E. STAUDER.

SUPPORT FOR GRINDING CUTTER HEADS.

APPLICATION FILED APR. 2, 1920.

1,358,998.

Patented Nov. 16, 1920.

2 SHEETS—SHEET 1.

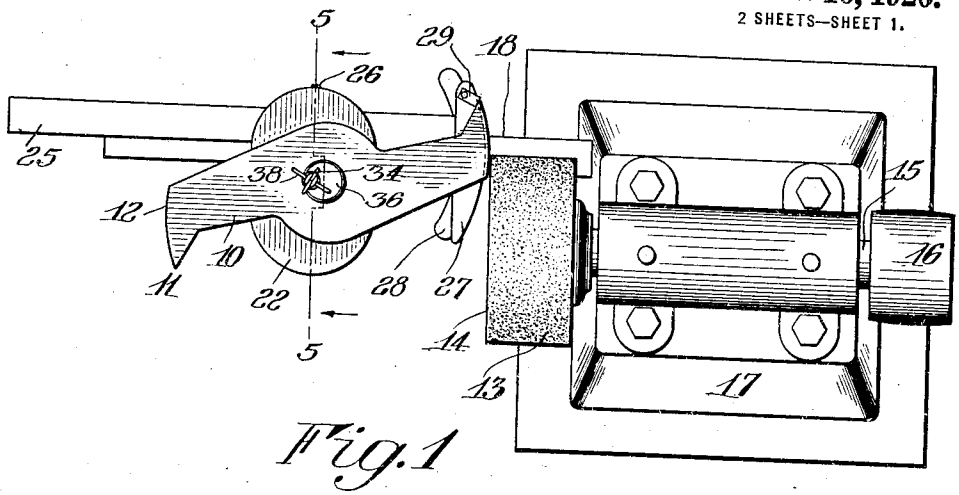


Fig. 1

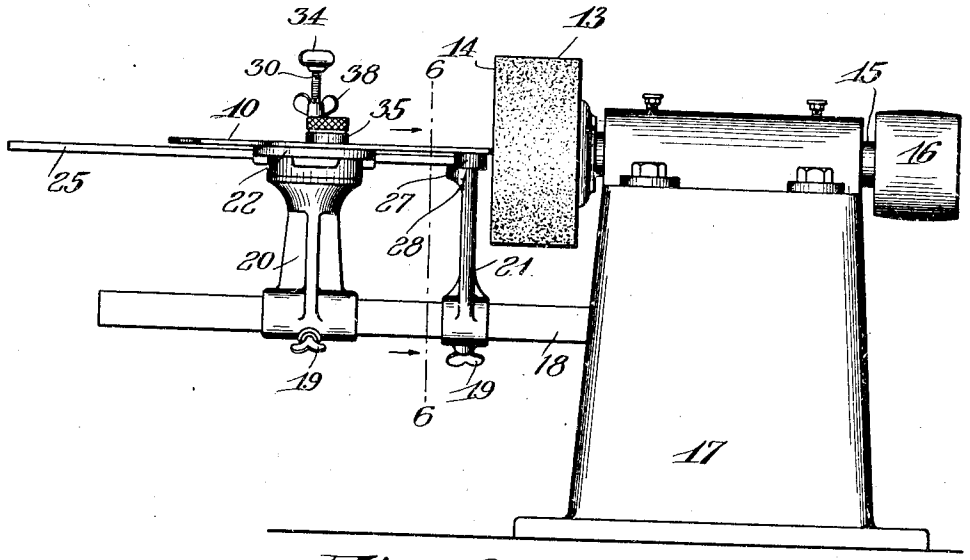


Fig. 2

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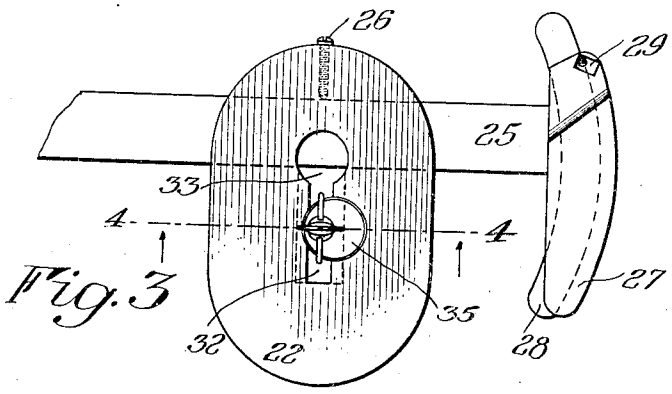


