

## Niquet

[15]     **3,703,055**

[45] **Nov. 21, 1972**

[54] **DRILL SHARPENING DEVICE**

[72] Inventor: **Samuel Niquet**, Charbonneau  
Avenue, East Freetown, Mass.  
02717

[22] Filed: **Jan. 25, 1971**

[21] Appl. No.: 109,296

**[52] U.S. Cl.....51/219R**

**[51] Int. Cl. ....B24b 3/26**

[58] **Field of Search**.....51/219

## [56] References Cited

## UNITED STATES PATENTS

2,356,175 8/1944 Olson.....51/219 R

## FOREIGN PATENTS OR APPLICATIONS

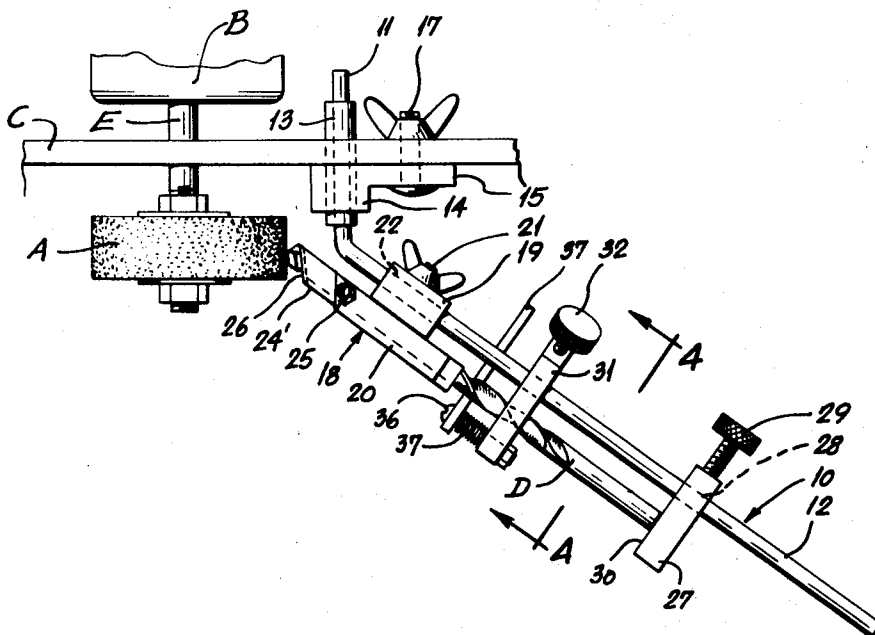
|         |         |                     |          |
|---------|---------|---------------------|----------|
| 342,109 | 12/1959 | Switzerland.....    | 51/219 R |
| 123,513 | 2/1919  | Great Britain ..... | 51/219 R |

**Primary Examiner—Harold D. Whitehead**  
**Attorney—Pierre Lesperance**

[57]                      **ABSTRACT**

The invention relates to a drill sharpening jig in which the drill is held for grinding against a wheel by a pivotable support which has a table with an edge against which the flute edges of the drill are held, a holder and a stop for the chuck end of the drill, the support causing the drill tip to generate a conical surface for producing a progressively increasing clearance angle for the drill cutting edges.

