Oct. 23, 1956 F. L. KELLER 2,767,531

GRINDING FIXTURE

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Fig. 1

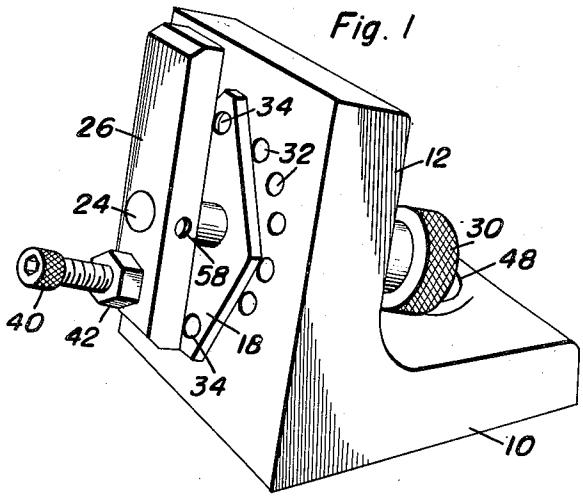


Fig. 7

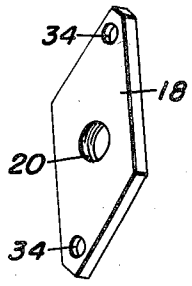


Fig. 2

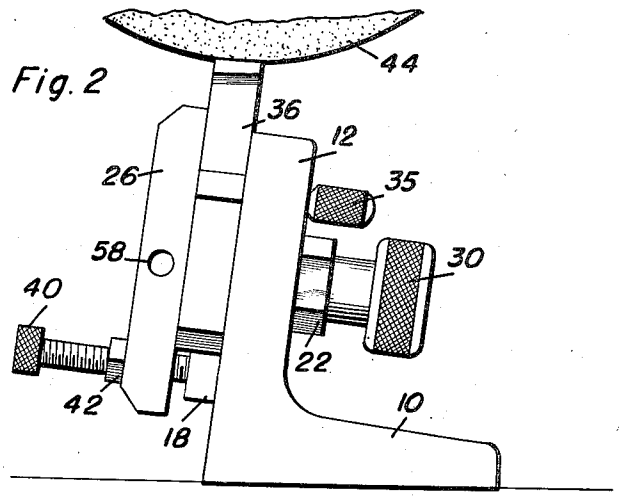


Fig. 8

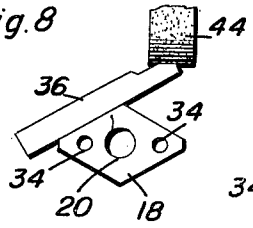
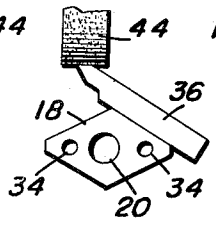


