No. 660,001. Patented Oct. 16, 1900.

L. F. CARSTENSEN.

PIPE THREADING MACHINE.

(Application filed Feb. 7, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 2.

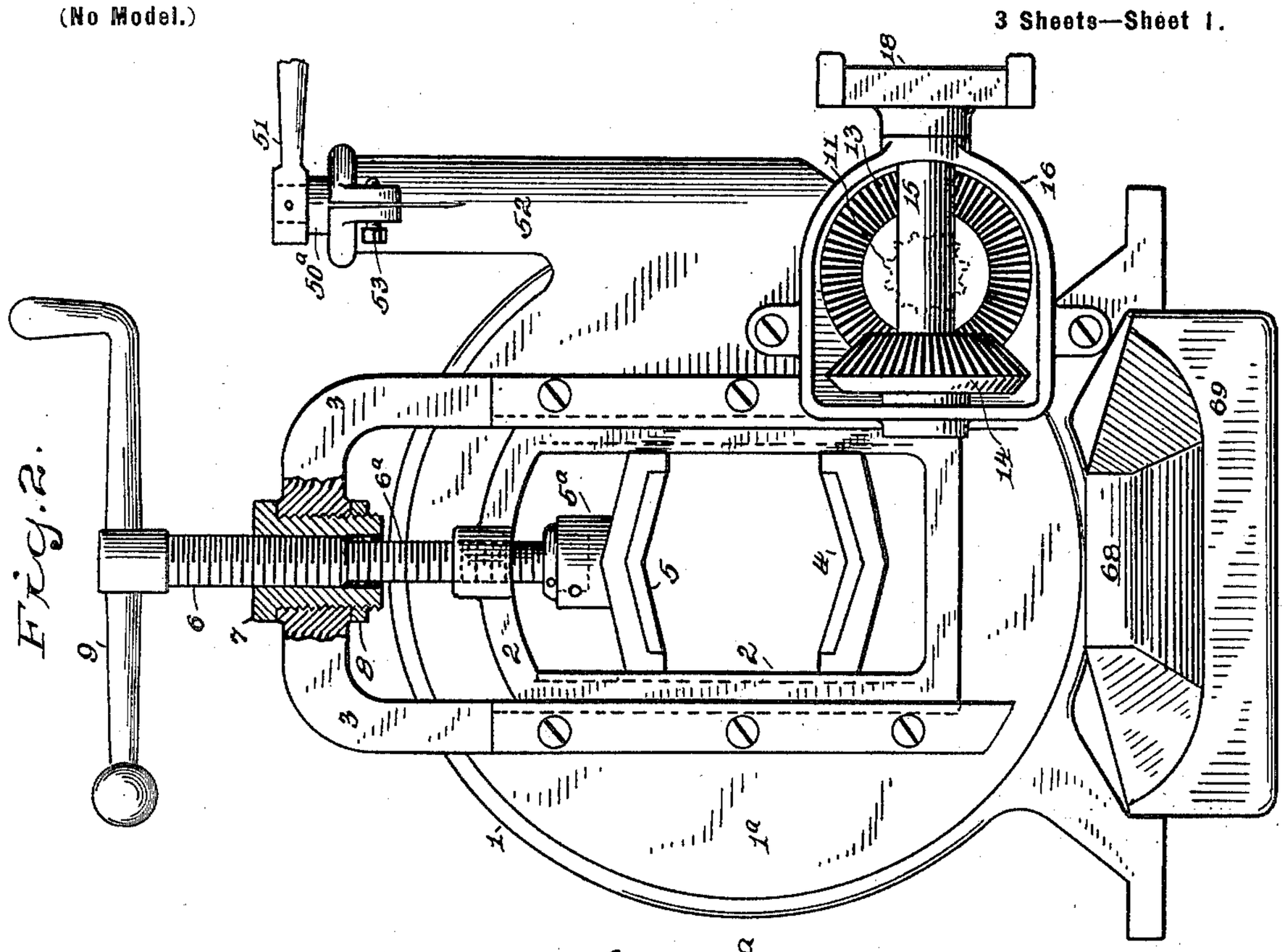

Fig. 1.

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Fig. 4.

