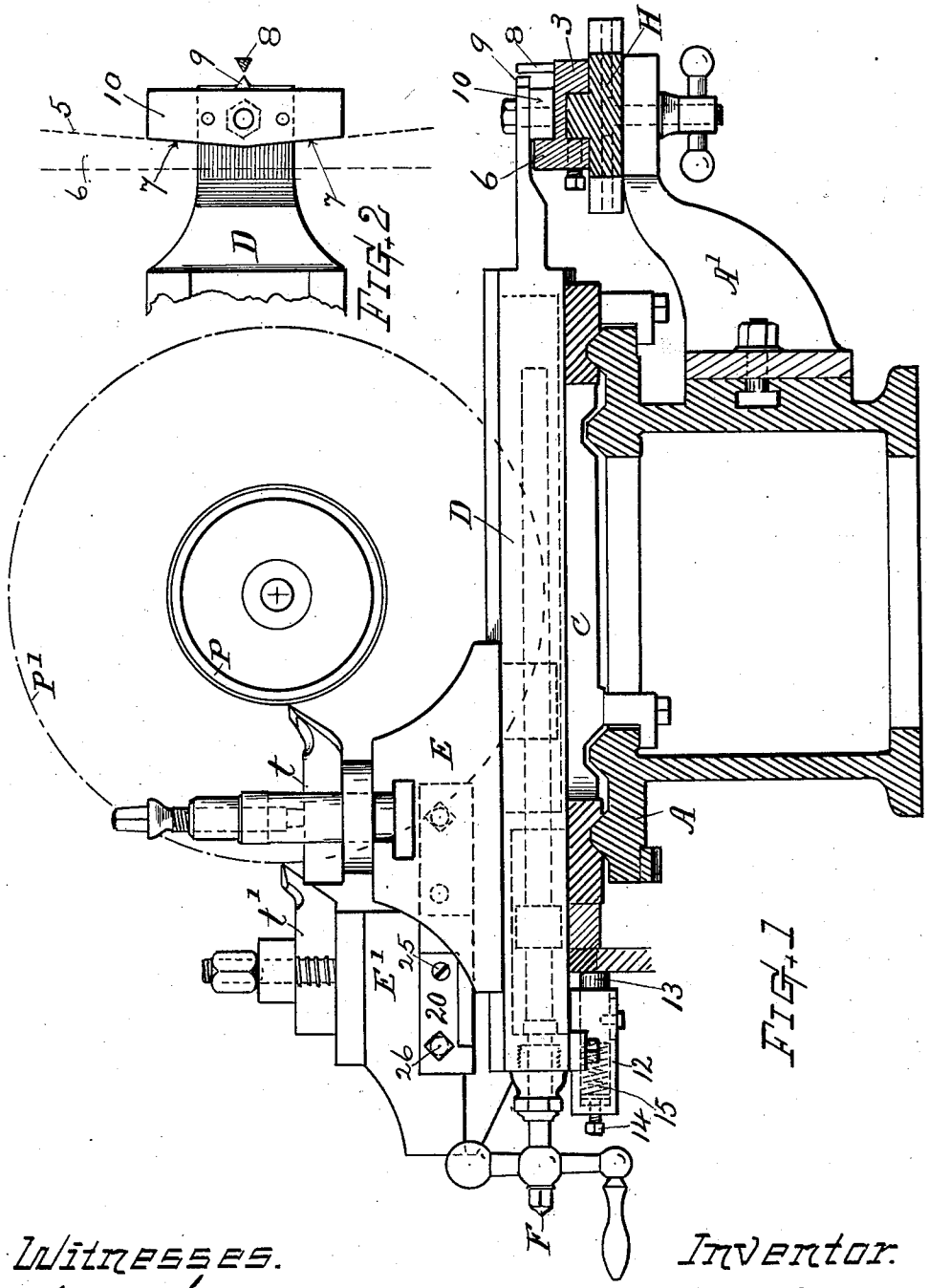
No. 758,628. PATENTED MAY 3, 1904.

