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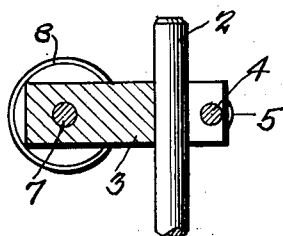
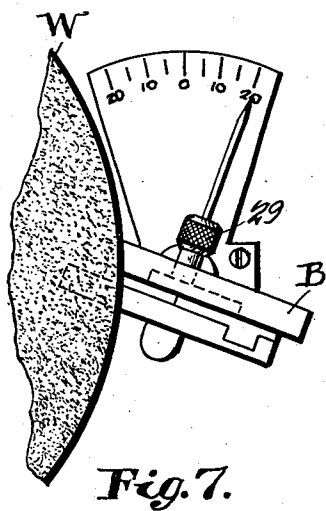
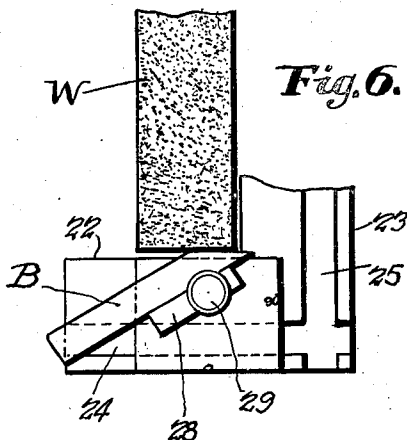
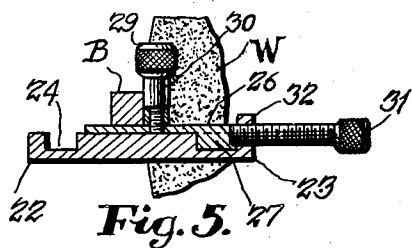
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CUTTER BIT GRINDING JIG

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2 Sheets-Sheet 2



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CUTTER BIT GRINDING JIG

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4 Claims. (Cl. 51—238)

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The present invention relates generally to improvements in work holders for edge tools while being sharpened upon a rotary grinding wheel, and more specifically the invention involves an improved cutter-bit grinding jig or clamp appliance that is capable of universal adjustment with relation to the grinding wheel in order that a variety of grinding operations on the edge tool may be performed with facility and accuracy. While the work holder or jig of my invention is adapted for use in sharpening various kinds of edge tools, it is especially designed for grinding or abrading cutter-bits employed in metal working lathes, which bits require the performance of several abrading or grinding operations which are made possible by the facile adjustment of the work holder.

The work holder is adapted for use with standard types of power operated grinding or abrading wheels, and the unitary appliance may be installed with facility upon a bench or other support in operative relation to the grinding wheel.

A minimum number of parts are utilized, which may be manufactured at low cost to production, and assembled with facility, to provide an appliance that is simple in construction and operation, and which may be manipulated with convenience to secure the desired adjustments. In combination with the adjustable parts of the appliance a gauge is provided to determine and indicate the desired angle of the bit with relation to the wheel, and the resulting angle of the ground face of the bit.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged in accord with one mode I have devised for the practical application of the principles of my invention; but it will be understood that various changes and alterations are contemplated and may be made in these exemplifying drawings, within the scope of my appended claims without departing from the principles of my invention.

Figure 1 is a view in side elevation of a jig or appliance embodying my invention and holding an edge tool or bit against the peripheral or circumferential face of a rotary grinding wheel, for abrading a side of the bit; and

Figure 2 is a top plan view of the appliance of Fig. 1.

Figure 3 is a transverse vertical sectional view at line 3—3 of Fig. 1 disclosing the protractor or gauge for setting the angularly adjustable work holder.

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Figure 4 is a transverse vertical sectional view at line 4—4 of Fig. 2 through the adjustable head and arm of the appliance.

Figure 5 is a detail vertical transverse sectional view at line 5—5 of Fig. 2 through the work holding means.

Figure 6 is a detail top plan view of a portion of the work holder with the edge tool in position for grinding its acute back face.

Figure 7 is a detail end view of the work holder adjusted to the grinding wheel for grinding an obtusely disposed back face of the edge tool or bit, and indicating the use of the protractor or setting gauge; and

Figure 8 is a detail vertical longitudinal sectional view at line 8—8 of Fig. 2 through the vertically adjustable arm as mounted on the supporting column or post.

In the preferred form of the invention shown in the assembly views Figs. 1 and 2, as well as in other views, a conventional rotary grinding or abrading wheel W is illustrated for grinding or sharpening an edge tool here shown as a cutter-bit B, and I utilize a flat angular base 1 that is slotted to accommodate bolts or other means for rigidly fastening the appliance to the bench or other support for the wheel that rotates or revolves on a horizontal axis.

An upright support in the nature of a solid cylindrical column or post 2 at its lower end is rigidly mounted in the base, and a horizontally disposed vertically adjustable lateral arm 3 is mounted on the post and clamped in adjusted position by means of a clamp bolt 4 mounted in a split end of the arm, and secured by nut 5 on a protruding end of the bolt.

The horizontally arranged arm supports a split resilient clamping head 6 that is rotatable on a horizontal axis in a vertical plane, and for this purpose the head is provided with a rigid stud bolt 7 passing through and journaled in a bore of the arm 3, and lock nuts 8 and 9 are threaded on the bolt to retain the head in adjusted position.

The head 6 is provided with a transverse bore in which a preferably solid cylindrical supporting bar 10 is mounted for longitudinal adjustment, and a clamping bolt 11 is passed through holes in the split resilient side of the head and secured by nut 12 for clamping the head in fixed position on the bar in order that the head and bar may be rotatably adjusted to desired position.

