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1,915,247

WORK HOLDING DEVICE FOR GRINDING MACHINES

Filed Sept. 17, 1930

2 Sheets-Sheet 1

Fig. 1

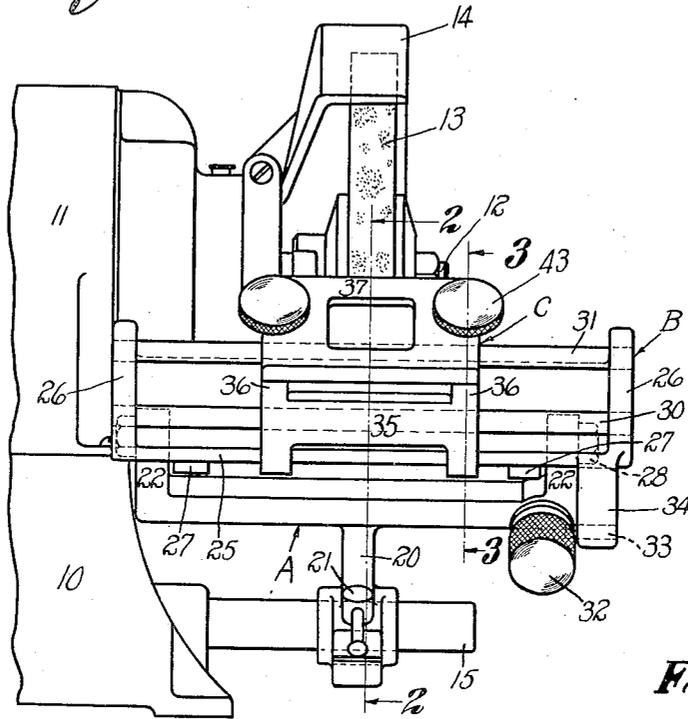
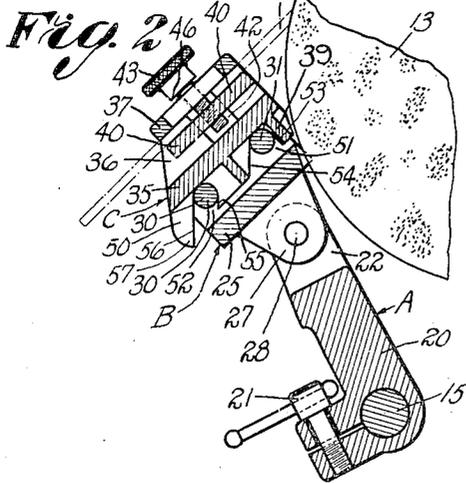
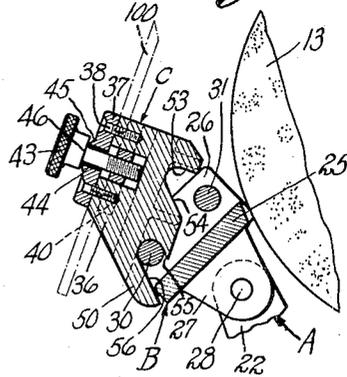


