Sept. 30, 1952 J. BECKER 2,612,012

DRILL POINT GRINDER

Filed Oct. 13, 1950 2 SHEETS—SHEET 1

Fig. 4

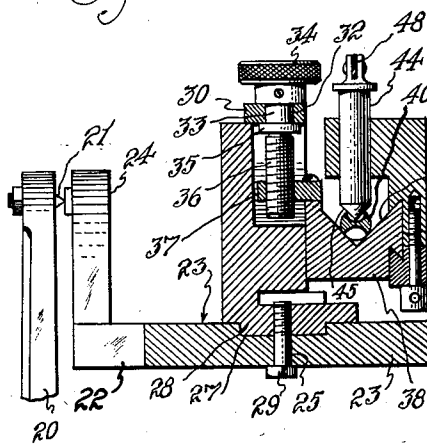


Fig. 5

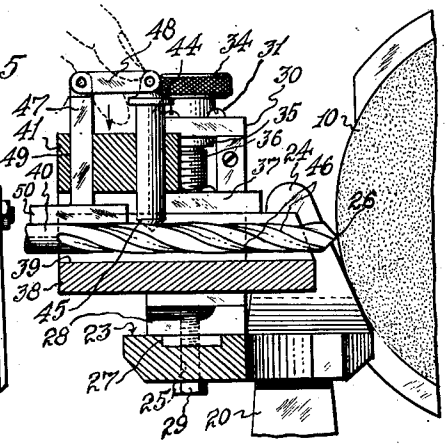


Fig. 1

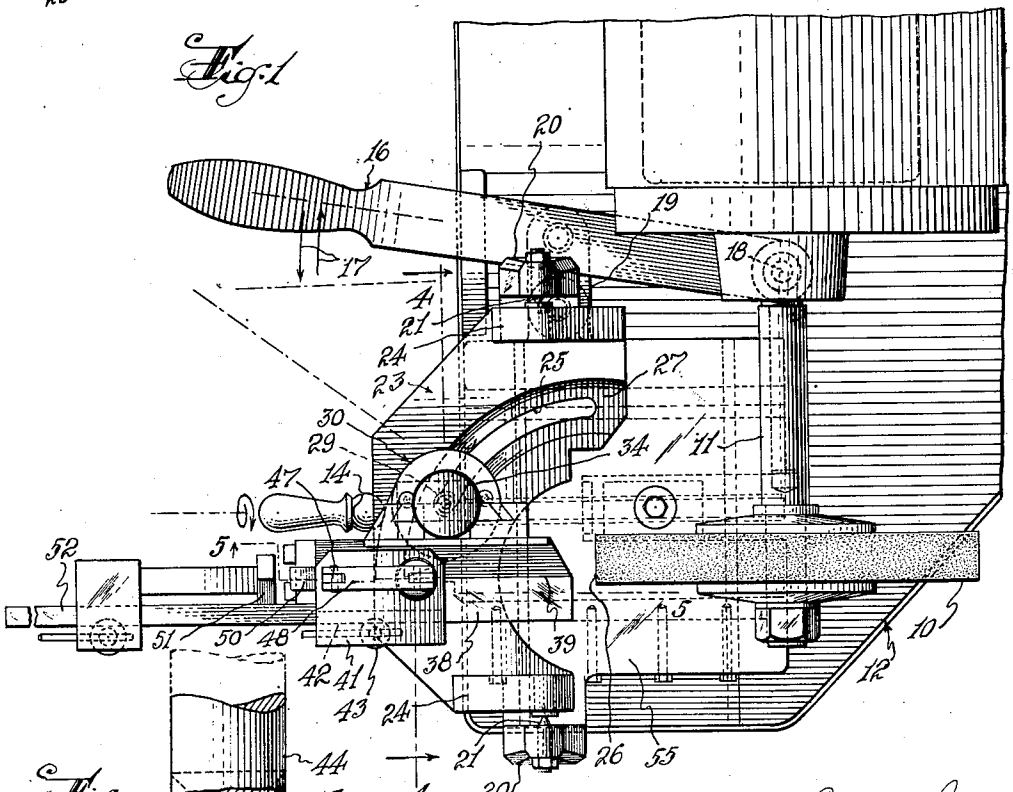
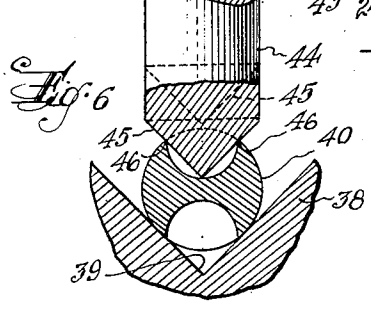


