No. 710,174. Patented Sept. 30, 1902.

A. H. & J. A. BEDWORTH.

TOOL HOLDER.

(Application filed May 16, 1901.)

(No Model.)

Fig: 1.

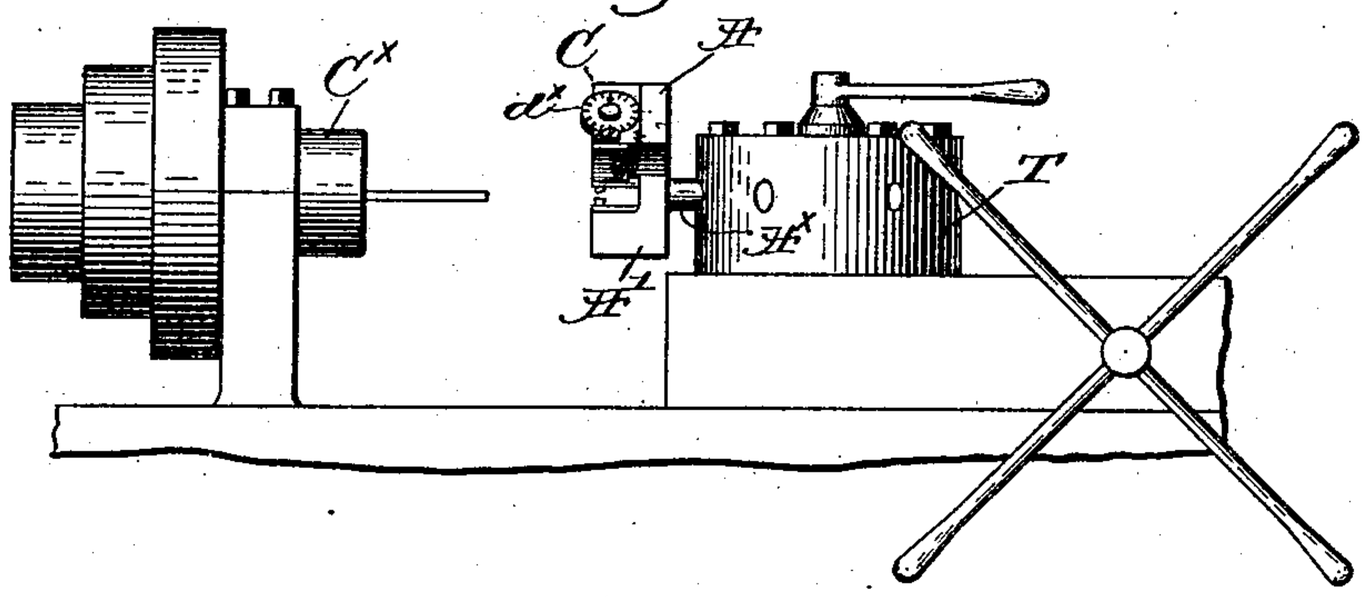


Fig: 3.

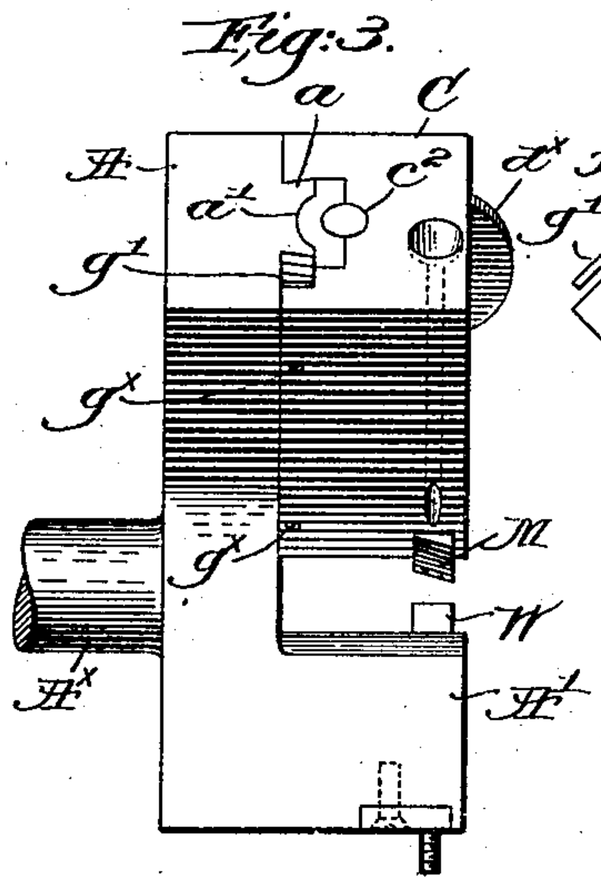


Fig: 2.