Fig. 3



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2 Sheets-Sheet 2

Fig. 4

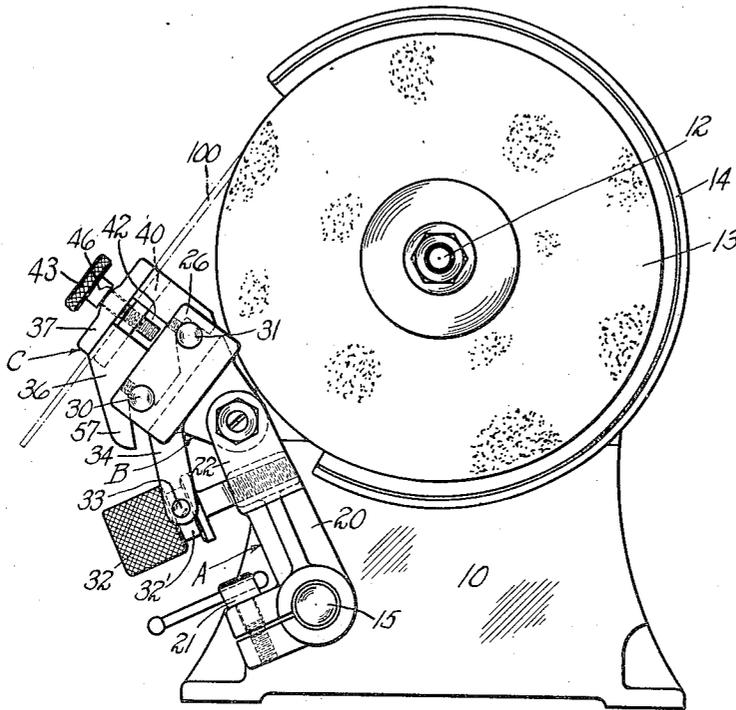
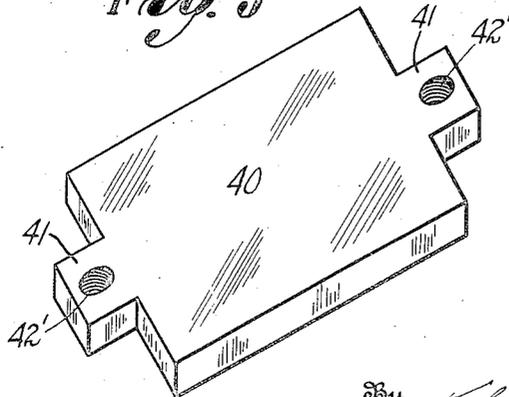


Fig. 5



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WORK HOLDING DEVICE FOR GRINDING MACHINES

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The present invention relates generally to a mechanism for use in grinding the cutting edges of tools, and has particular reference to means for properly positioning and supporting the work relative to the grinding wheel.

The aim of the present invention is to provide a simple and effective arrangement by the use of which edge tools, such as plane irons, chisels, et cetera, may be readily and quickly ground or sharpened with precision and with safety, and without any particular skill on the part of the operator.

Other objects will be in part obvious, and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein is shown, for illustrative purposes, one of the many embodiments which the present invention may take,

Fig. 1 is a front view of the improved mechanism applied to a grinding machine;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1 and showing the holder in operative position.

Fig. 3 is a view similar to Fig. 2 but illustrates the holder as having been tipped back, this view being taken on line 3—3 of Fig. 1;

Fig. 4 is an end view of the arrangement shown in Fig. 1; and

Fig. 5 is a perspective view on an enlarged scale of the clamping plate.

It is to be understood that the improved work-holding device of the present invention may be applied to grinding machines of any suitable construction or type. By way of illustration, there is shown, in the accompanying drawings, a grinding machine of the motor-driven bench type having a base 10 and a motor 11 with a horizontally disposed shaft 12 which carries a grinding wheel 13 protected by a guard 14. Extending from

the base and in parallelism to the shaft 12 is a post 15.

The device of the present invention comprises, generally, a support adjustable towards and away from the periphery of the grinding wheel, and a work holder mounted on the support and slidable thereon on a line generally parallel to the axis of the grinding wheel. In the present illustrative disclosure, the support comprises, generally, a base bracket A mounted on the post 15 for swinging and adjustable movements toward and away from the grinding wheel; and a supporting bracket B pivoted to the bracket A and adapted to support the work holder, designated generally by the letter C. The base bracket A has a depending central arm 20 with a split opening which receives the post 15. The bracket is adapted to be secured to the post 15 with the desired pressure or friction by means of a quick-operating locking bolt 21. The upper end of the bracket A is forked, and has a pair of upstanding ears 22. The supporting bracket B has a plate-like body portion 25, the ends of which are upturned so as to provide upstanding ribs or flanges 26. Depending from the body portion 25 are lugs or ears 27 respectively pivoted to the ears 22 of the base bracket A by pins or studs 28. Extending longitudinally of the supporting bracket B and having their ends located in the upstanding flanges 26, are parallel rods 30 and 31 which constitute tracks on which the work or tool holder C is mounted for sliding movement.

By preference, there is provided between the brackets A and B adjusting means whereby the bracket B, together with the tool holder thereon, may be sensitively adjusted or moved relative the grinding wheel in order that as fine or light a cut as desired may be taken. This adjusting means may have any suitable form, but it is here shown as comprising a screw 32 threaded into the bracket A and having a circumferential groove 32' in which engages a stud or projection 33 carried by an arm 34 on the upper bracket B. It will be observed that when the screw 32 is turned in one direction, the tool holder will be moved towards the grinding wheel, and

when turned in the other direction, the tool holder is moved away from the grinding wheel.