Fig. 3

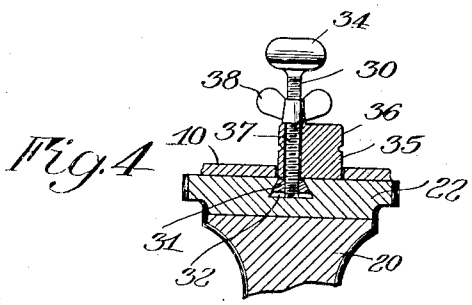


Fig. 4

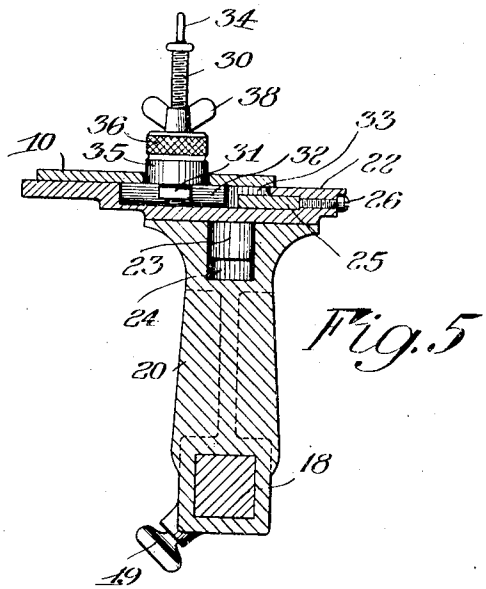


Fig. 5

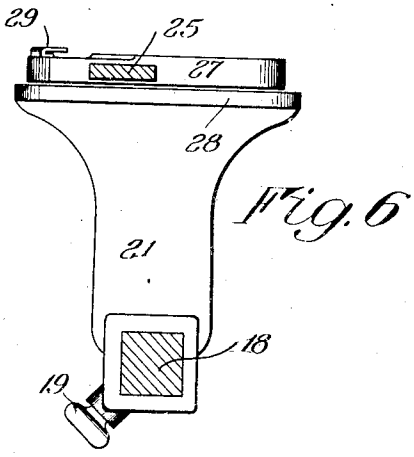


Fig. 6

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UNITED STATES PATENT OFFICE.

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SUPPORT FOR GRINDING CUTTER-HEADS.

1,358,998. Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed April 2, 1920. Serial No. 370,670.

To all whom it may concern:

Be it known that I, EMANUEL STAUDER, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Supports for Grinding Cutter-Heads; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference-numerals marked thereon.

The present invention relates to grinding machines of the type employing an abrasive element or wheel and a pivotal support for the cutter or dado head to be ground. The object of this invention lies in the provision of an adjustable mounting and feeding mechanism for the cutter head whereby the periphery or boundary thereof may be ground on any desired curve whose center does not coincide with that of the cutter head.

Another object of this invention lies in the provision of a feeding mechanism, which will feed the work or cutting head longitudinally toward the grinding wheel, and at the same time slightly change the eccentric mounting of the cutter on the pivotal support so that the curve of the ground edge may be slightly changed.

To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a plan view of the cutter or dado head in position against the abrading element.

Fig. 2 is a side view of the device shown in Fig. 1.

Fig 3 shows a plan view of the seat and centering member for the cutter head.

Fig. 4 illustrates a section on the line 4—4 of Fig. 3.

In Fig. 5 is shown a section on the line 5—5 of Fig. 1.

Fig. 6 represents a view on the line 6—6 of Fig. 2, without showing the cutter head, threaded post, and grinding wheel in position.

Similar reference characters throughout the several views indicate the same parts.

