Aug. 1, 1933. W. B. WARD 1,920,537

GUIDE FOR CORRECT GRINDING OF TWIST DRILLS

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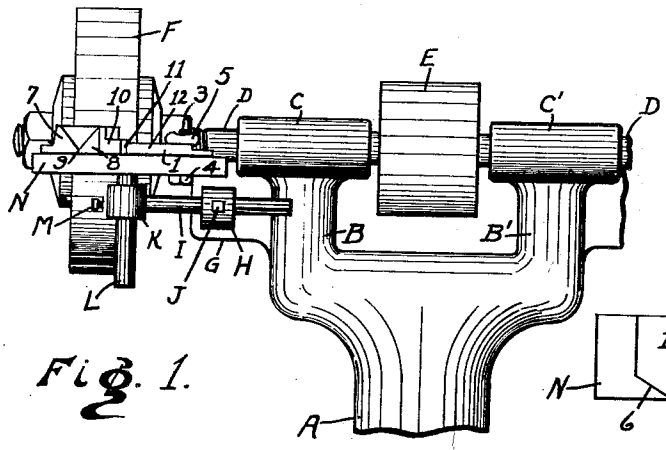


Fig. 1.

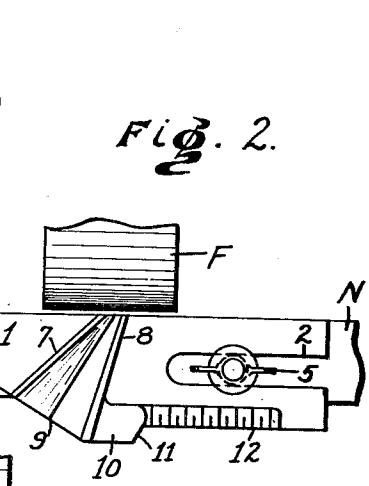


Fig. 2.

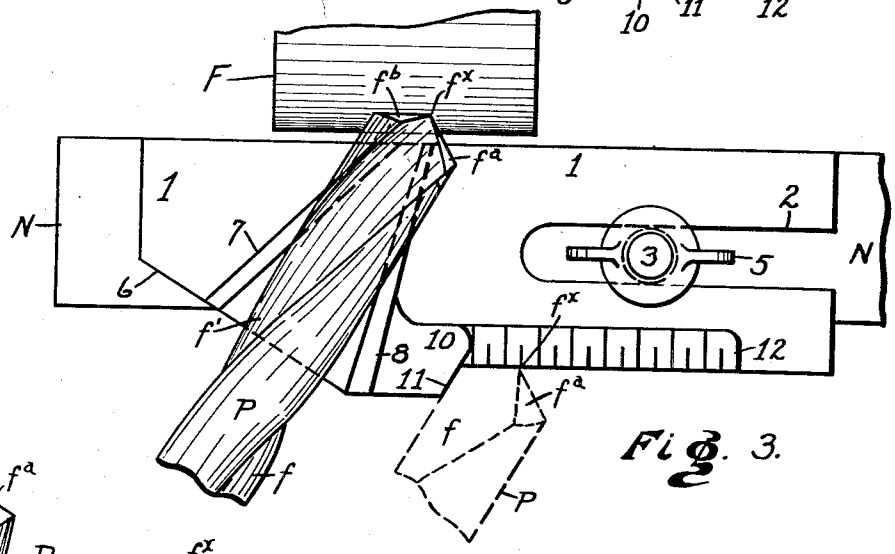


Fig. 3.

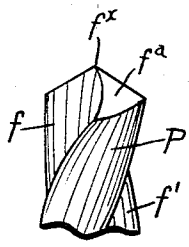


Fig. 6.

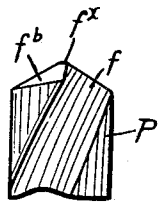


Fig. 7.

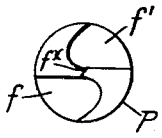


Fig. 8.

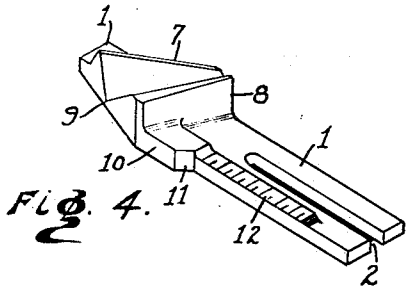


Fig. 4.

