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HOLDER FOR A TOOL BLADE

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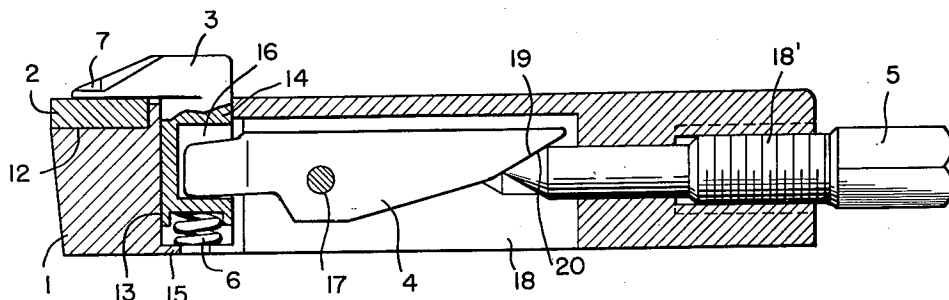


FIG. 1

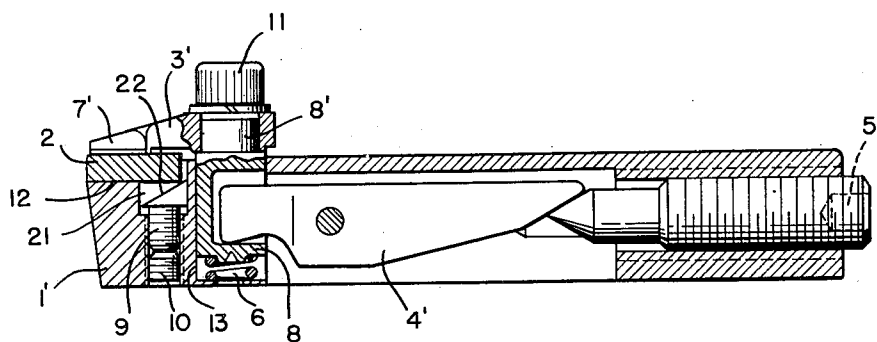


FIG. 2

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HOLDER FOR A TOOL BLADE

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14 Claims. (Cl. 29—96)

The present invention relates to a holder for a tool blade, particularly to a holder for a cutting blade used in a lathe.

There are known holders of the general type above referred to, in which the holder is formed with a groove receiving the end of the blade. Screws threaded through the bottom of said groove and into the blade end serve to secure the blade in the holder.

Holders of this type are somewhat inconvenient in use as the holes in the holder and the blade end must be accurately matched before the screws can be inserted. Furthermore, the number of times a blade can be reground for sharpening is severely limited so that the blade must be discarded without using the major portion of the blade.

One of the objects of the present invention is to provide a novel and improved holder for a tool blade such as a cutting blade which permits a rapid and convenient attachment and detachment of the blade and which securely holds the blade in position.

Another object of the invention is to provide a novel and improved holder which permits a regrinding of the blade a far greater number of times than conventional blade holders thereby allowing a utilization of the blade to a much greater extent than heretofore possible.

Still another object is to provide a novel and improved tool holder in which the clamping means retaining the blades include a member constituting a chip breaker.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims forming part of the application.

In the accompanying drawing several now preferred embodiments of the invention are shown by way of illustration and not by way of limitation.

In the drawing:

Fig. 1 is a sectional view of blade holder according to the invention, and

Fig. 2 is a sectional view of a modification of the blade holder.

Referring first to Fig. 1 in detail, the exemplification of the invention according to this figure shows a holder comprising a support member in which a recess 12 for a blade 2 is formed. This blade may be visualized as a cutting blade made of a hard metal or tungsten carbide. The support member is further formed with a transverse bore or hole 13 disposed near recess 12. A bolt member 14 is fitted axially slidable in said hole. This bolt member is secured to or integral with a generally plate-shaped clamping member 3 which together with the bottom of recess 12 defines a clamping space for the blade. A loaded spring 6 fitted between bolt 14 and the bottom of hole 13 which may be completely closed or shouldered at 15 biases bolt 14 and with it clamping plate 3 in the direction away from blade 2.

Bolt 14 is formed with a lateral recess 16 in which is extended one arm of a two-arm lever 4 pivotal about a pivot point 17. This lever is shown as being disposed within a second recess or hole 18 formed within the support member transversely to hole 13. The other arm of lever 4 ends in a slanted bearing surface 19 which coacts with a bearing surface 20 at the end of a setting device 5. This setting device is shown as a headed screw threaded into an extension 18' of hole or recess 18.

The holder finally comprises a plate 7 secured to

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clamping plate 3 for instance by soldering or integral therewith. This plate is made of a very hard metal or tungsten carbide and serves as a chip breaker.

The holder as hereinbefore described, operates as follows:

Let it be assumed that there is no blade fitted in the holder and that it is desired to insert a blade. For this purpose, screw 5 is screwed out to a certain extent. As a result, the pressure of bearing surface 20 upon bearing surface 19 is relieved and spring 6 can push bolt 14 and with it clamping plate 3 upwardly thereby making space available for the insertion of a blade in the clamping space defined between the bottom of recess 12 and the lower surface of clamping plate 3, the said two surfaces forming in effect clamping jaws. As is evident, lever 4 is pivoted in clockwise direction when bolt 14 is pushed upwardly as seen in Fig. 1. After a blade has been fitted in recess 12, screw 5 is tightened as much as possible. As a result, the pressure of surface 20 against surface 19 pivots lever 4 in counter-clockwise direction thereby pressing the clamping plate 3 against the blade.