E. EARLE.

ENGINE LATHE.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.



Witnesses.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

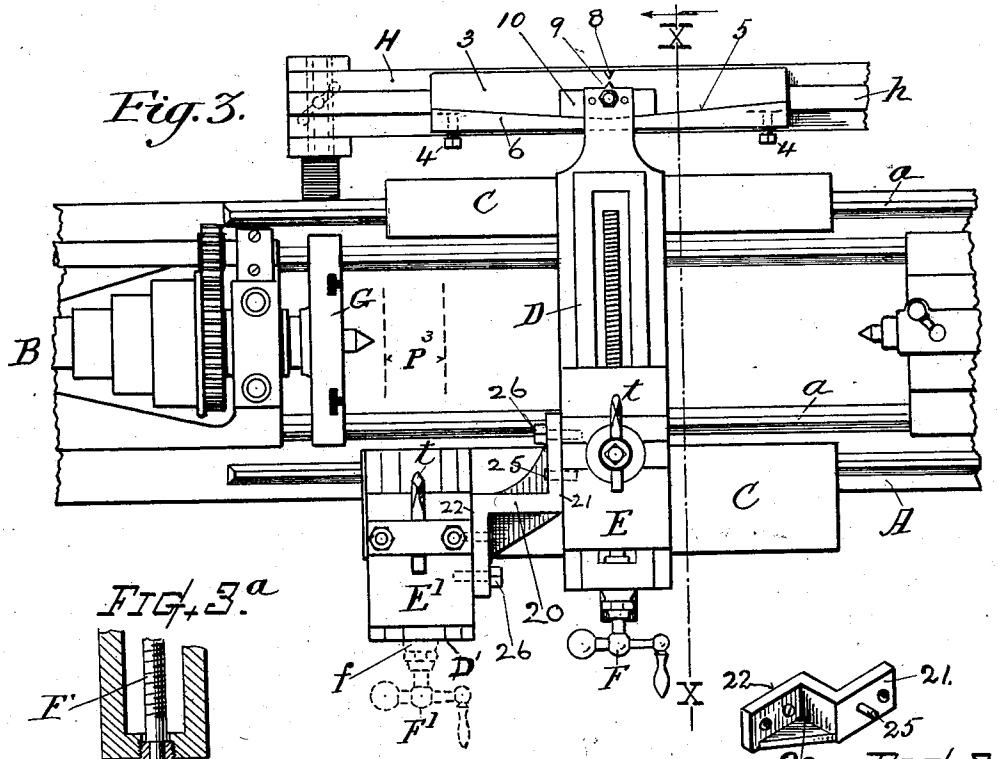


FIG. 3a.

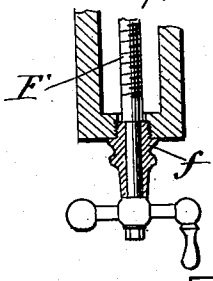


FIG. 7.

FIG. 5.

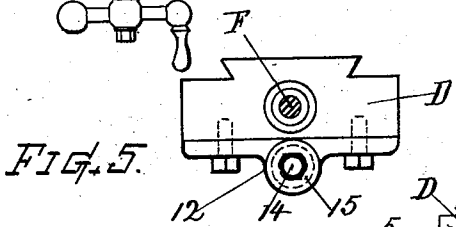
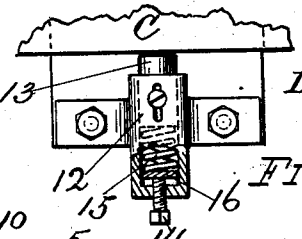


FIG. 6.



