

No. 649,447.

Patented May 15, 1900.

J. GRIME.

FEED DEVICE FOR SCREW CUTTING LATHES.

(Application filed Sept. 9, 1899.)

(No Model.)

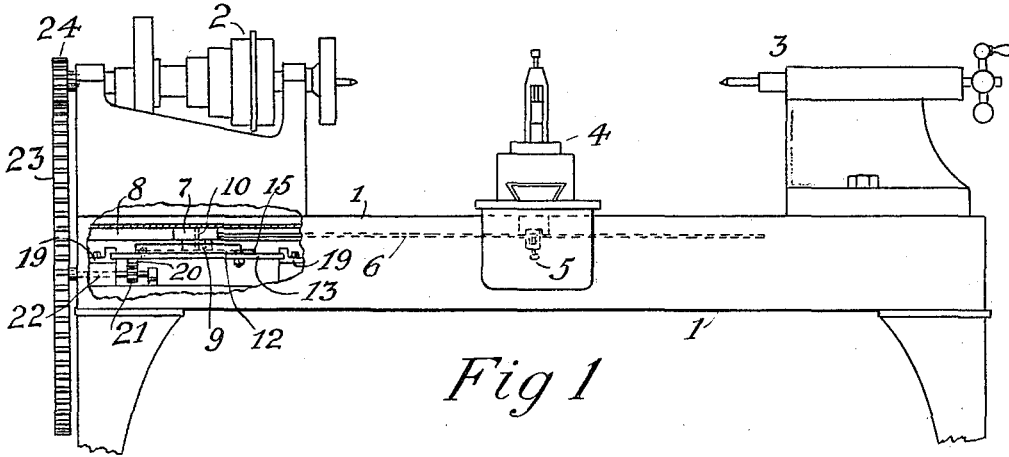


Fig 1

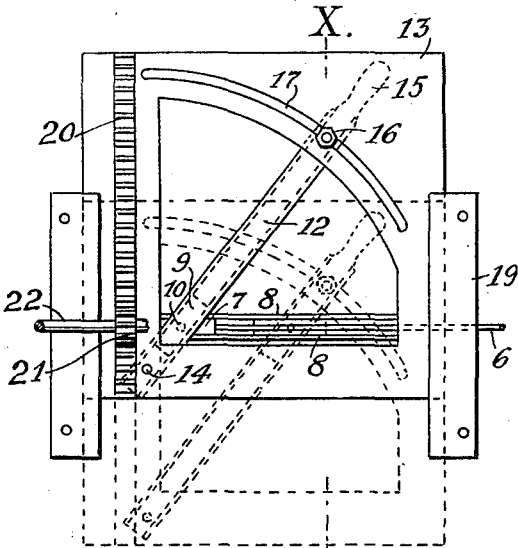


Fig 2

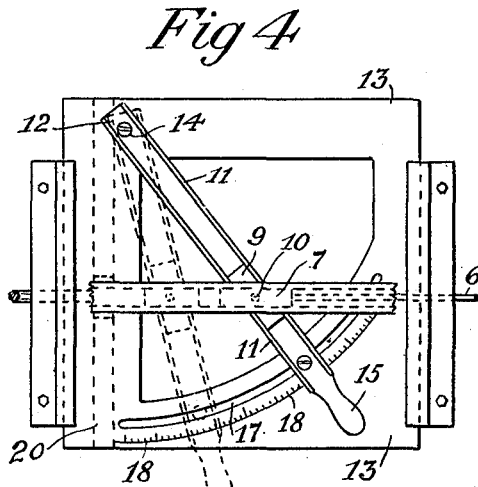


Fig 4

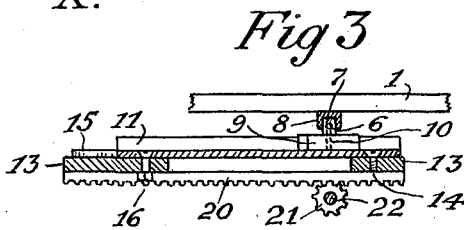


Fig 3

Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN GRIME, OF MINNEAPOLIS, MINNESOTA.

## FEED DEVICE FOR SCREW-CUTTING LATHES.

SPECIFICATION forming part of Letters Patent No. 649,447, dated May 15, 1900.

Application filed September 9, 1899. Serial No. 729,914. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN GRIME, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Feed Devices for Screw-Cutting Lathes, of which the following is a specification.

My invention relates to devices employed in screw-cutting lathes and like machines for feeding the tool or material in the operation of cutting spiral threads.

The object of the invention is improvement of the method and means of feeding, whereby geometrically-perfect screws may be produced and their pitch conveniently and accurately predetermined. This object is accomplished by employing in place of the usual lead-screw and gears as a means for feeding the slide-rest a horizontally-adjustable guide-bar on a carrier that is arranged to move transversely to the machine and sliding connections between such slide-bar and the tool-rest, (or work-carrier,) whereby the transverse movement of the slide-bar serves to regulate the feed and determine the pitch of the screw.

My improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a lathe provided with my improved feed devices. Fig. 2 is a detail, viewed from below, of the transversely-sliding frame and some of its connections. Fig. 3 is a sectional view on the line *xx* of Fig. 2, and Fig. 4 is a plan view of a portion of the devices shown in Fig. 2.

