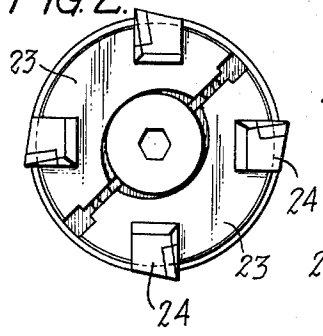
Aug. 8, 1950 W. T. HOWALD 2,517,668

TOOLHOLDER

Filed May 12, 1947

Fig. 2.



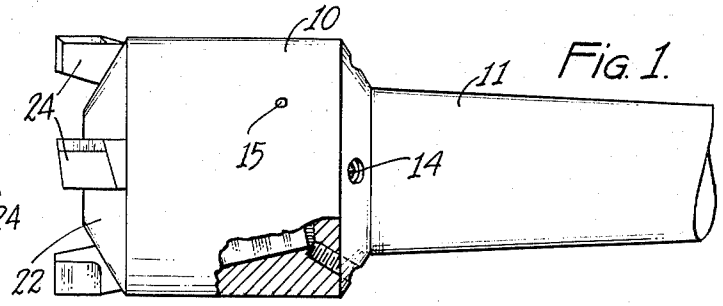


Fig. 1.

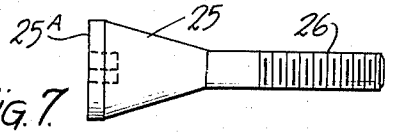


Fig. 7.

Fig. 4.

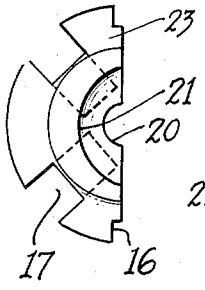
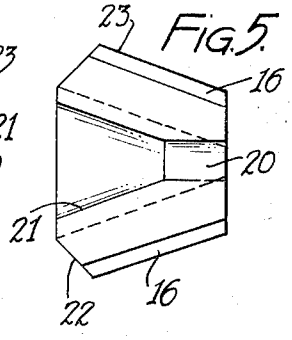


Fig. 5.



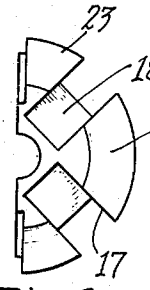


Fig. 6.

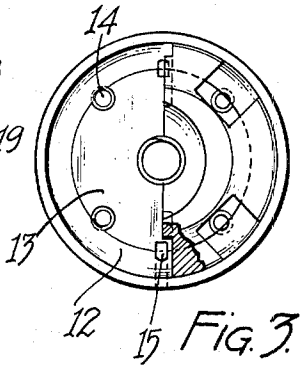
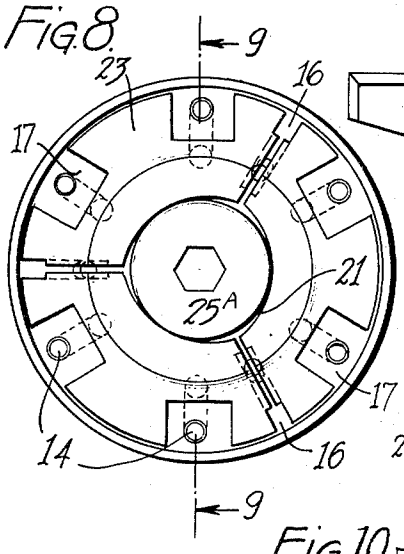


Fig. 3.

Fig. 8.



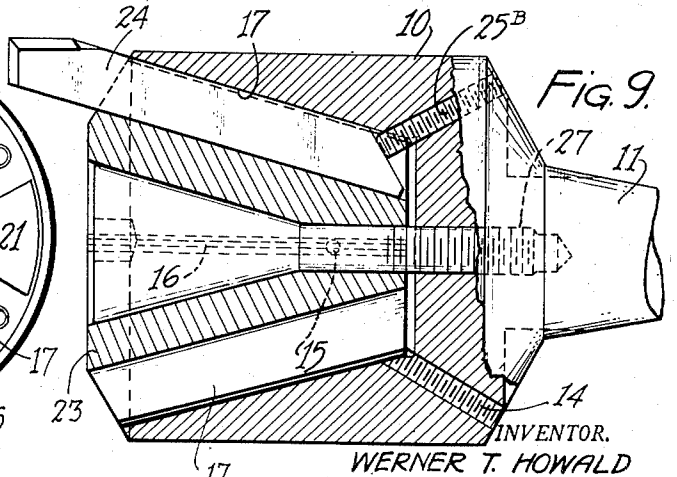
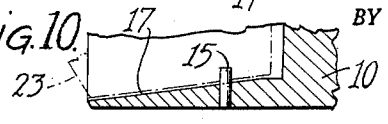


Fig. 9.

