(No Model.)

W. F. BARNES.

METAL TURNING LATHE.

No. 357,567. Patented Feb. 15, 1887.

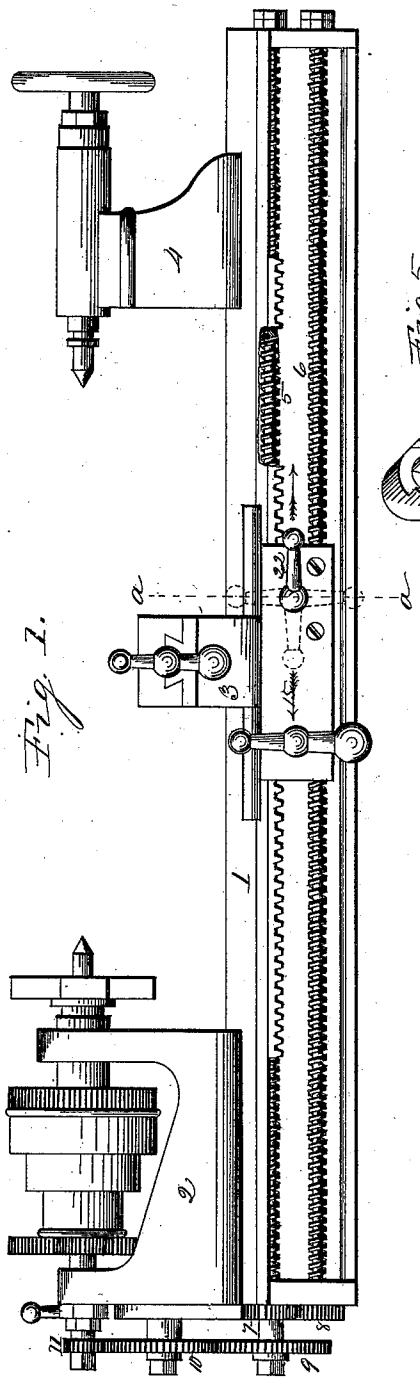


Fig. 1.

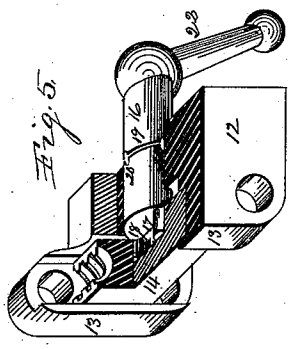


Fig. 5.

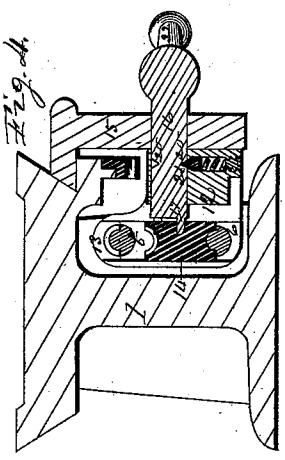


Fig. 4.

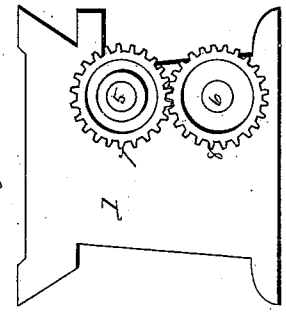


Fig. 3.

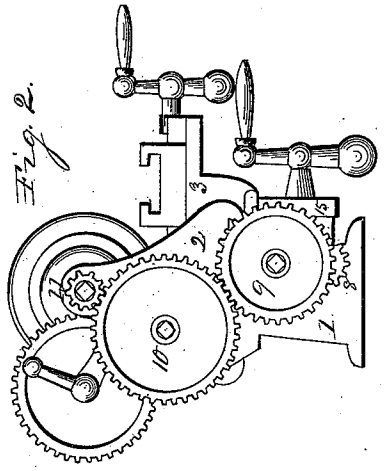


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM F. BARNES, OF ROCKFORD, ILLINOIS.

METAL-TURNING LATHE.

SPECIFICATION forming part of Letters Patent No. 357,567, dated February 15, 1887.

Application filed July 3, 1886. Serial No. 207,110. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BARNES, a citizen of the United States, residing in the city of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Machine-Lathes, of which the following is a specification.

This invention relates to a class of lathes known as the "engine-lathe." Its object is to impart a back-and-forth movement to the tool-carriage without reversing the movement of the feed screw.

It consists, in the main, in the employment of twin feed-screws and a semi screw-nut to engage one or the other of the feed-screws to move the carriage in one or the other direction, all of which, including the operating mechanism illustrated in the accompanying drawings, including their construction and operation, will be hereinafter more fully described.

