 29 is moved up to the pinion, so as to bring the teeth 28 and 30 into engagement. Then the shaft and pinion will turn together until released by moving the collar or sleeve out of engagement with the teeth in the pinion.

The movable carriage consists of the main cylinder portion 31, having the cross portions 32, upon which is mounted the friction-roller 33. This carriage is adapted to be moved easily back and forth by hand in the roadway

34. (See Fig. 8.) On one side of this roadway is an upwardly-projecting side piece 35 (see Figs. 1, 3, and 4,) having a side projecting flange 36, which extends over one of the friction-rollers 33, so as to prevent the carriage from being lifted up. At the bottom of the cylindrical portion 31 is a downwardly-extending rib having a series of rack-teeth 37. (See Fig. 4.) These teeth project down and engage with the teeth in the pinion 27, so that when the pinion turns the rack and carriage will be moved forward.

Rigidly secured to or forming a part of the carriage (or cylindrical portion 31) is a projecting mandrel *r*, having four deep longitudinal grooves 38; (see Figs. 4 and 6,) but there may be more or less of these grooves 38, if desired. Longitudinally through this mandrel and the cylindrical portion 31 is a hole, in which is fitted a rod 39. (Shown by dotted lines in Fig. 4.) To the forward end of the rod 39 is rigidly secured a small disk 40 (see Figs. 4 and 6) of exactly the same form or shape as the end of the mandrel, including the grooves 38, which are marked 38^a on the disk, so that it may be brought up to the end of the mandrel and all parts correspond. At the end of the cylindrical portion 31 is a single-turn spiral-faced portion 41, and rigidly secured to the end of the rod 39 is a corresponding spiral-faced portion 42, having a handle 43, by which the rod 39 is turned partly around back and forth. From this construction it will be seen that by turning the handle 43 up into the position shown in Fig. 4 and holding the two faces 41 and 42 in contact the disk 40 will be moved forward, as shown in said Fig. 4, and the grooves 38 in the mandrel and disk will be directly in a line with each other. When the handle 43 is turned back into the position shown in Fig. 8, the disk 40 is drawn up close to the end of the mandrel, and at the same time the notches 38^a are moved away from or passed by the grooves 38, for the purposes which will be more clearly hereinafter described.

At the back side of the machine is rigidly secured by bolts 44 a supporting-piece 45, having at the top a transverse box 46, which is located directly in a line with the mandrel *r*, so that a straight line will pass through the center of both. (See Fig. 4.) Mounted within the box 46 is a hollow sleeve or shaft 47, forming a part of or rigidly secured to the bevel gear-wheel 48. At the opposite end of the sleeve or shaft 47 is a screw portion 49, upon which is screwed in the usual way a screw-cutting chuck 50. This screw-cutting chuck is made in the usual way. 51 represents the screw-cutting dies, and 52 the set-screws by which they are forced forward, as required. On the shaft is mounted and rigidly fastened a bevel gear-pinion 53, which gears in with the bevel-wheel 48.

54 represents the oil-reservoir located above the machine and supported by the overflow-pipe 55 and force-pipe 56. The overflow-pipe

55 passes up into the reservoir nearly to the top, as shown by the dotted lines 57 in Figs. 1, 2, and 3, and the force-pipe 56 is connected with the pump 58 at or about the point 59. (See Fig. 1.)

The pump is connected with the lower reservoir 60 and is operated by means of the eccentric 61 (shown in Figs. 1 and 2) and the slotted arm 62, which is pivoted by a pin 63 to a support 64, a connecting-rod 65 being pivoted to the end of the arm 62 and having its opposite end pivoted by a pin 66 to the piston-rod of the pump.

A horizontally-projecting pipe 67 is provided with a downwardly-projecting stop-cock 68, from which the oil flows when the machine is in operation.

The tubes *e*, upon which the screw-threads are to be cut, are provided with a number of points 69, (see Fig. 5,) corresponding with the grooves 38 in the mandrel *r*, so that when put onto the mandrel, substantially as shown in Fig. 8, they are held fast, so that they cannot turn thereon, and when the handle 43 is turned into the position shown in said Fig. 8 the disk 40 is also turned and drawn up, as hereinbefore mentioned, and the tubes *e* are thus held rigidly in place to the mandrel.

At the front of the machine is a hopper or receptacle *s* for holding the tubes to be operated upon, and at the rear of the machine is a receptacle *t* to receive the tubes as they drop from the machine finished.

