(No Model.) 4 Sheets—Sheet 1.

L. B. CURTIS.

PIPE THREADING MACHINE.

No. 509,878. Patented Dec. 5, 1893.

Fig. 1.

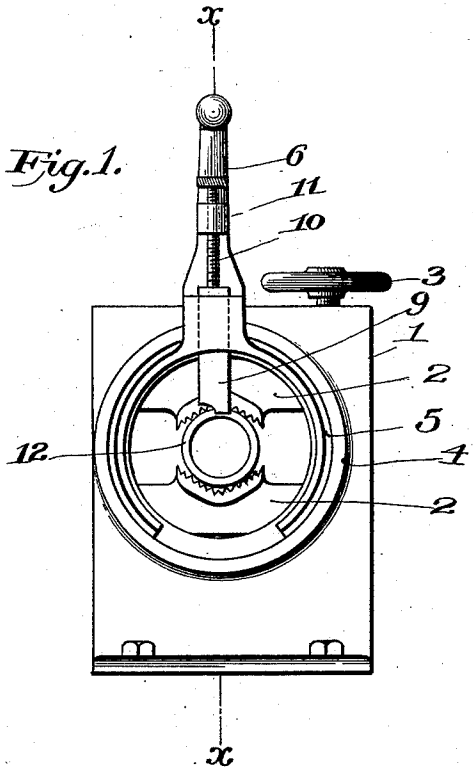
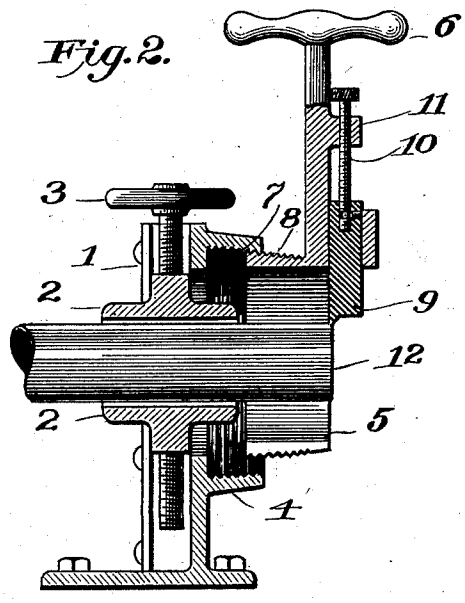


Fig. 2.



WITNESSES:

J. J. Finch.

A. S. Meloy

INVENTOR

Lewis B. Curtis

BY

D. B. Smith & Co.

ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

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Fig. 3.

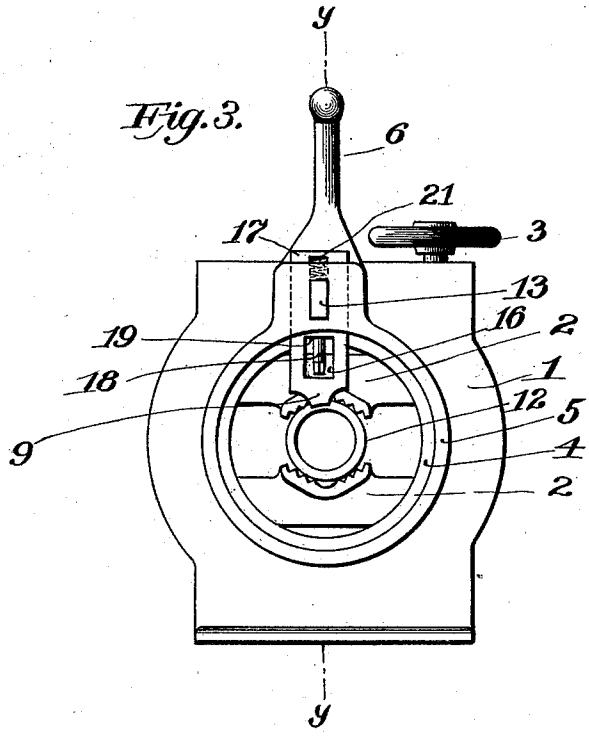
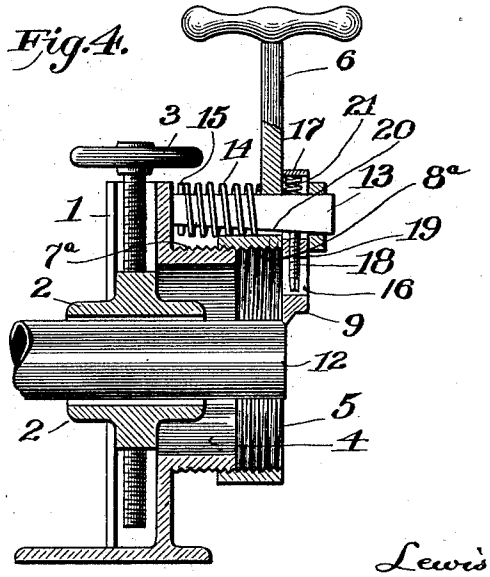


