July 21, 1925. 1,547,108

F. T. ELLIS

TOOL MOUNTING

Filed Sept. 5, 1924

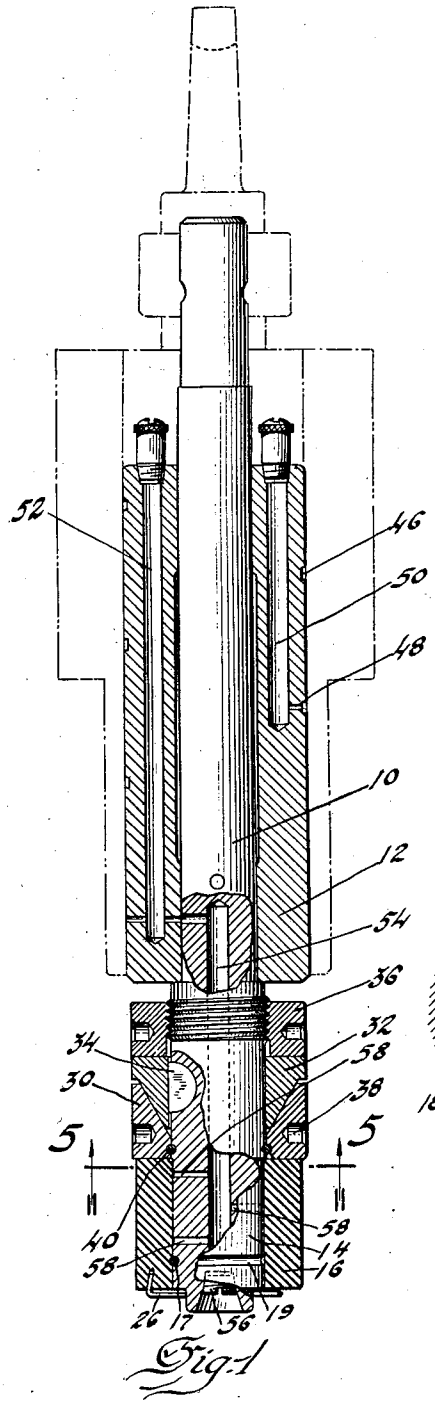


Fig. 1

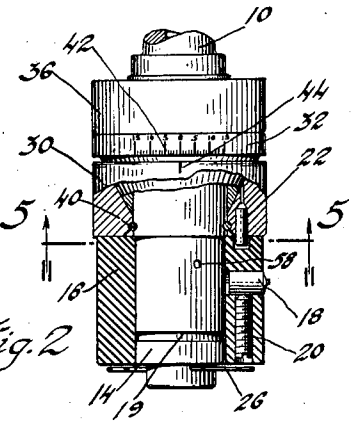


Fig. 2

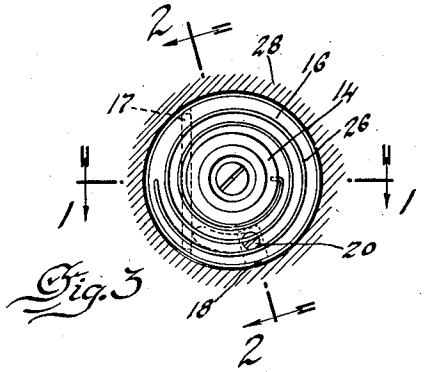


Fig. 3

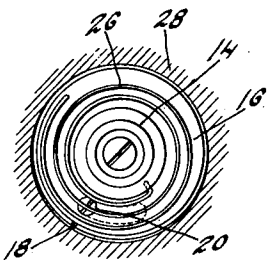


Fig. 4

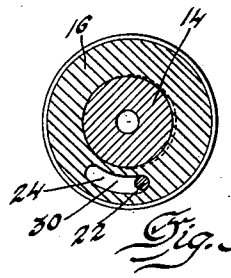


Fig. 5

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Patented July 21, 1925. 1,547,108

UNITED STATES PATENT OFFICE.

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TOOL MOUNTING.

Application filed September 5, 1924. Serial No. 736,088.

To all whom it may concern:

Be it known that I, FORREST T. ELLIS, a citizen of the United States, and a resident of Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Tool Mountings, of which the following is a full, clear, concise, and exact description, such as will enable others skilled in the art to which the invention relates to make and use the same, reference being made therein to the accompanying drawings, which form a part of this specification.

This invention relates to boring tools and the like, and is illustrated as embodied in a diamond boring tool for finishing surfaces such as the bearing surfaces of connecting rods, etc.

An object of the invention is to provide an accurate and quick adjustment for determining the radial position of the tool, for adjusting the tool accurately to the diameter of the bearing. In one desirable arrangement the tool is carried by a sleeve on an eccentric portion of a rotatable boring bar, and a pair of cooperating members having interfitting conical clutch surfaces are provided one member determining the angular position of the sleeve on the eccentric portion and the other keyed to the boring bar. Preferably these members are provided respectively with a pointer and a scale, so that the scale may be calibrated to show directly the adjusted radial position of the tool.

A further object of the invention is to provide means automatically moving the cutting member or equivalent tool radially inward when the tool is to be withdrawn from a finished bearing. One simple but efficient arrangement includes a stop (shown as carried by the first of the above-described clutch members), which determines an inoperative inner radial position and an active outer radial position for the tool, by fixing predetermined limits for angular movement of the sleeve on the boring bar, together with a spring urging the sleeve about the eccentric portion to carry the tool to its inoperative inner radial position. The drag of the tool on the work, when in use, carries the sleeve against the resistance of the spring to its other position determined by the stop in which the tool is in active outer radial position. If desired, use of the described clutch members or their equivalent provides means for accurately adjusting the stop.