Fig. 10.



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TOOLHOLDER

Werner T. Howald, Brooklyn, N. Y.

Application May 12, 1947, Serial No. 747,433

9 Claims. (Cl. 29—105)

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This invention relates to tool holders and in particular to a holder characterized as an end mill into which may be inserted cutting tools.

A particular object of the invention is to provide in a tool holder of the character referred to, a structure in which cutting tools may be inserted and from which they may be removed for sharpening with a minimum amount of adjustment and time.

An equally important object of the invention is to provide in a holder a cavity into which may be placed like jaw members that automatically position the cutters by an adjusting motion applied by a universal jamming member that can be quickly manipulated to lock the parts into position and accurately position them for precision machine work.

A still further object of the invention is to provide jaw members of like conformation so that no time need be wasted in the selection thereof when assembling the holder parts; to provide a simplified means for locking the parts against rotation when the same are in tool holding position and to so arrange the parts that the major working thrust on the tools in operation is borne by the solid parts of the tool holder so that they will not shift or get out of alignment.

With these and other objects in view, the invention comprises certain constructions hereinafter described and then particularly pointed out in the claims and a preferred embodiment of my invention is illustrated in the accompanying drawing, in which:

Figure 1 is a side view of a tool holder constructed in accordance with my invention, a part thereof being broken away to illustrate the location of the tool,

Figure 2 is a face view of the tool holder shown in Figure 1, the tool retaining means being shown in position,

Figure 3 is a view similar to Figure 2 showing one of the tool jamming jaws in position in the holder, a part being shown in section to show the rotation preventing means in position,

Figure 4 is a face view of one of the jaw members without the tools therein,

Figure 5 is a side view of the jaw illustrated in Figure 4, the obliquely disposed tool seats being shown,

Figure 6 is a view of the rear end of the jaw member shown in Figure 4,

Figure 7 is a side view of the center or jamming screw used to lock the jaws in tool fixing relation with the sides of the holder,

Figure 8 is a face view of a holder similar to Figure 2 showing three jaws for holding a larger number of cutting tools and,

Figure 9 is a section taken on the line 9—9 of Figure 8 showing the arrangement of the jaws,

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tools and holder in relative working arrangement.

Figure 10 is a fragmentary section showing the holding pin.

Referring to the drawing in detail, 10 indicates the head of a tool holder which has formed integrally therewith the tapered shank 11 through the medium of which the holder is secured for rotation in a chuck or other rotating part. The head is provided with a tapered cavity 12 extending inwardly from the front thereof and terminating at the inner wall 13, said wall being obliquely disposed with respect to the axis of the holder and providing a finished seat for the tools that are mounted in the holder. The head is provided with spaced threaded bores 14 which pass through the solid back of the head and open into the wall 13 in position to engage the rear or inner ends of tools positioned in the holder, so that threaded set screws 25B may be adjusted therein to vary the amount to which the tools may be lowered into the cavity. The tapered wall of the cavity may be represented by the numeral 17 and at diametrically opposite sides of the wall stud pins 15 are provided to act as stops to prevent turning of the jaw pieces in the holder.

The jaw pieces are in tapered cylindrical half units that fit together within the cavity to forcibly hold tool bits in place against the cavity wall. As both jaws, or any number that may fit into the cavity as in Figure 8, are substantially alike, a description on one will suffice. Each jaw unit 23 is exteriorly tapered as at 19 and fluted as at 17 to provide tool seats whose bottom walls 18 are parallel to the cavity wall 17 when the units are in place in the holder. The opposing faces of each unit are channelled as at 20 to provide a bore when the units are assembled and a well 21 opening from said bore. The well at the bore end is concentric and tapers or flares outwardly with an eccentric contour so that when a threaded jamming screw having a concentric taper 25 and a threaded stem 26 is threaded into the threaded bore 27 and in turning rides down into the well, it spreads the jaws apart and causes them to force the tools 24 effectively against the cavity wall 12. The front of the jaw is bevelled as at 22 and the seat slots 17 are not as deep as the thickness of the tool shanks so that as shown in Figure 9, the pressure of the jamming screw and the jaws is fully effective at any adjusted position of the tools in the cavity. The jam screw is indicated as 25A.

The opposing faces of the jaw members are also undercut as at 16 so that a flute is provided when the jaws are assembled and into which flute the stop or stud pins 15 project at opposite sides of the jaws to hold the latter from turning by effectively locking them to the holder as a unit. The jamming screw 25A is provided

with a suitable socket so that a wrench may be used to adjust it in place.