Fig. 4.



WITNESSES:

J. F. Finch.

A. L. Meloy

INVENTOR

Lewis B. Curtis

BY D. N. Smith Jr.

ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

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Fig. 5.

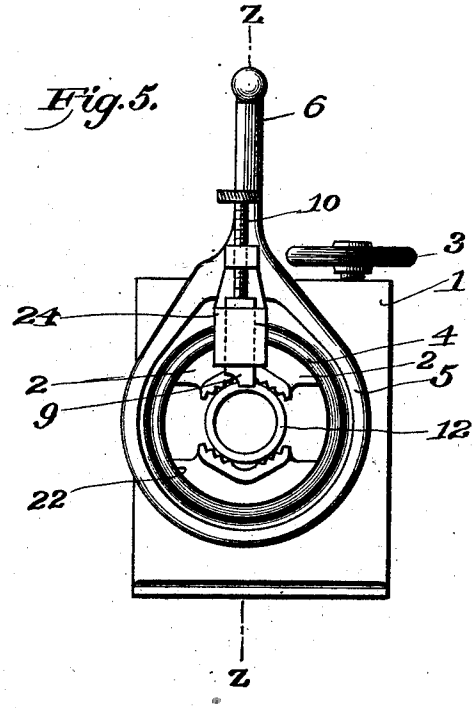
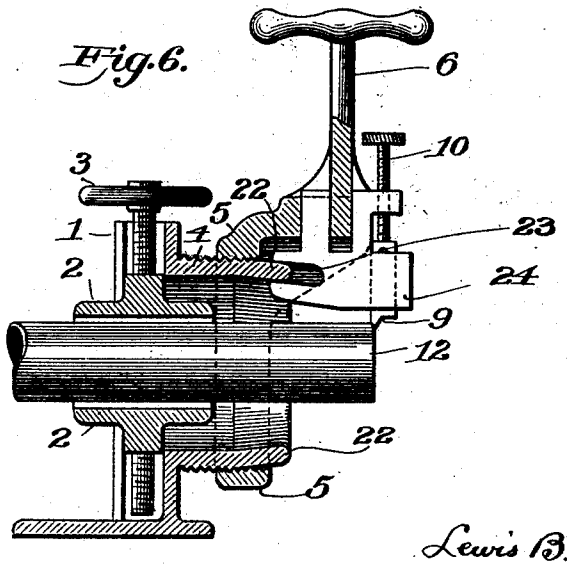


Fig. 6.



WITNESSES:

J. F. Finch.

A. S. Meloy

INVENTOR

Lewis B. Curtis

BY C. B. Smith Jr.

ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

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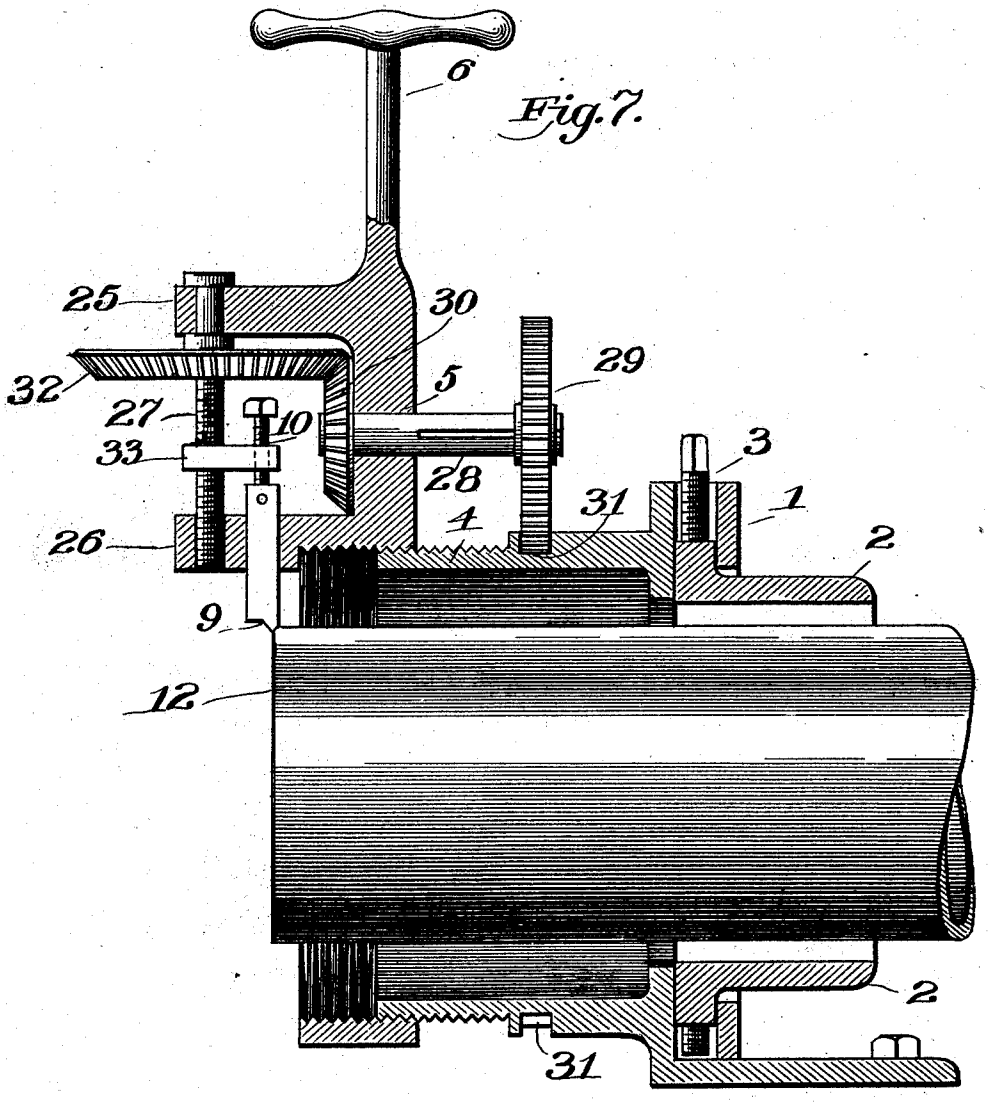
Fig. 7.



WITNESSES:
J. Stinech.
A. S. Meloy

INVENTOR
Lewis B. Curtis
BY D. M. Smith Jr.
ATTORNEY

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEWIS B. CURTIS, OF SOUTHPORT, ASSIGNOR TO CURTIS & CURTIS, OF BRIDGEPORT, CONNECTICUT.