Fig. 9



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Fig. 3

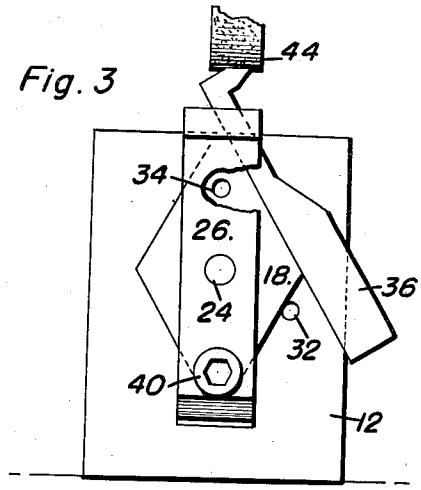


Fig. 4

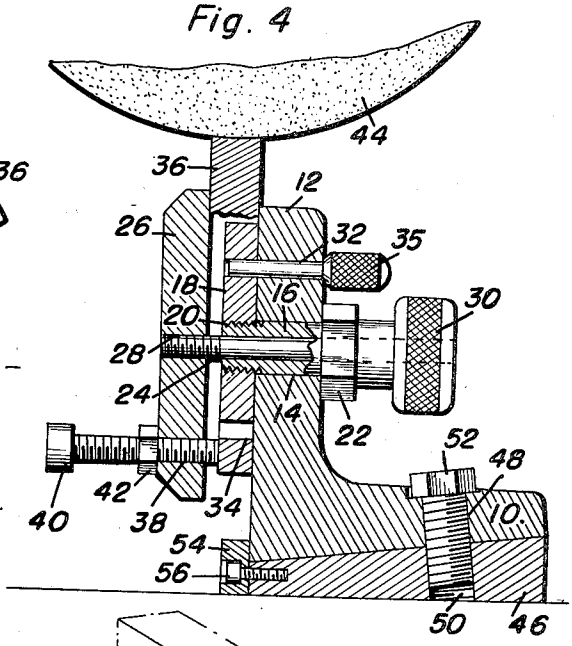


Fig. 5

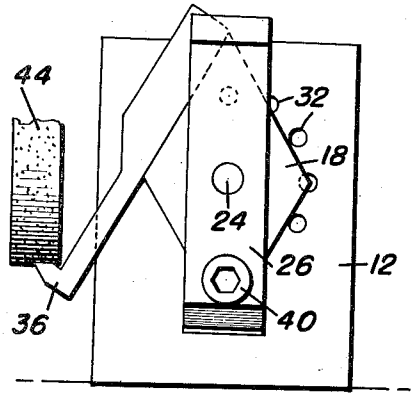


Fig. 6

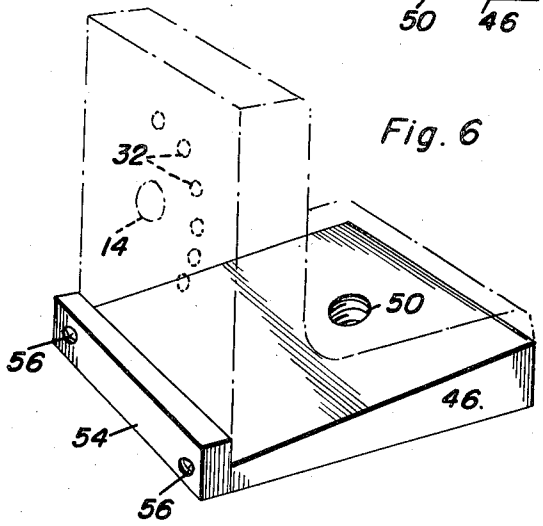
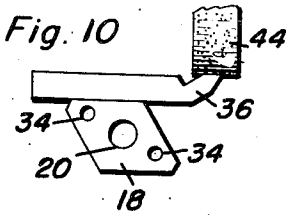


Fig. 10



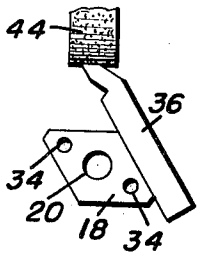


Fig. 11

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United States Patent Office 2,767,531 Patented Oct. 23, 1956

2,767,531

GRINDING FIXTURE

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Application March 11, 1954, Serial No. 415,666

4 Claims. (Cl. 51—220)

This invention relates to a grinding fixture and more particularly to a device which is adapted for positioning the tool for grinding purposes.

An object of this invention is to provide a grinding fixture wherein a cutting tool may be positioned for accurately grinding the same.

Another object of this invention is to provide a grinding fixture which has adjustable securing means for accommodating various sized tools.

A further object of this invention is to provide a grinding fixture wherein the means for positioning the tool comprises a plate having several faces upon which the tool may be positioned and clamped for removing under a grinding disk.

A further object of this invention is to provide a grinding fixture which is provided with an adapter whereby the fixture may be placed in a position to support a tool bit for shaping purposes.