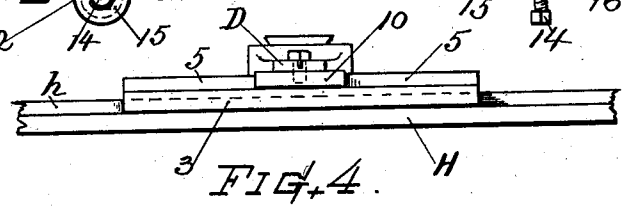


FIG. 4.

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UNITED STATES PATENT OFFICE.

ENOCH EARLE, OF WORCESTER, MASSACHUSETTS.

ENGINE-LATHE.

SPECIFICATION forming part of Letters Patent No. 758,628, dated May 3, 1904.

Application filed September 11, 1903. Serial No. 172,788. (No model.)

To all whom it may concern:

Be it known that I, ENOCH EARLE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Engine-Lathes, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide a more efficient and serviceable means, in combination with the mechanism of an engine-lathe, for conveniently and accurately controlling the tool-feed mechanism in the operation of turning the crowning-faces of pulleys and similar work and to render the mechanism adapted for uniformly-repeated operations without requiring readjustment of the controlling devices at each change of the work.

To this end my invention consists in the parts and the combination of parts organized for the mode of operation as hereinafter explained, the particular subject-matter claimed being defined in the summary.

A practical embodiment of this invention is represented in the accompanying two sheets of drawings, wherein—

Figure 1 is a transverse vertical section at line X X on Fig. 3, showing such parts of an engine-lathe mechanism as illustrates the nature of my invention. Fig. 2 is a fragmentary bottom view of the rear end of the cross-slide. Fig. 3 is a plan view, on somewhat smaller scale, of certain parts of the lathe with my improvements combined therewith. Fig. 3ª is a plan section at the removable collar of the block-adjusting screw. Fig. 4 is a detail rear view of the back bar and slide-connecting devices. Figs. 5 and 6 show, respectively, an end view and bottom view of the slide-retracting spring devices; and Fig. 7 is a perspective view of the block-connecting device.

On the drawings, the reference-letter A indicates the bed or frame. B indicates the head, comprising the spindle, means for rotating it, and the chuck, face-plate G, or means by which the work is driven or supported. C denotes the carriage; D, the cross-slide mounted on the carriage; E, the main tool-block; E′, the side tool-block, and F and F′ the respective tool-block-adjusting screws, all of which parts may be of usual well-known or any suitable construction.

H indicates the part known as the "taper-bar" or "back bar," a bar firmly supported at the rear side of the lathe approximately level with the bed and adjustable horizontally to stand in parallel or inclined relation to the alinement of the ways *a a′*, the rear end of the cross-slide being in common practice connected by a sliding shoe that travels along said bar when the latter is adjusted at an incline and the lathe is used in turning tapered work.

In accordance with my invention there is arranged upon the back bar H a shoe or flanged plate 3, some twelve inches, more or less, in length, the flanged edges thereof closely embracing the bar or its rib *h* and the shoe firmly secured to the bar by set-screws 4 or in a manner to permit of its longitudinal adjustment thereon when required. Said shoe 3 is provided with an upright ledge or offset portion 6, presenting a rearward bearing-face 5, composed of two reversely-inclined straight surfaces meeting at an obtuse angle at a central position, as shown. The rearwardly-extended end of the cross-slide D has connected therewith an overhanging lug or block 10, the front face 7 of which is formed with right and left inclined surfaces that countermatch with and rest against the inclined bearing-faces 5 of the shoe 3. The engaging block 10 is best made about four inches, more or less, in length to afford an ample sliding bearing-contact along the surfaces 5 and 7 at either side of the central apex. The degree of obtuse inclination for the surfaces 5 and 7 may be made more or less, as in any instance desired, the angle of the surfaces corresponding with the required crowning for the pulley.

At a convenient position—as, for instance, at the end of the cross-slide D—there is provided a centering-index pointer 9, and a center mark or point 8 is fixed on the shoe 3 to facilitate central alinement of the parts with the work at the primal adjustment.