Fig. 6



Inventor:
John Becker.

BY Thomas O'Neill, Jr.
Attorney.

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Fig. 2

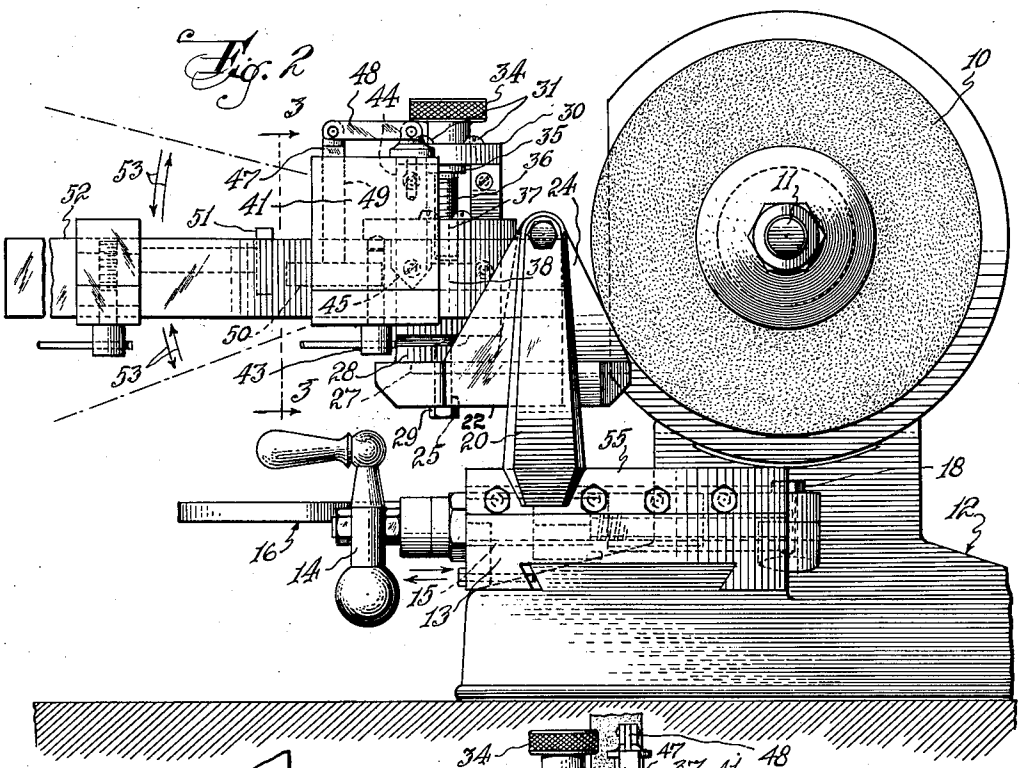
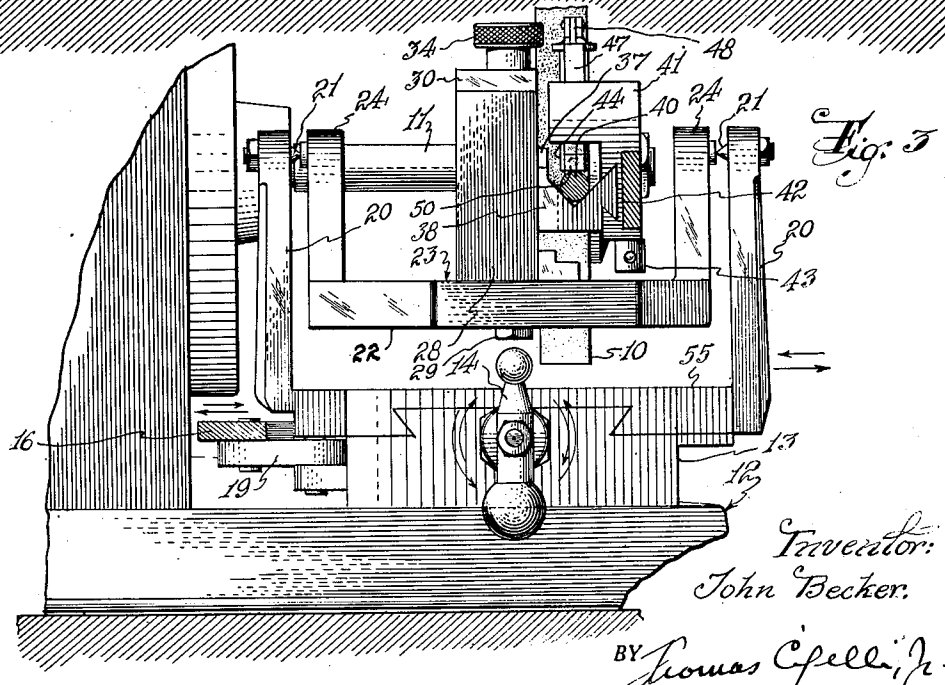


