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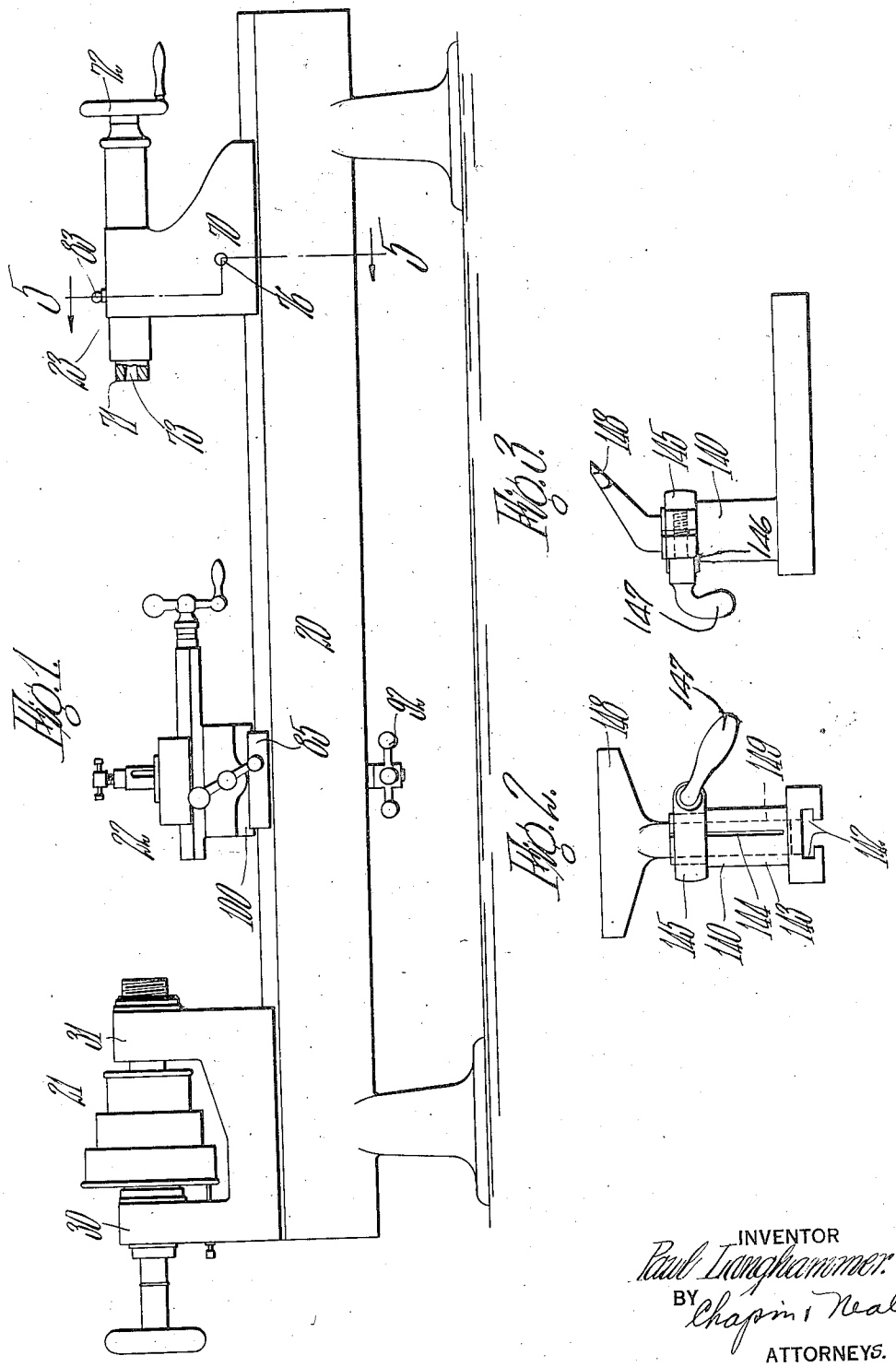
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P. LANGHAMMER

PRECISION LATH

Filed Dec. 15, 1919

3 Sheets-Sheet 1



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Paul Langhammer.

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Oct. 2, 1923. 1,469,226

P. LANGHAMMER

PRECISION LATH

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Fig. 4.