In the drawings, 1 designates the hollow bed of an ordinary screw-cutting lathe; 2, the head-stock; 3, the tail-stock, and 4 the slide-rest. The slide-rest is adjustably attached by means of a set-screw 5 or in any convenient way to a lead-rod 6, that extends lengthwise of the bed and is secured to a slide-block 7 near the head of the machine. Ways 8, provided on or beneath the bed, serve to guide the reciprocatory movements of the block longitudinally of the bed, and obviously such movements of the block will produce like movements of the rod and slide-rest or other object to which the rod is connected. At the under side of the block 8 is a similar block 9, the blocks being pivotally connected by a pin

10, and the block 9 is arranged in ways 11, formed lengthwise of a bar 12. This bar rests on a horizontal frame or plate 13, to which its inner end is pivoted, as at 14, so that it is adapted to be swung to different positions on the surface of the frame, a projecting handle 15 on the bar serving to conveniently operate it. To retain it in positions of adjustment, a thumb-screw 16 or other device may be used in connection with a curved slot 17 or holes (not shown) at intervals, and graduations or other marks 18 may be employed to indicate the degree of inclination of the bar from a base-line, to the end of predetermining the pitch of the screw to be cut.

The frame or carrier 13 may be of any desired construction adapting it to be reciprocated in guides or otherwise transversely of the bed. As illustrated it is of rectangular form and arranged in ways 19, secured to the bed 1 for guiding its movements at right angles to the longitudinal axis of the machine. To reciprocate it, there is attached to its under side a rack 20, placed transversely to the bed, and in mesh with the rack is a pinion 21, carried by a shaft 22, on which is a gear-wheel 23 at the head of the machine, and a pinion 24 on the shaft of the head-stock drives the gear-wheel 23, its shaft, and connections.

The reciprocations of the frame 13 may be produced by gearing differently arranged from that shown or by sprocket-wheels and a chain suitably connected to operate the pinion 21, it being only necessary for the purposes of the invention that the frame 13 or its equivalent be reciprocated uniformly and conformably to the rotary movements of the head-stock. The rotation of the pinion 21 moves the rack and frame at right angles to the bed, and as the guide-bar 12 moves laterally with the frame the guides 11 will move the connected slide-blocks 9 and 7 lengthwise of the machine, because of the engagement of the latter block with the longitudinal ways 8. The extent of such slide-block movements lengthwise of the machine relative to the distance of travel of the frame 13 crosswise of the machine obviously is determined by the degree of inclination of the guide-bar 12 from the direction of its movement. If the guide-bar be secured in the position indicated by full lines in Fig. 4, the bodily movement of

the connected slide-blocks lengthwise of the machine will obviously be greater for a given lateral movement of the sliding frame than for the same extent of frame movement if the bar were adjusted more nearly in line with the direction of the travel of the frame, as indicated by dotted lines in the same view. The directions of movement of the frame 13 and the slide-blocks 7 and 9 may be said to be along the lines of a right-angled triangle of which the guides 8 and 19 represent the sides and the guides 11 the hypotenuse, and the adjustability of such hypotenuse to vary the obliquity of the angles it forms with the sides (the guides 8 and 19) serves to regulate the extent of movement of the block 7 in its guides relative to the extent of the movement of the frame 13 in its guides, and in this way the advance movement of the slide-rest relative to the rotation of the work-holder is regulated to determine the pitch of the screw to be cut. For example, if the guide-bar were set at an angle of thirty degrees and in that position the machine were adapted to cut, say, six threads to the inch and if when the bar were adjusted to an angle of five degrees the threads cut would be, say, sixty to the inch, then obviously by setting the bar at the proper intermediate point any desired pitch of thread between the limits named could be produced.

The devices shown and described are obviously capable of considerable variation both as to specific construction and their arrangement without change of the mode of operation, and as I believe my invention to be broadly novel I do not wish to restrict my claims to such specific structures or arrangement.

What I claim is—

1. In a screw-cutting lathe, a lead-rod, a slide connected thereto and guided parallel therewith, a second slide pivotally connected to the first, an inclined guide therefor, a carrier to which the latter guide is adjustably connected, a guide for the carriage at right angles to the guides for the lead-rod slide, and means for reciprocating said carrier in its guides, substantially as set forth.

2. In a screw-cutting lathe, a feed device comprising a slide guided to move lengthwise of the bed, a second slide pivotally connected to the former and guided by an inclined guide, a carrier guided crosswise of the bed and to which the inclined guide is adjustably connected, and means for reciprocating said carrier in its guides to operate the feed device, substantially as set forth.

3. In a screw-cutting lathe, a feed device comprising superposed pivoted slides, fixed guides extending lengthwise of the bed for one of the slides, an adjustable inclined guide for the other slide, a carrier to which one end of the latter guide is pivoted to enable its inclination to be varied, guides for said carrier at right angles to said fixed guides, and means for reciprocating said carrier in its guides, substantially as set forth.

4. In a screw-cutting lathe, a feed device comprising superposed pivoted slides, fixed guides extending lengthwise of the bed for one of the slides, an adjustable inclined guide for the other slide, a carrier to which one end of the latter guide is pivoted, means for adjusting it horizontally about its pivot for varying its inclination and for indicating the degree of its inclination, guides for said carrier at right angles to said fixed guides, and means for reciprocating said carrier in its guides, substantially as set forth.

5. In a screw-cutting lathe, the combination with the head-stock and tool-holder, of a lead-rod for the latter, a slide connected to the rod, guides therefor, a second slide pivotally connected to the former, an inclined guide therefor, a carrier to which the latter guide is adjustably connected, a guide for the carrier at right angles to the guides for the lead-rod slide, and cooperating mechanism for suitably rotating the head-stock and moving said guide-carrier in its ways, substantially as set forth.

In testimony whereof I have hereunto set my hand this 4th day of September, 1899.

JOHN GRIME.

In presence of—

M. F. HARRISON,  
P. H. GUNCKEL.