No. 693,346. Patented Feb. 11, 1902.

A. H. & J. A. BEDWORTH.

TOOL HOLDER.

(Application filed Mar. 28, 1901.)

(No Model.)

Fig. 1.

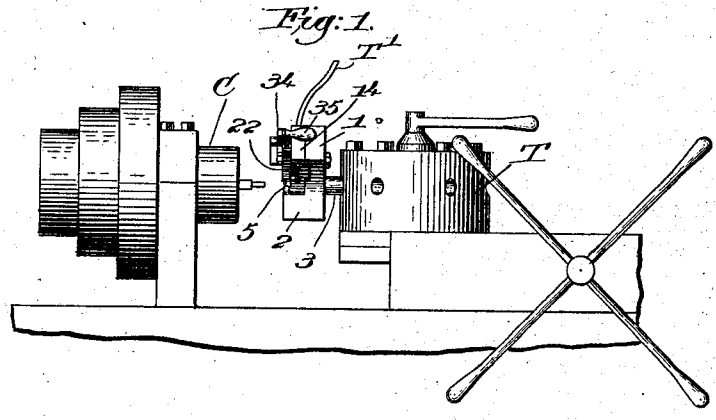


Fig. 3.

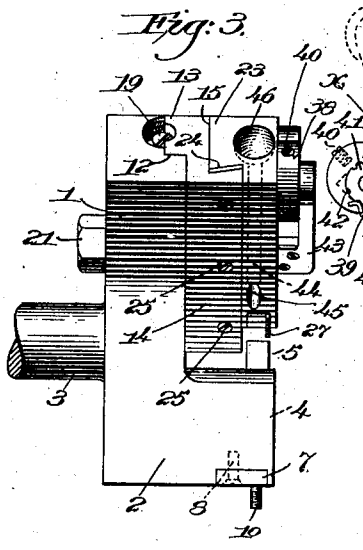


Fig. 2.

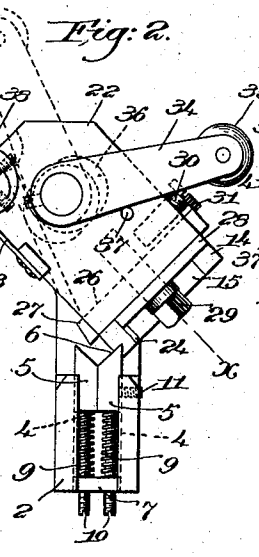


Fig. 4.

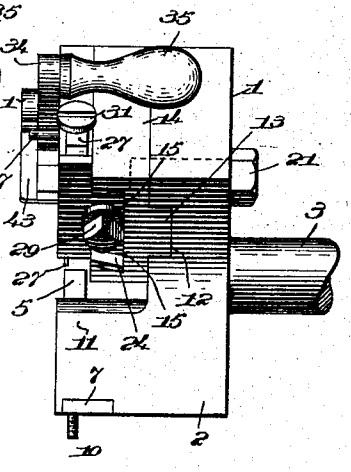
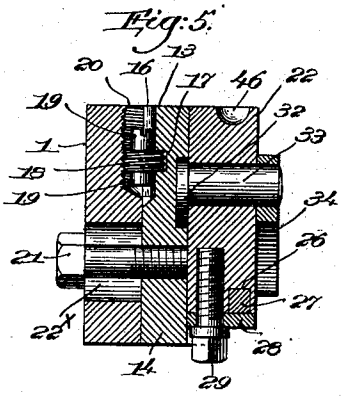


Fig. 5.



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UNITED STATES PATENT OFFICE.

ARTHUR H. BEDWORTH AND JOHN A. BEDWORTH, OF BOSTON, MASSACHUSETTS, ASSIGNORS OF ONE-THIRD TO F. S. WEBSTER COMPANY, OF BOSTON, MASSACHUSETTS; NEW YORK, N. Y.; CHICAGO, ILLINOIS, AND LONDON, ENGLAND, A CORPORATION OF MAINE.

TOOL-HOLDER.

SPECIFICATION forming part of Letters Patent No. 693,346, dated February 11, 1902.

