

July 27, 1943.

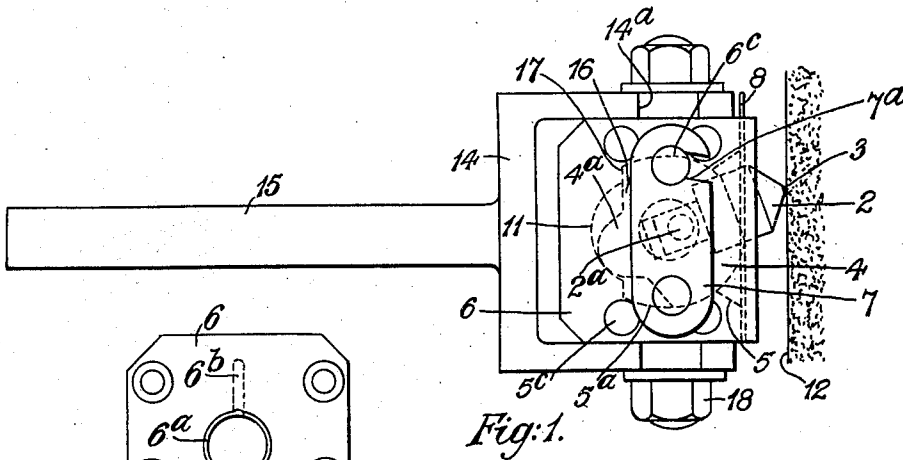
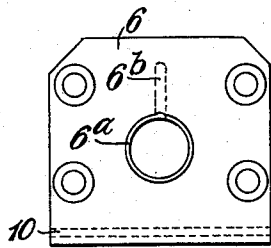
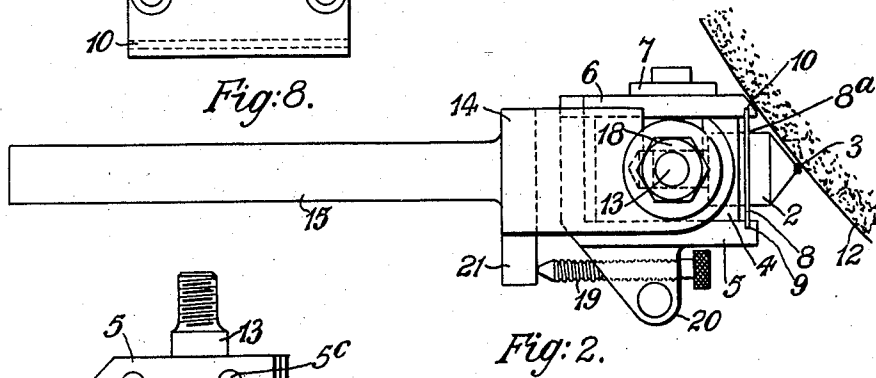
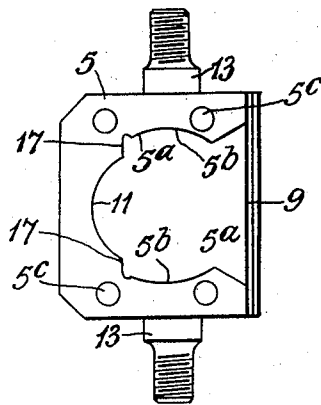
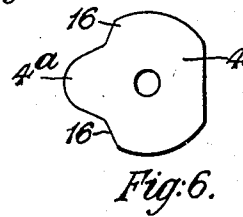
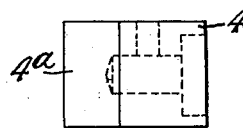
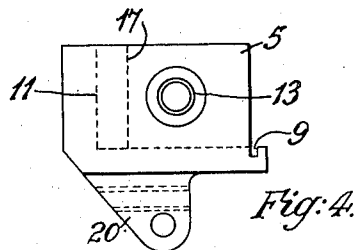
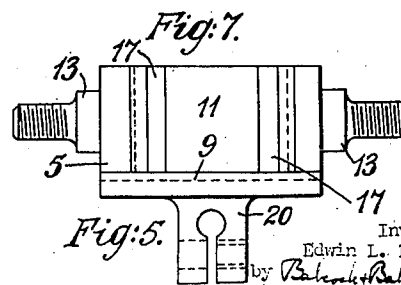
E. L. MEESON