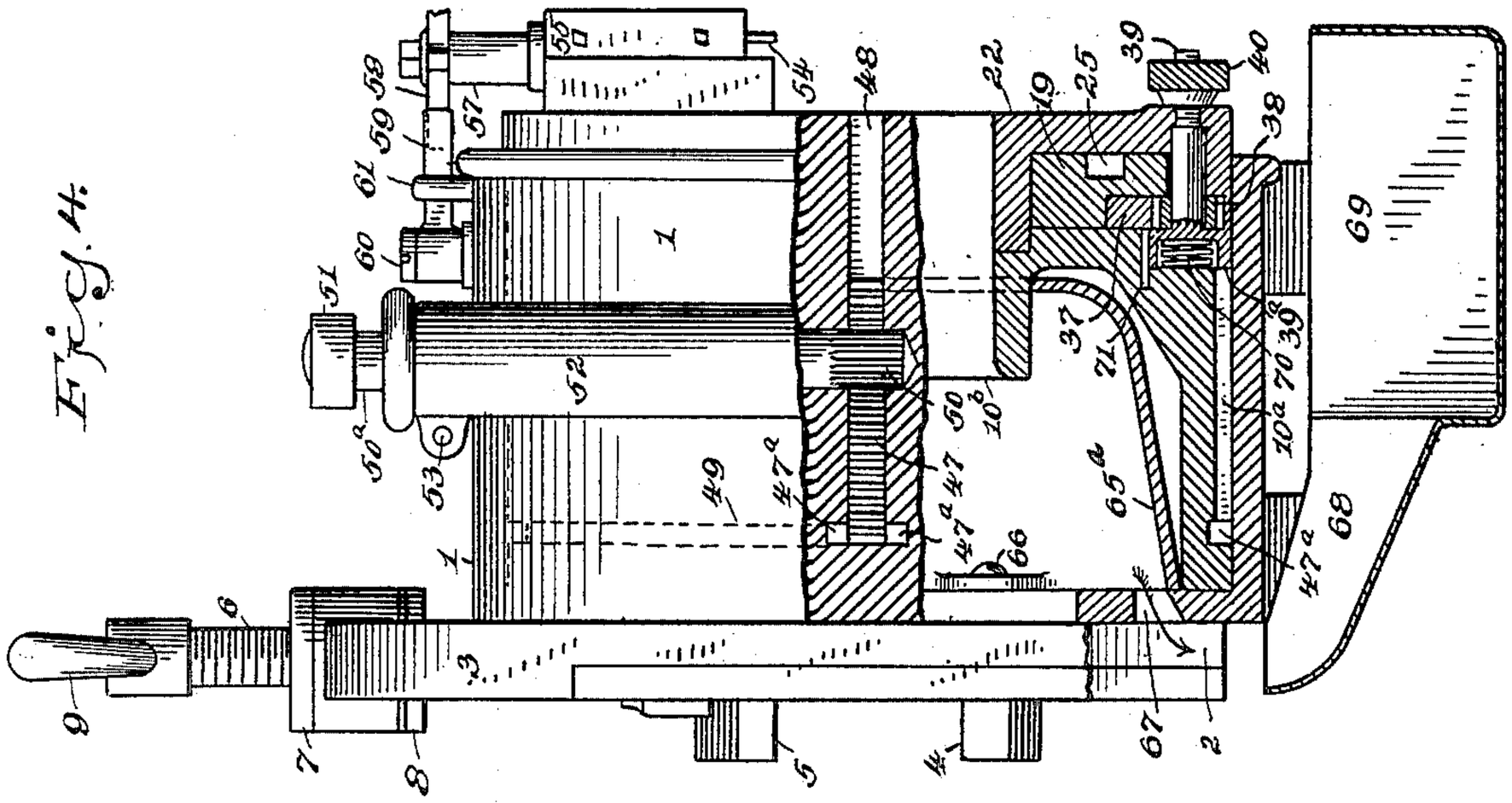

Fig. 3.

