May 27, 1958 A. NUDING 2,836,240

CUT-OFF TOOL

Filed June 9, 1955

Fig. 1

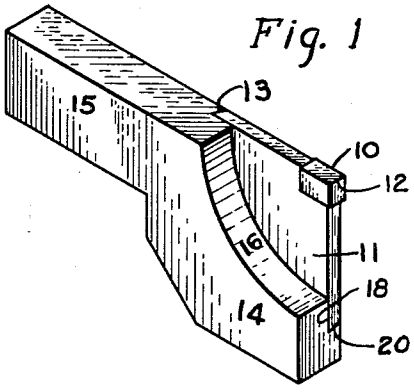


Fig. 2

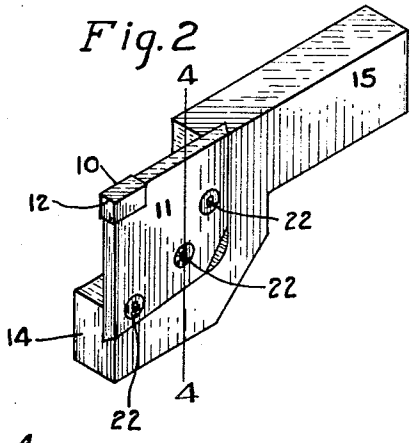


Fig. 4

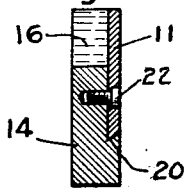


Fig. 3

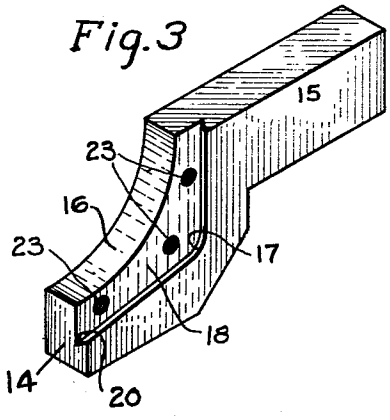


Fig. 5

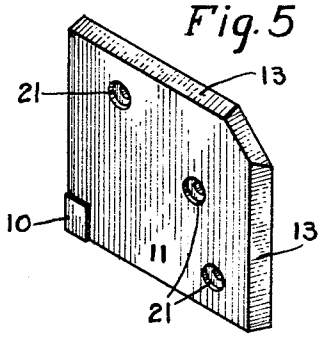
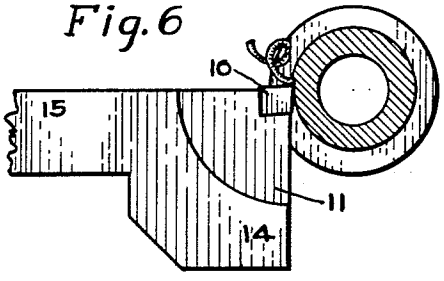


Fig. 6



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2,836,240

Patented May 27, 1958

2,836,240

CUT-OFF TOOL

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Application June 9, 1955, Serial No. 514,269

7 Claims. (Cl. 164—36)

The present invention relates to machine tools and more particularly to a cut-off tool for severing bar or tube stock, such as carbon steel or the like.

In tools of the character to which the invention relates it has been proposed, heretofore, to employ straight shank cutters in many instances, or insert bits in other instances, both of which have fundamental disadvantages. A primary objection to a bit or cutter projecting from, or part of a holder, is that it is unsupported in the vertical plane passing through the cutting edge so that chatter or vibration takes place. Where insert bits are used as an integral part of the tool any damage renders the entire tool worthless and it has to be replaced.

An object of the present invention is to provide a cut-off tool for cutting through rotating bar stock wherein the disadvantages of such prior tools are overcome.

Another object is to provide a cut-off tool wherein the cutting bit has a base below and in vertical alinement with the bit as a means for absorbing stresses downwardly upon the bit.

Another object is to provide a cut-off tool wherein the usual vibrations developing in the use of such tools are eliminated or substantially reduced.

A further object is to provide a novel removable supporting blade for a bit whereby bits can be repaired or replaced without losing a complete tool. Further objects will appear hereinafter.

In the accompanying drawings Figure 1 is a perspective view of a cut off tool of the invention showing one side of the tool: Figure 2 is a like view showing the opposite side of the tool: Figure 3 is a perspective view of the holder with the tool blade removed: Figure 4 is a section on line 4—4 of Figure 2: Figure 5 is a perspective view of a detached blade showing the scarfed anchoring edges: and Figure 6 is a fragmentary elevation of the tool in operative relation to the stock.

Referring to the drawings, one form of cutting tool of the invention is shown comprising a cutting bit **10**, preferably of the carbide type, mounted as a permanent insert at the other corner of a supporting blade **11** with its cutting edge **12** lying substantially in the plane of the edge of the blade **11**. As here shown, the bit **10** has a flat top ground into a cutting edge **12**, but the invention is not limited to this particular construction as other cutting edges can serve the purpose, for example a bevelled type of edge.