## 2 Claims, 4 Drawing Figures



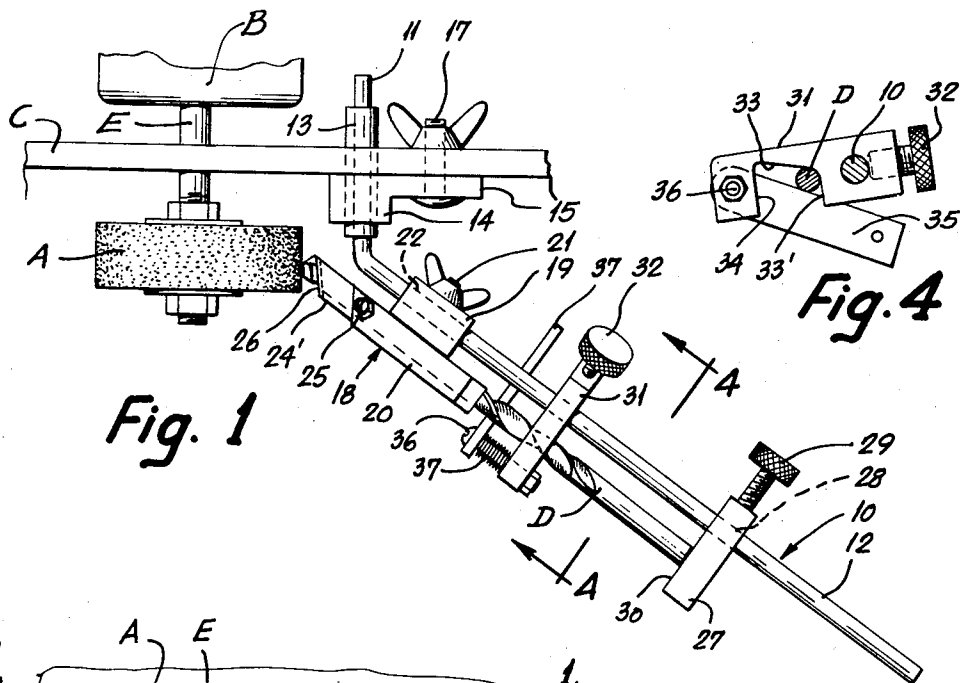


**Fig. 1**

**Fig. 4**

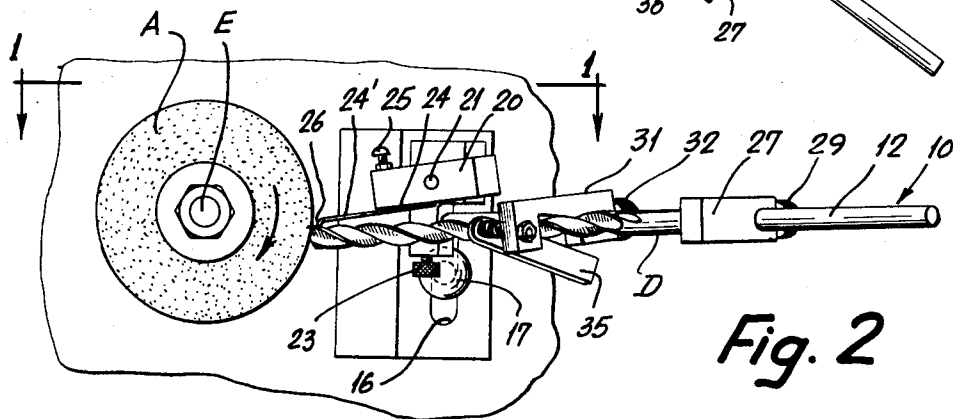


**Fig. 2**

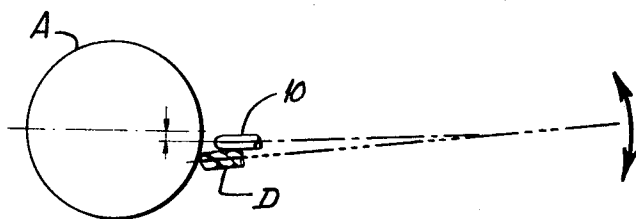


**Fig. 3**

INVENTOR  
**Samuel NIQUET**  
 BY *Pierre Desperance*  
 PATENT AGENT

**DRILL SHARPENING DEVICE**

This invention relates to a drill sharpening jig used in combination with an abrasive wheel.

It is an object of the present invention to provide a drill sharpening jig presenting a number of adjustable features which make it possible to obtain the optimum slope of the cutting edge for any given type of drill and progressively increasing the optimum clearance angle for the backing surface.

It is another object of the invention to provide a drill sharpening jig on which drills of various sizes can be rapidly and easily set up, and which will hold the drill throughout the grinding operation in accurate position.

Other objects of the invention will appear from the following description of a preferred embodiment thereof, illustrated in the accompanying drawings, in which:

FIG. 1 is a top plan view of a drill sharpening jig and associated abrasive wheel according to the invention seen along line 1—1 of FIG. 2;

FIG. 2 is an elevation of the same;

FIG. 3 is a schematic elevation showing the approach angle of the drill; and

FIG. 4 is a detail cross-section along line 4—4 of FIG. 1.

Referring now to the drawings in which like references indicate like elements throughout, an abrasive wheel A having a cylindrical outer face is mounted on the drive shaft of a suitable motor B and is driven thereby in a clockwise direction, as seen in FIG. 2.

The motor and wheel assembly includes as part of its structure, or is especially provided, with a plate C parallel to the plane of the wheel A, to which the drill sharpening jig is attached.

The drill sharpening jig comprises a round rod 10 which is bent near one end to form two straight rod portions, namely a pivot portion 11 and a support portion 12, at an obtuse angle to each other complementary to the optimum slope angle for the cutting edge of the drill D.

The pivot portion 11 of rod 10 is journaled in a bearing sleeve 13 which is fastened to and traverses a bracket 14 provided with a flange 15 having a slot 16 through which passes a bolt 17 by means of which the bracket 14 can be mounted onto the afore-mentioned plate C.

The axis of the sleeve 13 is therefore parallel to the shaft E of motor B and its level relative to the wheel A can be adjusted by moving bolt 17 along the slot 16 to apply the drill tip in the most convenient position of the wheel A.

A table assembly 18 is mounted on the rod support portion 12 adjacent the pivot portion 11. The table assembly 18 comprises a base 19 and a platform 20 secured thereto in adjustable angular position by means of a bolt 21. The base 19 has a bore 22 which is slidable and rotatable on the support portion 12 of the rod 10 with a screw 23 which fastens against the support portion 12.

The platform has fastened, to the underside thereof, the back portion of a resilient strip 24 having a free standing front portion 24' with a straight bent edge 26 against which the drill D is leaned during the sharpening operation with the edges of one of its flutes lying against the edge 26. Bending of strip 24 is effected by an adjusting screw 25 screwed in platform 20 and bear-

ing against the front portion 24' of strip 24. The drill can thus be held accurately in position and is prevented from rotating during grinding thereof.

