Dec. 7, 1948. D. CROWTHER 2,455,562

DEVICE FOR REPOINTING TWIST DRILLS

Filed Nov. 12, 1946

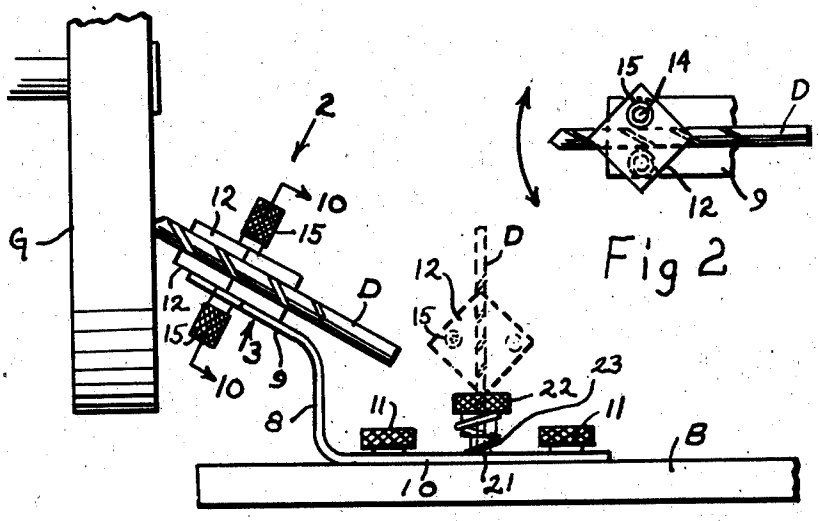


Fig 1

Fig 2

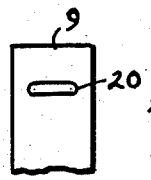


Fig 3

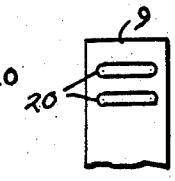


Fig 4

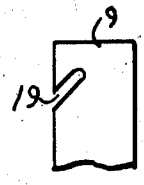


Fig 5

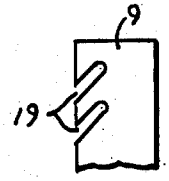


Fig 6

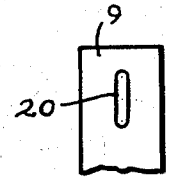


Fig 7

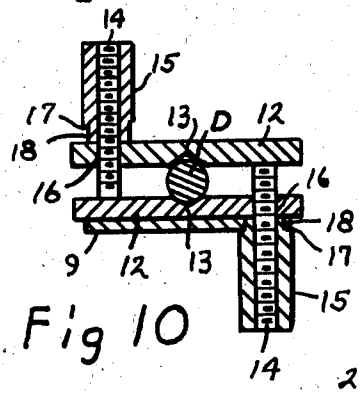


Fig 10

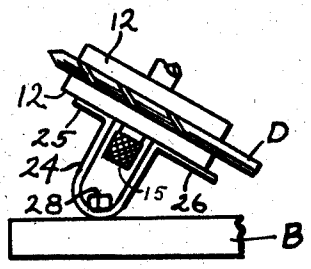


Fig 11

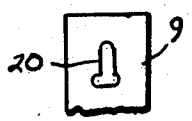


Fig 8

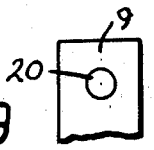


Fig 9

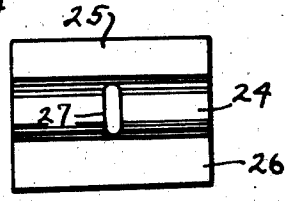


Fig 12

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Patented Dec. 7, 1948 2,455,562

UNITED STATES PATENT OFFICE

2,455,562

DEVICE FOR REPOINTING TWIST DRILLS

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Application November 12, 1946, Serial No. 709,191

3 Claims. (Cl. 51—219)

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My invention relates to devices for re-pointing twist drills. It relates more particularly to a device by means of which a drill to be re-pointed is supported in proper angular relation to a grinding wheel used to sharpen the drill. An object of the invention is to provide a device of this character which is simple and inexpensive to manufacture and at the same time is efficient and convenient for supporting a drill so that it may have its cutting end properly brought into engagement with a grinding wheel.