The blade **11** is, preferably, rectangular in shape and of a thickness such as to provide a rugged support for the bit **10** capable of resisting vibration during a cutting operation. As a further guard against vibration, the bottom and rear edge of the blade **11** are bevelled to form a solid interlock with the tool part when attached thereto as will be explained. As shown, the bevel **13** has an angular cut sufficient to resist lateral stresses and illustratively forty-five degree cut has been found practical.

As a support for the blade **11**, a holder is provided

having a base **14** forming an integral extension of a shank **15**, this later serving as a means to mount the tool in the post of a lathe, or the like. The base **14** is formed with an arcuate top face **16** developed on a radius approximately including the bit **10**, such face thereby providing a cut-out permitting the stock to ride freely therein during a cut-off operation. Further it should be noted that the base **14** is of substantial thickness capable of absorbing stresses ordinarily causing vibration. An L-shaped recess **17** is formed in one side of the base **14**, forming an angular seat conforming to the configuration of the meeting edges of the bottom and one side of the blade **11**. The recess **17** provides a relatively wide vertical plane surface **18** to firmly brace the blade in vertical position while its laterally off-set ledge **20** is bevelled throughout its length complementally to the bevelled edge **13** of the blade **11**, so that the latter seats firmly in the recess where assembled for use. The blade **11** is rigidly secured to the side of the base **14** by providing holes **21** in the blade **11** for the respective passage of screws **22** entering tapped holes **23** in the base **14**. The matching rows of holes **21** and **23** are arranged to conform to the curvature of the face **16** to thereby most effectively resist radial thrust from the bit **10** while cutting. This relatively wide support face and the interlocking bevels reduce vibration to a negligible minimum. The solid base **14** projecting below and in substantial alinement with the bit **10**, makes it possible to perform a cutting operation at unusually high speeds without vibration. Furthermore this overall stiffness built into the tool prolongs the life of the bit, saves resharpening time with consequent reduction in the cost of operations.

It will now be apparent that a complete unitary tool has been devised for effectively severing bar and tube stock while compensating for vertical and lateral stresses which, heretofore have presented a problem because of the development of vibrations. Also it should be understood that the construction shown is an example of one form of the invention and is not limited to a base specifically in exact vertical alinement with the bit because variations thereof can be made without departing from the spirit of the invention. Further while the recess **17** is shown on the left side of the base it is possible and sometimes advantageous to have the recess **17** on the opposite side to permit cutting off the work when turning in the opposite direction. While the preferred shape of the blade **11** is rectangular the invention is not to be limited to this particular configuration.

What is claimed is:

1. A cut-off tool comprising a cutting bit, a blade having two edges forming a notched corner for seating said bit in supported cutting position, said blade also having an angular edge opposite to said corner, a base having a recess in one side complemental to the contour of the said angular edges of said blade as a seat therefor, means to removably attach said blade to said base, said base also having an arcuate face terminating at one end in alinement with the cutting edge of said bit as a clearance for work being cut, and a shank for said base for attachment to a lathe post.

2. A cut-off tool according to claim 1 wherein means is provided between the blade and the base to resist laterally applied stresses.

3. A cut-off tool according to claim 2 wherein the resisting means are bevelled meeting surfaces of the blade edge and the base recess.

4. A cut-off tool comprising a cutting bit, a rectangular blade supporting said bit in cutting position, a base having a recess in one side complemental to the contour of a portion of the blade to seat said blade against relative movement edgewise, means removably attaching said blade in said recess, and a clearance surface formed on

one end of the top of said base developed on a radius substantially centered at said bit to pass under the stock being cut, said surface terminating at the leading end of the base in the vertical plane of the bit edge of the blade.

5. A cut-off tool, comprising a substantially rectangular flat blade, a cutting bit fixedly inserted in an upper corner thereof, a base having a recess opening from one end of said base and shaped to seat said blade against relative movement edgewise, a shank at the other end of said base for attachment to a lathe post, and means laterally anchoring said blade seated in said recess, said base also having an upper marginal arcuate face intersecting said recess and terminating at its lower end in the plane of the bit end of the blade when seated, whereby said bit has a vertically alined support to resist cutting pressure in all cutting positions.

6. A cut-off tool comprising a base having a top arcuate face and an angular side recess intersecting said face, said recess and face terminating at one end of said base in a common vertical plane, a shank on said base for attachment to a lathe post, a blade complementally contoured to seat in said recess and dimensioned to project laterally above said face as a side wall thereof, and with a free edge thereof lying in said vertical plane, and a cutting bit attached to the upper end of said free edge, whereby said bit has an alined vertical support to resist working pressure thereon.

7. A cut-off tool comprising a cutting bit, a substantially quadrilaterally shaped blade having two edges meeting to support said bit in cutting position as an insert, a base having a recess to receive a portion of said blade and forming a seat for the blade edges respectively opposite the bit supporting edges, means attaching said blade to said base, and a shank on said base for attachment to a lathe post.

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