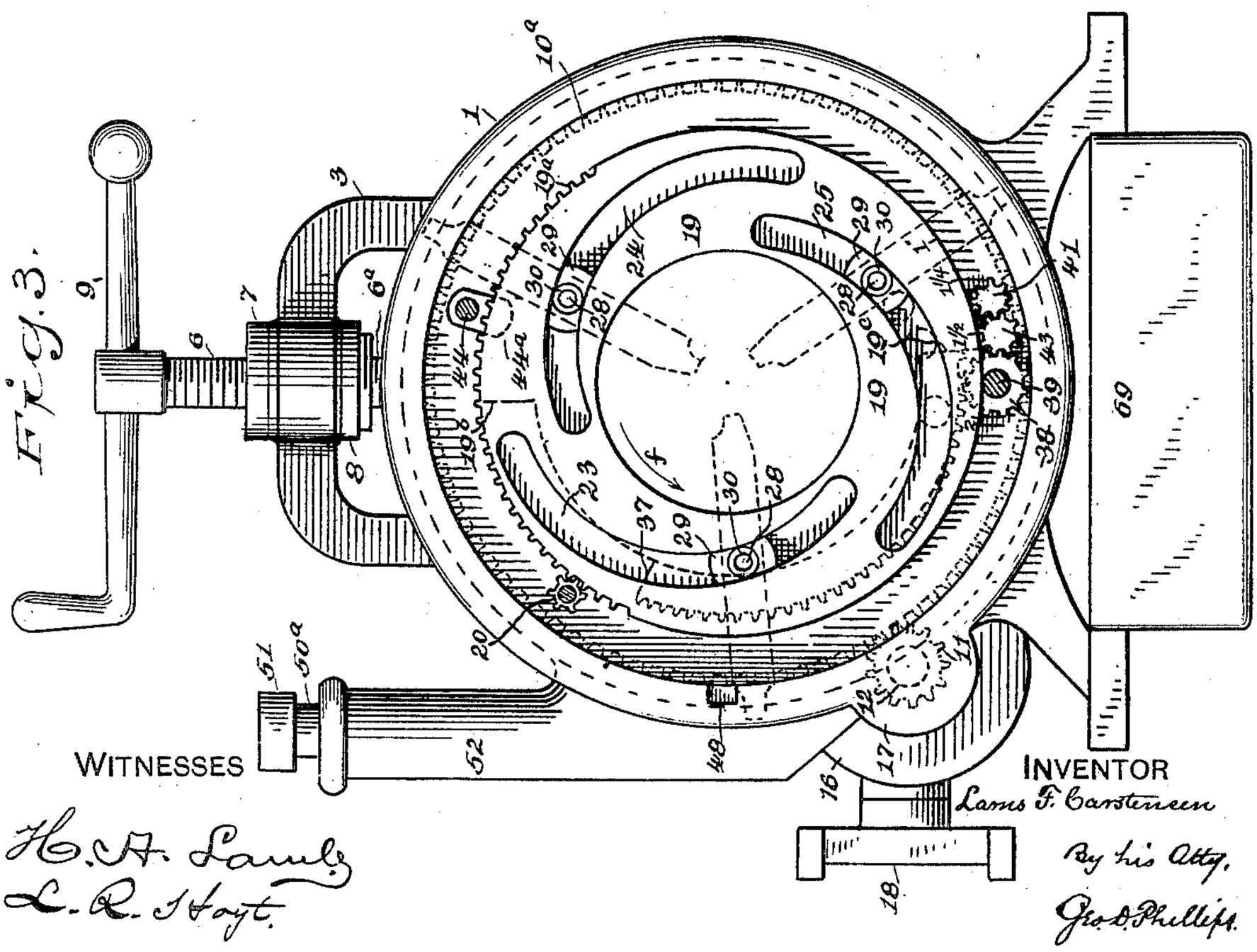

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Fig. 5.