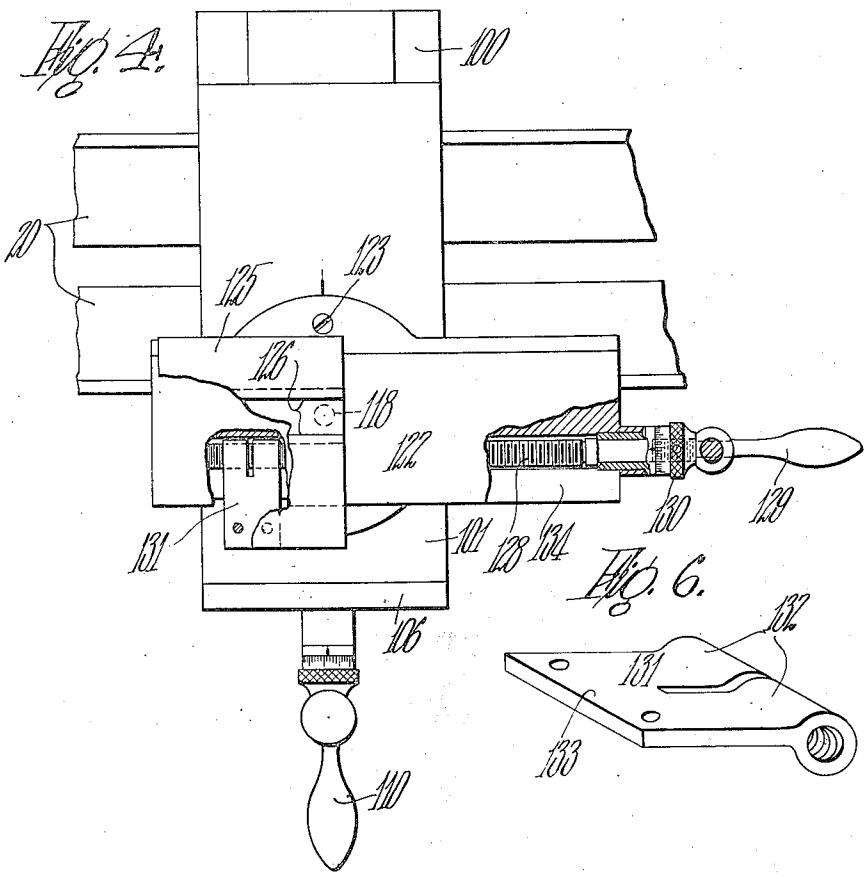
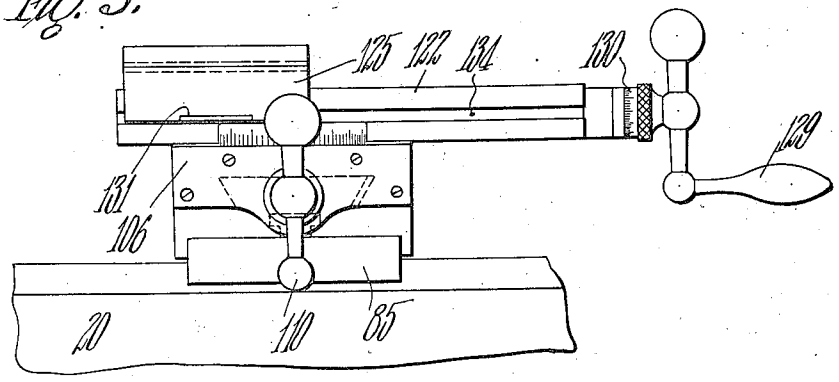


Fig. 6.

Fig. 5.



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Fig. 7.