Yet a further object of this invention is to provide a grinding fixture which is simple and efficient in construction, and durable and lasting in use.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the grinding fixture forming the subject of this invention;

Figure 2 is a side elevational view of the grinding fixture forming the subject of this invention showing the same in position beneath a grinding disk;

Figure 3 is a front elevational view of the grinding fixture forming the subject of this invention;

Figure 4 is a vertical sectional view of the grinding fixture forming the subject of this invention showing the adapter mounted thereon;

Figure 5 is a front end elevational view of the grinding fixture formed in accordance with this invention with a tool mounted in position thereon;

Figure 6 is a perspective view of the adapter used with the grinding fixture forming the subject of this invention with the main body of the grinding fixture shown in broken lines;

Figure 7 is a perspective view of the tool positioning plate;

Figure 8 is a view illustrating one position of the tool with respect to the positioning plate;

Figure 9 is a view illustrating another position of the tool with respect to the positioning plate;

Figure 10 is a still further view of another position of the tool with respect to the positioning plate; and

Figure 11 is a yet further view of a position of the tool with respect to the positioning plate.

Referring now more particularly to the accompanying drawings it will be seen that the improved grinding fixture forming the subject of this invention includes, a support

formed of a substantially L-shaped member having legs 10 and 12. The outer faces of the legs 10 and 12 form an angle of less than 90° with each other. The leg 10 is adapted to be positioned in a horizontal plane with the leg 12 extending substantially vertically upwardly therefrom.

The leg 12 is provided with a central aperture 14 extending therethrough. A hollow screw 16 is inserted through the aperture 14 and is threaded at one end thereof. The tool rest is adapted to be mounted on the screw 16. The tool rest comprises a substantially diamond shaped indexing plate 18 having a central internally threaded aperture 20 extending therethrough. The plate 18 is adapted to be positioned against the outer face of leg 12 with the threaded end of the screw 16 being positioned in the threaded aperture 20 of the plate. A head 22 is formed on the other end of the screw 16 and engages the inner face of leg 12 for locking the plate 18 in position against the outer face of leg 12.

Extending through the hollow screw 16 is a pin 24 having a threaded end extending beyond the plate 18. A strap 26 is provided with a central internally threaded aperture 28 which receives the threaded end of the rod 24. The other end of the rod 24 is threaded and receives thereon a knurled nut 30 whereby rotation in one direction of the rod 24 in the hollow screw 16 results in the strap 26 being urged toward and away from the plate 18 and leg 12 by virtue of the relationship of the threaded aperture 28 and the threaded end of rod 24.

In order to more accurately position the plate 18 with respect to the plate 12, the plate 12 is provided with a plurality of spaced apertures 32 extending therethrough. The apertures 32 are arranged radially of the aperture 14. The plate 18 is provided with a pair of apertures 34 adjacent the apices which are the most distant. The apertures 34 are adapted to selectively register with the apertures 32 in the leg 12. A pin 35 having an enlarged head at one end is adapted to be inserted through one of the apertures 32 and into one of the apertures 34 for selectively positioning the plate 18 on the leg 12.

As seen in Figures 4 and 5, the plate 18 is set in adjusted position and then a tool bit 36 is placed with one side thereof engaging one of the faces of the plate 18. The strap 26 is then tightened to frictionally retain the tool in position against the leg 12. As is readily apparent, the strap 26 engages the tool bit 36 at the upper end of the strap.

In order to balance the strap 26, the strap 26 is provided with an aperture 38 extending therethrough adjacent its lower end. The aperture 38 is internally threaded and receives therein an externally threaded screw 40. The screw 40 is also provided with a nut 42 whereby the screw 40 may be secured in adjusted position on the strap 26. Thus, it will be seen that the screw 40 may be adjusted so that the lower end of the strap 26 will be positioned away from the leg 12 a distance equal to the positioning of the upper end of the strap 26. Thus, the tool bit 36 will be held in adjusted position for movement beneath a grinding disk 44.

As shown in Figures 1 and 2, the support is positioned whereby the tool bit 36 may be ground to the desired angle. However, it is sometimes necessary to shape the tool bit prior to grinding the cutting faces. In such a case, it is necessary that the outer face of the leg 12 extend in a vertical position. In order to accomplish this, an adapter is provided for the support. This adapter comprises a block 46 having an upper face which has an angle opposite to the angle of the face of leg 10. Thus, when the block 46 is mounted on the leg 10 the leg 12 will extend in a vertical position.

