E. G. STRONG.

TOOL HOLDER.

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1,436,210.

Patented Nov. 21, 1922.

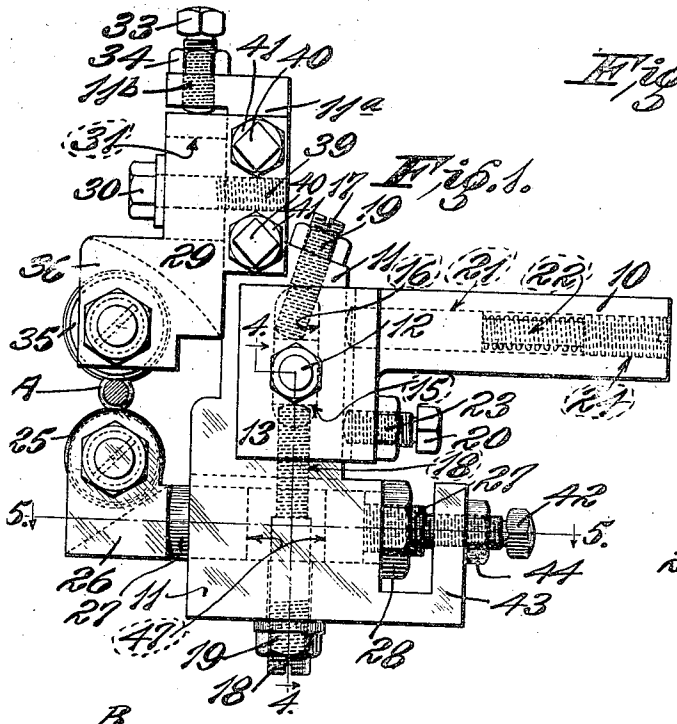


Fig. 1.

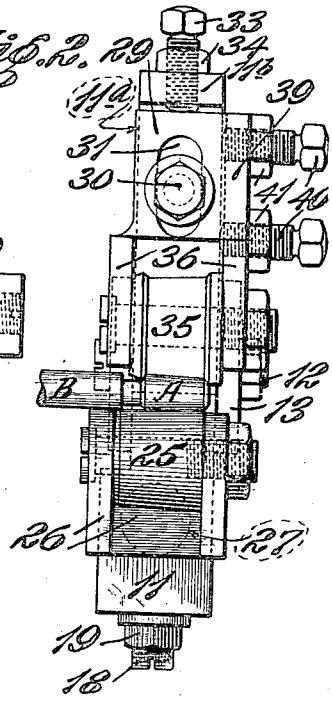


Fig. 2.

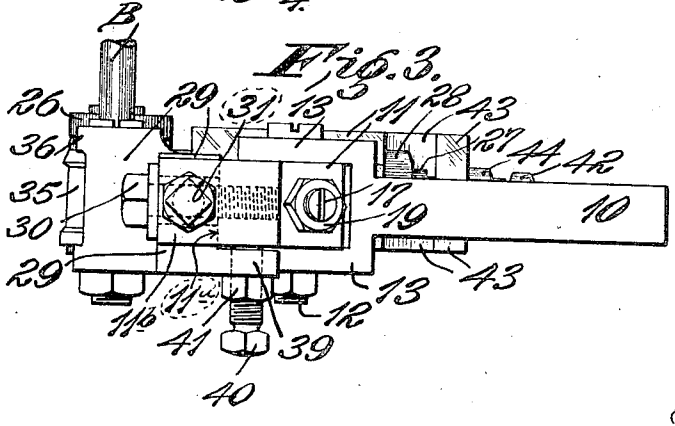


Fig. 3.

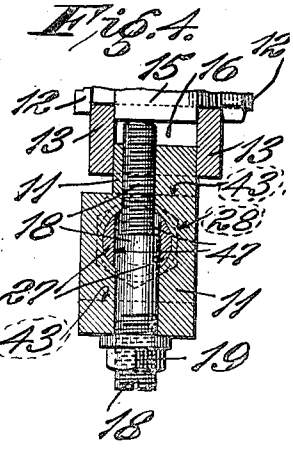


Fig. 4.