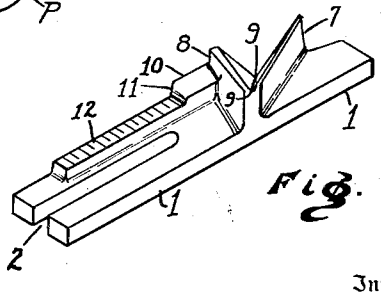


Fig. 5.

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GUIDE FOR CORRECT GRINDING OF TWIST DRILLS

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2 Claims. (Cl. 51—239)

The object of my invention is to provide means to enable an ordinary mechanic to properly grind twist drills, in order to obtain the results hereinafter set forth in the specification.

And another object is the provision of an attachment for employment with grinding twist drills, which can be manufactured and sold at a very low price, and employed with various styles of grinding machines.

One way of carrying out the principles of my invention, in a mechanically efficient manner, and that which in practice I have found to give the best results, is shown in the accompanying drawing, in which: Figure 1 shows an edge view, or elevation, of my invention, in connection with a drill grinding machine shown in elevation. Figure 2 shows a top plan view of my invention, taken at right-angles to that of Fig. 1, showing a portion of the table on which my device is mounted, and showing a portion of a grinding wheel associated therewith. Figure 3 is substantially the same as Fig. 2, except that it is taken on a larger scale, and shows a twist drill in one position, to be ground, and showing, in dotted line, the drill in position to be tested for accuracy in the work being performed thereon. Figure 4 is an isometrical view of my invention alone. Figure 5 is the same as Fig. 4, except that the position of the device is reversed. Figure 6 shows the working end portion of a twist drill. Figure 7 is the same as Fig. 6, except that the drill is shown as having been given a quarter turn. And Figure 8 is an end plan view of the drill. For a better understanding of the size of the parts with relation to each other, we will assume that Fig. 3 is full size; Fig. 2 being half size; Fig. 1, being one-fourth size; Figs. 4 and 5 being half size; and Figs. 6, 7 and 8 being full size. However said sizes are only relative, as the device may be of any size desired, and various size bits or drills may be operated upon without changing the size of the invention proper.

In the drawing similar indices designate like parts throughout the several views, the parts which are old being designated by letters of reference, and those which are parts of my invention being designated by numerals. The associated parts, with which my invention may be employed, comprises the pedestal A, which should be rigidly secured in the position shown in Fig. 1. Extending upwardly from the head of the pedestal are the spaced apart standards B and B', carrying the respective, spaced apart, bearings C and C', which carry the shaft D revolvably mounted therein. Secured on said shaft is the pulley E, which is located between the bearings B and B', and it provides means whereby the shaft may be rotated by power, however said shaft may be driven otherwise than that suggested in the drawing.

Secured on a projecting portion of the shaft D is the grinding wheel F.

Extending from the standard B is the flange or bracket G, to which is adjustably connected the supporting mechanism, comprising the rigid head H, a horizontal stem I slidable in the head H, and adapted to be rigidly secured by the set-screw J. Integral with the outer end of the stem I is the head K. Slidably mounted in the head K is the vertical stem L, which is adjustably secured by the set-screw M. Secured horizontally on the upper end of the stem L is the oblong work supporting table N, which extends across near the face of the grinding wheel F, and it is parallel therewith.

Letter P designates the working end portion of an ordinary twist drill, to the proper grinding of which my invention is importantly contributory, and in fact absolutely necessary.

The drill shown herein has two spiral channels, f and f', formed in the sides thereof and extending therearound parallel with each other. The working end of the drill has two faces, f^a and f^b, formed thereon, each at an angle with relation to the body of the drill, and at an angle with relation to each other, the juncture of the two faces, at the axial center of the drill, forms the cutting blade f^x, which terminates at the points of the drill, that is its center is the axial center of the working end of the drill.

The invention proper comprises an oblong plate 1, adapted to contact flat on the table N, with it straight edge, which extends from end to end thereof, adapted to extend flush and parallel with the inner edge of the table N, as shown in Fig. 3. Formed in the right-hand end portion of the plate 1, and parallel therewith, is a slot 2 adapted to receive the stem of the bolt 3, which bolt has a head 4 on its lower end and contacting with the underside of the table N, and on the upper portion of said bolt is threaded the winged nut 5 whereby the plate 1 may be clamped tightly onto the table N, as shown in Figs. 1, 2 and 3.