The cutter or dado head 10 to be operated upon by this machine is shown in Fig. 1 of the drawing provided with a central aperture for the reception of its operating arbor and which also coöperates with the mechanism about to be described. The grinding operation is for the purpose of having the periphery or boundary 12 formed to the desired shape and size, so that it curves away from the surface cut by the dado head in actual operation or in other words the boundary 12 is ground so that the cutting edge 11 is farther from the center of the cutter than any other point on the boundary 12.

Numeral 13 designates the abrading wheel, grinding or cutting tool against the flat side face 14 of which the grinding is done. The wheel 13 is supported by the shaft 15 having a pulley or other driving device 16 thereon and having a general supporting base 17 for both the work 10 and abrading wheel 13. The work-carrying bar 18 is suitably attached to the supporting base 17 and has thereon two supports 20 and 21 for the work 10 which are adjustable longitudinally on the bar 18 by means of clamp screws 19, in order that various sizes or lengths of cutters may be ground. The support 20 carries and positions the center of the cutter to be ground by means of a table or seat 22 bearing on the top of the support 20. This work table or seat is provided on its underside with a pivot pin 23 entering an aperture 24 in the support 20. Since gravity positions the table and pin on the support, the table or seat may be easily removed from the support for any purpose desired. The operating and work-guiding rod 25 is mounted in the table or seat 22 for adjustment longitudinally thereof by means of the clamp screw 26. The end of rod 25, remote from the abrading element, affords a handle whereby the operator may move the cutter back and forth across the abrading wheel because of the pivotal mounting of the table 22. The other end of the rod 25 is enlarged at 27 to afford a bearing surface for the cutter near the abrading tool, and also to afford a means for guiding the work as it is fed to the abrading wheel so that the work or cutter head will not turn about its center, but be held against the grinding element. The lug 29 is located on the enlarged end 27 for the purpose of guiding the work

against the abrading element, and preventing cutter head 10 from being turned away from the grinding wheel. The edge of the enlarged end 27 is curved on the arc of a circle about the pivot center of the table 22 and of a radius corresponding to the average radius of cutter heads to be ground, so that the work may have a substantially and uniformly small overhang of its edge to be ground. The enlarged end 27 rests upon a bearing surface 28 on the top of the supporting member 21.

The mechanism for adjustably positioning the cutter head on the seat or table 22 consists of a threaded clamping member or post 30 engaging a nut 31 located in the dovetail groove 32. One end of the groove is enlarged at 33 for the purpose of removing the nut from the groove. By turning the enlarged top or wing head 34 of the post 30, the latter may be clamped in any portion of the groove by forcing the nut 31 against the sides of the groove 32. A cylindrically shaped work centering stud 35 is eccentrically bored as at 37 with a smooth hole so that this stud does not engage the screw threads of the clamping post 30, but the hole is of such size as to enable the stud to fit over the screw threads of the post without any lost motion or chatter, and yet have the stud adapted to slide over the threads. A wing nut 38 is provided to clamp the centering stud 35 in position on the seat 22. A knurled band 36 is provided on the stud 35 by means of which it may be turned about the clamping post 30.

The purpose of the various adjustments is as follows:—The separation of the supporting members 20 and 21 depends upon the size or diameter of cutter to be ground. For the same reason the operating and work-guiding rod 25 is adjustable in the table 22. The work centering stud 35 is of such size as to enable the cutter to fit over it without chatter. The clamping post 30 is adjustable to the desired distance from pivotal center of the table 22. Obviously the farther the center of the cutter head is from the pivotal center of the table, the heavier will be the cut or grinding on the portion of the boundary 12 in rear of the cutting edge 11. By loosening the wing nut 38 the cylindrical centering stud 35 may be turned about the clamping post 30, and in so turning the stud 35 the cutter head or work will have its center advanced toward the abrading element, and at the same time moved toward or away from the pivotal center of the table 22, according to the direction in which the stud 35 is turned. The lug 29 on the end of the rod 25 adjacent the grinding tool, not only prevents the cutter from rotating when being ground, but also acts as a fulcrum about which the cutter is moved in being fed, and in its motion toward or away from the pivot center of the table 22. In Fig. 1, the feeding mechanism has reached its limit, so that when starting the grinding operation the stud 35 should be turned 180 degrees from the position shown in Fig. 1. With the stud in this starting position, turning it in either direction causes the work to be advanced toward the abrading tool, but in one direction the center of the cutter is moved farther from the pivot center of the table, while in the other direction the cutter is moved toward the pivot center of the table. Thus, it will be seen that the feeding mechanism not only moves the work toward the grinding wheel, but also simultaneously moves the cutter toward or from the pivot center of the table or seat 22 to more finely determine the curve given the bounding edge 12. This last mentioned movement toward or from the pivot center of the table is small compared to the adjustment possible by moving the post 30 in the slot 32.

