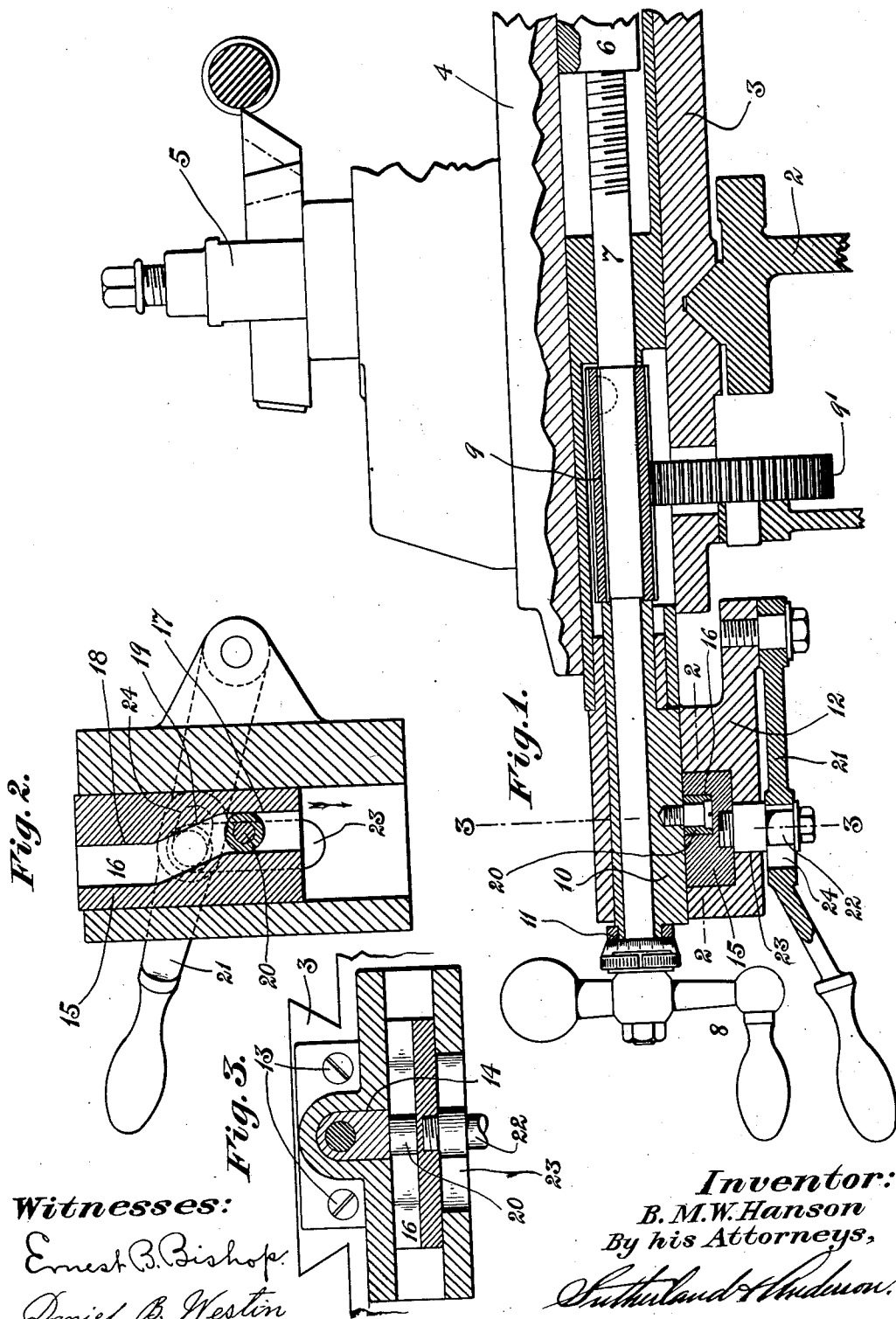


Patented Jan. 4, 1910.

945,456.



Witnesses:

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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

METAL-WORKING MACHINE.

945,456.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed December 23, 1908. Serial No. 468,948.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a specification.

This invention relates to metal working machines and more especially to lathes the primary object of the invention being to provide simple and effective means for bodily shifting the cross-slide or analogous member independently of the usual feed-screw and nut or equivalent means whereby said cross slide can be moved toward or from the work or similar functions obtained without affecting the adjustment thereof.

The invention possesses other advantageous features which with the foregoing will be set forth in the accompanying description wherein is outlined that form of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification.

Referring to said drawings, Figure 1 is a transverse sectional view of a lathe equipped with devices embodying my invention, Fig. 2 is a horizontal section on the line 2-2 of Fig. 1, and, Fig. 3 is a vertical section on the line 3-3 Fig. 1.

Like characters refer to like parts throughout the several figures of the drawings.

My invention can be incorporated in various kinds of machines and in the drawings I have illustrated portions of an engine lathe of known construction and these portions will be briefly described.