The above and other objects and features of the invention, including various novel combinations and desirable particular constructions, will be apparent from the following description of one illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a vertical section on the line 1—1 of Figure 3 through the assembled tool mounting;

Figure 2 is a vertical section through the bottom of the assembled tool mounting, on the line 2—2 of Figure 3, and at an angle to the plane of Figure 1;

Figure 3 is a bottom plan view, with the cutting member shown in its active outer radial position;

Figure 4 is a similar view with the cutting member shown in its inoperative inner radial position; and

Figure 5 is a section on the lines 5—5 of Figures 1 and 2, showing the above-described stop.

The tool is shown as operated by a rotatable boring bar 10 pinned to and rotating with a bushing 12, these being parts, except as further described below, of a standard boring machine.

Surrounding an eccentric portion 14 of bar 10 is a sleeve 16, in which a cutting member such as a cutting diamond 18 is clamped by a setscrew 20. Sleeve 16 is locked against axial movement by a cross key or pin 17 projecting into a circumferential groove 19 in boring bar 14. Angular movement of sleeve 16 about eccentric portion 14 is limited by a stop such as a pin 22 working in an arcuate recess 24 in the end of sleeve 16. A torsion spring 26 is connected at its opposite ends to sleeve 16 and to the end of boring bar 10, and urges the sleeve as far as permitted by stop 22 in a direction to move member 18 to an inoperative inner radial position. The cutting member 18 is moved against the resistance of spring 26, by the drag of the work, to an active outer radial position determined by engagement of pin 22 with the other end of slot 24. The first position, with the cutting member held by the drag of the work 28 in its outer active position, is shown in Figure 3. When the rotation of boring bar is stopped, or when the cutting member passes through the work,

spring 26 automatically moves the sleeve back to the position of Figure 4, with cutting member 18 in its inner radial position, so that the tool may be removed without cutting or scoring the work.

Stop 22 is mounted in a recess in a member 30, having an internal conical surface engaging an external conical surface on a second member 32 which is axially movable on the boring bar, but which is connected thereto by a key 34. When the member 30 is turned to place stop 22 in any desired angular position with respect to eccentric portion 14, it is locked by forcing member 32 toward it, forcing the two conical surfaces into clutching engagement, by tightening up a lock nut 36. Member 30 may have recesses 38 for a spanner wrench, and may be held axially by a locking spring 40. In order to allow calibration of the above-described adjusting means, member 32 has a scale 42, shown graduated in any desired units, and member 30 has a cooperating pointer such as a mark 44.

To facilitate lubrication, bushing 12 has a helical oil groove 46 connected by a passage 48 to an oil passage 50, while an oil passage 52 communicates in a similar manner with an axial bore 54 in bar 10, closed at its bottom by a plug 56. Radial passages 58 from bore 54 serve to lubricate the sleeve, etc.

While one embodiment has been illustrated and described, it is not the intention to limit the scope of the invention to that particular embodiment, or otherwise than by the terms of the appended claims.

I claim:

1. A boring tool comprising, in combination, a rotatable boring bar having an eccentric portion, a sleeve rotatably mounted on said eccentric portion and having a cutting member mounted on its outer edge to operate circumferentially of the sleeve, a stop to limit angular movement of the sleeve on said eccentric portion, and a spring urging the sleeve angularly about the eccentric portion to a position defined by said stop in which the cutting member is in an inner inoperative radial position, the drag of the cutting member against the work turning the sleeve against the resistance of the spring angularly about the eccentric portion to another position determined by the stop in which the cutting member is in a predetermined outer active radial position.

2. A boring tool comprising, in combination, a rotatable boring bar having an eccentric portion, a sleeve rotatably mounted on said eccentric portion and having a cutting member mounted on its outer edge to operate circumferentially of the sleeve, a stop to limit angular movement of the sleeve on said eccentric portion, a spring urging the sleeve angularly about the eccentric portion to a position defined by said stop in which the cutting member is in an inner inoperative radial position, the drag of the cutting member against the work turning the sleeve against the resistance of the spring angularly about the eccentric portion to another position determined by the stop in which the cutting member is in a predetermined outer active radial position, and means for setting the stop with respect to said eccentric portion, adjustably to predetermine said outer active radial position of the cutting member.

3. A boring tool comprising, in combination, a rotatable boring bar having an eccentric portion, a tool-carrying sleeve on the eccentric portion, a member on the boring bar having a conical surface and determining the angular position of the sleeve with respect to the eccentric portion, a second member having a cooperating conical surface and which is keyed to the boring bar, and means to force the conical surfaces into clutching engagement with each other to lock the first member in adjusted angular position, the adjacent edges of the two members being provided with a pointer and scale respectively, to permit calibration of the scale so that the radial position of the tool may be read on the scale.

4. A boring tool comprising, in combination, a rotatable boring bar having an eccentric portion, a tool-carrying sleeve on the eccentric portion, a member on the boring bar having a conical surface and determining the angular position of the sleeve with respect to the eccentric portion, a second member having a cooperating conical surface and which is keyed to the boring bar, and means to force the conical surfaces into clutching engagement with each other to lock the first member in adjusted angular position.

In testimony whereof I affix my signature.

FORREST T. ELLIS.