2,325,334

DIAMOND AND THE LIKE CUTTING TOOL

Filed July 1, 1942

2 Sheets-Sheet 1



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2,325,334

DIAMOND AND THE LIKE CUTTING TOOL

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2 Sheets-Sheet 2

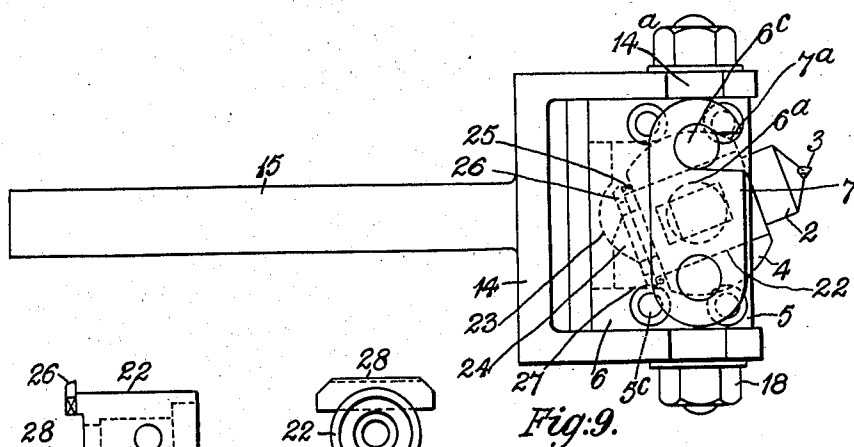


Fig. 9.

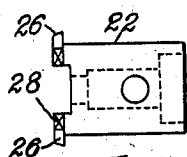


Fig. 16.

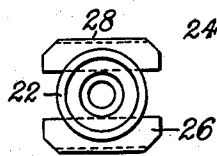


Fig. 17.

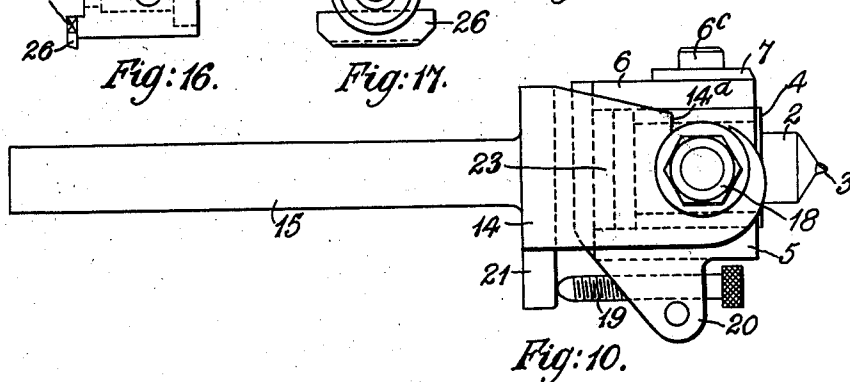


Fig. 10.

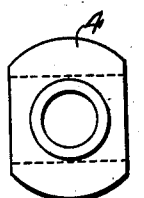


Fig. 14.

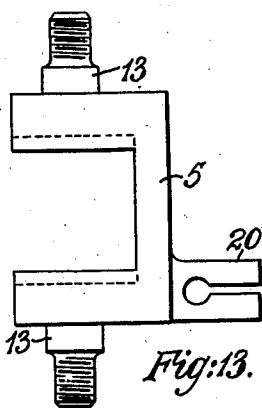


Fig. 13.

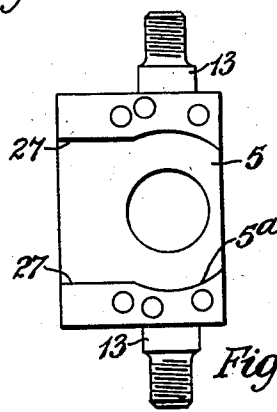


Fig. 11.

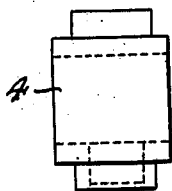


Fig. 15.

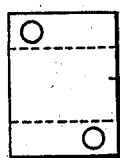


Fig. 18.

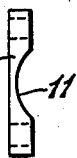


Fig. 19.

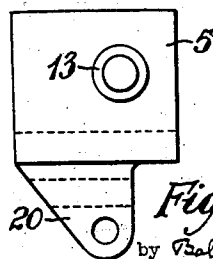


Fig. 12.

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UNITED STATES PATENT OFFICE

2,325,334

DIAMOND AND THE LIKE CUTTING TOOL

Edwin Laurence Meeson, Coventry, England

Application July 1, 1942, Serial No. 449,287

In Great Britain December 16, 1941

9 Claims. (Cl. 125—39)

This invention relates to diamond and the like cutting tools, such as are employed for dressing grinding and abrading wheels; and more particularly to the kind in which the tool proper, consisting of a mount or slug carrying one or more diamonds or the like cutting elements, is mounted so that when presented to a rotating grinding wheel it will give a trailing cut in either direction of traverse across the wheel surface and will be automatically rocked from one position to the other between successive traverses, by the action of the traversing motion.

The object of the present invention is to provide a mounting of this kind in which the position of the tool can be reversed at any point in its traverse in either direction without any risk of damage to the wheel or to the tool.