The leg 10 is provided with an aperture 48 extending therethrough. The block 46 is provided with an in-

ternally threaded aperture **50** extending therethrough and adapted to be placed in alignment with the aperture **48** and leg **10**. A suitable bolt **52** is adapted to be inserted through the aperture **48** and threadedly engaged in the aperture **50**. This will secure the block **46** to the leg **10**. In order to properly position the block **46** on the leg **10** at all times, the block **46** is provided with a vertically extending flange **54** secured to one end thereof and adapted to engage the lower edge of the leg **12**. Suitable fasteners **56** may be inserted through the flange **54** and into the block **46** for securing the flange **54** to the block **46**.

In order to prevent the rod **24** from unseating itself from the plate **26** when the knurled nut **30** is rotated a suitable tapered pin **58** may be inserted through the strap **26** and into engagement with the rod **24** for preventing relative movement between the rod **24** and the strap **26**.

In practical use of the device, when it is desired to shape a tool bit for cutting threads, the block **46** is positioned on the leg **10** so that the leg **12** extends in a vertical position. Then, the plate **18** is set to the desired angle. After a tool bit **36** has been placed on the plate **18** the strap **26** is tightened thereagainst to retain the tool bit in position. Then, the fixture is moved beneath a grinding disk for shaping the tool bit.

The block **46** is then removed by removing the bolt **52**. Then, the plate **18** is reset for the correct position and the tool bit **36** again mounted thereon by means of a strap **26**. The fixture is then moved beneath the grinding wheel as seen in Figure 2 to grind the end of the tool bit **36**.

Figures 8 and 9 illustrate the correct setting of the tool rest for grinding a straight external thread tool bit. Figures 10 and 11 illustrate the correct setting of the tool rest for grinding an offset tool bit. Figures 3 and 5 also illustrate the correct setting for grinding an internal threading tool bit and wherein Figure 3 illustrates how the outer angle is ground and Figure 5 illustrates the grinding of the inner angle.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A grinding fixture for supporting tool bits to be ground at various angles with respect to a horizontal support surface comprising a support member including a bottom leg element having a lower machined surface for engagement on a horizontal support surface beneath the grinding wheel and an upwardly extending leg element including a vertically and outwardly disposed clamping face portion, the upwardly extending leg element including a transverse apertured portion, a tubular support sleeve journaled in the apertured portion and including a threaded end portion extending beyond the clamping face portion of the upwardly extending leg element, an indexing plate including a centrally threaded apertured portion rotatably supported on the threaded end of the support sleeve parallel to the clamping face portion, said indexing plate being diamond-shaped and including a plurality of angularly related intersecting edge portions normal to the clamping face portion defining a support surface for orienting the tool bit with respect to the grinding wheel, said indexing plate including a transverse locking aperture extending therethrough in spaced relationship from the threaded aperture of said indexing plate, a plurality of radially disposed indexing apertured portions extending transversely through the upwardly extending leg element in a predetermined symmetrical relationship about the tubular support sleeve, said indexing apertured portions being alignable with the transverse locking aperture of the indexing plate, a removable stop pin element extendable through one of the indexing apertures and the locking aperture for providing a predetermined position of one of the edge portions of the indexing plate, a rotatable support rod extending through the tubular support sleeve and having the threaded end portion extending beyond the indexing plate, and a clamping strap including a centrally threaded apertured portion reciprocably received on the threaded end of the support rod, said clamping strap including a clamping face portion in parallel relationship to the clamping face portion of the upwardly extending leg element.

2. A grinding fixture as set forth in claim 1 including means carried by said clamping strap and engageable with the clamping face of said upwardly extending leg element for adjusting the distance between said clamping faces and maintaining said distance approximately the same as the tool being clamped therebetween.

3. A grinding fixture as set forth in claim 1 wherein said upwardly extending leg is angularly related to the bottom leg wherein the clamping face of the upwardly extending leg element and lower machine surface form an angle of less than 90°.

4. A grinding fixture as set forth in claim 3 including an adapter plate removably secured to the lower machine surface of the bottom leg element for orienting the clamping face of the grinding fixture normal to a lower support surface of said adapter plate.

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