

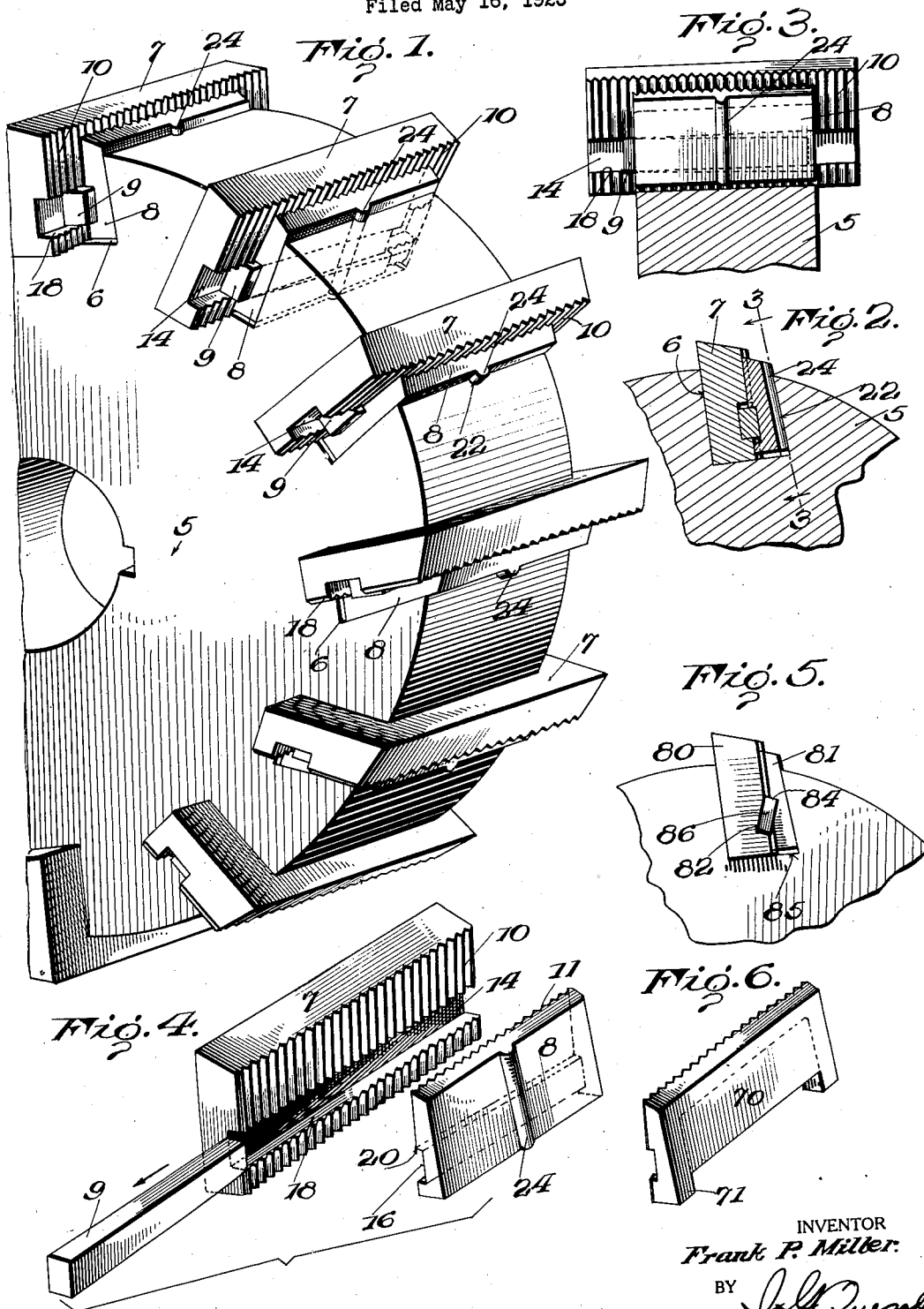
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ROTARY CUTTER

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ROTARY CUTTER.

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This invention relates to rotary cutters of the inserted blade type.

An important aim of this invention is to provide a rotary cutter in the form of a milling cutter, a reamer, or the like, having simple means whereby the inserted, detachable, work engaging elements are positively and firmly seated and are held against radial or longitudinal shifting while in use.

A further aim is to provide a rotary cutter which is characterized by fewness of parts, simplicity of adjustment, and practicability in the metal working art.

In the accompanying drawing forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a fragmentary perspective of a milling cutter embodying the invention;

Figure 2 is a detail sectional view through the cutter;

Figure 3 is a sectional view taken on line 3—3 of Figure 2;

Figure 4 is a group perspective of a blade and the holding means therefor;

Figure 5 is a fragmentary side elevation of a slight modification of the invention;

Figure 6 is a perspective illustrating a modified form of block, the modification consisting in the means to hold the wedge block against axial movement.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 5 designates a milling cutter body provided with slots 6 extending out through the periphery thereof for the reception of blades 7, wedge blocks 8, and wedge pins 9.