The work or tool holder C comprises a slide 5 having an opening for receiving the tool to be ground, and a plate for clamping the tool against the upper wall of the slide. The slide comprises a body portion having a bottom wall 35 and end walls 36. The slide also includes a top plate 37 secured in place on the upper end of the walls 36, as by means of screws 38. The clamping plate, designated generally by the numeral 40 and shown particularly in Fig. 5, has at each end a lug 41 adapted to respectively engage in vertical notches 42 in the end walls 36 of the slide. These lugs or extensions 41 are provided with threaded openings 42' which receive the threaded portions of screws 43, extending through, and journaled in, holes 44 in the top plate 37, as most clearly shown in Fig. 3. By preference, the screws 43 fit somewhat loosely in the holes 44, and the top plate adjacent these holes is provided with spherical bosses 45 against which the shoulders 46 on the heads of the screws are adapted to engage in order that the clamping plate may float, more or less, and adjust itself to non-parallel surfaces, such as the opposite sides of beveled edge chisels. Thus the tool holder is made adaptable so that any edge tool, whether it is a plane iron with parallel surfaces or a chisel the front and back surfaces of which are non-parallel, can be rigidly clamped in the holder and maintained in correct position with relation to the wheel.

On the underside of the tool holder are grooves, recesses, or notches adapted to respectively receive the rods or tracks 30 and 31, and so arranged and related that the tool holder may, at will, be maintained on the rods for sliding movement, or be removed entirely from the tool holder, or be tilted with respect to the supporting bracket without removing the tool holder therefrom. In the present illustrative disclosure, the slide is shown as having, at its opposite ends, depending webs 50 which are in effect continuations of the end walls 36. Each of these webs has a pair of recesses or notches 51 and 52. The forward notches 51 in the two webs are aligned, and the same is true with respect to the rear notches 52. Each forward notch 51 has a front wall or edge 53 which is substantially normal to the plane of the tool holder, and a downwardly and rearwardly inclined edge 54, the juncture of these edges being curved so as to form a seat which receives the foremost rod 31. Each of the rear notches 52 is disposed at an angle extending downwardly and rearwardly, that is to say, these notches are undercut, so to speak, the forward edges 55 being inclined downwardly and rearwardly and being generally parallel to the rear edge 56. The inner ends of the

notches 52 are semi-circular in cross section and constitute seats for receiving the rod 30. The rear ends of the webs project downwardly so as to provide lugs 57 adapted to engage the edge of the body portion 25 and thus limit the extent of tilting movement of the holder, as shown in Fig. 3.

When it is desired to grind the edge of a tool, such as a plane iron, designated by the numeral 100 and shown in dotted lines in Figs. 2 and 3, the tool is inserted through the opening in the slide and between the clamp plate 40 and the top plate 37. The clamp plate is then screwed up against the tool by turning the screws 43. Due to the arrangement of these screws, as previously described, the clamping plate may float somewhat so that if the tool to be operated upon should be irregular, or should it have its opposite faces non-parallel, (as in the case of a chisel) it can, nevertheless, be rigidly clamped in the holder and maintained in correct relation to the wheel. The upper bracket B may be adjusted relative to the lower bracket A by turning the screw 32 in order that the tool will be at the correct angle with respect to the wheel. The work holder and the tool thereon may be positioned upon the supporting bracket by first engaging the rear notches 52 with the rod 30, as shown in Fig. 3, and then allowing the holder to swing forwardly about the rod 30 as a pivot, and to the position shown in Fig. 2, and in which position the rod 31 has been received by the notches 51. During the grinding operation, the work holder is moved back and forth upon the rods in order to bring the various portions of the cutting edge of the tool into engagement with the grinding wheel, and the assembly may be moved towards the grinding wheel by the operator pressing his hand against the support. When taking a finishing cut on the tool, it may be of advantage to securely clamp the lower bracket A to the post 15 by turning up the screw 21, and then turn the micrometer screw 32 in order to feed the tool to the work. The slide is provided at its forward end with a depending web 39 which constitutes an apron for preventing any foreign matter from the wheel or the tool going onto the rods and lapping or throwing up any irregular surface which would prevent easy manipulation of the tool holder.