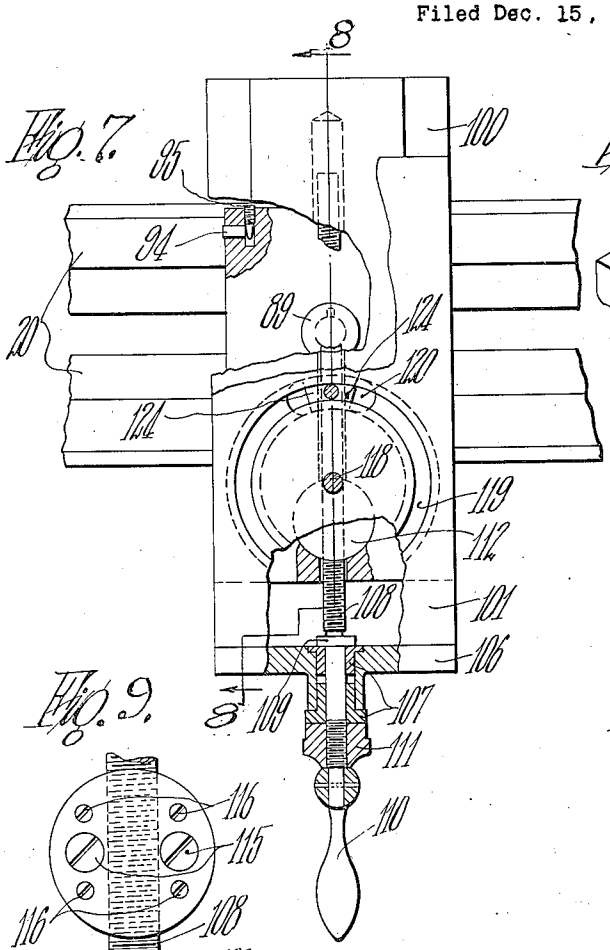


Fig. 11.

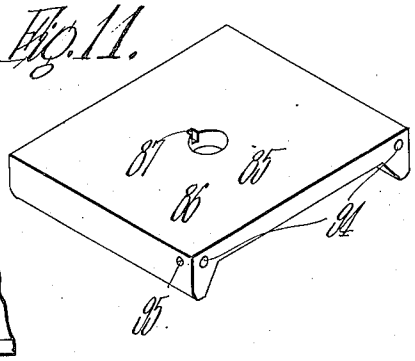


Fig. 12.

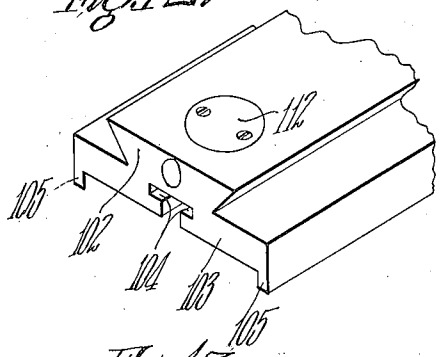


Fig. 9.

Fig. 10.

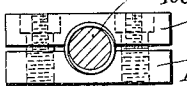


Fig. 13.

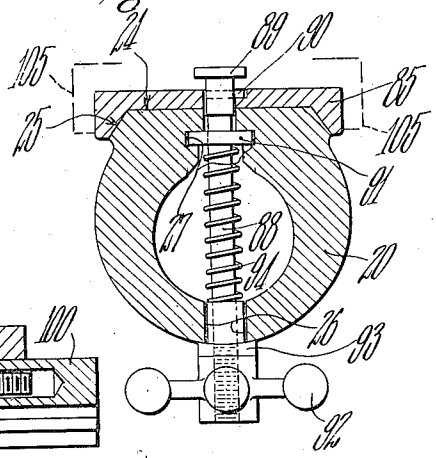
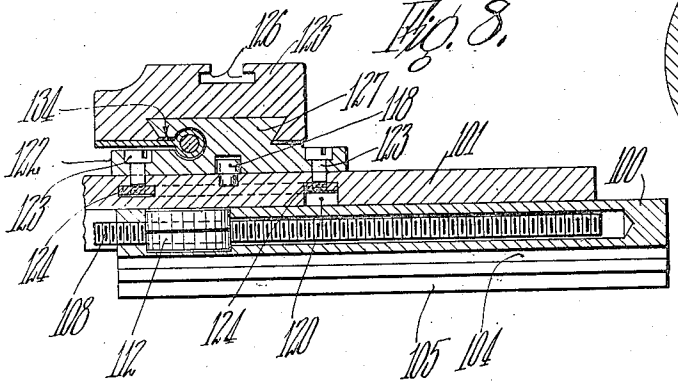


Fig. 8.