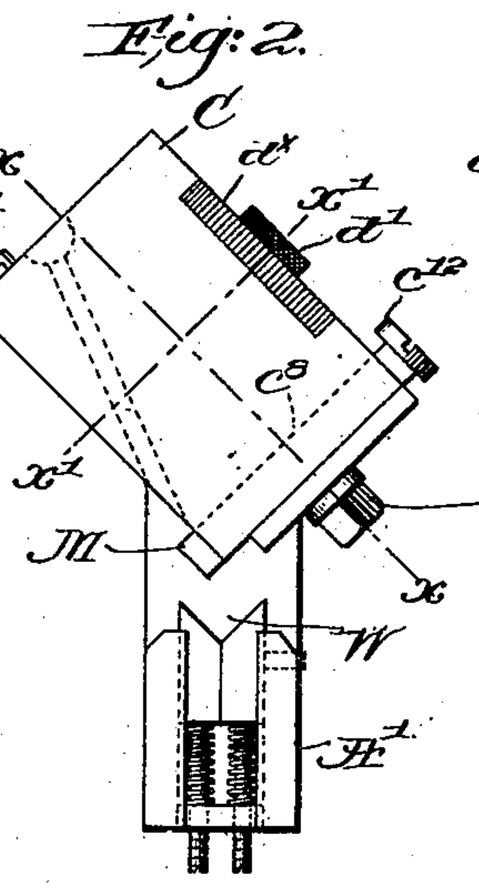


Fig: 4.

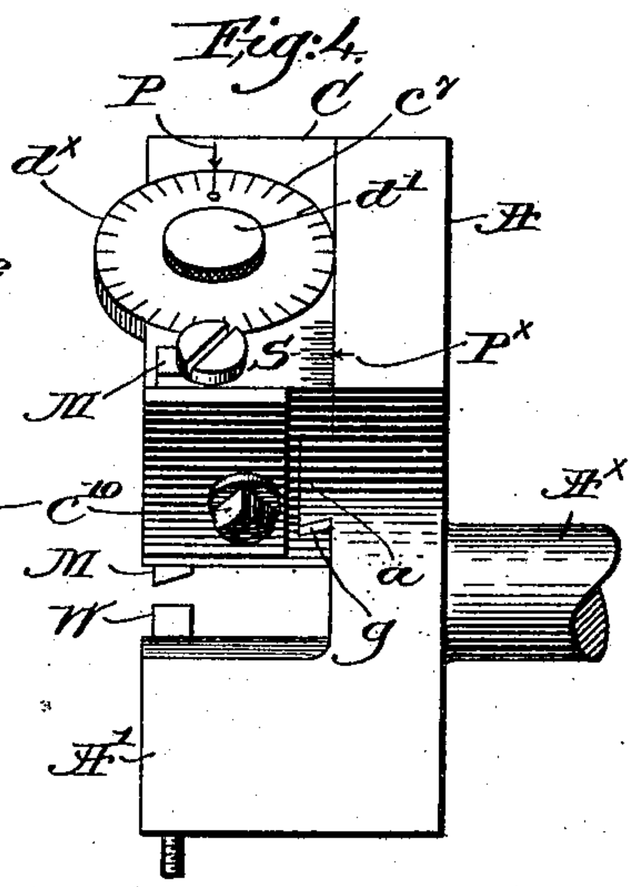


Fig: 5.

