Feb. 5, 1924. 1,482,916

D. H. DUGAR

TOOL HOLDER

Filed Aug. 6, 1921

Fig 1

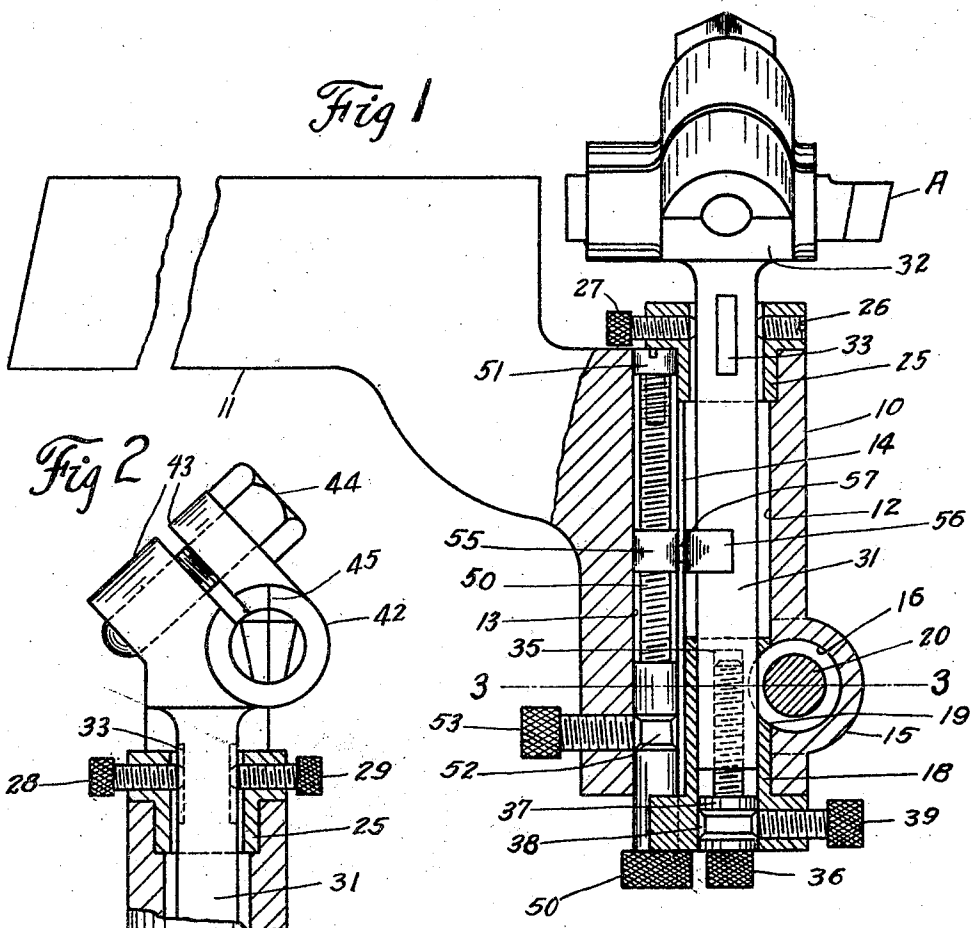


Fig 2

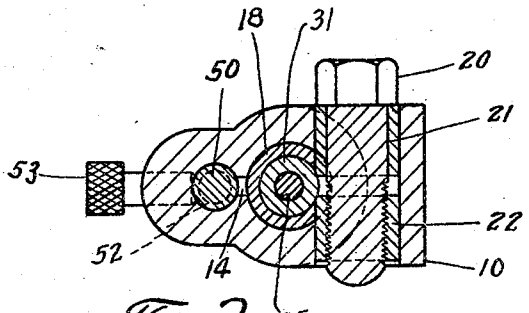


Fig 3

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UNITED STATES PATENT OFFICE.

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TOOL HOLDER.

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To all whom it may concern:

Be it known that I, DELANO H. DUGAR, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tool Holders; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to new and useful improvements in tool holders of the class in which a tool holding head or body is provided with a shank for mounting the holder in a machine and more especially to the type known as spring tool holders.

The object of this invention is to provide a device of the character indicated having such a construction as will permit the tool to be accurately adjustable and positively held in the tool holder and which will allow the amount of resiliency permitted to the tool post to be definitely gauged and positively restricted, thereby making the device especially adaptable for use in the production of accurate screw threads on thread gauges and the like.

A further object of my invention is to provide a device of this character which can be produced at a comparatively small expense and which will be very durable in service.