In Fig. 1 of the drawings the numeral 2 denotes the base or bed of the machine and I have shown as longitudinally reciprocative thereon a carriage as 3 upon which is represented the usual cross slide 4 equipped with its usual adjuncts including the tool post 5. There is shown on the underside of said slide the nut 6 rigid therewith. Coöperative with said nut is a feed-screw as 7 represented as provided at its forward or outer end with a handle as 8. Feathered or otherwise suitably fastened to said screw 7 is a pinion 9 in mesh with a gear as 9' forming part of the customary power-operated mechanism for turning said screw but which as it forms no part of the present invention need not be de-

scribed in detail. The screw 7 is normally held against endwise movement and when in this relation it will be evident that by turning the handle or crank 8 said screw can be turned to thereby through the nut 6 operate the cross slide 4 to move the latter toward or from the work so that the tool carried by the post 5 can be adjusted with respect to the work. The tool therefore so far as its movement toward and from the work is concerned is adjusted by the manipulation of the feed screw 7. There are times when it is very desirable to move the tool away from the work without disturbing the adjustment thereof and I find that cam mechanism is very advantageous for this purpose. For instance when the carriage 3 has reached the end of its advancing stroke I can move the cross slide 4 bodily away from the work without affecting the relation between the screw 7 and its coacting nut 6 and while this condition is present can return the carriage to its primary position at which point the reverse bodily movement of the cross slide will be accomplished and this again without changing the relation between said screw and nut.

I will hereinafter describe fully that simple embodiment of cam mechanism which I have illustrated for shifting the cross slide and I might state at this point that said cam mechanism acts preferably in conjunction with a bearing which sustains or aids in supporting said feed screw 7. There is shown as surrounding said feed-screw 7 a bearing 10 which may be conveniently made in the form of an elongated sleeve. The inner end of this sleeve is shown as bearing against one end of the barrel pinion 9 while the outer end thereof is shown as bearing against a collar as 11 rigid on said feed-screw. The said bearing 10 in the present case is reciprocative and it follows therefore that when said bearing is retracted or moved outward the feed-screw 7 and hence the nut 6 and cross slide 4 will be similarly moved so as to carry the tool on the tool post 5 away from the work. When said bearing is thrust inward the opposite action will occur; that is the tool will be moved toward the work. The bearing 10 is represented as supported for sliding movement by a box or casing like bracket as 12 rigidly fastened in some suitable manner to the carriage 3, screw or bolts 13 satisfactorily answering this purpose. Said bracket is therefore im-

movable or stationary with respect to the reciprocative bearing 10. The said bracket 12 has an opening 14 therein in which said bearing slides the sides of the bearing being shown as flattened to engage the correspondingly shaped walls of said opening 14 which presents a simple means to prevent turning of said bearing 10.

The cam mechanism to which allusion has been made preferably acts against said bearing 10 and it is of such a nature that it not only imparts to the bearing the necessary strokes but also locks said bearing positively and unyieldingly in its backward and forward positions the locking of the bearing in its forward position being advantageous in that the tool can be maintained in firm and solid engagement with the work.

The box or chambered bracket 12 is shown as inclosing a sliding block or plate 15 which in the present instance has a movement transverse to that of the reciprocative bearing 10 and which constitutes a cam device for effecting the actions to which I have referred. In the upper side of said block or plate there is shown a groove or channel 16 which is illustrated as being composed of two straight portions 17 and 18 and a connecting oblique portion 19 said straight portions being preferably at right angles to the bearing 10. Said bearing is represented as equipped with a pendent stud 20 to fit said groove 16 and said stud may as shown consist of an anti-friction roller. A groove of the kind set forth presents a simple means for securing the reciprocation of the bearing 10 and the locking of the same in its two extreme positions and it also gives to the said bearing a definite throw both forwardly and backwardly. It will be assumed and as illustrated in Fig. 2 that the anti-friction roller 20 is located in the straight portion 17 of said groove 16. This being so the tool through the intermediate parts will be held in solid contact with the work owing to the fact that the bearing 10 is locked in its advance position. It will be further assumed that the sliding block or plate 15 is moved in the direction of the arrow in said Fig. 2 a distance sufficient to cause said roller to enter the portion 18. Said anti-friction roller as the slide is thus operated will leave the portion 17 and enter and then pass through and out the portion 19 into the portion 18 the result being that the bearing 10 is slid outward so as to bodily retract the cross slide 4 and to also lock said cross slide in said retracted position while the roller is in said portion 18. To return the tool to its

initial position the said slide is moved to the position shown in said Fig. 2.

As a convenient means for operating the cam slide 15 I may provide a hand lever as 21 shown as fulcrumed at its forward or inner end to the underside of the box-like bracket 12 and as having its handle in position to be readily accessible to the attendant of the machine; in fact said handle is quite adjacent to the arm or handle 8. I have illustrated as tapped into the underside of said lever between the ends thereof a stud 22 depending therefrom and extending through a slot 23 in the bottom of the said bracket. This stud is shown as passing through a longitudinal slot 24 in the hand lever 21. It should be stated that the slot 23 is elongated longitudinally of the sliding cam plate 15. By operating said lever therefore it is a simple matter to shift said cam plate to either move the cross slide 4 bodily toward or from the work and without in anywise changing the relation between the screw 7 and its nut 6. The end walls of the slot 23 constitute suitable stop means for limiting the throw of the said lever 21 whereby excessive movement thereof will not be possible, notwithstanding the fact that I make the groove 16 open at its opposite ends.

As will be gathered from what has been stated I have described in detail that form of embodiment of invention selected for illustration in the accompanying drawings, this being so that those skilled in the art can practice said invention. I do not restrict myself to the disclosure made by the drawings and description for many changes can be adopted within the spirit of my invention and as set forth in my claim.

Having described the invention what I claim is:

The combination of a cross slide, a nut and a feed-screw for adjusting said cross slide, a reciprocatory bearing for reciprocating said feed-screw and having a stud, and a reciprocatory slide having a groove composed of two straight portions and a connecting oblique portion said stud being adapted to enter all three of the portions of the groove on the reciprocation of said slide.

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

BENGT M. W. HANSON.

Witnesses:

HEATH SUTHERLAND,
F. E. ANDERSON.