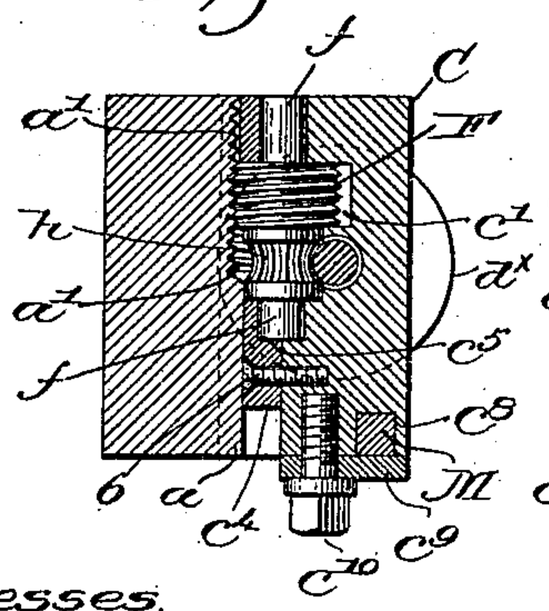


Fig: 6.

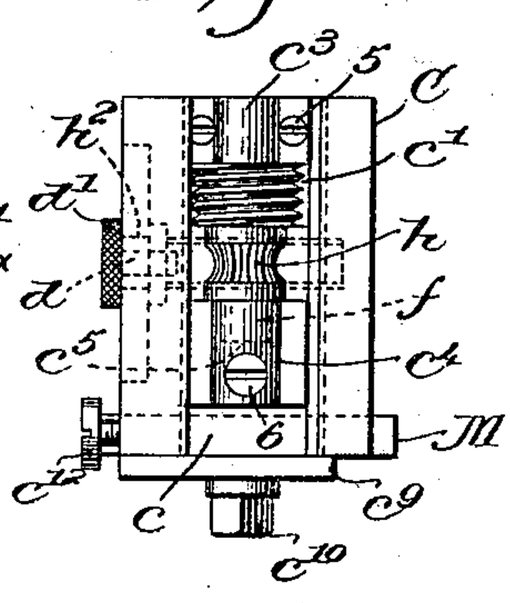
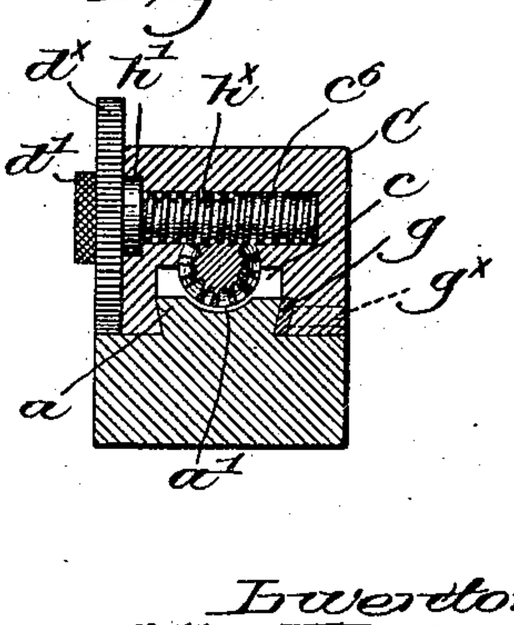


Fig: 7.



Witnesses,
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Att'ys.

UNITED STATES PATENT OFFICE.

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TOOL-HOLDER.

SPECIFICATION forming part of Letters Patent No. 710,174, dated September 30, 1902.

Application filed May 16, 1901. Serial No. 60,477. (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 more particularly adapted for use with turret-machines; and it has for one of its objects the production of means for quickly adjusting the tool-holder so that the tool will make a cut of the required depth.

Another object of our invention is the production of means for securing a very fine and accurate adjustment to follow up or complete an initial or rough adjustment.

The various novel features of our invention will be fully described hereinafter and particularly pointed out in the following claims.

Figure 1 is a side elevation of part of a turret-machine with a tool-holder embodying our invention mounted in the turret. Fig. 2 is an enlarged front elevation of the tool-holder. Fig. 3 is a left-hand side elevation thereof. Fig. 4 is a similar view looking toward the left, Fig. 2. Fig. 5 is a longitudinal sectional view through the tool-carrier on the line $x\,x$, Fig. 2. Fig. 6 is an under side view of the tool-carrier, showing the feed-screw and micrometer-actuating mechanism therefor; and Fig. 7 is a transverse sectional detail on the line $x'\,x'$, Fig. 2, but showing some of the adjusting means in elevation.