PIPE-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,878, dated December 5, 1893.

Application filed March 16, 1893. Serial No. 466,314. (No model.)

To all whom it may concern:

Be it known that I, LEWIS B. CURTIS, a citizen of the United States, residing at Southport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Pipe-Threading Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in pipe threading machines, but particularly has reference to that class of such machines in which a single pointed thread cutting tool is used.

Heretofore, in order to cut a thread on a taper, it has been necessary for the operator to advance and retract the tool manually during its lengthwise travel along the pipe, but the inaccuracies attaching to this method are such that it is generally considered impracticable, and machines of this class are used in very rare instances, and then only for the purpose of cutting straight threads.

The object of my present invention is to render the action of the cutting tool automatic as to its adjustment to the taper required, so that as said tool is revolved it will automatically cut the threads to a given taper.

In the accompanying drawings—Figures 1, 3 and 5, are front elevations of machines embodying my invention. Figs. 2, 4 and 6, are sectional elevations respectively of the constructions shown in Figs. 1, 3 and 5, and Fig. 7, is a sectional elevation showing still another way of carrying out my invention.

Similar numbers denote like parts in the several figures of the drawings.

In Figs. 1 to 6 inclusive, the cutting tool is caused to advance and retreat by means of suitable inclines, while in Fig. 7, these movements of the tool are effected by a screw.

Referring to all the figures; 1 is a casing, 2 a vise in said casing for holding the pipe, 3 the vise operating screw, 4 a threaded hub extending from said casing and constituting a lead screw, 5 a lead nut engaging said lead screw, and 6 a handle projecting from said lead nut whereby the latter may be revolved.

Referring to Figs. 1 and 2, it will be seen that the lead screw is threaded on a taper as at 7, while the lead nut is open at the bottom so as to have the quality of expanding and contracting, said nut being also threaded on a taper as at 8, to engage the threaded tapered portion of the lead screw. 9 is the cutting tool adapted to slide within ways in the forward part of the lead nut, and 10 is an ordinary thumb screw working through an extension 11 from the handle 6 and swiveled at its lower end to said tool, the obvious purpose of this screw being to provide means for normally adjusting the tool. 12 denotes the pipe to be threaded. The tool is adjusted so that at first it will cut the tapered thread only for a short distance on the pipe, then, after running the tool back to its first position it is adjusted a little farther inward, so that in the next operation it will cut said thread deeper and throughout a longer distance on the pipe, and so on, each successive cutting of the tool being deeper (that is, nearer the axis of the pipe) and longer. During the inward travel of the tool, the axis of the lead nut will progressively move away from the axis of the pipe owing to the resistance offered to the tool by the pipe thereby gradually and constantly retracting the cutting tool and causing the same to cut the threads on a tapered area which is concentric with the tapered area of the lead screw.

In Figs. 3 and 4, a wedge 13 is shown supported in the lead nut transversely thereof and having a coil spring 14 around the same and bearing against the handle 6 and a pin 15, extending from said wedge, the function of said spring being to hold the rear end of the wedge against the casing at all times. The cutting tool is adapted to slide in ways in the front part of the lead nut and is recessed at 16. The upper part of the tool is formed into a yoke 17 which surrounds the wedge, and a thumb screw 18 is passed up through a cross-piece 19 of the tool against the incline 20 of the wedge by means of which screw the normal adjustment of the tool is effected. The threads on the lead screw and lead nut are straight, as seen at 7^a, 8^a and not tapered, and as the nut advances, the spring 14 will be compressed and the cutting tool

will also advance along the wedge, and will gradually be retracted as the set screw 18 travels up the incline 20. Owing to the resistance offered to the tool by the pipe, the screw will always be kept firmly against the incline during operation, and by reason of a coil spring 21 placed between the upper edge of the wedge and the inner wall of the yoke 17, the screw will be kept against the incline when the tool is beyond the end of the pipe.