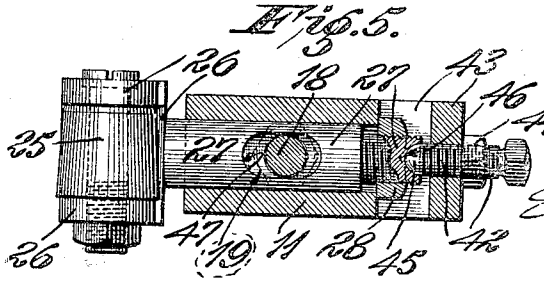


Fig. 5.

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UNITED STATES PATENT OFFICE.

ERNEST G. STRONG, OF CANTON, OHIO, ASSIGNOR TO THE TIMKEN ROLLER BEARING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

TOOL HOLDER.

Application filed September 30, 1921. Serial No. 504,297.

To all whom it may concern:

Be it known that I, ERNEST G. STRONG, a citizen of the United States, and a resident of the city of Canton, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Tool Holders, of which the following is a specification.

This invention relates to improvements in tool-holders for screw machines of the single and multiple spindle types and has for its principal object to provide a floating support for the tool, whereby said tool is adapted to automatically adjust itself with relation to the work and accommodate itself to the surface thereof.

The invention consists in an improved means for automatically adjusting tools with relation to the work and in means for adjusting the tool cross-wise of the work and for locking the tool against movement in such direction; and it also consists in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification, and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a side elevation of a tool-holder, showing the work in position between tools in the form of burnishing rolls, the lower roll being shown supported in an adjustable tool-support embodying my invention;

Fig. 2 is a front elevation of the tool-holder;

Fig. 3 is a top plan view thereof;

Fig. 4 is a fragmentary section on the line 4—4 in Fig. 1; and

Fig. 5 is a horizontal section on the line 5—5 in Fig. 1.

The tool-holder shown in the accompanying drawing is of a well known type and comprises a supporting arm 10 having a swinging body member 11 pivotally mounted on a pivot bolt 12 between bifurcated end portions 13. The supporting arm 10 of the tool-holder is usually held in a slot in one of the top-working tool slides of the screw machine (not shown). The pivot bolt 12 extends through a swivel block 15 which fits in an elongated slot 16 formed in the body portion 11 of the tool-holder, the swivel block being shorter than the slot in which it slides. This arrangement permits adjustment of the swinging member 11 of the tool-holder with relation to the supporting arm 10. This adjustment is accomplished by means of two screws 17 and 18, which are threaded into the body member 11 and bear against the squared opposite ends of the swivel block 15. The adjusting screws 17 and 18 are provided with lock-nuts 19 for holding the swinging body member 11 in the desired adjusted position.

The swinging or pivotal movement of the body member 11 on the pivot bolt 12 is controlled by means of a stop-screw 20 against which the body portion 11 is held by means of a plunger 21 and a coil spring 22, both of which are mounted in a bore in the supporting arm 10. The stop-screw 20 is provided with a lock-nut 23 for locking the screw in any position of adjustment; and the plunger 21 is stopped by a set-screw 24, which is threaded into the end of the bore in which the plunger 21 and the coil spring 22 are located. This spring and stop arrangement allows the body member 11 to yield slightly and accommodate itself to the work, thus making it unnecessary to set the tool-holder accurately.

An upper tool-support 29 is secured to the front face of the reduced upper portion of the swinging member 11 by means of a cap-screw 30. The cap-screw 30 extends through an elongated slot 31 in the upper tool-support 29 and is threaded into a hole provided therefor in the reduced upper portion of the swinging member 11, which portion is shown in the form of a post 11^a of rectangular section.