Figure 4 illustrates that each blade 7 is provided on one side face thereof with transverse teeth or serrations 10 adapted to interfit with the transverse teeth or serrations 11 on the opposed face of the tapered wedge block 8. The wedge block 11 is uniformly tapered toward the outer edge thereof so that when it is forced outwardly it will bind the blade securely in position.

In carrying out the invention the opposed sides of the blades 7 and the wedge blocks 8 are provided with grooves 14 and 16, respectively, which form in effect shoulders or abutments 18 and 20, for engagement by the tapered wedge pins 9.

In use, the blades 7 and the wedge blocks 8 are inserted into the slots 6 with the

grooves 14 and 16 in opposed relation. The tapered wedge pins 9 may be driven into the openings formed by the opposed grooves 14 and 16 and into engagement with the oppositely located abutments 18 and 20. When the tapered wedge pins 9 are driven into place, the tapered wedge blocks 8 are driven outwardly while the blades 7 are driven inwardly. It will be seen that one of the abutments 14 or 16 extends at an angle to the other abutment so that both abutments are properly presented to the wedge pin 9. In other words, the shoulders or abutments converge. By thus driving the blades inwardly they are firmly seated against the bottom walls of the slots 6 or against shims which may for the purpose of adjustment be placed between the inner edges of the blades and the bottom walls of the slots. The outward movement of the tapered wedge blocks 8 will cause the wedge blocks to be firmly anchored in place in binding engagement with the blades 7 whereby the blades are not only seated firmly and flatly in engagement with the bottom walls of the slots, but are effectively braced at the opposite sides thereof to withstand the strain to which milling cutters and the like are subjected.

Particular attention is directed to Figures 1 and 2 which illustrate that one side wall of each slot 6 is provided with a transverse groove 22 extending out through the periphery of the body 5 for the reception of a rib 24 formed on one side of the tapered wedge block 8. When the rib 24 is received in the groove 22 axial movement of the wedge block 8 and the blade interlocked therewith will be positively prevented. In other words, the rib 20 effectively transmits the end thrust on the blade to the body.

Figure 6 illustrates a modified form of taking the end thrust on the blade. By reference to this figure it will be seen that the ends of the wedge block 70 are provided with lugs 71 at the ends thereof, which lugs overhang the body 5 and thereby prevent endwise movement of the wedge block and the associated blade.

A further modification of the invention is illustrated in Figure 5 wherein it is shown that the opposed surfaces of the blade 80 and the wedge block 81 are grooved as shown at 82 to define shoulders or abutments 84 against which the tapered wedge pin 86 en-

gages for forcing the tapered wedge block 81 outwardly and the blade 80 inwardly into firm seating engagement with the bottom wall of the slot. It will be seen with reference to Figure 5 that the grooves 82 are approximately triangular in cross section and this disposes the tapered wedge pin at an angle with respect to the plane of the blade.

When the blades of the improved milling or other cutter are firmly wedged in place, they will remain in adjustment and more specifically they will be held against axial or in-and-out movement as the result of strain incident to use. It will be seen by reference to Figures 5 and 6 that the teeth 10 extend over the entire inner faces of the blades 7 and therefore permit of the longitudinal adjustment of the blades.

It is a simple matter to detach any one or all of the blades and the wedge blocks by simply tapping the reduced ends of the wedge pins 21 and withdrawing the same whereupon the wedge blocks may be loosened and quickly detached with the blades.

In summarizing, it will be seen that each slot 6 receives a work engaging member consisting of a pair of sections, the opposed sides of which have more or less converging shoulders with which the tapered wedge pin 9 is engaged to force one of the sections outwardly and the other section inwardly to lock the sections firmly in place. The grooves which define the shoulders 18 and 20 extend out through opposite ends of the sections 7 and 8 so that the wedge pins are accessible from either side of the body for tightening or loosening.

The foregoing description and the accompanying drawing illustrate that the invention is capable of a variety of mechanical expressions and it is therefore to be understood that such minor changes in construction and arrangement of parts may be made as will remain within the spirit of the invention and the scope of what is claimed and that the invention may be employed in connection with reamers, milling cutters, tool holders for lathes, counterbores and the like.

Having thus described the invention, what is claimed is:—

1. A cutter comprising a body having a slot, a blade in said slot, a tapered wedge block in said slot and having means to hold the blade against radial and longitudinal displacement, and an axially extending wedge pin between said blade and block and having means to urge the blade inwardly and the block outwardly.