With these objects in view and with the intention of securing other advantages which will hereinafter appear my invention consists of the features of construction and combination of parts described in the specification, particularly pointed out in the claims and illustrated in their preferred form in the accompaanying drawings.

Referring to the accompanying drawings, Fig. 1 is a view, mostly in central section, showing a tool holder embodying my invention. Fig. 2 is an end elevation of the same, partly in section and Fig. 3 is a section on line 3—3 of Fig. 1.

Again referring to the drawings, 10 represents the body portion of my tool holder and 11 represents the shank portion which is formed integral with the body portion. The body 10 is, generally speaking, pear shaped in cross section and the portion of the body adjacent to the shank hereinafter will be referred to as the back, the portion directly opposite as the front, and the intermediate portions as the sides. A large bore 12 is formed towards the front of the body and extends entirely therethrough from top to bottom. This bore is termed the tool-post socket. A smaller bore 13 is formed at the rear of the bore 12 and this bore also extends entirely through the body from top to bottom. A slot 14 is formed in the wall between the two bores and extends from the top of the body to within a short distance of the bottom thereof.

Toward the bottom of the body, at the front and extending transversely thereof, is formed a semi-circular shaped boss 15. In the boss 15 is formed a horizontally arranged bore 16 and the diameter of this bore 16 is such that in the forming thereof the portion of the front wall of the bore 12, adjacent to the bore 16 is entirely cut away and therefore the two bores intersect or are in common at this point. A flanged sleeve or gland 18 is snugly fitted into the lower end of the bore 12 and extends up beyond the point of intersection of the bore 16 with said bore 12. At said point of intersection an opening 19 is formed in the wall of said sleeve 18 and said opening 19 is so formed that the edges thereof form a true continuation of the partial walls of the bore 16. In the bore 16 is arranged a cap screw 20 which is smaller in diameter than said bore and extends the full length of said bore. The threads on the cap screw 20 extend only about half its length and on the unthreaded or shank portion of the screw is arranged a sleeve 21 which fits snugly on said screw and fits snugly within the bore 16. On the threaded end of the screw 20 is mounted an interiorly screw threaded sleeve 22 which fits snugly in the bore 16. It will be readily understood that the sides of the sleeves 21 and 22 will extend into the opening 19 in the sleeve 18 and interlock with said sleeve 18. Through this interlocking of the sleeves 21 and 22 with the sleeve 18, the sleeve 18 is prevented from slipping down out of the bore 12 and is positively locked in the body 10. This is one object sought to be accomplished by the provision of the sleeves 21 and 22 and a further object of said sleeves is to provide means for locking the tool post against movement as will be explained later.

In the bore 12 at the upper end of the body 10 is arranged a flanged sleeve or gland 25, the interior diameter of which is slightly greater than the interior diameter of the

sleeve 18. In the flange of the sleeve 25 at the front of the body is mounted a set screw 26 and in said flange at the back of the body is mounted a thumb screw 27. In the said flange 25, at each side of the body portion, is mounted a thumb screw shown at 28 and 29. These screws are all arranged radially and can be caused to extend into the bore of the sleeve 25 a greater or less distance as desired.

The tool-post comprises a shank portion 31 and a head portion 32. The shank portion 31 is circular in cross section and the lower end thereof is adapted to fit snugly in the sleeve 18. The upper end of the tool-post passes loosely through the sleeve 25 so that there is a decided space between the post and the surrounding walls of the sleeve. In the upper end of the tool-post are formed depressed seats 33 for the ends of the thumb screws 28 and 29. In the lower end of the tool-post is formed an interiorly screw threaded bore 35 and in said bore 35 is mounted a large size thumb screw 36. On the shank end of the thumb screw 36 is formed a collar 37 which has an annular groove or key way 38. In the flange of the sleeve 18 is mounted a thumb screw 39, the end of which is adapted to extend into the key way 38. The thumb screw 39 in the bottom of the tool-post is free to turn but can not move up or down in the body portion. Therefore when the thumb screw is turned it will screw into or out of the interiorly threaded bore 35 and thereby raise or lower the tool-post. Now when it is desired to lock the tool-post in its adjusted position it is only necessary to turn the cap screw 20 which will cause the sleeve 22 to move in on the threaded portion of the cap screw and approach the sleeve 21. The adjacent portions of the sleeves 21 and 22 will clamp against the tool-post and bind it in the sleeve 18.

The head portion 32 of the tool-post is formed in the customary manner having a split socket 42 for the reception of the shank of the cutting tool shown at A and ears 43 in which is mounted a cap screw 44. By tightening or loosening the cap screw 44, the ears 43 are caused to approach or move away from each other, thereby clamping or freeing the shank of the cutting tool. An index mark 45 is placed on the head to indicate the vertical center line of the socket.