Movement of the upper tool-support 29 away from the work is prevented by means of a stop-screw 33, which passes through a forwardly projecting bracket portion 11^b formed on the upper end of the post 11^a of the swinging member 11 and bears against the adjacent end of the said tool-support. The stop-screw 33 is provided with a lock-nut 34, which bears against the bracket 11^b of the body member 11 and locks said screw in the desired adjusted position.

The upper tool-support 29 is provided with a tool in the form of a conical burnishing roller 35 which is journaled on a screw between the bifurcated portions 36 of said tool-support. The tool-support 29 has a side flange 39 which projects rearwardly from the rear face of the tool-support along the side of one of the side faces of the reduced upper portion 11^a of the swinging

member 11 of the tool-support. Two set-screws 40 are threaded into the side flange 39 of the tool-support 29, the screws being equally spaced on opposite sides of the cap-screw 30 which secures the tool-support to the swinging member 11. The inner ends of these screws 40 are adapted to engage the adjacent side face of the swinging member 11 for the purpose of adjusting the angle of the roller with relation to the work; and said screws are provided with lock-nuts 41 for clamping them in the desired adjustable position. This adjustment is shown and described in Drowns Patent No. 1,375,875, dated April 26, 1921, and forms no part of the present invention.

The tool-holder is provided with a lower tool in the form of a tapered or conical burnishing roller 25, which is journaled on a screw in the bifurcated head portion of a tool-support 26 and serves as a support for the work. The lower tool-support 26 is provided with a cylindrical shank portion 27 which is mounted in a bore that extends through the body member 11 at right angles to the axes of the burnishing rollers. The rear end of the cylindrical shank portion 27 of the lower tool-support 26 terminates in a reduced threaded portion adapted to receive a stop-nut 28. This stop-nut abuts against the rear face of the body member 11 and serves as an adjustable stop for preventing forward movement of the tool-support 26. An adjustable stop in the form of a stop-screw 42 is also provided for preventing rearward movement of the tool-support 26 in the body member 11. This stop-screw is threaded into the upstanding portion of a L-shaped flange 43 which extends rearwardly from the rear end of the body member at the base thereof and thence upwardly across the reduced threaded portion of the shank 27 of the tool-support. The screw 42 is provided with a lock-nut 44 for locking the screw in the desired adjusted position. The screw 42 is disposed in axial alinement with the cylindrical shank portion 27 of the lower tool-support and has a semi-spherical end portion 45 adapted to fit into a similarly shaped concavity 46 formed in the adjacent end of the shank portion 27 of the tool-support.

The shank portion of the lower tool-support 26 is provided with an elongated slot 47, through which the lowermost adjusting screw 18 extends. This slot is of a length sufficient to permit the desired adjustment of the cylindrical shank portion of the tool-support longitudinally of the bore and is of a width sufficient to permit a slight rocking movement of said shank portion therein. Movement of the shank longitudinally of the bore is controlled by the adjusting nut 28 and the adjusting screw 42, said nut and screw serving also as locking devices for preventing movement of said shank longitudinally of the bore. The screw 42 does not, by reason of the pivot-bearing formed by the engagement of its rounded end 45 with the socket 46 in the end of said shank 27, interfere with the rocking of said shank in the body member. The distance which the shank is permitted to rock is controlled by the clearance between slot 47 therein and the adjusting screw 18.

With the arrangement described, the lower roller 25 may be adjusted transversely to the axis of the upper roller 35 by manipulating the nut 28 and the screw 42. The slight rocking movement of the shank portion of the lower tool-support 26 permits the roller journaled thereon to automatically adjust itself to the taper of the roll A, as formed on the stock B, by the forming tools (not shown). The principal advantage of this arrangement is that the lower roller 25 is self-alining and conforms to whatever it is rolling, and, therefore, eliminates the necessity for accuracy in setting up and adjusting the lower tool-support. Another advantage is that, in the event that the burnished article is off-taper, the forming tools only need be adjusted to correct the error; whereas, with the rigid type of tool-holder it is difficult to determine whether the forming tools or the burnishing tool are in need of adjustment.