It will be observed that the tool holder is so constructed that it is possible for the operator to move it away from the wheel without taking it off the supporting bracket, or to remove the tool holder entirely from its support without any interference with the wheel and without any likelihood of the operator being injured by having his hand come into engagement with the wheel. If the operator wishes to quench the tool being ground, or inspect it, he need merely pull upwardly on

the tool holder, with the result that the tool holder will pivot to the position shown in Fig. 3.

If it is desired to entirely remove the tool holder from its support, this may be done by then merely lifting the tool holder from the position shown in Fig. 3. In any event, whether the operator merely tips the holder back or entirely removes it, he can replace it upon the rods in identically the same position which it previously occupied, with the assurance that the grinding operation will be continued in the proper manner.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A work-holding device for use with grinding machines having a grinding wheel and a base with a post in parallel relation to the axis of the wheel, a base bracket, means for adjustably clamping the base bracket on said post for adjustment at its free end toward and from the grinding wheel, a supporting bracket pivotally mounted upon the free end of the base bracket, a screw adjustment arranged between the base and supporting brackets for imparting a final minute adjustment of the supporting bracket subsequent to the adjustment of the base bracket, a work-holder having spaced forward and rear bearing portions with the rear bearing portion undercut, and forward and rear slide rods mounted on said supporting bracket in parallel relation to the axis of the grinding wheel for engaging the bearing portions of the work-holder to support the latter in a definite relation upon the supporting bracket and to admit of the pivoting of the work-holder backwardly on the rear rod for temporary removal of the work from the grinding wheel.

2. In a device of the character described, a supporting bracket, means for adjustably holding the supporting bracket with respect to a grinding wheel, said supporting bracket having a pair of parallel tracks arranged parallel to the axis of the grinding wheel, a work-holder having tool clamping means and provided with slide means for engagement with said parallel tracks, the rear slide means interlocking with the rear track for

holding the work-holder from pivoting forwardly and adapted to free said slide means from the rear track when the work-holder is tilted backwardly to a predetermined extent.

3. In a device of the character described, a support having a pair of parallel rods, and a work holder comprising a slide and means for clamping a tool thereto, said slide having on its underside notches receiving said rods, the notches receiving the foremost rod being arranged to permit the slide to pivot about the rearmost rod towards and from the grinding wheel, the walls of the notches receiving the rearmost rod being so formed and arranged as to maintain the slide upon the rearmost rod and to permit the removal of the slide from the rearmost rod when the slide has been swung away from the grinding wheel.

4. In a device of the character described, a support having a pair of parallel rods, and a work holder comprising a slide and means for clamping a tool thereto, said slide having on its underside notches receiving said rods, the notches receiving the foremost rod being arranged to permit the slide to pivot about the rearmost rod towards and from the grinding wheel, the notches receiving the rearmost rod being inclined downwardly and rearwardly to normally maintain the slide upon the rearmost rod and to permit the removal of the slide from the rearmost rod when the slide has been swung away from the grinding wheel.

5. A work-holder for grinding machines having a grinding wheel and a base with a post disposed in parallelism to the shaft of the grinding wheel, comprising a base bracket pivotally mounted upon said post, means for clamping the base bracket in adjusted position on said post, a supporting bracket pivotally mounted on the upper end of the base bracket and adapted to be bodily swung towards and from the grinding wheel and to be adjusted at various angles to the base bracket, means for holding the base and supporting brackets at the adjusted angle to one another, and a detachably and pivotally mounted work-holder carried upon the supporting bracket for adjustment therewith and for independent swinging thereon and removal therefrom.

6. In a device of the character described, in combination, a support having a pair of parallel rods, a work holder having on its under side notches receiving said rods, the notches receiving the foremost rod being arranged to permit the work holder to pivot about the rearmost rod towards and from the grinding wheel, the walls of the notches receiving the rearmost rod being so formed and arranged as to maintain the work holder upon the rearmost rod and to permit the removal of the work holder from the rearmost rod when the work holder has been swung

away from the grinding wheel, said work
holder having end walls and a topping wall
extending across the upper edges of the end
walls, said end walls having notches therein
5 extending downwardly from the upper edges
of the end walls, a clamping plate loosely
mounted beneath said top wall and having
at opposite ends projections engaging in said
last mentioned notches, and binding screws
10 loosely journalled in said top wall and thread-
ed into said projections for adjusting said
clamping plate toward and from said top
wall.

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