2. A cutter comprising a body having a slot, a blade in said slot, a transversely tapered wedge block in said slot and having means to hold the blade against radial and longitudinal displacement, and a wedge pin between said blade and block and having

means to urge the blade inwardly and the block outwardly, said pin being tapered and being accessible from one side of the body.

3. A rotary cutter comprising a body having a slot, a blade positioned in said slot, a wedge block in said slot, said blade and said block being provided with oppositely located abutments, and a pin extending substantially parallel to the axis of the body and positioned between said abutments in engagement with the same to urge said blade in one direction and the block in the other direction.

4. A rotary cutter comprising a body having a slot, a blade in said slot, a tapered wedge block in said slot, the opposed sides of said blade and said block being provided with abutments, and a longitudinally adjustable tapered wedge pin confined between said abutments in engagement with the same and urging the blade into firm seating engagement with the bottom wall of the slot and urging the wedge block outwardly into binding engagement with the blade.

5. A rotary cutter comprising a body having a slot, a blade in said slot, a tapered wedge block in said slot, the opposed sides of said blade and said block being provided with converging abutments, and a tapered wedge pin confined between said converging abutments in engagement with the same and urging the blade into firm seating engagement with the bottom wall of the slot and urging the wedge block outwardly into binding engagement with the blade, the opposed sides of said blade and said wedge block being provided with interfitting holding means.

6. A rotary cutter comprising a body having a slot, a blade in said slot, a tapered wedge block in said slot, the opposed sides of said blade and said block being provided with converging abutments, and a tapered wedge pin confined between said converging abutments in engagement with the same and urging the blade into firm seating engagement with the bottom wall of the slot and urging the wedge block outwardly into binding engagement with the blade, the opposed sides of said blade and said wedge block being provided with interfitting holding means, there being means associated with said wedge block to hold the same against axial movement.

7. A cutter having a slot, a blade in said slot, a wedge block at one side of said blade, the opposed sides of said blade and said wedge block being provided with grooves defining shoulders, and means in said grooves in engagement with said shoulders to urge the blade into firm seating engagement with the bottom wall of said slot and to urge the wedge block outwardly into firm binding engagement with said blade and the adjacent wall of the slot, said grooves affording easy

access to said means for tightening or loosening the same.

8. A cutter having a slot, a blade in said slot, a wedge block at one side of said blade, the opposed sides of said blade and said wedge block being provided with angularly extending grooves defining converging shoulders, and means in said grooves in engagement with said converging shoulders to urge the blade into firm seating engagement with the bottom wall of said slot and to urge the wedge block outwardly into firm binding engagement with said blade and the adjacent wall of the slot, there being means to hold said blade and said block against axial movement.

9. A rotary cutter comprising a body having a slot, a work engaging member in said slot and consisting of a pair of sections, the opposed sides of which have converging shoulders, and a wedge pin extending substantially parallel to the axis of the body and engaging said shoulders to urge one of the sections inwardly and the other section outwardly, said wedge pin being movable endwise and being accessible from either side of the body.

10. A rotary cutter comprising a body having a slot, a work engaging member in said slot and consisting of a pair of sections having shoulders, and a tapered wedge pin engaging said shoulders to urge one of the sections outwardly and the other section inwardly, one of the sections being tapered transversely.

11. A rotary cutter comprising a body having a slot, a work engaging member in said slot and consisting of a pair of sections having the opposed sides thereof provided with interfitting holding means and with converging shoulders, and a wedge pin extending approximately parallel to the axis of the body and engaged with said shoulders

to urge one of the sections inwardly and the other section outwardly.

12. A rotary cutter comprising a body having a slot, a blade positioned in said slot, a wedge block of tapered formation in said slot, the opposed surfaces of said blade and said block being provided with interfitting teeth and with oppositely located angularly extending grooves defining converging shoulders, a tapered wedge pin received in said grooves in engagement with said shoulders to urge the blade into firm seating engagement with the bottom wall of the slot and to urge the tapered wedge block outwardly into binding engagement with the blade and an adjacent wall of the slot, the outer wall of said wedge block and an adjacent wall of the slot being provided with interfitting locking means for holding the wedge block and the blade against axial movement, the inner wall of said wedge block being normally spaced from the bottom wall of the slot.

13. A cutter comprising a body having a slot, a blade and a wedge block in said slot, the opposed surfaces of said blade and said block being provided with grooves substantially triangular in cross section, and a wedge member adjustable longitudinally in said grooves and disposed at an angle with respect to the plane of the blade.

14. A rotary cutter comprising a body having a slot, a blade and a wedge block in said slot, the opposed sides of said blade and said wedge block having abutments, one of which extends at an angle to the other, and a pin engaging said abutments and having ends accessible from the sides of the body whereby the pin may be moved endwise in both directions.

In testimony whereof I affix my signature.

FRANK P. MILLER.