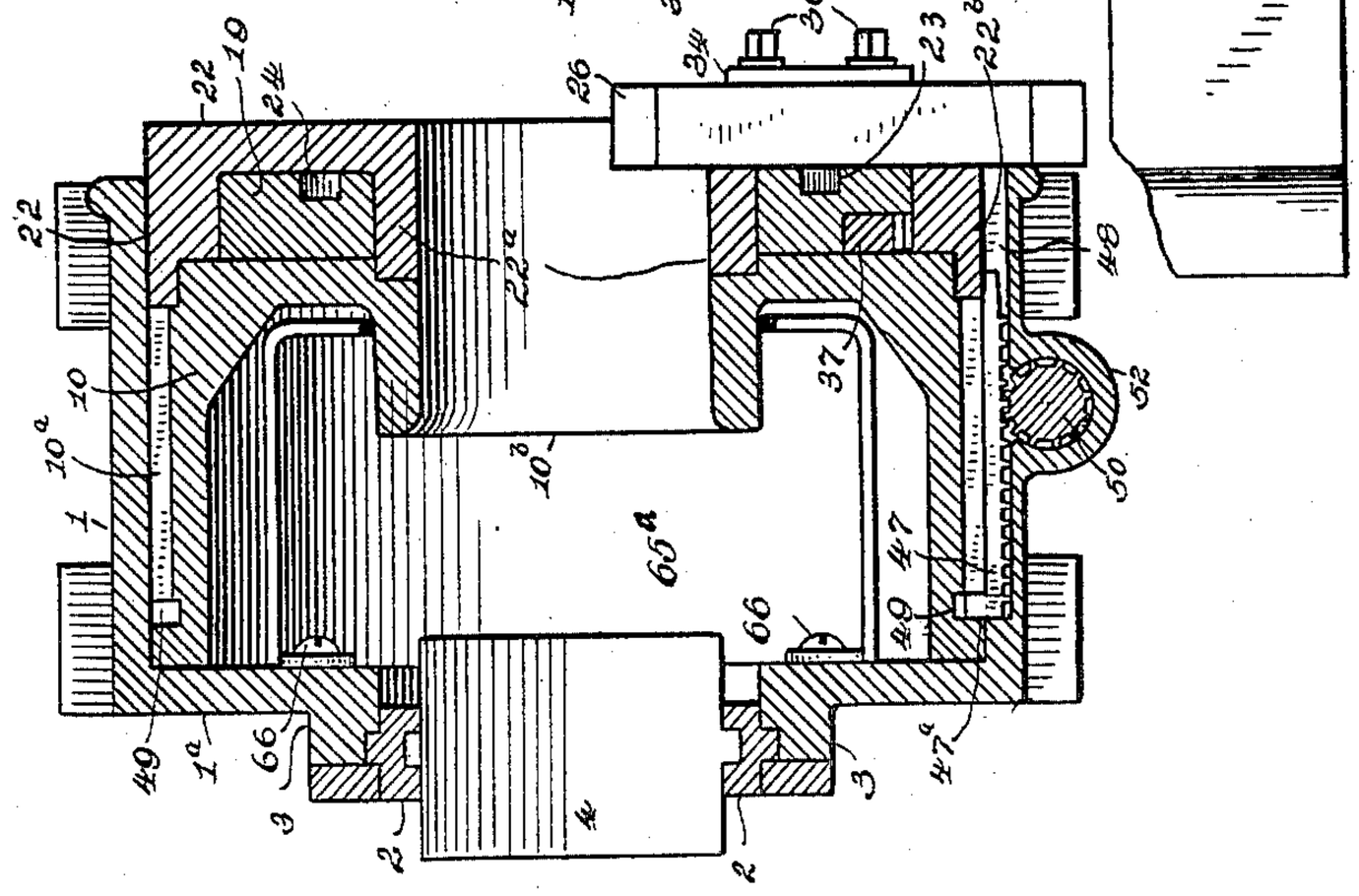


Fig. 6.

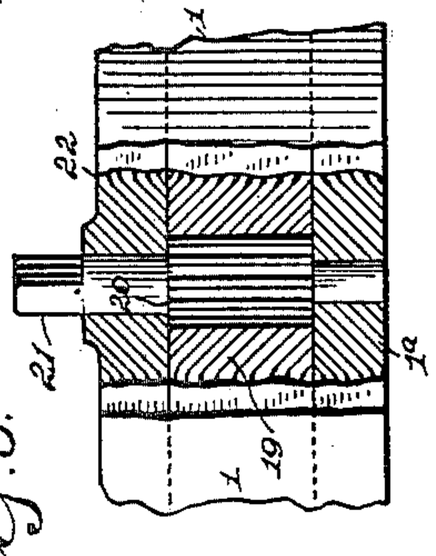


Fig. 7.

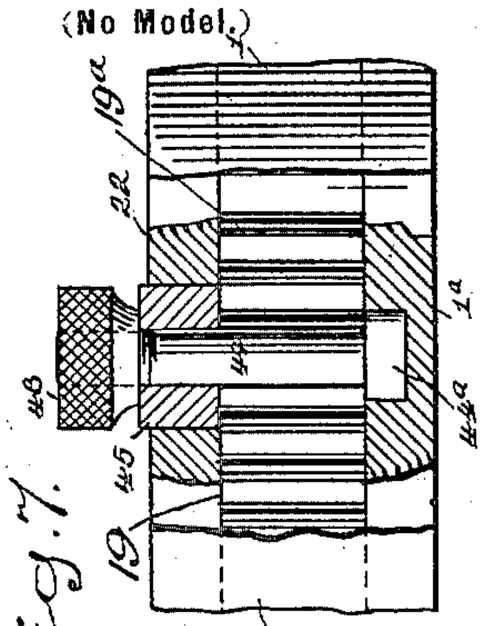


Fig. 8.