The blade holder according to Fig. 2 is similar in principle to the blade holder according to Fig. 1. Accordingly, corresponding parts are designated by the same reference numerals though primed.

The arrangement of the lever and the setting device are the same as in Fig. 1 with the exception that the screw head of Fig. 1 is replaced by a threaded bore. According to Fig. 2, a bolt member 8 is fitted axially slidable in transverse hole 13. The bolt ends in a set-off stub 8' upon which clamping plate 3' and the chip breaking plate 7' secured to plate 3' are rotatably fitted. Plates 3' and 7' can be tightly clamped to bolt 8 by tightening a lock nut 11. The adjustability of the angular position of plate 7' relative to bolt 8 and hence also relative to blade 2 permits to set the chip breaker for an angle best suited to the cut for which the blade has been designed or set.

Support member 1' is formed with a second transverse hole or bore 21 disposed parallel to bore 13 and opening in the bottom of recess 12. A bolt 9 is inserted in bore or hole 21 so that the bolt is axially displaceable but preferably secured against rotation. The end of bolt 9 is formed with or is secured to a slanted bearing surface 22. This bearing surface is so positioned that it is engageable with the inner edge of a blade 2 inserted in the holder. A screw 10 threaded in bore or hole 21 serves to position bolt 9 within the hole and to move the slanted surface 22 into the clamping space defined between clamping plate 3' and the bottom of recess 12.

The operation of the holder according to Fig. 2 is as follows:

The insertion of a blade in the holder and the tightening of the blade therein are apparent from the description of Fig. 1.

Let it now be assumed that the blade has been reground one or several times so that its rear edge will no longer bear against the rear end wall of the recess, Fig. 1 showing the blade bearing against the said end wall. As a result, a gap is left between the rear edge of the blade and the end wall of the recess resulting in a corresponding loss of the clamping support for the blade.

The arrangement of Fig. 2 permits to compensate for the reduction in the length of the blade end by tightening screw 10 whereby the slanted surface 22 is forced to abut against the rear edge of the blade thus effectively preventing a rearward displacement of the blade within the recess.

As appears from the previous description, bolt 9 and its slanted surface 22 permit a compensation of variations of the blade length in the holder within wide limits. This has the advantage that a cutting blade can be used to the fullest extent and also that blades having different lengths can be inserted in the same holder.

While the invention has been described in detail with respect to certain now preferred examples and embodiments of the invention it will be understood by those

skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed as new and desired to be secured by Letters Patent, is:

1. A holder for a tool blade comprising a blade support member, clamping means for releasably clamping the blade between said support member and said clamping means, said support member having a hole therethrough, a bolt member secured to the clamping means and slidably fitted in said hole for displacement of the clamping means in unison with the bolt member, a two-arm lever pivotally supported by said support member, one arm of said lever operatively engaging said bolt member for axial displacement thereof, and an adjustable setting means coacting with the other arm of said lever for pivoting the lever and retaining the same and said bolt member in a position in which a blade is clamped between the clamping means and the support member.

2. A holder according to claim 1, wherein said support member has a second hole issuing in the first hole transversely thereto, and wherein the said two-arm lever is pivotally mounted within said second hole, the said setting means being operable from the outside of said support member.

3. A holder according to claim 1 and further comprising loaded yieldable means disposed within said hole and biasing the bolt member in the direction for moving the clamping means away from the support member.

4. A device according to claim 1, wherein the said setting means and the respective arm of the two-arm lever each has a bearing surface, the said bearing surfaces coacting with each other so as to effect pivoting of said lever upon adjustment of said setting means.

5. A holder according to claim 4, wherein the said coacting bearing surfaces are in form of slanted surfaces in engagement with each other, and wherein the said setting means are adjustable for varying the distance between the pivot point of said lever and the setting means thereby effecting pivoting of the lever by varying said distance.

6. A holder according to claim 5, wherein the said support member includes a second hole issuing in the first hole transversely thereto, the said two-arm lever being pivotally mounted within said second hole, and wherein the said setting means comprise a screw member threaded in said support member and protruding into said second hole, the inner end of said screw member forming the respective slanted bearing surface.

7. A holder according to claim 1, wherein the bolt member is rotatable within said hole, and wherein the said clamping means comprise a plate-shaped member

secured to the bolt member for rotation in unison therewith relative to the support member, the said plate-shaped member and a respective outer surface of the support member forming two jaws for clamping the blade therebetween.

8. A holder according to claim 7, wherein the said plate-shaped member has a portion made of very hard metal and shaped to form a chip breaker.

9. A holder according to claim 8, wherein the said bolt member is formed with a stub protruding from the support member, the said plate-shaped member being rotatably fitted upon said stub, and wherein a locking nut is provided for securing the plate-shaped member on said stub in a selected angular position relative to the support member.

10. A holder according to claim 1, wherein the said support member has a second hole therethrough disposed parallel to the first hole, and wherein a second bolt member is fitted in said second hole axially adjustable therein, one end of said second bolt member forming a bearing surface positioned to abut against the inner edge of a blade clamped in the clamping space defined between said clamping means and said support member.

11. A holder according to claim 10, wherein said bearing surface of the second bolt member extends into said clamping space and is slanted so as to form an abutment for the inner edge of a clamped blade for preventing displacement of the blade within said clamping space.

12. A holder according to claim 11 and further comprising a second setting means coacting with the other end of said second bolt member for varying the axial position of said second bolt member in its hole thereby correspondingly varying said clamping space.

13. A holder according to claim 12, wherein the said second setting means comprise a screw member threaded in said support member on the side thereof opposite to the clamping space.

14. A holder according to claim 13, wherein the said second bolt member is secured against rotation within its hole.

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