

H. GAUTSCHI.
PIPE AND ROD THREADER.
APPLICATION FILED SEPT. 1, 1908.

942,200.

Patented Dec. 7, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

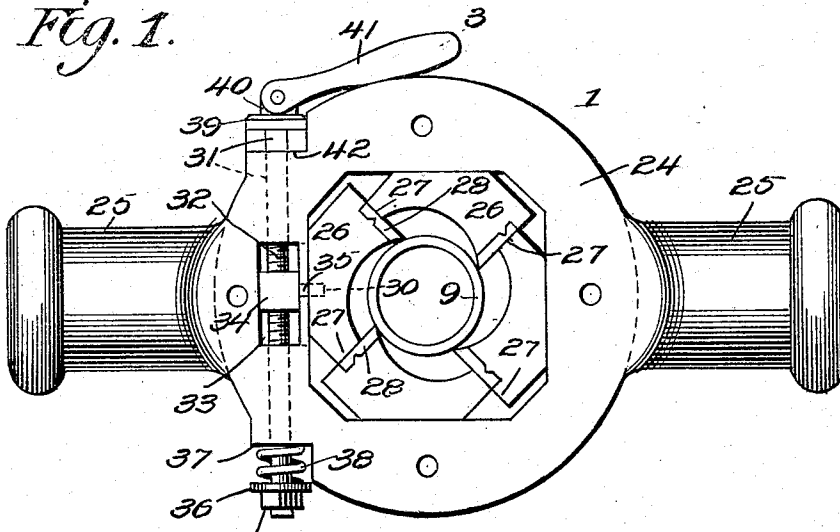


Fig. 2.

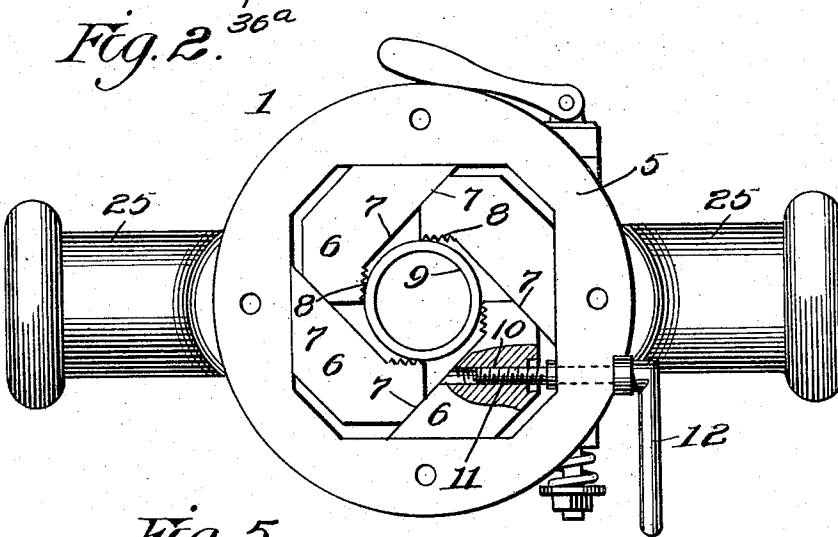
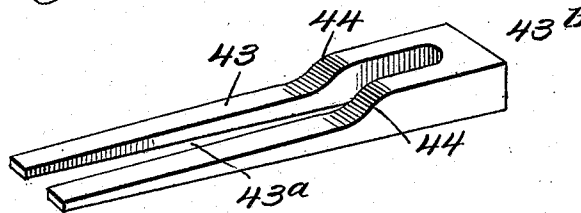


Fig. 5.



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PIPE AND ROD THREADER.

942,200.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 1, 1908. Serial No. 451,211.

To all whom it may concern:

Be it known that I, HENRY GAUTSCHI, a citizen of the Republic of Switzerland, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Pipe and Rod Threaders, of which the following is a specification.

This invention relates to a machine for threading pipes, rods or like objects, and is designed to provide a machine of this character which is simple of construction, inexpensive of production, easy and efficient of operation, and is adapted to automatically project and retract the threading dies at the beginning and end of the threading operation.

The invention is further designed to provide a machine in which the dies are adjustable for different sized pipes or rods, and which, by the automatic retraction of the dies, may be conveniently slipped off the threaded pipe, thus obviating the necessity of turning the machine backward.