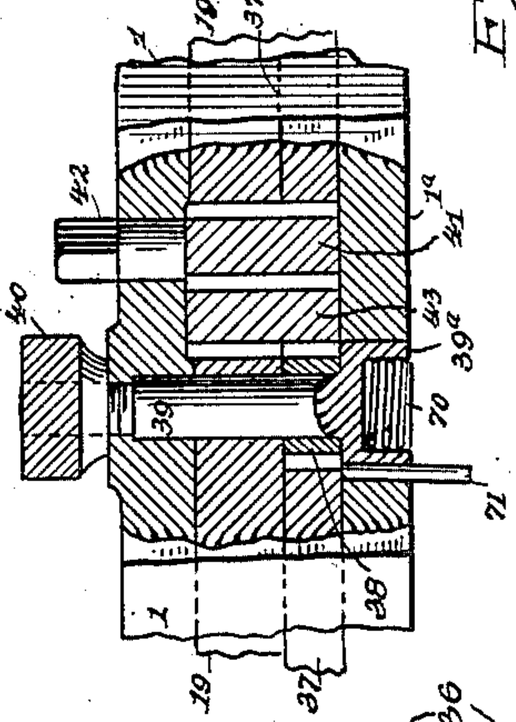


Fig. 9.

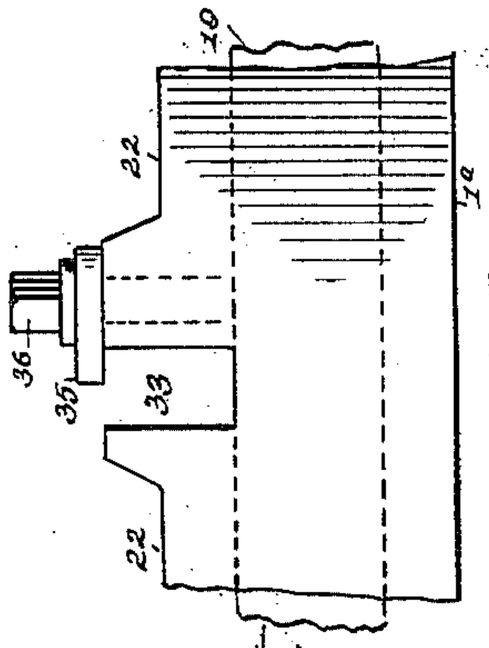


Fig. 11.

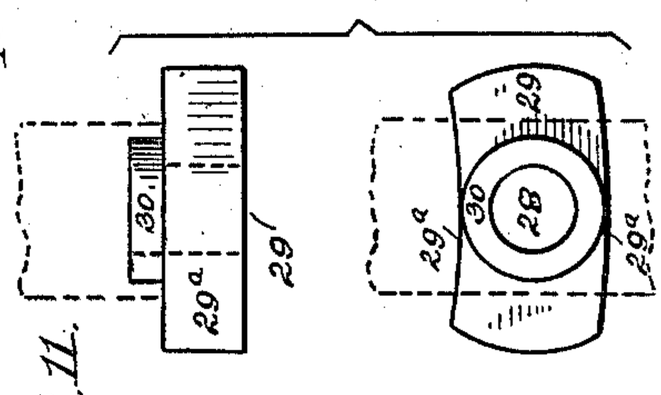
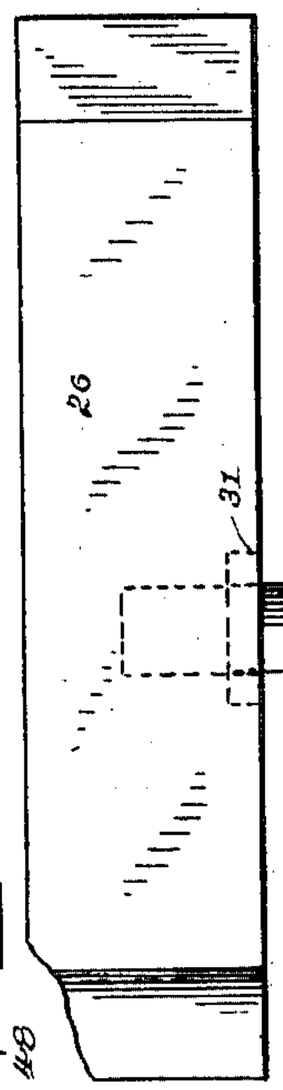


Fig. 10.



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UNITED STATES PATENT OFFICE.

LARNS FRÜS CARSTENSEN, OF BRIDGEPORT, CONNECTICUT.

PIPE-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 660,001, dated October 16, 1900.

Application filed February 7, 1900. Serial No. 4,422. (No model.)

To all whom it may concern:

Be it known that I, LARNS FRÜS CARSTENSEN, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Pipe-Threading Machines, of which the following is a specification.