The operation of the machine is as follows: Motion being given thereto by the driving-pulley moving in the direction of the arrow 70, (see Figs. 2 and 3,) this turns the pinion 7, and by that the spur-wheel 9 and shaft 10, in the direction of the arrow 71, thereby turning the screw-gear in the direction of the arrow 72, and the pinion 17 turns the bevel gear-wheel 22 and shaft 21 in the direction of the arrow 73. This motion, when the pinion 27 and rack 37 are in engagement, as hereinbefore mentioned, would cause the carriage carrying the mandrel *r* to move with just motion enough to allow the screw-threads to be cut on the tubes *e* on the mandrel. The shaft 10 carries the bevel-gear 53, which turns the bevel gear-wheel 48 and its shaft or sleeve 47, carrying the screw-cutting chuck 50 in the proper direction to cut the screw-threads. After the screw-threads are cut on all the tubes on the mandrel the pinion 27 is released from the collar 29 by moving the collar and its teeth away from and out of gear with the teeth 28, hereinbefore mentioned, so as to stop it from moving with the shaft 21. The handle is now turned so as to bring the notches in the disk 40 in a line with the grooves 38 in the mandrel, and the tubes *e* are pushed off and pass through the opening through the sleeve 47 and bevel-wheel 48 and drop into the receptacle *t*. The mandrel is then filled with short tubes again and the operation repeated.

In Figs. 1, 3, 4, and 8, 75 represents a knob-

shaped handle by which the carriage and mandrel *r* may be moved back and forth along the roadway when the pinion 27 is released, as hereinbefore mentioned. Below the machine (see Fig. 1) is a trough or spout 76, through which the refuse oil falls into the receptacle 77 and from thence into the reservoir 60, to be again forced up into the reservoir 54 by the pump.

10 I claim as my invention—

1. In a machine for cutting screw-threads on tubes, the combination of a carriage and holding-mandrel to receive and hold the tubes to be screw-threaded, the whole mounted upon a roadway secured to the frame of the machine, a rack at the bottom of the carriage, a pinion in engagement with said rack, mounted loosely on a transverse shaft passing through the carriage-support, the means, substantially as above described, for giving the shaft a rotary motion, and mechanism for connecting the pinion or disconnecting it from the shaft for feeding the mandrel and carrying the tubes to be cut into the dies for cutting the screw-threads, substantially as described.

2. In a machine for cutting screw-threads on tubes, the combination of a carriage and grooved tube-holding mandrel mounted on a roadway on the machine, and its rack-and-pinion movement for carrying it forward, a rod passing longitudinally through the carriage, having a disk on its forward end provided with notches corresponding with the grooves in the mandrel, and a spiral-faced tightening device at its opposite end for drawing the disk up to the end of the mandrel and slightly turning it at the same time to secure a series of tubes in place preparatory to cutting the screw-threads on them, substantially as described.

3. In a machine for cutting screw-threads on tubes, the combination of a carriage and tube-holding mandrel mounted on a roadway on the frame of the machine for carrying a series of tubes forward while being screw-threaded, the means, substantially as above described, for holding the tubes in place while being cut, a rack and pinion for giving the carriage its required forward movement, a screw-cutting chuck mounted directly opposite and in line with the tube-holding mandrel on a hollow shaft set in a box secured to the machine and provided with a bevel gear-

wheel, a pinion adapted to gear therewith and secured to a shaft at right angles thereto in suitable bearings attached to the frame of the machine and connected by a spur gear-wheel and pinion with the driving-pulley for giving motion to the screw-cutting mechanism, and a train of gearing connected therewith for giving the proper feeding movement to the tube-holding carriage, substantially as described.

4. In a machine for cutting screw-threads on tubes, the combination of a carriage and tube-holding mandrel, the means, substantially as above specified, for securing a series of tubes thereon while being screw-threaded and for giving the required movement to the carriage, as above specified, a hollow screw-chuck mounted on a hollow shaft, connected by gear-wheels with the driving-shaft for giving it its necessary rotating motion, and a receptacle for receiving the tubes as they pass through the hollow shaft after being screw-threaded, substantially as specified.

5. In a machine for cutting screw-threads on tubes, the combination therewith of an elevated oil-reservoir, an oil-reservoir at the base of the machine, a pump connected with the upper and lower reservoirs by a force-pipe and an overflow-pipe, a stop-cock connected with the upper reservoir for lubricating the screw-cutting parts, a trough for carrying off the drip to the lower oil-reservoir, and the means consisting of a pivoted slotted arm operated by an eccentric on the driving-shaft for giving the pump its required movements, substantially as above described.

6. A means for securing and holding the short tubes *e* to be cut, consisting of a mandrel having longitudinal grooves over which the tubes are passed and prevented from turning by said grooves, in combination with a rod passing longitudinally through said mandrel, having a disk rigidly secured to its forward end, provided with notches corresponding with the notches in the mandrel, and at the opposite end with a spiral-faced disk which bears against a corresponding spiral-faced end on the cylindrical portion, through which the mandrel passes, and a handle for operating it, substantially as described.

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Witnesses:

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