A stop 27 is longitudinally and rotationally adjustably secured to the support portion 12 remote from the pivot portion 11. The stop has a bore 28 sliding over the rod 10 and a screw 29 for fastening it to the rod.

The stop 27 has a front flat surface 30 serving to abut the chuck end of the drill D during the grinding operation to prevent longitudinal movement thereof irrespective of the distance of the drill D from portion 12 of rod 10.

To prevent lateral movement of the drill D during the grinding operation, there is provided between the table assembly 18 and the stop 27, a holder 31, also adjustably secured on the rod support portion 12 in both angular and longitudinal directions by means of a screw 32. The holder 31 has an inclined bottom face 33 and a side face 33' partly defining a cavity 34 and a lever 35 is pivoted to holder 31 by pivot screw 36 and resiliently urged towards face 32 by a coil spring 37 surrounding pivot screw 36. The drill D is removably seated between lever 35 and cavity faces 33 and 33'.

With the wheel A at rest, the rod 10 is held so that the plane common to its pivot portion 11 and its support portion 12 is at a small distance, as indicated in FIG. 3, from the axis of the wheel. The drill D is then inserted in holder 31 and leaned with its flute edges on the edge 26. The position of the platform 20 is longitudinally adjusted, so that one of the cutting edges of the drill will lie at the proper rotational angle upon the cylindrical surface of the wheel A. The position of the drill D is then adjusted by means of table assembly 18 and holder 31, so that it lies at a small angle to the plane of rod 10 outwardly from the wheel axis, as seen in FIG. 3, this angle being determined according to the optimum clearance angle of the backing surface adjacent the drill cutting edge for the type of drill in question. The stop 27 is then brought up to back the chuck end of the drill D. Grinding can now be started by setting the wheel A in motion and rotating the rod 10 back and forth about its pivot portion 11. No further adjustments are necessary to grind the other cutting edge, the drill D being merely rotated 180° until the edges of the opposite flute lie against the edge 26.

Adjustment of the various parts is facilitated by the fact that the screws 23, 29, and 31 and the nuts for the bolts 17 and 21 are hand operated. The position of the rod 10 can be freely adjusted along pivot portion 11 to seek the most favorable section of the wheel surface.

It is noted that rotation of rod 10 in sleeve 13 causes of the drill D along a conical surface, thereby producing a backing surface for the drill cutting edge with a progressively increasing clearance angle.

It is further noted that blade edge 26 (referring to FIG. 1) is not parallel to pivot portion 11 but makes an angle of approximately 10° therewith. Thus, blade 26 is not true with pivot portion 11 nor with the wheel A. The reason for this inclination is to compensate for the change of flute angles in drills of various sizes. For instance, a standard 1/8 inch drill is fluted at 25°, while a standard 1/4 inch drill is fluted at 32°.

Drills of various sizes always rest on side face 33' of holder 31 and on the side surface of base 19, therefore

always at the same distance from rod support portion 12 and parallel thereto. Therefore, with an increase in the drill size, the drill axis is further away from rod support portion 12 and the blade edge 26, not being true with the wheel A, will cause the drill to protrude more from blade edge 26 after grinding, thus compensating for the different flute angle.

Thus, the grinding results are obtained for drills of any size without changing any adjustments of the jig, except adjusting the position of stop 27 for the length of the drill.

What I claim is:

1. A drill sharpening jig used in combination with an abrasive wheel, comprising a pivot which is mounted with its axis parallel to the wheel axis, an elongated support rigid with said pivot at an angle thereto, a table having a base and a platform angularly adjustably secured thereto, said base secured to said support and adjustable along the same, the platform having a free-standing resilient strip with a straight bent edge against which the drill is leaned with the flute edges thereof lying against said straight edge of said strip, said straight edge making an acute angle with the pivot axis, a stop adjustably secured to said support remote from said pivot to abut the chuck end of the drill, and a holder secured to said support between said stop and

said table to receive and hold the drill therein.

2. A drill sharpening jig used in combination with an abrasive wheel, comprising a bearing which is mounted parallel to the wheel axis at an adjustable level relative to the wheel axis, a round rod having a pivot portion journaled in said bearing and a support portion at an angle to said pivot portion, a table, adjacent said pivot portion, having a base slidable and rotatable on said support portion and a screw fastening against said rod support portion, said table having a platform angularly adjustably secured to said base, said platform having a free-standing resilient strip with a bent straight edge against which the drill is leaned with the flute edges thereof lying against said edge of said strip, said straight edge making an acute angle with the pivot axis of said pivot portion, a stop having a bore slidable on said rod support portion and a screw fastening against said rod support portion, said stop being mounted remote from said pivot portion to abut the chuck end of the drill, and a holder having a bore slidable and rotatable on said rod support portion and a screw fastening against said rod support portion, said holder being mounted between said stop and said table to receive and removably hold the drill therein.

\* \* \* \* \*

30

35

40

45

50

55

60

65