Formed integral with plate 1, and extending upwardly therefrom, are the two angular and upwardly tapering ridges 7 and 8, the outer sides of which are at right-angles to the plate 1, while their inner faces are angular, converging in the center at the line 9. Said line, or point of convergence of the inner faces of the members 7 and

8, extends upwardly and forwardly at an angle from near the bottom of the outer edge of the plate 1 to near the forward terminals of the ridges 7 and 8, thereby providing a V-shaped upwardly and inwardly extending channel, as shown most clearly in Figs. 2 and 5. The outer left-hand corner portion of the plate 1 is formed angular; to provide the angular edge 6, which is at right angles to line 9.

Integral with the surface of the plate 1, adjoining the member 8, and located adjoining the outer edge of said plate, is the lug 10, whose free-end forms an angular shoulder 11, which extends even with the underside of the plate 1, which will hereinafter be further explained.

Integral with the surface of the plate 1, and extending parallel with and adjoining the outer edge thereof, is the graduated scale-bar 12, one end of which adjoins the lug 10, and the shoulder 11. Said scale bar is for the purpose of determining the differences if any, between the radial length of the faces f^a and f^b of the working end of the drill, in order that the same may be corrected by the application of the faces of the drill to the grinding wheel F. Said scale acts as a determinative element as follows: Suppose, for instance, that the drill be placed in the position in which it is shown in dotted lines in Fig. 3, the angle of the shoulder 11, with relation to the edge of the scale bar 12, is such that the blade f^x, being then in vertical position, will be brought to a definite point of the scale, thereby determining the length of the face f^b, which position will be noted by the operator. Then by giving the drill a half turn in an axial direction, the other face f^a will be brought to the same position as was the face f^b, thereby enabling the operator to compare the difference, if any, and then by contacting the longer face of the drill to the wheel F he is able to make them equal, thereby correctly centering the drill.

It is to be observed that my complete guide shown in Figs. 4 and 5, is formed by a single piece of material, that is to say,—all of the parts are integral with each other.

The operation of my invention is extremely simple, after one has mastered his own movements with relation thereto. The operations which have been suggested above, may be carried out as follows: Resting the forward portion of the drill in the notch which is formed by the members 7 and 8 and parallel with the junction line 9, one is given the proper angle to form the faces f and f', at the same time rotating the drill axially, while the rear or stem portion of the drill is moved up and down, thus one is enabled to give the face of the drill the proper curvature. Also by means of said movements one is enabled to form the blade f^x, whose angular relation to the channels f and f', shown in Fig. 8, is a very important attainment. Stated in another way: While the face of the drill is being ground, that is while its face is held in contact with the revolving grinding wheel, the operator should impart to the drill limited gyratory movements, combined with substantially vertical movements of the stem of the drill, but without lifting the working end portion of the drill from contact with the guide, whereby while the face of the drill will be formed diagonally in a straight line from point to periphery of the drill, yet the face of the drill will be formed rounded in an axial direction, with all the parts thereof concentric with the axis of the drill stem.

All of the operations required for properly grinding a drill are accomplished without removing the drill from contact with the members 7 and 8, by which the drill is always properly supported for accurate grinding thereof. Only the determining of the relative width of the faces f^a and f^b to each other, requires the removal of the drill from the notch formed by the members 7 and 8, and this of course is not a grinding operation.

It should be noticed that the V-shaped channel formed by the members 7 and 8 may, if desired, be formed U-shaped, or as a half circle.

I desire that it be understood that various other changes may be made in the several details herein set forth, and in the arrangement and relative sizes of the parts thereof, without departing from the spirit of the invention or sacrificing any of the advantages thereof which are new and useful, and which involve invention.

Having now fully shown and described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A guide for the correct grinding of twist drills, comprising an oblong plate, means for securing said plate in operative position with relation to a grinding wheel, a pair of ridges integral with said plate and extending thereabove, said ridges being located diagonally with relation to said plate and with each other and providing a V-shaped channel between said ridges, with said channels formed tapering convergently with the juncture of said ridges inclined at an angle with relation to said plate.

2. A device for facilitating the correct grinding of tools, comprising a single unit adapted to be detachably secured in horizontal position in front of a grinding wheel, and consisting of a plate, a pair of ridges projecting upwardly from said plate and extending thereacross at different angles with relation to each other and with relation to said plate, with their forward ends approaching near to each other and diverging apart to their rear ends, with a V-shaped channel formed between said ridges, the center line of said channel being at an angle sloping upwardly from the rear edge to the forward edge thereof, and means carried by said plate for determining the accuracy of the grinding operation at the will of the operator, all substantially as set forth.

WILFRED B. WARD.