Fig. 3



Inventor:
John Becker.

BY Thomas C. Pell, Jr.
Attorney.

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DRILL POINT GRINDER

John Becker, Irvington, N. J.

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11 Claims. (Cl. 51—219)

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This invention relates to a novel drill point grinder and more especially to a grinder which enables an operator easily and accurately to grind drills of any size and to utilize the circumferential face of the grinding wheel, instead of the plane faces as is customary with conventional grinders.

A specific embodiment of my invention is described herein by way of example only and in accordance with the manner I now prefer to practice the invention, the following detailed description taken in connection with the accompanying drawings in which like numbers represent like parts throughout and which form a part hereof, being intended for the purpose of illustration.

In the drawings:

Fig. 1 is a top plan view of my novel device shown in relation to a grinding wheel;

Fig. 2 is an end elevational view of the device of Fig. 1, taken from the end at the bottom of Fig. 1 as shown:

Fig. 3 is a section taken along the line 3—3 of Fig. 2;

Fig. 4 is a section taken along the line 4—4 of Fig. 1;

Fig. 5 is a longitudinal section, taken along the line 5—5 of Fig. 1; and

Fig. 6 is an enlarged detailed view, partly in section, showing the plunger resting on the edges of the flutes of a drill while the latter is in the drill channel.

Referring to the drawings, a grinding wheel 10 is shown mounted on a shaft 11 in conventional manner with other associated parts. My novel device is carried on a suitable base 12 on which is mounted a cross slide 13, also in conventional manner. Above the slide 13 and keyed to it at right angles thereto is a carriage 55 which in the conventional manner permits the parts carried by it to be moved back and forth with relation to the wheel 10 by means of the usual lathe-type structure, including the ball crank 14 and screw 15.

Rectilinear movement of the cross slide 13 and associated parts along the base 12 from side to side is permitted by moving lever 16 in the direction of the arrows 17 shown in Fig. 1. Lever 16 is pivoted as at 18 and is joined to the carriage 55 by means of link 19 movably mounted on lever 16 and the carriage 55.