The tool-holder is herein shown as comprising, essentially, a body portion A A′, having a rearwardly-extended shank $A^{\times}$, a work-rest W, mounted in the foot A′ of the body, and a longitudinally-adjustable tool-carrier C, mounted on the body portion, the detailed construction of the work-rest forming no part of the present invention, the same having been described in detail and claimed in another application, Serial No. 53,291, filed by us the 28th day of March, 1901. The shank $A^{\times}$ fits into one of the apertures of the turret-head T, as shown in Fig. 1, in usual manner, the work being held in a work-holding chuck $C^{\times}$, which may be of usual construction.

The face of the body A is provided with a guideway a, having undercut sides and extended diagonally across the body, preferably at an angle of about forty-five degrees, and at its upper end (see Fig. 5) a screw-threaded seat a' is formed in the guideway.

The rear face of the tool-carrier C has a longitudinal recess c therein, extended from end to end, the sides of the recess being beveled to correspond to the sides of the guideway a; but the width of the recess is greater than that of the guideway, so that the tool-carrier can be removed from or applied to the guideway.

In order to retain the tool-carrier thereon, we have provided a locking-gib g, which when in place fills the clearance between one side of the guideway and the adjacent wall of the recess, as shown in Figs. 3 and 4, the gib having a lug g', by which it can be withdrawn, and clamping-screws $g^{\times}$, extended through threaded holes in the side of the tool-carrier, bear upon the gib and when set up hold the tool-carrier rigidly clamped upon the guideway.

The tool-carrier has mounted upon it a feed-screw F and micrometer mechanism for actuating the feed-screw, the latter being secured to a shaft f, which is supported in semicircular bearing-recesses c^2 in the bottom of the recess c, a pocket c' being formed in the bottom of the recess to receive a portion of the feed-screw, as shown in Fig. 5.

A retaining-cap c^3 covers the bearing c^2 at the upper end of the tool-carrier and is secured in place by suitable screws 5, (see Fig. 6,) while a second retaining-cap c^4 extends over the other end of the shaft f and by means of a shoulder c^5 tends to take up some of the end thrust when the feed-screw is rotated, the cap c^4 being held in place by a suitable screw 6.

When the tool-carrier is operatively positioned upon the guideway, a portion of the periphery of the feed-screw will enter and engage the threads in the seat a', so that rotation of the screw in one direction or the other will move the tool-carrier up or down to move the tool toward or away from the center of the work mounted on the work-rest W.

We have provided micrometer mechanism for effecting rotation of the feed-screw to secure quickly and easily a very fine and delicate adjustment of the tool-carrier, said mechanism being herein shown as comprising a worm-gear h, fast on the screw-shaft f and in connection with a worm $h^\times$, rotatably mounted in a transverse seat c^6 in the tool-carrier, the worm having an annular head h', which enters the socketed end of the seat c^6 and guides and supports the worm.

The side of the tool-carrier is cut out or recessed, as at c^7, to receive a dial $d^\times$, concentric with the worm and adapted to be clamped against the head h' thereof by a clamping-screw d, provided with a milled or other suitable head d', the clamping-screw entering a threaded hole in the worm, and, as shown by dotted lines in Fig. 6, the worm has a smooth cylindrical extension h^2 beyond its head to enter a suitable hole in the dial $d^\times$. Obviously, when the dial is clamped to the worm the latter will be rotated by longitudinal movement imparted to the dial, and through the worm-gear the feed-screw f will be turned in one direction or the other to effect feed of the tool-carrier.

In preparing the tool-holder for a piece of work after a rough adjustment has been made, as will be described, the final adjustment is effected by the micrometer mechanism hereinbefore described, and after the workman has adjusted the tool-carrier to about the proper point he unclamps the dial, brings the zero-point opposite the pointer P on the tool-carrier, and then reclamps the dial, after which the latter is rotated in one direction or the other through the desired number of graduations to effect precisely the adjustment desired, and this adjustment can be secured down to one one-thousandth of an inch, and not only that, but with great rapidity.