While the stud 35 has been described as a work centering member, it is to be understood that this member or stud may perform its functions even if not in the center of a symmetrical cutter. For example the present invention is applicable to a rotary cutter having only one instead of two teeth 11, and is in fact also applicable to a cutter having any number of teeth if so spaced as not to interfere with the grinding wheel

I claim as my invention:

1. A supporting device for a cutter head, comprising a work table mounted for pivotal motion during grinding, said table provided with a centering stud for the cutter, the stud being adjustable over the table relative to the pivot center of the table.

2. A supporting device for positioning a cutter head during grinding, comprising a pivotal seat for the head and a work centering mechanism for positioning the head on the seat, said mechanism being adapted for adjustment for the purpose of moving the head or work longitudinally as a feed mechanism as well as in other directions independently of said seat.

3. A supporting device adapted to position a cutter head during the grinding of its outer edge, comprising a pivotally mounted seat and a work centering device on said seat for positioning the head thereon, said device being provided with a single means for adjustment of the head relative to the pivot center of the seat, and also for moving the head relative to an abrading tool as a feed mechanism.

4. The combination with an abrading tool of a holding and feeding device for a cutter head, said device comprising a pivoted support, a member thereon adjustable laterally of the pivot of the support, and a cutter centering stud mounted on said member

and adjustable in all directions in a plane at right angles to the axis of the pivot.

5. A supporting device for positioning a cutter head during grinding or cutting, comprising a seat pivotally mounted and having thereon a single adjustable feeding mechanism adapted to simultaneously move the center of the head toward a cutting or grinding tool and also either toward or from the pivot center of the seat.

6. The combination with an abrading tool of a holding and feeding device for a cutter head, comprising a pivoted support, a member thereon adjustable laterally of the pivot of the support, a rotatable centering stud adapted to enter the aperture in a cutter head, and having an eccentric connection with the adjustable member and securing means for holding the parts in adjusted position.

7. A supporting device for holding and feeding a cutter head during grinding, comprising a pivotally mounted seat, a post on said seat adjustable to and from the pivot center of the seat, a work centering member of circular cross-section eccentrically mounted on said post, a clamping device for retaining said member in position, and a guide lug to prevent the cutter head rotating about said centering member during grinding.

8. The combination with an abrading tool of a holding and feeding device for a cutter head, said device comprising a pivoted support, a member thereon laterally adjustable of the pivot, a cutter centering stud adjustable thereon, and a stop mounted on the support for coöperating with the cutter and positioning the same relatively to the abrading tool when the centering stud is adjusted.

9. The combination with an abrading tool, of a holding and feeding device for a cutter head, said device comprising a pivoted support, a work-centering member thereon radially adjustable of the pivot and eccentrically mounted on said support for feeding said cutter toward the abrading tool and for additional adjustment radially of the pivoted support, and a stop mounted on the support coöperating with the cutter head to position the same relatively to the abrading tool when the centering stud is adjusted.

10. The combination with an abrading tool of a holding and feeding device for a cutter head, said device comprising a pivoted seat for the cutter, a centering member on the seat for positioning the cutter, said centering member being adjustable in all directions over the seat, a stop on the pivoted seat to coöperate with the cutter to position the same relatively to the abrading tool when the centering member is adjusted.

11. The combination with an abrading tool of a holding and feeding device for a cutter head, said device comprising a freely pivotal support, a post on said support adjustable to and from the pivotal center of the support, a work centering stud of circular cross section eccentrically mounted on said post and rotarily adjustable about the center of said post, a clamping device for retaining said stud in position, a guiding lug on the support adjacent the abrading tool and coöperating with a cutter head to prevent rotation thereof during grinding and to position the same relative to the abrading tools when the centering stud is adjusted.

EMANUEL STAUDER.