Application filed March 28, 1901. Serial No. 53,291. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR H. BEDWORTH and JOHN A. BEDWORTH, citizens of the United States, and residents of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Tool-Holders, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to tool-holders for use in lathes for turning bolts, screws, pins, &c., and the tool-holder is particularly adapted for use in turret-machines.

One of the objects of our invention is to positively move the tool-carrier toward and from the work in such a manner that the cut will always be on the center line of the work, so that the tendency to break the tool due to catching or digging into the work is entirely obviated. Means are provided for adjusting the throw of the tool-carrier according to the depth of cut and the diameter of the work.

Another object of our invention is to provide a self-adjusting work-rest which automatically adapts itself to the diameter of the work, after which the work-rest is securely clamped in adjusted position.

Another object of our invention is to provide convenient means for conveying lubricant directly to the cutting portion of the tool.

Various other novel features of our invention will be hereinafter described, and particularly pointed out in the following claims.

Figure 1 is a side elevation of part of a turret-lathe with a tool-holder embodying one form of our invention mounted in the turret in operative position. Fig. 2 is an enlarged front elevation of the tool-holder shown in Fig. 1. Fig. 3 is a left-hand side elevation thereof. Fig. 4 is a right-hand side elevation of the tool-holder; and Fig. 5 is a sectional view thereof on the line x x, Fig. 2, looking toward the right.

We have herein shown the tool-holder as comprising a substantially L-shaped body portion 1 2, provided with a rearwardly-extended shank or stem 3, adapted to be fitted in one of the sockets of a turret T, Fig. 1, or in any other suitable support, the lower and forwardly-extended arm 2 of the tool-holder having an upright longitudinal guideway 4 therein. (See Fig. 2.) We have mounted the work-rest in this guideway, and said work-rest is herein shown as comprising two independent members or jaws 5 5, placed side by side and longitudinally movable in the guideway, the upper ends of the jaws being oppositely beveled, as at 6 6, to receive the work. A plate 7 is secured in the bottom of the guideway, as by screws 8, Fig. 3, said plate supporting two spiral springs 9, one for each jaw, and interposed between the plate and the bottom of the jaw a back-stop for each jaw, shown as a long screw 10, being supported in a threaded opening in the plate 7 and extending up through the spring 9 to the under side of the jaw. When setting up the tool, the back-stops are withdrawn from the jaws 5, permitting the springs to control them, a clamp-screw 11, extended into the side of the guideway to bear against one of the jaws, being also loosened, so that the jaws can move easily in the guideway. The work is held in the chuck C, Fig. 1, and the turret is moved toward it until the end of the work engages the jaws 5, and obviously they will adjust themselves thereto accurately by the action of the springs, after which the clamp-screw 11 is set up, tightly holding the jaws clamped in adjusted position, and the back-stops are screwed in until they touch the ends of the jaws and provide rigid supports therefor.

Heretofore it has been common to adjust the work-rest to the work by means of adjusting-screws, the eye of the workman and his sense of touch being depended upon to get the proper adjustment; but such method is slow and unsatisfactory and frequently a number of trials have to be made. So, too, the work is often thrown off center very slightly, but enough to prevent great accuracy in the finished article.

With our invention the springs act to just

bring the jaws against the work, there being nothing to throw the latter out of line or distort it in any way, and a few seconds suffice to get the work-rest ready and accurately adjusted for use.

The outer or front face of the upright part 1 of the body is provided with a groove or guideway 12, Figs. 3 and 4, preferably at an angle of forty-five degrees to a vertical line through the work-rest, to receive a rib 13 on the back of a guide 14, shown as an elongated block provided in its front face with an undercut groove 15.

Referring more particularly to Figs. 3 and 5, the upper end of the rib is longitudinally recessed at 16 and provided with a transverse socket 17, the latter receiving loosely a portion of a short adjusting-screw 18, having journals 19 supported in the recess 16. The bottom of the guideway 12, at its upper end, has a semicircular threaded recess 20 opposite the recess 16, and when the guide 14 is in position on the body the teeth of the screw 18 engage the threaded recess, so that rotation of the screw in one direction or the other will move the guide longitudinally up or down, the upper journal of the screw being nicked to take the blade of a screw-driver, by which it may be rotated. A strong retaining-screw 21 is extended through an elongated slot 22 in the back of the body of the tool-holder into the guide 14 to retain the latter in place and to clamp it in position after it has been longitudinally adjusted by rotation of the screw 18, the adjustment of the guide, which supports the tool-carrier, accommodating stock of different diameters, the larger the diameter of the work the more will the guide be moved upward on the tool-holder body.