In the drilling art, a twist drill has a body portion provided with a point, the latter term being used to designate the entire cutting end. Two deeply cut helical grooves known as flutes extend diametrically opposite each other along the body portion of the drill. A sharp tip at the extreme forward end of the drill is formed by the intersection of cutting lips produced by the flutes. This tip must be kept during the sharpening operation in the exact center of the axis of the drill. The heel is the portion of the point back of the cutting lips. An efficient cutting edge for the lips would not be provided unless they are sharp. So in order to produce this cutting edge, the surface of the point must be ground exactly back of the lips, this being known as lip clearance. This clearance allows the lips to enter the metal or material which is being drilled, and the effectiveness of the drill depends largely on the grinding of the lip clearance at the proper angle which is substantially 12° at the periphery of the drill. Furthermore, the most desirable angle which is given to the cutting lips is considered to be substantially 30° with relation to the axis. With the foregoing explanation in mind, it will be understood that a special object of my invention is to provide a device by means of which the angles just referred to may be conveniently and accurately ground in order to provide the drill with the proper point.

The novel features which I believe characteristic of this invention are set forth with particularity in the appended claims. The invention, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments thereof when read in connection with the accompanying drawings in which,

Fig. 1 is a side elevational view of the device showing the point of a drill in proximity to a grinding wheel.

Fig. 2 is a top plan view looking in the direction indicated by the arrow 2 in Fig. 1.

Fig. 3, 4, 5, 6, 7, 8 and 9 are fragmentary views

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of the upper end portion of a bracket support showing some of the different forms of openings which may be made therein, these views being in the direction of the arrow 3 in Fig. 1.

Fig. 10 is a view in section on the line 10—10 of Fig. 1.

Fig. 11 is an elevational view of another form of bracket support.

Fig. 12 is a plan view of this form of bracket.

Referring to the construction shown in the accompanying drawings in order to illustrate the principles involved in this invention, the numeral 8 designates a bracket support having an inclined upper end 9 and a horizontal lower end 10. The end portion 10 is secured by screw bolts 11 to a horizontal surface such as the bench B of a grinding machine. A pair of clamping plates 12 are provided with longitudinal V-shaped grooves 13 in their surfaces which face each other, the two grooves being parallel to each other. These plates are made of any suitable material such as steel. When they are square in shape as shown, they are so positioned in operation that corners or points thereof are located nearest to the face of a grinding wheel G. However the shape of these plates is not a material feature so long as a reduced part thereof is directed toward the grinding wheel in order that no part of the plates shall come into engagement with the wheel during the back and forth movement of the clamping plates while holding a drill D to be pointed in the V-shaped grooves. This movement is indicated in Fig. 2.

A bolt or threaded stud 14 is secured at one of its ends to each of the plates 12, the projecting end being threaded to receive a knurled nut 15. The two plates are placed together so that each of the bolts 14 passes through a hole 16 in the opposed plate before the nuts 15 are applied. There are shoulders 17 at the inner ends of the knurled nuts 15 with reduced cylindrical portions 18 adapted to be clamped upon the outer faces of the two plates respectively. It will now be understood that when the two plates are assembled, the bolts extend in oposite directions from each other and spaced from each other in a vertical direction. In other words, the two parallel mating grooves 13 are exactly midway between the two bolts 14 and at right angles to a line extending between the bolts. Therefore when the holder is turned over with a drill clamped between the plates 12, the drill will be in the same relative position to the grinding wheel but turned half way around so that the lip of the drill will be ground exactly like the lip previously ground.

It will be understood from the drawings, that the drill holder is supported upon the flat inclined end portion 9 of the bracket. For this purpose the member 9 is provided with one or more open ended inclined slots 19, or with one or more openings 20 which do not extend through either edge of the support 9. In operation, the cylindrical portion 18 associated wtih the downwardly extending bolt 14 will be placed in a slot 19 or an opening 20 of the support 9 so that when the holder is engaged by the hand of the hand of the operator, the provision of the cylindrical portion 18 permits the holder assembly to be given a limited back and forth movement with relation to the face of the grinding wheel in order to grind the proper clearance back of the lip of the drill which at the same time is being ground at the proper angle.