Integrally joined to the carriage 55 at each end are upright supports 20 having inwardly tapering set screws 21 located on the inner faces of the supports 20 near the tops thereof. Suspended between the points of set screws 21 is swivel (frame) 22 comprising base 23 and supporting arms 24 having conventional bearing surfaces.

The base 23 has an arcuate groove 25 which is

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so located as to be equidistant throughout its length from a predetermined point 26 on the wheel 10. The groove 25 has a shouldered recess 27 on either side and along the length thereof. Movably fitted into the shouldered recess 27 is a column 28 provided on its bottom with a guide threaded bolt 29 adapted to move in slot 25 when column 28 is moved along the shouldered recess 27 and to hold column 28 and base 23 together in any desired position.

Attached to the top of column 28 is a bearing 30 shown in the drawings as being attached to the column by means of screws 31. The bearing 30 has a circular guide opening 32 therethrough for receiving the shaft 33 of the adjusting means comprising thumb wheel 34, shaft 33, collar 35 and threaded stem 36. The anchored adjusting means just described engages with adjusting nut 37, whereby turning of the thumb wheel 34 in one direction causes nut 37 and its associated parts to move upwards, while turning of the thumb wheel 34 in the opposite direction causes the downward movement of nut 37 and its associated parts.

Rider nut 37 is rigidly attached to the drill receptacle 38 by suitable means so that the receptacle 38 moves up and down with the rider nut 37. The receptacle 38 has a V-channel 39 along which the drill 40 to be ground rests. Longitudinally movable along the receptacle 38 is plunger guide 41 which is keyed as at 42 to the receptacle 38 and which can be firmly attached to the receptacle by suitable means, including a thumb screw 43, as shown in Fig. 4.

Vertically movable within plunger guide 41 is a plunger 44 having a tapered conical face 45 so angled as to rest upon conventional drill flute edges 46. The plunger 44 is joined to heel shaft 47 by movable plunger link 48. The heel shaft 47 is movable vertically within the opening 49 in plunger guide 41 and has a heel 50 which rests on the drill 40. In operation, pressure may be applied downward on link 48 to keep the drill 40 from moving during the grinding operation.

To prevent back slipping of the drill 40 a drill stop 51 is provided along the bar 52 which is rigidly connected to the drill receptacle 38 and may be considered an extension thereof.

In operation, my device is brought to the correct position as regards distance in front of the grinding wheel 10 by suitable adjustment of the ball crank 14. The correct lateral position is obtained by moving the lever 16 in the direction of the arrows 17, causing the carriage 55 and associated parts carrying the device of my invention to be moved laterally.

The foregoing adjustments are conducted with the drill **40** in place in the V-channel **39** as shown in Fig. 5. Any desired lifting or lowering of the drill for more or less drill lip clearance is accomplished simply by turning thumb screw **34**.

As will be understood by those skilled in the art of drill point grinding, it is necessary to impart a curved surface to each drill face. This is accomplished in accordance with my invention by swiveling and lowering the bar **52**, as shown by the bar arrows **53** in Fig. 2.

After one face of a drill has been ground the swivel **22** is moved to the right by lever **16** to turn the drill so that the other face can be ground to correspond with the first simply by lifting the plunger link **48** and turning the drill **40** around so as to cause the plunger face **45** to contact the other drill flute edges **46**. For example, in Fig. 6, the bottom flutes shown will be the ones to be contacted by the plunger face **45** when the second drill face is to be ground.

While I have described my invention in detail in its preferred embodiment, it will be obvious to those skilled in the art, after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications and changes. Further, I have not deemed it necessary to specify size of parts, nature of the material from which the parts are made and other details as such matters are within the knowledge of those skilled in the art and form no part of the inventive ideas herein embodied and claimed.

I claim:

1. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, means for vertically-adjusting said drill-holding means, said vertically-adjusting means comprising a screw-actuated vertical slider rigidly united to said drill-holding means, and means for horizontally-adjusting the position of said plunger and plunger-related member, said latter horizontally-adjusting means comprising a guide member for receiving said plunger and plunger-related member in parallel vertical alignment and being slidably-movable along said drill-holding means to any desired fixed position.

2. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face drill-holding means, the improvement which comprises a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

3. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face drill-holding means, the improvement which comprises a vertically-rotatable frame having a base, an arcuately-disposed slot in the base a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, a downwardly-extending bolt carried by the base for the drill-holding means extending below the bottom surface of the shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

4. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering lower end adapted to engage drill flute edges and to keep the drill in non-rotary position relative to the drill holding means during the grinding operation, a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

5. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering lower end adapted to engage drill flute edges and to keep the drill in non-rotary position relative to the drill holding means during the grinding operation, a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, a downwardly-extending bolt carried by the base for the drill-holding means extending below the bottom surface of the shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

6. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill

point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

7. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, a vertically-rotatable frame having a base, an arcuately-disposed bolt in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, a downwardly-extending bolt carried by the base for the drill-holding means extending below the bottom surface of the shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

8. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, means for vertically-adjusting said drill-holding means, said vertically-adjusting means comprising a screw-actuated vertical slider rigidly united to said drill-holding means, and means for horizontally-adjusting the position of said plunger and plunger-related member, said latter horizontally-adjusting means comprising a guide member for receiving said plunger and plunger-related member in parallel vertical alignment and being slidably-movable along said drill-holding means to any desired fixed position, and slotted guide means operatively associated with said drill-holding means for arcuately adjusting said drill-holding means so that the drill point is fixed with regard to a predetermined point on the circumferential face of a grinding wheel.

9. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, means for vertically-adjusting said drill-holding means, said vertically-adjusting means comprising a screw-actuated vertical slider rigidly united to said drill-holding means, and means for horizontally-adjusting the position of said plunger and plunger-related member, said latter horizontally-adjusting means comprising a guide member for receiving said plunger and plunger-related member in parallel vertical alignment and being slidably-movable along said drill-holding means to any desired fixed position, a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

10. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the improvement which comprises drill-holding means including a vertically-movable plunger having a downwardly-tapering conical lower end adapted to engage drill flute edges, and a vertically-movable plunger-related member linked with said plunger and resting on the drill during the grinding operation whereby said plunger and vertically-movable member keep the drill in non-rotary position relative to the drill-holding means during the grinding operation, means for vertically-adjusting said drill-holding means, said vertically-adjusting means comprising a screw-actuated vertical slider rigidly united to said drill-holding means, and means for horizontally-adjusting the position of said plunger and plunger-related member, said latter horizontally-adjusting means comprising a guide member for receiving said plunger and plunger-related member in parallel vertical alignment and being slidably-movable along said drill-holding means to any desired fixed position, a vertically-rotatable frame having a base, an arcuately-disposed slot in the base, a shouldered recess in the base around said slot and another base for drill-holding means, said latter base having a bottom conforming to the size and configuration of and horizontally-movable within said shouldered recess, a downwardly-extending bolt carried by the base for the drill-holding means extending below the bottom surface of the shouldered recess, whereby the drill-holding means can be arcuately adjusted so that the drill point is fixed with regard to a predetermined point on the circumferential face of the grinding wheel.

11. In a device for grinding the faces of a fluted drill on a grinding wheel having a circumferential face, the combination which comprises a base, a sliding member adapted to move transversely of said base, means for moving the device longitudinally of the base, supporting members carried by said longitudinally-movable means, a frame, including a base pivotally mounted between said supporting members for rotary movement vertically, a curved guide slot in said base located so as to be equidistant throughout its length from a predetermined point on the circumferential surface of the grinding wheel, drill-holding means having a portion adapted to be moved within said slot, said drill-holding means including a plunger having a conical lower end adapted to engage the drill flutes and to keep the drill in non-rotary position relative to the drill-holding means during the grinding operation.

JOHN BECKER.

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