In Figs. 5 and 6, the lead screw and lead nut have straight and not tapered threads, but from the end of said screw extends a plain tapered part 22 which is engaged by the inclined gate 23 in the tool carriage 24 which latter is guided in the lead nut so as to be capable of a free sliding movement in a plane at right angles to the axis of the pipe. The cutting tool 9 is guided within the carriage 24 and is swiveled to the thumb screw 10 as in Fig. 2. As the cutting tool travels along the pipe, said tool will gradually be retracted therefrom, and during the retreat of the tool toward the end of the pipe said tool will be advanced toward the pipe.

In the construction shown at Fig. 7, the threaded portions of the lead screw and nut are straight, and two ears 25, 26, extend forward from the nut, between which ears is journaled a threaded shaft 27 confined as against any movement but revolution. 28 is a horizontal shaft journaled in the body of the lead nut and having splined on its rear end a spur gear 29 while on the front end is secured a bevel gear 30. The spur 29 is in engagement with gear teeth 31 sunk in the circumference of the casing 1, and the shaft 28 is free to slide through said spur, so that it will be readily understood that when the lead nut is revolved, said spur will also be revolved and will impart revolution to the shaft 28 during the advance of the lead nut. The bevel gear 30 is in engagement with the bevel gear 32 secured on the shaft 27, whereby the latter is revolved.

The cutting tool 9 is capable of vertical reciprocation within the forward part of the lead nut and has its adjusting thumb screw 10 passed through the nut 33, which latter is operatively mounted on the threaded part of the shaft 27, said nut acting as a carriage for the cutting tool.

The relation of the gears to each other and the pitch of the threads on the shaft 27 are predetermined, so that the cutting tool will, during the inward and outward travel of the lead nut, be retracted from and advanced toward the axis of the pipe, thereby conforming in its field of action to the required taper.

From the foregoing it will be evident that there are many ways in which I can carry out my invention, and I do not therefore wish to be limited to any particular construction of parts, the gist of my invention resting in the broad idea of providing a stationary vise for holding the object to be threaded, a permanent stationary lead screw and a permanent lead nut in operative engagement therewith, and in combining with these parts a single pointed cutting tool carried by said lead nut and moving in harmony therewith but having also an independent movement in a plane at right angles to the axis of the object to be threaded.

I claim—

1. In a machine for cutting tapered screw threads on a cylindrical surface, the combination of a stationary vise for holding the object to be threaded, a permanent stationary lead screw independent of the latter, a permanent lead nut in operative engagement with said screw, a single pointed cutting tool carried by said lead nut and moving in harmony therewith but capable of an independent movement in a plane at right angles to the axis of the object to be threaded, and means for automatically effecting such independent movement during the travel of the lead nut, substantially as set forth.

2. In a pipe threading machine, the combination of a stationary pipe holding vise, a permanent stationary lead screw, a permanent lead nut engaging said screw, a single pointed cutting tool carried by said nut and moving in harmony therewith but capable of an independent movement in a plane at right angles to the axis of the pipe, and means operated through suitable inclines for automatically effecting the independent movements of said tool, substantially as set forth.

3. In a pipe threading machine of the character described, the combination of the casing, the pipe holding vise therein, the lead screw having a plain tapered part extending therefrom, the lead nut, the tool carriage guided within said nut and capable of a vertical play and having an inclined gate in engagement with said tapered part, and the single pointed cutting tool mounted in said carriage, substantially as set forth.

4. In a pipe threading machine the combination of stationary means for holding the pipe, a single pointed cutting tool, means independent of said pipe for supporting, revolving and leading said tool bodily along and around the pipe, and means independent of such pipe for automatically imparting to said tool during such revolution and leading a constant movement in a plane at right angles to the axis of the pipe, substantially as set forth.

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

LEWIS B. CURTIS.

Witnesses:
F. W. SMITH, Jr.,
A. S. MELOY.