The tool-carrier is shown as a block 22, having on its rear face a rib 23, whose sides are undercut or beveled to correspond to the undercut groove 15 in the guide, so that the tool-carrier will be retained upon the guide without interfering with its longitudinal movement thereupon. The rib 23 is made somewhat smaller than the guideway 15 to permit the insertion of a gib 24, held in place by screws 25, (see Fig. 3,) and serving to take up wear.

The lower end of the tool-carrier is provided with a transverse seat 26 for the tool 27, the latter being securely clamped upon the tool by a clamp-screw 29, extended into the tool-carrier, as clearly shown in Figs. 2 and 5. By slightly loosening the clamp-screw 29 the face-plate is slackened sufficiently to permit removal of the knife longitudinally from the seat for grinding or replacement, as the case may be.

We have provided a back-stop for the tool, herein shown as a screw 30, mounted in the tool-carrier and with its head 31 extended across the back end of the tool.

By setting up the clamp-screw 29 easily a very fine adjustment for the tool can thereafter be effected by rotative movement of the back-stop 30. This back-stop also provides a support for the tool in the direction of its length, so as to prevent any possible chance of longitudinal movement when making the cut.

The tool-carrier is positively moved upon the guide 14 by simple means now to be described, said means being herein shown as a disk 32, eccentrically mounted on a shaft 33, which extends through the tool-carrier and at its outer end has secured to it an actuating-arm 34, provided with a suitable handle 35. The cam-disk 32 extends into a transversely-elongated seat 36 (see dotted lines, Fig. 2) in the bottom of the guideway 15, formed in the guide 14, so that rotative movement of the shaft 33 will slide the tool-carrier positively in one direction or the other.

In Fig. 2 the tool-carrier is shown as moved away from the work; but if the actuator is swung into dotted-line position, Fig. 2, the tool-carrier will, through the coöperation of the cam 32 with the seat in the guide 14, move the tool-carrier downward to bring the tool into cutting position, and it will be obvious that the depth of the cut will depend upon the position of the actuator when thrown to the left. A fixed stud 37 limits the movement of the actuator, and consequently the retractive movement of the tool-carrier, and we have shown a simple form of adjustable stop to limit the throw of the actuator, and hence the movement of the tool-carrier, in the opposite direction. A disk 38 is eccentrically pivoted at 39 on the base of the tool-carrier, near its upper end, said disk being provided with a series of adjustable stop-screws 40, the outer ends of which are different distances from the pivot 39 of the disk. A smaller disk 41 is secured to or forms a part of the disk 38 and is provided with notches 42, adapted to coöperate one at a time with a spring locking-finger 43, mounted on the tool-carrier. The notches 42 are so arranged that they correspond to the several screws 40. As shown the disk is set for the intermediate position between maximum and minimum cut, so that when the actuator 34 is moved into dotted-line position, Fig. 2, the cut will be neither maximum nor minimum, also that one of the screws 40, whose outer end is nearest the pivot 39, will of course permit the greatest movement of the acuator, and hence the deepest cut, while the screw farthest away from the pivot will, if turned into operative position, permit only the minimum cut to be made. The locking-finger 43 entering one or the other of the notches 42 will hold the disk 38 in position with the desired stop in the path of the actuator.

With the tool-holder herein shown the cut can be started with the work of maximum diameter and the latter turned down to desired diameter without any adjustment whatever

to keep the tool on the center line of the work, and the tool is particularly adapted for necking or forming and for making headed screws or necked screws and studs of various types.

The cutting-tool is located above the work, as will be manifest, so that front and back tools can be brought into operative position above the tops of the jaws of the work-rest to act upon the work without interfering with the parts of the tool-holder herein shown and described.

By turning the screw-stops 40 in or out in the disk the adjustment for the movement of the tool-carrier may be varied to within very small limits, and a very delicate adjustment is thereby effected.