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Patented Oct. 2, 1923. 1,469,226

UNITED STATES PATENT OFFICE.

PAUL LANGHAMMER, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO PACKAGE MACHINERY COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PRECISION LATHE.

Application filed December 15, 1919. Serial No. 345,117.

To all whom it may concern:

Be it known that I, PAUL LANGHAMMER, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Precision Lathes, of which the following is a specification.

This invention relates to improvements in lathes and has for its object more particularly the addition of features to render the lathe more efficient, simple and precise in its operation.

Further objects will appear from the following specification and accompanying drawings in which a preferred embodiment of my invention is set forth.

In the drawings,—

Fig. 1 is a side elevation of the lathe;

Fig. 2 is an end elevation of the tool rest;

Fig. 3 is a side elevation of the same;

Fig. 4 is a plan view of the cross slide and compound slide with parts broken away;

Fig. 5 is an end elevation of the same;

Fig. 6 is a perspective of the compound slide feed screw nut;

Fig. 7 is a plan view of the cross slide with the compound slide removed;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a plan view of the upper slide feed screw nut;

Fig. 10 is an elevational view of the same;

Fig. 11 is a perspective view of the lathe shoe;

Fig. 12 is a fragmentary perspective view showing the end of the lower slide; and

Fig. 13 is a section through the lathe bed and shoe and showing the clamping means therefor.

Referring more particularly to the drawings, the lathe includes a suitably supported bed 20 on which is adjustably mounted a head-stock 21, a cross slide 22, and a tail stock 23. The bed 20 is tubular in cross section as will best be seen in Fig. 5 and has a flat finished surface 24 on its upper side with beveled finished surfaces 25. These surfaces 24 and 25 provide a way for the units before mentioned to slide upon for various relatively adjusted positions. The bed 20 is further provided in its uppermost side with a T slot 27 extending longitudinally thereof throughout its entire length, said slot being adapted to receive various clamping devices as will later appear. A slot 26 is provided in the lowermost side of the bed, this slot being vertically alined with the slot 27 and extending from points adjacent the innermost side of the bed supports for a purpose as will later appear. The T slot 27 communicates with the hollow interior of the bed 20 as well as opening to the upper side of the bed so that an aperture is provided which extends from the upper to the lower faces of the bed and substantially throughout the length of the bed.

Mounted upon the bed 20, between the head-stock 21 and the tailstock 23, is a shoe 85 (see Figs. 14 and 16), and which is yieldingly held to the bed by spring pressure but which, is adapted to slide to various positions of adjustment on the bed and to be clamped to the bed in adjusted positions. This shoe 85 is finished to interfit surfaces 24 and 25 of the bed, and is further provided with an opening 86 and a key way 87 extending part way therethrough. A bolt 88 having a cylindrical head 89 on its upper end, is screw threaded at its lower end, and has integral therewith a key 90 beneath its head in engagement with the key way 87 of the shoe. This bolt 88 fits loosely the opening 86 of the shoe and has in threaded engagement with its lower end a hand wheel 92. A clamping collar 93 is loosely mounted on the bolt 88 adjacent the hand wheel and has a shank portion slidably mounted within the lower slot 26 of the bed 20. A floating collar 91 is also loosely mounted on the bolt 88 and fits loosely within the T slot 27 of the bed 20. A spring 94 surrounds the bolt and normally forces the collar 91 against the T slot 27 of the bed and bearing against the clamping collar 93 tends at all times through the key 90 to hold the shoe 85 in yielding engagement with the bed. This shoe 85 is further provided with the take-up friction pins 94 slidably mounted therein for taking up play between the shoe and the cross slide 22 or the like and adjusting screws 95 with tapered ends abutting the pins 94 are adapted to force the said pins outwardly against the cross slide 22 to take up any lost motion between the cross head and shoe as will later appear.