Connected with the cross-slide D there is arranged an attached socket or guide piece 12, carrying a presser-stud 13 and spring 15, adapted for exerting pressure against the body of the carriage C as an opposing abutment and which acts to yieldingly force the cross-slide and tool-block in a retractive direction and to keep the bearing-faces 5 and 7 of the lug 10 and shoe 3 in working contact with each other while the former moves to the right or left along the latter. This spring device takes up all backlash and also tends to keep the tool from forward displacement. The spring is best provided with a device for regulating its tension, as by the set-screw 14, threaded in the end of the socket 12, and a seating-plate 16 at the end of the spring, against which the screw impinges. The socket 12 is secured to the under front part of the cross-slide, as shown in Figs. 5 and 6, and it can be readily put on and taken off by simply removing the attaching-bolts. The invention is therefore applicable to any standard lathe without special change in the lathe structure and without interfering with the use of such lathe in its ordinary working.

In the operation the pulley P is first placed in position in the lathe. The tool is then set in line with the center of the pulley-face and the shoe 3 is adjusted upon the bar H, so that the index 9 and center-mark 8 correspond. Then the shoe is secured firmly at such position. This brings all the parts in proper working alinement. The tool is then drawn back by the screw F and the carriage moved to bring the tool to the edge of the pulley-rim. The tool is then adjusted for turning and the carriage started for feeding the tool across the pulley-face. During the turning operation the lug 10 slides along the shoe 3 and a straight inclined face 7 of the lug sliding on the inclined face 5 of the shoe moves the cross-slide and tool in a manner to give the crowning inclination upon the face of the turned pulley. The incline of the faces 5 and 7 being straight afford an ample and sufficiently operative bearing either at right or left side of the central point. For turning pulleys of larger diameter, as P′, where the carriage and cross-slide have to be moved away from the head to let the pulley-rim swing between (see position as Fig. 3) it is customary to employ the auxiliary tool block E′, mounted upon the carriage at one side of the regular or main tool-block E. This auxiliary or side tool-block E′ is furnished with the usual dovetailed guide-way member D′, that is seated upon and secured to the laterally-projecting portion or arm of the carriage-body and is provided with a screw F′ for adjusting the tool-block toward and from the work in the normal use of the lathe. Said adjusting-screw is connected to the guiding member by a releasable collar-nut *f* and can be readily disconnected when desired. The auxiliary or side tool-block being upon the arm of the carriage is arranged to thus stand in front of the pulley-rim space P^3. (See Fig. 3.)

As a feature of my invention I provide means for rigidly but detachably securing the main tool-block E and side block E′ together, so that after releasing the feed-screw F′ of the block E′, means for which is provided at *f*, the two blocks E and E′ will be operated in unison by the controlling devices 3 and 10, arranged at the back of the lathe and acting as above described. The release of the adjusting-screw F′ is effected by unscrewing the usual threaded bearing-collar *f* from the block-supporting member into which said collar is threaded. The connection device in the present instance consists of an offset bracket or brace 20, (see Figs. 3 and 7,) having parallel faces 21 and 22, that seat against the sides of the respective tool-blocks, and provided with dowels 25, that fit into holes formed therein, and removable attaching-bolts 26, that secure the parts firmly together. This attachment can be quickly removed when the lathe is desired for ordinary uses and the tool-blocks separately adjusted.

By connecting the main and auxiliary tool-blocks, as above described, I am enabled to turn the crown-face on a pulley the diameter of which equals the full swing of the lathe and to effect this by the aid of the controlling devices, as well as in turning pulleys of lesser diameters.

It will be understood that a series of tools can be used in the respective tool-blocks E and E′ and the device connectedly employed for turning simultaneously the various sections on coned pulleys, giving to each section a crowned face and producing a crowning of similar form on all the faces at one operation.