We have provided means for conveying lubricant directly to the cutting portion of the tool by making an oil-duct 44 in the tool-carrier, the delivery end 45 of said duct being located adjacent the cutting end of the tool, and by inserting the end of a flexible tube T', Fig. 1, in the upper or inlet end 46 of the oil-duct the latter can be connected continuously with a suitable reservoir, the tube conveying the lubricant to the duct, obviating movement of the oil-nozzle back and forth by the operator, as is now very common practice.

With our improved tool-holder the operations of roughing and finishing the work are performed at the same time, something which cannot be accomplished with a hollow mill, the form of tool usually employed for doing the same class of work.

We believe that the roughing and finishing is due to the firm support of the work by the work-rest during the action of the single cutting-tool, the work being so held that there is no vibration or jarring thereof possible.

Our invention is not restricted to the construction and arrangement herein shown, as the same may be modified or changed in various particulars without departing from the spirit and scope of our invention.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, a tool-carrier movable toward and from the work, a guide upon which the tool-carrier slides, a cam rotatably mounted on one of said members and in operative engagement with a seat in the other, to positively move the tool-carrier on its guide, an actuator rigidly secured to and to rotate the cam, and means mounted on the tool-carrier and coöperating with the actuator to vary the movement of the tool-carrier toward the work.

2. In a device of the class described, a tool-carrier movable toward and from the work, a guide upon which the tool-carrier slides, a cam rotatably mounted on one of said members and in operative engagement with a seat in the other, to positively move the tool-carrier on its guide, an actuator rigidly secured to and to rotate the cam, a fixed stop to limit the movement of the actuator in one direction, and an adjustable stop to control its movement in the opposite direction, said adjustable stop being mounted on the tool-carrier.

3. In a device of the class described, a tool-carrier movable toward and from the work, a guide upon which the tool-carrier slides, a cam rotatably mounted on one of said members and in operative engagement with a seat in the other, to positively move the tool-carrier on its guide, means to adjust the guide in the direction of movement of the tool-carrier and to hold it in adjusted position, and an actuator rigidly secured to and to rotate the cam and thereby move the tool-carrier on the guide toward and from the work.

4. In a device of the class described, a tool-carrier movable toward and from the work, a guide upon which the tool-carrier slides, said guide having a cam-seat in its face, a cam mounted on the tool-carrier, and in operative engagement with the seat, to positively move the tool-carrier in either direction, a swinging handle secured to and to rotate the cam, a fixed stop to limit movement of the handle to retract the tool-carrier, an eccentrically-mounted stop-disk to limit its movement in the opposite direction, and a locking device to hold said stop-disk in adjusted position.

5. In a tool-holder of the class described, a movable tool-carrier, a guide on which it moves, an adjusting-screw rotatably mounted on the guide and engaging a threaded seat in the tool-holder, to adjust the guide longitudinally, and means to clamp the guide in adjusted position.

6. In a tool-holder, a work-rest including two independent, yieldingly-supported and self-adjusting jaws arranged side by side and independently movable in parallelism, and means to maintain the jaws in their self-adjusted position.

7. In a tool-holder, a guide, a work-rest mounted therein and including a plurality of longitudinally and independently slidable jaws arranged side by side, spring-operated means to effect movement of the latter into adjustment relative to the work, and means to clamp the work-rest in adjusted position in the guide.

8. In a tool-holder, a self-adjusting work-rest, an adjustable back-stop for the work-rest, and an independent clamping device to clamp the work-rest in adjusted position.

9. In a tool-holder, a work-rest including two independent self-adjusting jaws, an adjustable back-stop for each jaw, and a clamping device to clamp the jaws in adjusted position.

10. In a tool-holder, a guide, a work-rest comprising two jaws independently movable therein, a spring for each jaw, to move it against the work, a back-stop adjustable be-

hind each jaw when adjusted, and means to clamp the jaws in the guide in adjusted position.

11. In a device of the class described, a self-adjusting work-rest, and an overhanging guide, a tool-carrier movable on the guide, and means to positively move the tool-carrier toward and from the work-rest, and independently of the latter.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ARTHUR H. BEDWORTH.
JOHN A. BEDWORTH.

Witnesses:
JOHN C. EDWARDS,
AUGUSTA E. DEAN.