The shoe 85 is adapted to support and carry thereon a cross slide 22 or the like, and slides along the bed into various ad-

justed positions, where it is clamped, by the hand wheel 92 being turned to force the clamping collar 93 in a clamping engagement with the bed 20. This turning action also brings the under side of the bolt head 89 into clamping engagement with the slot 104 of the lower slide 100 and thereby clamps them all firmly together. When it is required to slide the shoe 85 along the bed the hand wheel is turned slightly which allows the spring 94 to force in a downward direction the clamping collar 93, handwheel 92, and consequently the bolt 88, at which time the key of the bolt 88 abuts the bottom of the key way 87. As will be seen, the shoe 85 is now held yieldingly on the bed as it slides thereon, and the interfitting surfaces are not separated, thereby preventing chips or foreign matter from lodging between the shoe and the bed.

The cross slide 22 as is well understood in the art, comprises a lower slide 100, and an upper slide 101. The lower slide 100 is provided with a dovetail 102 (see Fig. 15) which interfits corresponding surfaces of the upper slide 101. The lower slide 100 as before mentioned, may be carried on the shoe 85 and has a base portion 103 with a T slot 104 extending longitudinally thereof for the reception of the head 89 of the clamping bolt 88. Depending flanges 105 abut the sides of the shoe 85 as in Fig. 16, and any lost motion therebetween is taken up by the adjustable pins 94 and screws 95 of the shoe. The upper slide 101 has on its forward end a bearing plate 106 and integral therewith suitable feed screw supporting bushings 107. A feed screw 108 is rotatably mounted in the bushings 107 and is provided with a thrust collar 109 abutting the inner bearing 107 and an actuating handle 110, secured to its end. An adjusting collar 111 is in threaded engagement with the feed screw 108 and may be used for taking up wear or lost motion between the collars 107 and 111.

The lower slide has loosely mounted therein near its forward end (see Figs. 10 and 15) an internally threaded adjustable feed screw nut 112 which is in operable engagement with the feed screw 108. This nut 112 (see Figs. 12 and 13) comprises separable disks 113 and 114, each having half nut threads for engagement with the feed screw 108, and are held together by the screws 115. Set screws 116 in threaded engagement with the disk 114 bear against the disk 113 as will be seen. The nut thus described is adjustable to take up wear or back lash in its threads caused by action of the feed screw, and adjustment is accomplished by loosening the set screws 116 and bringing together the disks 113 and 114 by use of the screws 115, after which the screws 116 are set to retain the disks in this adjusted relation.

The upper slide is adapted to carry a compound rest, and for this purpose it is provided with the upstanding swivel pin 118 integral therewith, and a concentric T slot 119 which has connected therewith at its lowermost side the opening 120.

A compound rest 122 is carried on the upper slide 101 and adapted to be rotated on the said upper slide to adjusted positions for which purpose it is provided with a pivotal bearing embracing the swivel pin 118. Binding screws 123 are carried by the rest 122 and have their threaded ends in engagement with the binding nuts 124 within the T slot 119. Thus, it will be seen that the compound rest may be rotated completely about the axis of the swivel pin 118 and clamped in any desired position, by tightening the screws 123.

The compound rest 122 being thus mounted for rotation has slidably mounted thereon a tool-post rest 125, which is provided on its uppermost side with a T slot 126 for the reception of a tool post in the usual and well known manner.

The compound rest 122 is provided with an upstanding dovetail 127 which engages in slidable relation an interfitting dovetail of the tool-post slide to facilitate the sliding action. The feed screw 128 (see Fig. 7) is rotatably mounted in the compound rest 122 and is provided with an actuating handle 129 secured to its end, and an adjusting collar 130 in threaded engagement with the screw for taking up longitudinal lost motion or wear between said screw and the compound rest.

An adjustable nut 131 (see Fig. 9) comprising internally threaded eye portions 132 connected by an attaching plate 133 is secured to the under side of the tool post slide 125, and has its threaded eye portion 132 in engagement with the feed screw 128 as will best be seen in Figs. 7 and 11. A longitudinal slot 134 parallel to the axis of the feed screw 128 permits the plate 133 to pass freely therein as the tool post slide is moved longitudinally of the compound rest. When it is desired to take up lost motion between the feed screw 128 and the nut 131 to insure the tool post slide being held in close connection with the compound rest, the separately threaded eye portions 132 of the nut are forced slightly out of line with one another thereby causing said portions to bear on opposite sides of the feed screw.