My invention relates to pipe threading and cutting-off machines, to be more particularly described and set forth in the following specification.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a front elevation of the machine, and Fig. 2 a rear elevation. Fig. 3 is a front elevation with the head removed and the threading-bits in dotted position. Fig. 4 is a broken side elevation, partly in section. Fig. 5 is a transverse section through *a a* of Fig. 1, showing one of the threading-bits in position and the forked back rest removed. Fig. 6 is a broken view, partly in section, of the outer shell-head and cam-plate through lines *b b* of Fig. 1; also, view of the pinion for operating said cam-plate. Fig. 7 is a broken view, partly in section, of outer shell-head, cam-plate, and clamp for said plate through line *c c* of Fig. 1; also, view of the clamping-bolt and its nut in position. Fig. 8 is a broken view, partly in section, of the outer shell-head, cam-plate, and toothed segment through line *d d* of Fig. 1; also, tension-bolt for said segment. Fig. 9 is a broken view of the outer circumference of the flange portion of the head, having an opening or se at therein for one of the threading-bits and a clamping-screw therefor. Fig. 10 is a detail side elevation of one of the threading-bits. Fig. 11 is a detail side elevation and plan view of the shoe that is connected with each of the threading bits or dies, which shoe is adapted to travel in a groove of the cam-plate.

Its construction and operation are as follows:

1 represents an open-mouth shell or outer covering adapted to inclose the internal mechanism presently to be described. 1^a is the back of said shell.

2 is a cage or sliding frame adapted to have a vertical movement in the stationary frame 3. The sliding frame 2 carries the stationary jaw 4 and the movable jaw 5, adapted to engage and hold the pipe or rod to be cut from rotating therein.

The upper pipe-jaw 5 and the sliding frame 2 are regulated by a differential screw having threads of different pitches—viz., the upper or larger portion 6 of said screw operates in the internally-threaded bushing 7, which bushing is externally threaded to engage with a threaded hole in the top of the frame 3. 8 is a locking-nut, which nut, combined with the upper flanged portion of said bushing, will secure said bushing in any of its adjusted positions in the frame 3. The lower portion 6^a of the said operating-screw passes through a threaded hole in the upper end of the sliding frame 2, and its lower end is rotatably anchored in the boss 5^a of the movable jaw 5. The pitch of the portion 6^a of this screw is double that of the upper portion 6, so that when the screw is operated by means of its handle 9 the clamping-jaws 4 and 5 will be carried toward the center of the machine in equal time. The object of the threaded bushing is to locate the proper position of the sliding frame 2 relative to the center of the machine, and when that position is found the said bushing is locked to the frame 3, as before mentioned.

10 is the barrel, having teeth 10^a around its circumference by which the same is rotated within the shell 1, as follows: 11 (see Figs. 2 and 3) is a pinion registering with the teeth of said barrel, and such pinion is mounted on the short shaft 12. On the end of this shaft is the bevel-gear 13, which registers with the bevel-gear 14 on the shaft 15. Both of said gears and the shaft 15 are within the housing 16, while the shaft 12 and pinion 11 are in the housing 17, projecting from the outer surface of the shell or body 1. On the outer projecting end of shaft 15 is the T-shaped piece 18, adapted to receive a wrench or crank-handle whereby the mechanism just described is operated.

19 is the cam-plate, having the teeth 19^a formed in a part of the outer circumferential surface thereof, which teeth are engaged by the small pinion 20, whereby said cam-plate is rotated the required distance. 21 is a shaft on which said pinion is mounted, the squared

end of such shaft projecting through the head 22 to receive a wrench.

23, 24, and 25 are cam-slots in the plate 19 to control the movements of the threading dies or bits 26. 27, Fig. 10, is a stud projecting from the under or lower face of these dies, which stud is adapted to freely enter the hole 28, Figs. 11 and 12, of the shoe 29. 30 is a boss projecting from the upper surface of said shoe and is adapted to freely enter the circular recess 31 of the cutting-die. The edges 29[a] of these shoes are of the same curvature as the cam-slots of the before-mentioned cam-plate, so that such plate may rotate freely to carry the cutting-dies to and from the center of the machine. While the stud 27 itself could operate in the cam-slot of said cam-plate, the shoe gives a better bearing-surface and less friction. The engagement of the boss 30 of said shoe with the recess 31 of the cutting-die acts as a double brace so as to effectually prevent any tendency of the shoe to tilt or cramp in the cam-slot. It will be observed that this stud is located at one side of the center of the cutting-die, so that the shorter end of said dies may be used for the larger sizes of pipe and are reversed and the longer end used for the smaller sizes of pipe. The projections 32 rise from the outer face of the head 22, having slots 33, Fig. 9, to receive the cutting-dies. Overlying these dies are the caps 34, which, in combination with the bolts 36, keep said dies in place, but not so firmly as to prevent their moving in or out when the cam-plate is operated.