In the drawings, Figure 1 is a side elevation of portions of a lathe embodying my invention. Fig. 2 is an elevation of the head end of the lathe. Fig. 3 shows the gear-connection of the twin feed-screws. Fig. 4 is a transverse section on dotted line *a* of Fig. 1; and Fig. 5 is an isometrical representation of the semi screw-nut to the twin screws, its supports, and its operating mechanism, in which portions are shown in section.

The several portions, consisting of the bed 1, head-block 2, with its spindle, cone-pulley, back gear, and gear-train connection with the feed-screw, the tool-carriage 3, with its tooth-gear connection with the bed and its tool-holder and transverse feed, and the tail-block 4 and its spindle, are substantially the same and operate in the same manner and for the same purpose as like parts of lathes heretofore in use. Like feed-screws 5 and 6 are placed on the side of the lathe-bed parallel with the ways, and are supported to revolve in end bearings. The twin screws 5 and 6 are connected to revolve in opposite directions by means of like gear-wheels 7 and 8, fixed to the screws in such a manner that their gear-teeth shall engage each other in working contact.

A gear-wheel, 9, is fixed on the projecting end portions of the screw 5, outside of the gear-wheels fixed on the screws, and an intermediate gear-wheel, 10, on stud-bearing connects the gear-wheel 9, and a gear-pinion, 11, on the head-block spindle, and constitutes the gear-train connection of the feed-screws with the spindle.

A sliding bearing, 12, is provided with vertical end jaws, 13, bored to receive the twin screws and to slide thereon freely. The inner faces of the jaws are provided with vertical grooves, which receive the ends of a semi screw-nut, 14, placed between the screws, and capable of a sliding movement in its grooved connection with the jaws, to engage either of the screws, or to be placed between them, detached from both. The slide-bearing 12, with semi screw-nut in place therein, is placed on the twin screws, and is removably fixed to the inner face of the depending face-plate 15 of the tool-carriage.

A shaft, 16, is supported to oscillate or rotate in a bearing formed in the face-plate of the tool-carriage and in the sliding bearing fixed to its inner face, and a stud-pin, 17, projecting eccentrically from its inner end enters a slot-opening, 18, formed lengthwise in the inner face of the semi screw-nut. The shaft 16 is provided with an annular groove, 19, and at equal annular intervals in the groove, on opposite sides of the shaft, are formed conic depressions 20, to receive a conic spring-actuated detent, 21, to hold the shaft in its adjustments in a manner to permit it to be turned in either direction to any of the divisions of the conic depressions, and also to permit it to be withdrawn from its bearing. The shaft 16 is provided with a lever-handle, 22, by means of which it may be turned, withdrawn, or replaced. In this instance the relative position of the lever-handle, the conic depressions in the shaft, the detent, and the eccentric stud-pin in its connection with the semi screw-nut is such that when the lever is turned from its horizontal position toward the tail end of the lathe, as shown in the solid lines in Figs. 1 and 2, the semi screw-nut will be depressed in working contact with the lower feed-screw, 6, as shown in Fig. 2, and in the movements of the lathe the carriage will move toward the tail end of the lathe, as indicated by the arrow. When the lever is turned to the horizontal position in dotted lines in Fig. 1 toward the head of the lathe, the semi screw-nut will

be raised to engage the upper feed-screw in working contact, as in the dotted lines in Fig. 4, and in the movements of the lathe the carriage will move toward the head of the lathe, as indicated by the arrow on its dotted-line position of the lever on Fig. 1.

From the foregoing it will be seen that the position of the lever toward the head or tail ends of the lathe indicates the direction of movement of the carriage.

When the lever-handle 22 is in its vertical position, either up or down, as shown in dotted lines on Fig. 1, the semi screw-nut will be disengaged from the feed-screw and the carriage will be free to be moved in either direction on the ways by means of its rack-and-pinion connection.

In the employment of twin feed-screws revolving in opposite directions, I obtain a back-and-forth movement of the carriage without reversing the movement of the feed-screw or head-spindle or shifting of the driving-belts.

Instead of the like feed screws moving in opposite directions, a right-hand and left-hand screw moving in the same direction may be employed, and the lever-handle of the shaft employed to operate the semi screw-nut may be adjustable in any position relatively with the movement of the tool-carriage and still be within the scope of my invention.

I claim as my invention—

1. In a lathe, the combination, with the parallel screws substantially identical in construction, having a gear-connection with the head-spindle, and so geared with each other as to rotate in opposite directions, of the tool-carriage and mechanism for throwing either of said screws into engagement with the carriage to reverse the movement of the latter without reversing the movement of the screws, substantially as set forth.

2. The combination, with twin feed-screw and with a screw-nut to engage the screws, of an eccentric to operate the screw-nut, substantially as and for the purpose set forth.

3. The combination, with the eccentric to operate the screw-nut, of a detent to hold the screw nut in its adjusted position, substantially as and for the purpose set forth.

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