In some lathes in which the taper bar H is not employed the shoe 3 may be connected in any efficient manner to the bed A or to a supporting member attached to the bed, the shoe and lug 10 being made and combined for operation substantially as before described.

I am aware that it is not broadly new to move the cross-slide of an engine-lathe by means of a pattern mechanism combined with the rear end thereof and that differently-constructed devices have been heretofore devised for such purpose. Therefore I do not herein claim means irrespective of its construction for effecting such movement; but my invention involves the improved means and the combinations substantially as specified and defined.

What I claim herein as of my invention to be secured by Letters Patent is—

1. In an engine-lathe, in combination as described, with the bed, the back bar, the cross-slide carrying the tool-block and cutting-tool; of the longitudinally-flanged shoe mounted on said back bar, means for securing it at adjusted position thereon, said shoe being provided

with right and left inclined straight bearing-faces that meet at an obtuse angle, an overhanging lug-block fixed to the rear part of the cross-slide, said lug-block provided with right and left inclined faces formed on an angle that corresponds with the angle of the bearing-faces on the shoe, one of said inclined faces of the lug-block seating fully and squarely against the correspondingly-inclined face of the shoe, respectively, as said lug-block is moved to either side of the angle.

2. In an engine-lathe, in combination with the head-spindle, the carriage, the cross-slide carrying the tool-block, the block-adjusting devices, and the usual taper guiding back bar; of the flanged shoe adjustably secured upon the back bar, said shoe being provided with upright flat bearing-faces forming right and left inclined planes that meet at an obtuse angle, an engaging member fixed to the cross-slide and provided with an angular front having opposite right and left inclined plane bearing-faces that respectively countermatch with and seat their entire length flatly against the respective bearing-faces of said shoe, and means for yieldingly forcing forward the cross-slide to maintain contact of said bearing-faces.

3. In an engine-lathe, the combination with the sliding carriage, the tool-block, a cross-slide carrying said tool-block, and means for adjusting said cross-slide and tool-block; of the spring-containing socket detachably secured to the forward end of said cross-slide, a presser-stud and spring mounted therein and acting against the front part of the carriage to yieldingly exert retractive pressure on said cross-slide, for the purpose set forth.

4. In an engine-lathe, the combination with the carriage the cross-slide and means for controlling the cross-slide; of the detachably-connected spring-supporting socket or guide attached to the forward end of said cross-slide, a spring and spring-pressed stud mounted in said socket, said stud impinging against the carriage, and an adjusting device for regulating the tension of the spring, all substantially as set forth.

5. In an engine-lathe, the combination, with the main tool-block, the second or side tool-block, the cross-slide, and means for controlling said cross-slide; of a block-connecting device rigidly uniting said tool-blocks, and means for detachably securing said device to the respective tool-blocks.

6. In an engine-lathe, the combination with the carriage having parallel guideways, of a main tool-block, an auxiliary tool-block independently mounted on the guideways, means for temporarily uniting said tool-blocks laterally to operate toward and from the lathe-axis in unison, and means for automatically controlling the movement of the main tool-block.

7. In an engine-lathe, in combination with the carriage, a plurality of tool-blocks, an adjustable cross-slide supporting one of said blocks, adjusting-screw mechanism for independent operation of said tool-blocks, a controlling device having inclined directing-guides, a guide-following means attached to said cross-slide, means for releasing the adjusting-screw of the side tool-block and a block-connecting means detachably secured to and rigidly uniting the respective tool-blocks, for the purposes set forth.

8. A tool-block-connecting bracket comprising an offset body having bearing-faces adapted for seating against the sides of two tool-blocks, and provided with position-indicating devices, and attaching-screws for securing said bracket in position, in combination with the carriage, a pair of tool-blocks, and tool-supporting mechanism in an engine-lathe, for the purpose set forth.

Witness my hand this 7th day of September, 1903.

ENOCH EARLE.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.