37, Figs. 3, 4, 5, and 8, is a toothed segment adapted to operate in a recess formed in the inner face of the cam-plate 19, and, like such cam-plate, its inner face rests against the outer vertical face of the revolving barrel 10.

38 is a pinion loosely mounted on the clamping-bolt 39 between the head 39[a] of such bolt and the under side of the cam-plate 19. 40 is a nut mounted on the projecting end of this bolt, whereby the said pinion 38 is drawn firmly against the under side of the flange portion 22[b] of the head, so as to hold the segment stationary without interfering with the movement of the cam-plate.

41 is a pinion preferably integral with its shaft 42, whose upper end is squared to receive a wrench, which squared end projects through the head 22.

43 is an intermediate pinion between the pinions 38 and 41, whereby motion is transmitted to the former.

The cam-plate 19 is held against rotation, Figs. 3 and 7, by means of the bolt 44, whose eccentric head 44[a] engages the under side of said cam-plate, while the clamp 45 rests on the upper side thereof. 46 is a tightening-nut whereby the clamping effect is produced. This cam-plate, as before mentioned, slides on the vertical face of the barrel 10 and also in a circumferential groove of the head 22, which groove is bounded by the internal flange portion 22[a] and the external flange portion 22[b]. It will be observed (see Fig. 5) that the inner edges of these flanges fit into grooves in the outer vertical face of the barrel 10, which serves in a measure to support and steady said barrel.

19[b] and 19[c] (see dotted lines, Fig. 3) represent the extreme ends of the groove of the cam-plate in which the toothed segment 37 operates, which ends act as stops for said cam-plate, the purpose of which will presently be described.

47, Figs. 1, 4, and 5, is a rack adapted to have a longitudinal movement in the slot 48 of the outer shell 1. 47[a] is a right-angle projection which enters the circumferential groove 49 of the barrel 10, whereby said rack is held in place, it being understood that the projecting head 47[a] of the rack loosely fits the said groove, so as not to interfere with the rotative movement of said barrel. The purpose of this rack is to effect a longitudinal movement of said barrel within the shell 1. 50 is a pinion integral with the shaft 50[a], which pinion meshes with said rack, and 51 is a handle on the upper end of said shaft for operating the same. This shaft is mounted in the vertical shell 52, whose upper portion is split, which, in combination with the tightening-screw 53, will hold the shaft 50[a] and its pinion 50 stationary, and thus prevent the longitudinal movement of the barrel when the cutting-off tool is in operation.

54 is a cutting-off tool mounted in the traveling carriage 55, sliding in the ways 56. 57 is a shaft whose lower end (not shown) is threaded to engage with said traveling carriage to operate it to and from the pipe to be cut.

58 is a star-wheel mounted on the outer end of shaft 57 to be engaged by the arm 59 and is secured by screw 60 to the outside surface of the shell 1, so that when it is desired to cut off a section of pipe the arm 59 is brought against the stop 61, and the rotation of the barrel 10 will bring the said star-wheel against said arm and cause the cutting-off tool to be fed in a distance proportionate to the amount of engagement of said star-wheel and arm. 62 is a forked back rest opposite to said cutting-off tool, having the slotted end 62[a] adapted to receive the clamping-bolt 63. This back rest is mounted in the seat 64 and is adapted to be shifted to and from the pipe to be cut, so as to properly support the pipe against the cutting action of the cutting-off tool.

65, Fig. 1, is an elongated opening through the head 22 in order to read the figures marked on the face of the cam-plate, which figures indicate the different sizes of pipe that can be cut on the machine. One edge of said opening is beveled, and a scale is formed on such beveled edge, which scale consists of a central or zero mark with marks on each side thereof. The object of this scale is to vary the size of the thread to be cut—for instance, the one-inch mark on the cam-plate now coincides with the zero-mark on the head, which indicates

that the said cam-plate has been set to cut one inch. If desired to vary the size of the thread to be cut, so as to make it larger or smaller than an inch, the one-inch mark on the cam-plate is brought opposite one of the short marks and the size cut will be larger or smaller, according to which side of the zero-mark the said inch-mark is placed. The greater the distance the greater the variation, and vice versa. The object of this scale on the head is to be able to bring the mark on the cam-plate to the exact place each time, and thus make it possible to thread any number of pipes above or below the standard size and have them all uniform.