It is evident that numerous changes may be made without departing from my invention; therefore, I do not wish to be limited to the exact form of tool-holder and tools shown and described.

What I claim is:

1. A tool-holder for screw machines and the like comprising a body member and a tool-support having a shank disposed substantially perpendicular to the work and rotatably mounted on said body member whereby said tool-support is adapted to rock transversely of the work to enable the tool supported thereon to accommodate itself to the surface of the work.

2. A tool-holder for screw machines and the like comprising a body member, a tool-support mounted on said body member, and adapted to hold a tool, means for adjusting said tool-support transversely to the axis of the work, and means for permitting a limited free rocking movement of said tool support on an axis transverse to the work whereby the tool supported thereon is adapted to automatically adjust itself to the surface of the work.

3. A tool-holder for screw machines and the like comprising a body member, a tool-support mounted on said body member and adapted to hold a tool, means for adjusting said tool-support transversely to the axis of the work and for locking said tool-support in the desired adjusted position,

and means for permitting a limited free rocking movement of said tool support on an axis transverse to said work whereby the tool supported thereon is adapted to automatically adjust itself to the surface of the work.

4. A tool-holder for screw machines and the like comprising a supporting arm and a body member adjustably mounted therein, means for adjusting said body member, and a tool-support mounted on said body member and adapted to support a tool, said tool-support being arranged for rocking movement on an axis transverse to the work whereby the tool supported thereon is adapted to accommodate itself to the surface of the work, the means for adjusting said body member in said supporting arm constitut- means for limiting the rocking movement of said tool-support.

5. A tool-holder for screw machines and the like comprising a body member, a tool-support, a tool mounted on said support, said tool-support being rotatably mounted in said body member on an axis transverse to the work whereby a rocking movement of the tool-support is permitted, thereby permitting the tool-support thereon to adjust itself to the surface of the work, and means mounted on said body member for limiting the rocking movement of said tool-support.

6. A tool-holder for screw machines and the like, comprising a body member, a tool-support comprising a head portion adapted to support a tool and a cylindrical shank portion journaled in said body member for free rocking movement transversely to the axis of the work, means for adjusting said tool-support longitudinally of its axis, and means for limiting the rocking movement of said tool-support.

7. A tool-holder for screw machines and the like comprising a body member, a tool-support comprising a head portion adapted to support a tool and a cylindrical shank portion journaled in said body member for free rocking movement transversely to the axis of the work, means for adjusting said tool-support longitudinally of its shank portion, and means for limiting the rocking movement of said tool-support, said means comprising a member detachably secured to said body member and passing through an elongated slot in said tool-support, said slot being wider than said limiting means.

8. A tool-holder for screw machines and the like comprising a body member, a tool-support comprising a head portion adapted to support a tool and having a shank portion projecting therefrom, said shank portion being mounted in an opening extending through said body member in a direction transverse to the axis of the work, and means for adjusting said tool-support longitudinally of said opening, said means comprising a nut threaded on the end of said shank portion and adapted to bear against the adjacent face of said body member and a screw threaded into said body member and adapted to abut against the end of said spindle, said nut and screw constituting locking devices for preventing movement of said shank longitudinally of the opening therefor.

9. A tool-holder for screw machines and the like comprising a supporting arm and a body member pivotally supported thereon, means for adjusting said body member with relation to the pivot therefor, said body member having a cylindrical bore extending therethrough transversely to the axis of the work, a tool-support comprising a cylindrical shank portion journaled in said bore and a head portion adapted to support a tool, said shank portion having a slot formed therein extending longitudinally of the axis of said shank, the adjusting means for said body member being adapted to cooperate with said slot to permit a limited rocking movement of said shank in said bore, and means for adjusting said shank longitudinally of the bore and for locking said shank in its adjusted position.

Signed at Canton, Ohio, this 26th day of September, 1921.

ERNEST G. STRONG.