To retain the supporting bar against longitudinal movement within the head, a pair of laterally adjustable collars 13 and 14 are mounted upon the bar, one at each side of the head, and

set screws or bolts 15 are utilized to fasten the collars in adjusted position.

As best seen in Fig. 3, one of the collars, as 13 is equipped with a radial needle or pointer 16 that co-acts with a fixed gauge plate 17 that is attached as by screws 18 upon a vertical face of the head 6, and the plate is provided with a scale calibrated in degrees ranging in right and left angles from zero up to twenty degrees, for use in accurately setting the work holder, and bit B for sharpening its cutting edge.

One projecting end of the supporting bar 10 is provided with an adjustable weight 19, and a set screw or bolt 20, for counterbalancing the load of the work holder that is rigidly mounted upon the other end 21 of the bar, which is preferably offset from, but parallel with the plane of the axis of the main portion of the bar. Thus the bar may be turned or twisted and then fixed in the head in order to present the work holder and the bit at various angles and positions with relation to the wheel W for sharpening the edge tool.

The work holder, which is rigidly mounted on the offset end of the rotatably and longitudinally adjusted supporting bar includes an L-shaped or right-angular plate or table including the two sections 22 and 23 that is fixed, as by welding, upon the offset shank 21 of the bar 10, and the upper faces of these integral sections are provided with right angle grooves 24 and 25.

For selective use with either of the two angular sections of the table, a slide plate 26 of rectangular shape, is fashioned on its underside with a tongue 27 complementary to the grooves 24-25, and as indicated in Figs. 2 and 6, the angular table 22-23 may be adjusted in position with one section transversely of the wheel and the other section disposed in a plane transversely of the axis of rotation of the wheel. The removable and adjustable slide plate 26 forming the holder for the bit, may be mounted for adjustment in a plane transversely of the grinding wheel, as well as in a plane transversely of the axis of the wheel.

For retaining the edge tool or bit B in grinding position upon the plate 26, a pivotal guide block 28 is mounted on the upper face of the plate, and secured in adjusted position by means of a set screw or bolt 29, having a clamp shoulder 30, and threaded in a socket of the plate, and as best seen in Fig. 5, the set screw, by use of its shoulder, clamps the pivotal block in rotatably adjusted position.

To form a stop for the slide plate, and for precisely adjusting the plate and the pivotal guide block on the table, a set screw 31 is shown threaded in an upright bracket 32 of the table located at the grooved end of the table, and the screw is of ample length to engage the slide plate or carrier in various adjusted positions on the table.

In Fig. 2 the bit B is held by the guide block against the circumferential abrading surface of the grinding wheel W, for grinding a side face of the bit; in Fig. 6 the bit is set for abrading its bevel face at an acute angle; and in Fig. 7 the bit is set for sharpening the bit with an obtuse bevel face. The several settings for the bit are accurately and with facility determined and indicated by setting the pointer or needle 16 with relation to the calibrated scale on the plate 17, and adjusting the various supporting parts of the work holder with relation to the wheel W.

The supporting arm 3 is adjustable vertically; the head 6 and bar 10 are pivotally adjustable in a vertical plane; the bar 10 is longitudinally adjustable and rotatably adjustable in its head with relation to the wheel to present the work table to the wheel; and the work table, together with the pivotally adjustable guide block may be presented to the wheel at various selected angles.

By rotatably adjusting the bar 10 in the head 6, the work holder and its guide block mounted on the offset shank 21 of the bar may present a face of the bit to the grinding face of the wheel W on a line with the transverse horizontal axis of the wheel, as well as within an ample range above and below this line, for grinding operations. Due to the convexity of the grinding wheel, in some instances, the dressed face of the bit is concave, and to remove this concavity the table and guide bar may be raised above or lowered below the median line of the wheel, to insure a flattened face.

By means of the adjustable slide plate or holder 26 the pivotal guide bar may be pressed to hold the bit along the face of the grinding wheel, and the holder may be moved back and forth during the grinding operation to prevent local wear on the face of the wheel.

For grinding top, back and front angles or rakes on the bit the work table may be adjusted with its section 23 parallel with the side of the wheel and the guide bar or block 28 is set at the back or front rake desired. The top side of the bit is then held against the outer edge of the guide block and the slide holder is pushed against the feed screw 31. The upper end of the bit may then be ground against the face of the wheel while moving the work holder up and down, as in grinding or dressing side angles and clearances to insure flat ground surfaces.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a work-support for use with a grinding wheel; the combination with a stand having a vertically adjustable arm, and a head rotatably adjustable in the arm, of a longitudinally adjustable bar rotatably mounted in the head and means for clamping the head and bar in adjusted position, and a work-holder mounted on the bar in position for adjustment above and below the horizontal transverse axis of the wheel.

2. In a work support for use with a grinding wheel, the combination with a stand having a lateral arm, and a head rotatably adjustable in the arm, of a longitudinally adjustable bar rotatably mounted in the head and having an axially offset shank, of a work holder rigidly mounted on the shank, and an adjustable guide block pivotally mounted on the work holder.

3. In a work support for use with a grinding wheel, the combination with a stand having a lateral arm, and a head rotatably adjustable in the arm, of a bar having an axially offset shank and rotatably adjustable in the head, an L-shaped table rigid with the shank, a removable holder adapted for selective use with the table, and an adjustable guide block pivotally mounted on the holder.

4. In a work support as described, the combination with a support, a head rotatable in the support, and means for fixing the head in adjusted position, of a longitudinally adjustable bar rotatable in the head, means for fixing the bar against longitudinal movement, means for clamping the head on the bar, said bar having

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an axially offset shank, a table rigid with the shank, a work holder adapted for co-action with the table, and a guide block mounted for pivotal adjustment on the work holder.

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