Another important feature of my improved pipe-threading machine is to provide means whereby its interior is kept clear of chips. Heretofore this has been a serious drawback in the use of pipe-machines of this character, as the chips fall into the teeth of the barrel and interfere with its working. To overcome this difficulty, I provide the chip-receptacle 65^a, which is attached to the inside wall of the back 1^a of the shell by the screws 66. This receptacle or pan projects forward, Figs. 4 and 5, beyond the hub 10^b of the barrel 10, so that no matter whether said barrel is in or out of the shell the chips passing through the bore of said hub will always fall into this pan, and by means of the rearward inclination of such pan the chips and oil will pass through the aperture 67 in the back 1^a, and from thence they will drop into the spout 68 and be carried into the receptacle 69.

In operating the machine the cam-plate 19 is turned so that any one of the marks thereon, from one inch to two inches, as required, is brought opposite the before-mentioned scale on the head, as shown at Fig. 1, and is firmly clamped in that position by means of the bolt 44 and its nut 46. Then the segment-plate 37 is brought against the end wall 19^c of its recess in the cam-plate, as shown at Fig. 3, after which the barrel, with all the mechanism connected therewith, is run out of the shell the required distance by means of the pinion 50 and rack 47. Then the clamping-jaws 4 and 5 are brought firmly onto the pipe and the threading is then done by revolving the barrel through the medium of the T-shaped piece 18, as before mentioned. While cutting one size of pipe the toothed segment 37 remains where it was originally locked and is never disturbed unless a change of size is required, so that when the cutting-dies have been run up on the pipe the distance required the cam-plate is loosened and turned to the left or in the direction of arrow *f* until the end wall 19^b, Fig. 3, strikes the end of the segment 37, which movement of the said cam-plate will be sufficient to release said cutting-dies from the pipe, so as to permit its removal. Throwing the cam-plate around in the opposite direction until the end wall 19^c strikes the other end of said segment will, as before mentioned, limit the inward travel of the cutting-dies. The importance of this segment, in connection with a machine of the character, can thus be readily seen, as it enables the cam-plate to be brought to the same position when closed or open. To cut another size pipe, the cam-plate is rotated until the number indicating such size is opposite the before-mentioned scale on the head and the segment is properly located relative to the position of said cam-plate and the cutting is proceeded with, as before. To prevent the segment getting out of control of its pinion when this shifting is being done, the under side of the head portion 39^a of the bolt 39, Figs. 4 and 8, is countersunk to admit the spring 70, which spring rests on the vertical face of the barrel 10. This will exert sufficient tension on the pinion 38 to keep it steady. 71 is a key in the outer surface of the head of the bolt 39 to prevent such bolt turning.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a pipe-threading machine of the character described, of a rotatable cam-plate having a recess therein, a segment adapted to be temporarily secured thereto but shorter than such recess so that, the ends of such segment engaging the end walls of such recess, will limit the rotatable movement of said cam-plate in either direction, for the purpose set forth.

2. In a pipe-threading machine, the combination with a rotatable cam-plate adapted to engage and operate threading-dies, of a segment adapted to be recessed in the periphery of said cam-plate, means for rotating said segment and means for locking it against rotation whenever the said cutting-dies are being operated through the medium of the said cam-plate, means on said cam-plate for engaging said segment so as to limit the degree of opening and closing of said dies, for the purpose set forth.

3. In a pipe-threading machine of the character described, the combination with the outer shell and a barrel adapted to have both a rotative and a longitudinal movement therein, of a rack connected to said barrel in such a manner as not to interfere with its rotary movement, a pinion adapted to register with said rack whereby the longitudinal movement of said barrel is effected, means whereby said pinion is operated, means whereby said pinion is locked against rotation when the said barrel is revolving during the operation of cutting off pipe, for the purpose set forth.

4. In a pipe threading and cutting-off machine of the character described, the arm 59 pivotally supported on the outer surface of the shell 1, combined with the star-wheel 58 of the cutting-off tool, the stop 61 to support said arm when engaged by said star-wheel, for the purpose set forth.

5. The combination with an outer shell and a longitudinally-movable barrel having the

hub 10^b, of the receptacle 65^a attached to said shell and adapted to receive the chips and oil passing through the bore of said hub, said receptacle extending under said hub and embracing or partially embracing the same so that, the said receptacle is always in position to receive oil and chips passing through said hub whatever the position said barrel may be in, for the purpose set forth.

6. The combination, in a pipe-threading machine of the character described, consisting of a shell having a barrel portion operatively mounted therein, of a receptacle located within said barrel and adapted to receive the chips and oil, and means whereby such chips and oil are carried outside of the machine, for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 1st day of February, A. D. 1900.

LARNS FRÜS CARSTENSEN.

Witnesses:

SAMUEL G. MEEKER,

L. R. HOYT.