The invention is still further designed to provide a machine composed of telescopic parts, one carrying the pipe-gripping means and the other the threading dies, combined with a spring for holding the parts normally closed or collapsed and means co-operating therewith for automatically opening and closing the dies at the limits of movement of the die-carrying part, said spring being compressed when the die-carrying part is set for operation and exerting its expansive action to assist the operator in the operation of threading.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts hereinafter fully described, and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a front elevation of the machine with the face plate of the turning head removed. Fig. 2 is a rear end elevation of the machine with the face plate of the gripping head removed. Fig. 3 is a longitudinal section on the line 3—3 of Fig. 1, showing the turning head projected for the threading movement. Fig. 4 is a top plan view of the machine. Fig. 5 is a view of the retractor bar or fork.

Referring to the drawings, 1 designates the machine as a whole which is designed to be arranged for operation in a horizontal position. The body or stock of the machine

is longitudinally extensible and contractible and comprises tubular telescoping sections 2 and 3. The section 2 incloses the section 3 and is stationary in operation relative to the section 3. The rear end of the section 2 is provided with an outwardly extending flange 4 to which is secured a gripping head 5 chambered to receive an annular series of gripping jaws or blocks 6 having outer relatively angular faces to bear against the side walls of the chamber and provided with beveled or inclined faces 7 for contact with each other, and also having toothed surfaces 8 to engage the rod or pipe 9 which is to be threaded. One of the blocks is formed with a threaded opening 10 to receive an adjusting screw 11 journaled on the head and having at its outer end a handle 12 by which it may be turned in one direction or the other to adjust the jaws, which are normally loose, into gripping engagement with the rod or pipe to hold the same against movement during the threading operation. The gripping jaws are insertible and removable through the outer and rear face of the head, to which latter is secured in any suitable manner, as by screws 5^a, a removable cover or face plate 13 which retains the jaws in position against outward movement. These screws may also be employed to fasten the head to the flange 4.

The forward end of the tubular body section 2 is provided with an outwardly extending flange 14 and an inwardly extending flange 15 while the tubular body section 3 is provided at its rear end with a short outwardly extending flange 16 and its forward end with an outwardly extending flange 17. The flanges 15 and 16 center and guide the tubular section 3 in its movements, as hereinafter described, and the two sections 2 and 3 are of such relative diameters as to provide an intervening space or chamber for the reception of a coiled expansion spring 18 which bears at its ends against the said flanges 15 and 16. In practice, the flanges are properly constructed and arranged to permit the two telescopic sections of the body to be readily and conveniently assembled and disassembled, as by threading or otherwise detachably securing the flanges 16 to the body section 3. A casing 19 is secured to one side of the tube 2 and has slidably mounted therein a detent 20 which is adapted to be projected into the space

between the tubes to engage the coils of the spring 18. This detent is provided with a reduced stem 21 carrying at its outer end a knob or finger piece 22, and surrounding the inclosed portion of the stem within the casing and between the same and the detent is a coiled spring 23, whereby the detent is automatically projected.

The flange 17 of the tubular body section 3 is adapted to abut against the flanges 14 and 15 when said section 3 is at the limit of its inward movement, and said flange forms a support for a turning head 24 which is suitably fastened thereto and provided at diametrically opposite sides with hand bars or arms 25. The turning head is chambered to receive a series of die-holding blocks 26, having angular outer faces to bear against the walls of the chamber and beveled or inclined inner faces 27 for sliding engagement with each other, said blocks being arranged to provide an intervening annular passage for the rod or pipe 9. Clamped between the meeting faces of the block is a series of threading dies 28, the cutting ends of which project inwardly beyond the blocks to engage and thread the surface of the rod or pipe. The blocks are adapted to be applied and removed with the dies through the front of the head and are retained within the chamber by a removable cover or face plate 27 secured in any suitable manner to the outer or front face of the head, as by screws 24^a, which may also be employed to secure said head to the flange 17. The blocks are loosely held in position so that a slight relative movement thereof will project the dies sufficiently to engage or release the rod or pipe. One of the blocks is provided in its outer edge with a socket 30, and arranged for sliding movement diametrically through one side of the head adjacent to and in a plane parallel with said block is a controlling rod 31 having an intermediate threaded portion 32 exposed through a slot 33 intersecting the guide chamber and extending through the face of the head. Adjustably mounted on the threaded portion of the rod is a nut 34 carrying a pin or projection 35 extending into the recess 30. One end of the rod projects beyond one side of the head and carries a disk or washer 36 held by a nut 36^a and between which and a shoulder 37 formed upon the head is disposed a coiled spring 38 encircling said projecting end of the rod and exerting its expansive action on the disk to maintain the rod in normal position, in which the nut 34 is disposed to force the recessed block inward to the slight necessary extent to tighten the blocks and project the threading tools into engagement with the rod or pipe. The other end of the rod extends beyond the diametrically opposite side of the head and is provided with a shoulder

or enlargement 39 and a lug 40, to which latter is pivoted a handle 41, whereby the rod may be manually slid outward at any time to retract the recessed block against the resistance of the spring 38 to free the dies from engagement with the rod or pipe. By turning the handle 41 in one direction or the other, the nut may be adjusted along the slot 33 to set the dies for work on pipes or rods varying in diameter.