A tool rest 140 best shown in Figs. 2 and 3 may be mounted on the shoe 85 for a sliding movement along the bed 20. This slide rest 140 comprises the base 141 and has a T slot 142 to receive the head 89 of the shoe clamping bolt 88. An upstanding hollow socket 143 adjacent the end of the base 141 is split at 144 throughout its length to allow of a compressing action thereof. A split clamping collar 145 is rotatably mounted on the

socket 143 adjacent its end and rests upon a shoulder 146 to prevent an axial movement thereof. A binding handle 147 is provided and adapted to draw the split collar 145 into a clamping relation with the socket 143. A T rest comprising a lateral tool supporting member 148 has its shank portion in relative engagement with the hollow socket 143. As will be seen, the T rest may be adjusted to any angle with relation to the base and clamped therein, and the clamping collar may be rotated to such a position that its binding handle on being rotated will not interfere with the tool supporting member.

Having thus described my invention in its preferred embodiment, I do not wish to be limited to the specific structure shown as many changes may be made without departing from the scope of the invention as claimed.

I claim—

1. In a lathe, the combination with a feed screw of a nut coacting therewith comprising separated portions engaging said feed screw at opposite sides of its axis and means to adjust said separable portions toward the axis of said screw to take up the lost motion in the working engagement of said screw.

2. In a lathe, the combination with a feed screw, of a nut comprising an attaching portion with separated screw threaded eye portions, said eye portions adapted to be bent out of line with the axis of said feed screw to engage the same at opposite sides of said axis.

3. In a lathe, a slide support and a slide thereon having interfitting sliding surfaces means for taking up the loose play between said surfaces comprising movable friction members adapted to protrude from one of said surfaces and actuating members movable at an angle to said friction member for adjusting the same into frictional engagement with the other interfitting surface.

4. In a lathe, the combination with a feed screw, of a nut coacting therewith comprising a two part disk divided in a plane parallel to the flat faces of the disk, said disk parts having diametrically disposed screw-threaded recesses in their opposed faces adapted to engage with the threads of the feed screw at opposite side of the latter, means for securing said disk parts in assembled relation and adjusting them toward or from each other, and means for fixing the disk parts in adjusted position.

5. In a lathe, the combination with a feed screw, of a nut coacting therewith comprising a two-part disk divided in a plan parallel to the flat faces of the disk, said disk parts having diametrically disposed screw-threaded recesses in their opposed faces adapted to engage with the threads of the feed screw at opposite side of the latter, screws for securing said disk parts together and for adjusting them toward and from each other, and a plurality of set screws threaded through one of said disks and bearing against the other disk for locking said disks in adjusted position.

6. In a lathe, the combination with a slidable member having a recess bounded by a cylindrical side wall and opening to the exterior of said member, a feed screw extending through said recess and through diametrically disposed apertures in the side wall thereof, a two part cylindrical nut fitted within said recess and coacting with said feed screw, said nut comprising separated portions engaging the screw at opposite sides of its axis, and means removable from the exterior of said member for securing the parts of the nut together.

7. In a lathe, the combination with a longitudinally slotted lathe bed, of a shoe slidably mounted upon the bed, means for clamping the shoe to the bed in various positions of adjustment, said means including a bolt extending through the shoe and the bed, a nut threaded upon the bolt beneath the bed, a clamping collar upon said bolt between the nut and the bed, and means including a spring surrounding the bolt between said collar and the upper portion of the bed for yieldingly holding the shoe against the bed.

8. In a lathe, the combination of a longitudinally slotted bed, a shoe slidably mounted upon said bed, means for securing the shoe in different positions of adjustment longitudinally of the bed comprising a bolt extending vertically through said shoe and through said slots, a nut threaded on the lower end of said bolt, a clamping collar between said nut and said bed, a compression spring encircling said bolt and resting upon said collar, a floating collar on said bolt above said spring, means on said bed for preventing upward and downward displacement of the said floating collar in all positions of adjustment of said shoe longitudinally of the bed, means cooperating with said bolt and nut to clamp said shoe in adjusted position upon the bed when said nut is turned in one direction and to transmit the force of said spring to the shoe to yieldingly hold the latter against the bed when said nut is turned in the opposite direction.

PAUL LANGHAMMER.