As shown in Fig. 1, I provide an upwardly extending threaded stud 21 provided with a nut 22 adapted to be turned more or less down on the stud so that the extent of hole in the nut above the top of the stud constitutes a gauge which may be used to determine the proper length of the drill for extending beyond the holder. This length may be decreased or increased according to whether the nut 22 is turned upwardly or downwardly on the stud 21. The nut is backed up by a spring 23 so that any vibration which occurs will not change the depth of the exposed hole when the proper depth has been determined.

Figs. 11 and 12 show a different form of bracket support for the drill. This bracket consists of a U shaped body portion 24, the two ends of which are extended angularly outward to constitute the members 25 and 26 of a drill holder suport. The curved portion of the U member is provided with a slot 27 through which a securing bolt 28 passes. Upon loosening this bolt, the drill holder support can be tilted at any desired angle and then secured in such position by turning the bolt down. The downwardly extending knurled nut 15 enters the space in the U member. This space forms an opening in which either one of the bolts having nuts 15 may be placed to serve as a pivot for swinging back and forth lateral movement of the drill holder provided by the pair of clamping plates 12.

The operation and advantages of my invention will be readily understood in connection with the foregoing description and the accompanying drawings. In order to repoint a drill when it becomes dull, it is placed between the two grooves which face each other in the plates 12 and with the cutting end thereof projecting the proper distance as shown in Fig. 1. In order to accurately determine this distance, a gauge such as shown in this figure at 21—22 may be used.

The knurled nuts 15 are then turned down to clamp the drill in place. One of the bolts 14 is then applied to the upper portion of the bracket with the cylindrical portion 18 in the opening or slot provided therein and the shoulder 17 just beneath the lower side of the bracket member. The clamping device is given a limited back and forth movement with the cylinder 18 serving as a pivot, this movement serving to grind the heel of the drill to provide the proper angle of lip clearance. When this grinding has been performed for one half of the cutting end, the clamping device is removed from the bracket, turned over and the other bolt 14 applied to the bracket, so that the other half of the drill is ground exactly like the first half. The use of this device insures this desirable result since it is not necessary to loosen the drill in the clamping device for the two grinding operations. When the bracket support is provided with two openings, the lower opening may be used in order to give a greater radius for the back and forth movement of larger drills.

I claim:

1. In a device for re-pointing twist drills, the combination of a drill clamping holder embodying two clamping plates having opposed longitudinal grooves in their surfaces for receiving a drill between them, said plates containing holes equally spaced laterally from said grooves, a clamping bolt secured to each of said plates and extending in opposite directions through the hole of the associated plate, and a support for said holder containing an opening in which either one of said bolts may be placed to serve as a pivot for swinging back and forth lateral movement of said holder with relation to the face of a grinding wheel.

2. In a device for re-pointing twist drills, the combination of a drill clamping holder embodying two clamping plates having opposed longitudinal grooves in their surfaces for receiving a drill, said plates containing holes equally spaced laterally from said grooves, a clamping bolt secured to each of said plates and extending in opposite directions through the hole of the associated plate, and a bracket having an inclined upper end portion containing an opening in which either one of said bolts may be placed to serve as a pivot for swinging back and forth lateral movement of said holder with relation to the face of a grinding wheel.

3. In a device for re-pointing twist drills, the combination of a drill clamping holder embodying two clamping plates having opposed longitudinal grooves in their surfaces for receiving a drill, said plates containing holes equally spaced laterally from said grooves, a clamping bolt secured to each of said plates and extending in opposite directions through the hole of the associated plate, a U-shaped bracket having angularly extending end portions for supporting said holder, the space between the arms of said U member forming an opening in which either one of said bolts may be placed to serve as a pivot for swinging back and forth lateral movement of said holden with relation to the face of a grinding wheel, the curved portion of said bracket containing a slot, and a securing bolt passing adjustably through said slot.

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The following references are of record in the file of this patent:

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