The shoulder 39 is disposed opposite a co-operating shoulder 42 on the turning head, which shoulders form a guide-way for a die-retracting device comprising a longitudinally slotted or forked bar 43, the slotted portion of which receives the adjacent end of the rod 31 which is adapted to slide therein. The guide slot 43^a in the bar opens through the forward end of the bar and terminates adjacent to the rear end 43^b thereof, and the outer face of the latter-named end of the bar is formed on opposite sides of the slots with inclined or cam surfaces 44, while the arms of the bar are tapered or have their faces which engage the shoulder 39 inclined from their free ends to the said cam surfaces 44. The slot in the bar corresponds in length with the length of travel of the turning head in its threading operation, and the inner or rear end of the bar is adapted to engage and travel around the flange 14 in such threading operation.

Figs. 3 and 4 show respectively the position of the turning head when at the beginning and end of its working movement, from which latter figure it will be seen that the telescopic body is held collapsed by the spring 18 with the flange 17 in abutting contact with the flange 14, in which position the enlargement 39 of the controlling rod engages the inclined or cam surfaces 44 at the inner end of retracting bar and thus holds the die-setting pin 31 retracted. With the parts in such position, the machine is fitted upon the rod or pipe 9 to be threaded, both the machine and pipe being disposed in a horizontal position. The handle 12 of the screw 11 is then operated to project the toothed surfaces of the gripping jaws 6 into engagement with the pipe, and then the handle bars 25 are grasped by the operator and pulled down to draw the turning head away from the gripping head and to slide the tube 3 forwardly in the tube 2 until the spring 18 is compressed to its limit between the flanges 15 and 16, as shown in Fig. 3. In this operation of moving the turning head forward the coils of the spring ride over the beveled face of the detent 20, which is allowed to recede by its spring 23 to permit the coils to pass until the spring is fully compressed, at which time the straight front face of the detent will lie in the path of the adjacent coil in advance thereof and hold the spring 18

from expansion. Owing to the frictional engagement between the parts 39, 42 and 44, the retractor bar 43 will be carried forward with the head 24 and will therefore maintain the pin 35 in retracted position, so that the threading dies may move easily along the surface of the rod or pipe without cutting thereinto. While the threading head is thus held in projected position by the detent 20, the bar 43 is manually slid back until its inner end engages the flange 14, whereby the cam surfaces 44 will be withdrawn from engagement with the enlargement 39, so that the spring 38 will be free to expand and slide the rod to adjust the recessed die block and project the threading dies to act upon the surface of the rod or pipe. The detent 20 is then withdrawn from engagement with the spring by the finger piece 22, leaving the spring 18 free to expand, such expansive action being exerted on the flange 16 of the tubular section 3, thus tending to move the section 3 back into the section 2. As soon as the detent is released, in which position it is held in any preferred manner, the operator grasps the hand bars 25 and rotates the turning head in the usual way to cause the threading dies to cut the thread upon the rod or pipe, the action of the dies causing the turning head to feed inwardly toward the gripping head as will be readily understood. In this operation of threading the rod or pipe, the muscular exertion of the operator is reduced to a material degree by the action of the spring in expanding and tending to draw the section 3 inward, the action of the spring thus diminishing the amount of power necessary to operate the turning head. When the turning head reaches the limit of its inward or threading movement, during which the rod slides in the slot in the retractor bar 43, the end 43^b of which rides on the flange 14 during the rotation of said head, the enlargement 44 of said rod comes into contact with the inclined or cam surfaces 44 of the bar, by which the rod is forced to slide in the proper direction against the resistance of the spring 38 to free the threading dies from engagement with the rod or pipe. By retracting the screw 11 the gripping jaws 6 may be released from engagement with the pipe, leaving the pipe free to be withdrawn from the threader or the latter to be slipped off the pipe. The machine may then be reset for operation in the manner before described for threading another rod or pipe, and after the turning head has been set for action and the rod 31 released by manually retracting and resetting the bar 43, it will be understood that the spring 38 will automatically retract the rod to draw the pin 35 into position to throw the threading dies into action. It will be understood that the spring 18, in addition to reducing the amount of power re-

quired to operate the turning head on its working movement, normally holds the apparatus in closed or relapsed condition, whereby the threading dies are at all times held retracted for the application of the rod or pipe and adjustment of the turning head to working position until said head has been adjusted to the limit of its outward movement. Owing to the fact that the outer faces of the arms of the forked retractor bar are inclined as described, it will be apparent that in the operation of the turning head the enlargement 39 of the controlling rod will gradually move outward and thus adjust said rod to gradually project the dies a greater distance inward to form a tapered thread, but if desired the acting faces of the retractor bar may be straight or lie in the same plane throughout to maintain the dies in a determined position to form a thread of the same depth throughout.