The micrometer mechanism for operating the feed-screw is essentially a slow-motion mechanism, and were the entire adjustment to be effected thereby it would be unnecessarily slow, so that we have provided for a first rough adjustment. The clamp-screws $g^\times$ are loosened, the gib g withdrawn, and the tool-carrier is lifted sufficiently to disengage the teeth of the feed-screw from the seat a', and then the tool-carrier is moved up or down upon the guideway to about the desired point, after which the gib is replaced and the clamp-screws $g^\times$ are partly turned up. The final adjustment is then effected, as has been described, after which the clamp-screws are tightly set up and the tool-holder is locked in adjusted position.

A pointer $P^\times$ (see Fig. 4) is suitably inscribed upon the side wall of the body portion A of the tool-holder to coöperate with a graduated scale S on the adjacent portion of the tool-carrier, and the rough adjustment of the tool-carrier is effected by or through the coöperation of this scale and pointer $P^\times$.

The tool M is held in a transverse seat c^8 in the lower end of the tool-carrier and held in place by a clamp-plate c^9 and clamping-screw c^{10}.

A back-stop screw c^{12} is let into the tool-carrier in such position that its head overhangs the upper end of the tool, as clearly shown in Figs. 2 and 4.

When the tool has been properly set in the tool-carrier, it is clamped in place and the back-stop supports the tool in the direction of its length.

When it is necessary to grind the tool, it is of course removed from the tool-carrier, ground, and replaced, and then by employing a usual tool-gage and setting up the back-stop c^{12} the cutting edge of the tool may be again brought to precisely the same point as before it was ground, thus avoiding any readjustment of the tool-carrier.

Our invention is not restricted to the precise construction and arrangement herein shown, as we have illustrated and described one practical embodiment of the invention without attempting to show the various modifications thereof which could be made by those skilled in the art without departing from our invention.

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

1. In a tool-holder, a guideway provided with a threaded seat, a longitudinally-movable tool-carrier, a feed-screw in engagement with the seat, micrometer mechanism to rotate the feed-screw, the latter and said mechanism being mounted on the tool-carrier, and means to provide for rough adjustment of the tool-carrier independently of the micrometer mechanism.

2. In a tool-holder, a guideway provided with a threaded seat, a longitudinally-movable tool-carrier, a feed-screw in engagement with the seat, micrometer mechanism to rotate the feed-screw, the latter and said mechanism being mounted on the tool-carrier, and means to lock the tool-carrier on the guideway, with the feed-screw in engagement with the threaded seat, release of said means permitting the feed-screw to be disengaged from the seat and reseated thereon, to roughly adjust the tool-carrier.

3. In a tool-holder, a guideway provided with a threaded seat, a longitudinally-movable tool-carrier, a feed-screw mounted thereon and in engagement with the seat in the guideway, an actuating-worm and worm-gear

for the feed-screw, a graduated dial mounted on the worm, and adapted to coöperate with a pointer on the tool-carrier, and means to lock the dial on and to rotate the worm.

4. In a tool-holder, an undercut, longitudinal guideway having a threaded seat, a tool-carrier having a recess therein to engage the guideway, a removable gib adapted to be interposed between one side of the recess and guideway, to prevent removal of the tool-carrier, and a feed-screw and micrometer-actuating mechanism therefor, mounted on the tool-carrier, the screw engaging the seat in the guideway, rotation of the screw adjusting the tool-carrier longitudinally.

5. In a tool-holder, a guideway having a threaded seat, combined with a tool-carrier longitudinally movable on the guideway, a longitudinal shaft mounted in bearings on the tool-carrier and having a feed-screw and a worm-gear fast upon it, a transverse worm also mounted in the tool-carrier and in mesh with the worm-gear, and a setting-dial on the worm, the feed-screw normally engaging the threaded seat, whereby rotation of the screw will effect longitudinal movement of the tool-carrier to adjust the same.

6. In a tool-holder, a guideway provided with a threaded seat, a longitudinally-movable tool-carrier, a feed-screw mounted thereon, and in engagement with the seat in the guideway, and micrometer mechanism to rotate the feed-screw, said mechanism including a worm-gear and actuating-worm, and a graduated dial rotatable with the worm.

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,
MARGARET A. DUNN.