In order to provide means for positively adjusting and controlling the stiffness or degree of resiliency in the tool-post, the following arrangement is provided. In the bore 13 is arranged an endless thumb screw 50. The shank portion of the screw 50 fits snugly in the lower part of the bore 13 so as to take the side thrust and eliminate any play. The threaded portion of the thumb screw 50 is considerably smaller in diameter than the diameter of the bore 13 and it extends to within a short distance of the upper end of said bore. At the upper end of the threaded portion is mounted an annular head 51 which fits snugly in the bore 13 and furnishes a side bearing for the upper end of the thumb screw 50. In the shank portion of said screw is formed an annular key-way 52 and a thumb screw 53 is mounted in the body 10 and extends into said key-way 52. The thumb screw 53, therefore, locks the thumb screw 50 against longitudinal movement in said bore 13 but leaves said screw free to turn. In the bore 13 on the threaded portion of the thumb screw 50 is mounted an interiorly threaded sleeve 55. A semi-circular bracket member 56 is arranged in the bore 12 and is connected to the sleeve 55 by a small web 57 which passes through the slot 14. The inner face of said bracket is curved so as to fit snugly around the tool-post and the outer face is curved so as to fit snugly against the wall of the bore 12, but with sufficient clearance so that it can slide freely on the tool-post. Now when the thumb screw 50 is turned one way or the other, the sleeve 55 travels up or down on the screw 50 and as it moves up or down it carries the bracket member 56 with it.

The operation or manner of using my tool holder is as follows: The cutting tool is mounted in the head of the tool-post and clamped therein by tightening the cap screw 44. Now if we suppose a screw thread is to be cut on a piece of metal, the tool holder is advanced toward the work and then by turning the thumb screw 36, the necessary vertical adjustment of the tool-post can be secured. When the tool-post has been raised or lowered sufficiently to bring the cutting point of the tool in line with the longitudinal center line of the stock which is to be operated on, the cap screw 20 is tightened causing the sleeves 21 and 22 to clamp against the tool-post and locking it in its vertically adjusted position. Now as different conditions demand a different degree of resiliency or stiffness in the tool-post, I make my next adjustment to secure the proper resiliency of the tool-post. This is accomplished by turning the thumb screw 50 so as to cause the sleeve 55 to travel either up or down and thereby adjusting the bracket member 56 up or down on the tool-post 31. It will be readily understood the higher up the bracket member 56 is adjusted, the stiffer the tool-post will be. When the bracket member has been adjusted at the proper height, the thumb screw 53 is tightened, thereby locking the thumb screw 50 against movement so that the bracket member is firmly held in its adjusted position. The actual amount of spring or movement permitted to the tool-post is next definitely fixed by turning the thumb screw 27 in or out in the flange of the sleeve 25.

Now in cutting screw threads where absolute accuracy is required, as in the production of thread gauges and the like, it is best to cut each side of the thread separately and then cut the root to the proper depth thereby making the complete thread in three operations. It is therefore necessary to adjust the tool laterally to one side or the other so as to place it in position for cutting the first side of the thread. This is accomplished through manipulating the screws 28 and 29. For instance, to cut the first side of the thread, we throw the tool slightly to the left (reference being to Fig. 2) and to do this we loosen the screw 28 and turn in on the screw 29. Then to cut the other side of the thread, we throw the tool to the right, which we accomplish by loosening the screw 29 and screwing in on the screw 28. After both sides of the thread have been cut, we adjust the screws 28 and 29 so that the tool-post is held absolutely central and the tool is then in position to complete the root of the thread.

What I claim is:

1. A tool holder comprising a body having a shank portion for mounting said body in a suitable support, a tool-post carried by said body, means for rigidly clamping the lower end of said tool-post in said body while leaving the upper end of said tool-post free to oscillate or vibrate laterally, means adjustable longitudinally of the tool-post for re-enforcing the post at any point above its fixed support in the body and means for mounting a cutting tool in the upper end of the said post.

2. A tool holder comprising a body having a shank portion for mounting said body in a suitable support, a tool-post carried by said body, means for adjusting said tool-post vertically in said body, means for rigidly clamping the lower end of said tool post in said body while leaving said upper end of said tool-post free to oscillate or vibrate laterally, means adjustable longitudinally of the tool-post for re-enforcing the post at any point above its fixed support in the body and means for mounting a cutting tool in the upper end of said post.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

DELANO H. DUGAR.

Witnesses:

VICTOR C. LYNCH,

RUDD H. BENDER.