Constructed and arranged as described, the device is for cutting a right hand thread, but by a simple reversal of the operating parts, it may be adapted to cut a left hand thread. In this operation of changing the device from a right to a left hand thread cutter, the nut 36^a, washer 36 and spring 38 are removed, the controlling rod screwed out of the block 34 and withdrawn from engagement with the head, and said rod then fitted reversely in its receiving openings in the head, so that the enlarged portion 39 thereof will be arranged adjacent the shoulder 37, while the threaded opposite end will project beyond the shoulder 42, after which the spring 38 is applied on said end of the rod to bear against said shoulder 32, and the washer 36 and nut 36^a fitted in position to hold said spring in engagement with the shoulder. The retracting fork is then placed in position to lie between the enlargement 34 and the shoulder 37, which is a counterpart of the shoulder 42, so that upon simply removing and replacing the dies in a reversed position so as to cut in the opposite direction, the machine will be adapted for cutting a left hand thread.

From the foregoing description, taken in connection with the accompanying drawings, the construction and mode of operation of my improved threading machine will be readily understood, and it will be seen that a simple type of machine is provided which has an automatic threading action and which may be readily and conveniently controlled.

Having thus described the invention, what is claimed as new, is:—

1. A threading apparatus comprising a relatively stationary section provided with a gripping head having means to grip the rod or pipe to be threaded, a relatively movable section slidably connected with said relatively stationary section and forming a

turning head, feeding means for obtaining a relative movement of the turning head toward the gripping head, radially movable dies upon the turning head, adapted to be
5 projected and retracted, a controlling device for said dies slidably mounted on the head, a spring for maintaining the same in position to hold the dies normally projected, and a forked retracting device mounted on
10 the turning head and rotating therewith and engaging and held from longitudinal movement by the relatively stationary section, said device being provided with an inclined face to engage and operate said controlling
15 device to retract the dies at the limit of the threading movement of the turning head.

2. A threading apparatus comprising a relatively stationary section formed with a gripping head provided with means for
20 gripping a rod or pipe to be threaded, a relatively movable section telescopically connected with said stationary section and forming a turning head, a feed connection between the sections, radially movable dies
25 on the turning head, a laterally movable controlling device on the turning head for adjusting said dies in and out, said device being spring operated in one direction to hold the dies retracted and provided with a
30 bearing surface, and a retracting device slidably fitted between said bearing surface and a corresponding surface on the head and adapted to rotate with said head and engaging and held from longitudinal movement by the stationary section, said retracting
35 device being adapted to engage the bearing surface of the controlling device and move said device to retract the dies at the limit of the threading movement of the turning
40 ing head.

3. A threading apparatus comprising telescopic turning and gripping sections, means for securing a feed motion of the threading

section, relatively movable threading dies upon the turning section adapted to be projected and retracted to engage and release the
45 work, a controlling device slidably mounted on the turning section and operative in reverse directions to adjust the dies in and out, means for normally holding said
50 vice in die projecting position, and a device slidably mounted upon and rotatable with the turning section and held from longitudinal movement by the gripping section for moving said controlling device in op-
55 position to said holding means to retract the dies at the limit of threading movement of the turning section.

4. A threading apparatus comprising telescopic gripping and turning sections, means
60 for securing a feed motion of the turning section, relatively movable dies on the turning section adapted to be projected and retracted to engage and release the work, a controlling rod slidably mounted on the
65 turning section and operatively arranged to project and retract the dies upon reverse sliding movements thereof, means for normally holding said rod in die projecting position, and a forked retractor bar slidably
70 engaging the turning section and arranged to rotate therewith and held from longitudinal movement by contact with the gripping section, said bar having its forked portion operatively engaging the rod and provided with inclined surfaces to retract said
75 rod and release the dies against the resistance of said holding means at the limit of threading movement of the turning section.
80

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

HENRY GAUTSCHI.

Witnesses:

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WM. C. HITZKE.