It is evident that any number of jaws may be employed depending upon the capacity of the holder and the locking of the tools 24 into position in the holder provides an effective holding means that acts against the thrust of the tool in cutting action so that the accuracy of the machine work is assured and the resetting of the tools after servicing or sharpening is facilitated by requiring only a slight adjustment of the parts.

It is evident therefore that I have provided a novel tool holder or mounting including a solid steel body hardened and ground, into which may be placed standard tools that can be easily applied to the holder and can be maintained accurately in position with a minimum of time and trouble and one that lends itself to use in a variety of ways. An important feature of the invention is the three point support including the two wall points or bearing surfaces for the tools and the pressure application point of the jamming screw. Tools jammed against a ground wall are accurately and positively held against displacement.

My invention is not to be restricted to the precise details of construction shown since various changes and modifications therein may be made without departing from the scope of the invention or sacrificing the advantages to be derived from its use.

What I claim is:

1. A tool holder comprising a body having an inwardly tapered opening at one end thereof constituting a tool seat, jaws removably associated with said opening and presenting tool slots in the peripheries thereof and coacting eccentric and concentric means for jamming said jaws into the opening to hold tools disposed in said slots forcibly against the wall of the opening.

2. A tool holder comprising a body having an inwardly tapered opening at one end thereof constituting a tool seat, jaws removably associated with said opening and presenting tool slots in the peripheries thereof, the bottom of said slots being parallel to the wall of said opening means for jamming said jaws into the opening to hold tools disposed in said slots forcibly against the wall of the opening and said slots being of less depth than the thickness of the tools held therein.

3. A tool holder comprising a body having an inwardly tapered opening therein constituting a seat for tools, separable like jaw members in the opening presenting surface slots arranged parallel with the wall of said opening and of lesser depth than the thickness of said tools for holding tools, a jamming screw threaded into said body and arranged to spread the jaws apart to force the tools into forcible contact with the wall of the opening and means for preventing rotation of the jaws with respect to said body.

4. A tool holder comprising a head and a shank and the head being formed to provide an inwardly tapered opening terminating in an inner wall, the wall of the opening constituting a tool seat, opposed jaw members fitting into said opening and shaped to provide seats for tools positioned against said wall, the opposing faces of said jaw members being shaped to provide eccentric well forming faces and a concentric jamming screw threaded into said holder and adjustable along said faces to separate said jaw members and force the tools therein into forcible engagement with said inner wall.

5. A tool holder comprising a head and a tapered shank extending therefrom, the head being shaped to provide a tapered opening and an end wall, tapered jaw units for fit within said opening said units having slots for tools fitting between the jaws and the wall of the tapered opening, said slots being of lesser depth than the thickness of the tools held therein, means for expanding the jaws to force the tools into contact with the wall, and means for limiting the movement of the tools into said tapered opening.

6. A tool holder comprising a head having a tapered opening therein, opposing jaw members fitting within said opening and presenting a central well and bore, a jamming member fitting into the well and the bore and adjustable in the latter to spread the jaws apart, said jaw members being longitudinally slotted along their outer surfaces to provide tool receptacles beyond which the longitudinal sides of the tools protrude to engage the said tapered opening and be jammed thereagainst by the spreading movement of said jaws, and means for preventing the turning of said jaws with respect to the holder.

7. A tool holder comprising a body having an inwardly tapered opening therein constituting a tool seat, segmental jaw members arranged to fit into said opening and having outer slotted faces for receiving tools to be held in the holder, a central jamming screw adjustably mounted in said holder extending into said opening and about which the segmental jaw members fit, said screw having a concentric tapered portion and the jaws having eccentric tapered walls whereby the jaws are spread apart to jam the tools against said tapered opening wall when the screw is advanced into said opening.

8. A tool holder comprising a body having a tapered opening, segmental-jaw members fitting into said opening and presenting slots for tools on the outer faces thereof, the slots being of lesser depth than the thickness of the tools the opposing faces of the jaws being undercut, stop studs in the wall of the opening for engagement with said undercuts to prevent turning of the jaws relatively to the body, and means for spreading the jaws to jam tools in said slots against said body.

9. A tool holder comprising a hollow head, jaw members fitting into the hollow of the head and being slotted to receive tools adapted to seat on the wall of said hollow, a tapered jamming member fitting between said jaw members, means for adjusting the jamming member axially of the head and the coacting faces of the jaw members and the jamming member engaging each other at points intermediate the tools whereby said jaw members constitute means for jamming the tools individually against the wall.

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