According to the present invention a diamond tool of the kind herein referred to is characterized in that during the rocking movement of the tool from one trailing position to the other, the point of the diamond describes a straight-line path parallel or substantially parallel with the surface of the grinding wheel so that if the trailing position of the tool is reversed at any point in its traverse in either direction no undue stresses are set up in the tool and there will be little or no tendency for the point of the diamond to dig into and damage the surface of the grinding wheel.

This very desirable result is obtained by providing for the slug or mount carrying the diamond to have a combined pivotal and axial movement, the former being produced by the traversing movement and limited by suitable stops, and the latter controlled by means of a cam surface with or without the assistance of spring pressure.

In the accompanying drawings,

Figure 1 is a plan view of one construction of diamond tool embodying the present invention.

Figure 2 is a side view thereof.

Figure 3 is a plan view of the housing.

Figure 4 is a side view thereof.

Figure 5 is a front view thereof.

Figure 6 is a plan view of the cylindrical member.

Figure 7 is a side view thereof.

Figure 8 is a detail view of the top plate.

Figure 9 is a plan view of an alternative construction of diamond tool embodying the present invention.

Figure 10 is a side view thereof.

Figure 11 is a plan view of the housing.

Figure 12 is a side view, and

Figure 13 a view thereof as seen from the right hand of Figure 11.

Figure 14 is a detail plan view of the cylindrical member.

Figure 15 is a plan view thereof.

Figure 16 is a plan view of the sleeve, and

Figure 17 is an end view thereof.

Figure 18 is a plan view of the concave plate, and

Figure 19 an end view thereof.

Throughout the drawings like parts are designated by similar reference characters.

In the construction shown in Figures 1-8, the slug or mount 2 carrying the diamond 3 is fixed in a member 4 of part cylindrical form, see Figures 6 and 7, which is mounted so as to be free to turn about its geometrical axis in a horizontal plane and to have a limited movement in each direction at right angles to said axis, in a housing 5, see Figures 3, 4 and 5, the interior configuration of which is such as to provide substantial bearing surfaces 5^a for said member in each position it may occupy therein along a line at right angles to said axis. For this purpose the said surface comprises two part-circular arcs joined together by flat portions 5^b of a length equal to the required movement of said member at right angles to its axis. The housing is open at the front and at the top but is normally closed to exclude grit removed by the tool from the grinding wheel, by means of a plate 6, Figure 8, located on the upper face of the housing by means of pins 5^c, and by a front plate 3 which slides in grooves 9, 10 in the front edges of the housing and top plate, and is formed with a slot 8^a through which the front end of the slug 2 protrudes. The rear wall of the housing is formed interiorly with a concave cam surface 11 of elliptical form against which a rounded projection or nose 4^a at the rear of the said member 4 makes constant contact. The top plate, see Figure 8, is provided with an opening 6^a to give access to a set screw 2^a which secures the slug 2 in the member 4, and to enable lubricant to be supplied via the duct 6^b to the cam surface. A swinging plate 7 pivoted at one end to the top plate and having an open-ended slot 7^a in the other for engagement with a pin 6^c, is provided to close the opening 6^a.

The formation of the cam surface is such that as the said member 4 turns about its axis in the housing 5, when the direction of traverse of the tool is changed, it allows the said member to move in a direction at right angles to the axis of the latter to such a varying extent that the point

of the diamond, during the change over from the one trailing position to the other, describes a straight line path parallel with the surface of the grinding wheel 12.

The housing itself is angularly adjustable about a horizontal axis on trunnions 13 which are supported in open vertical slots 14^a in the limbs of a yoke or fork 14. The yoke is provided with a stem or shank 15 for attachment to a slide or carriage (not shown) by means of which the tool is traversed across the face of the grinding wheel.

The trailing angle of the tool in each direction of traverse is determined by shoulders 16 on the member 4 co-operating with stops 17 on the housing 5.

The annular position of the housing about the axis of the trunnions is locked by means of nuts 18 screwing onto the ends of the latter and the housing is positively prevented from turning in one direction against the action of the grinding wheel on the tool by means of a screw 19 carried by a split lug 20 on the housing and adapted to bear against an abutment 21 on the yoke 14. A fine adjustment for the housing in one direction about the axis of the trunnions can be obtained by adjusting the said screw in its lug. The screw itself can be locked in its adjusted position by clamping the split lug about it by means of a bolt or screw passing through the split ends of the lug.

In the alternative construction shown in Figures 9-19 which also gives a straight line motion for the diamond point, the slug or mount 2 instead of being rigidly fixed in the part cylindrical member 4 is fixed in a sleeve 22 having a longitudinal or axial fore and aft sliding movement in the member 4. In this case the said member has an oscillating movement in bearings 5^a in the housing 5 about a fixed centre and the axial movement of the sleeve carrying the slug is controlled by a concave cam surface 11 formed in a plate 23, Figures 18 and 19, at the back of the housing, against which surface a projection 24 carried by the inner end of the sleeve is held by means of a spring 25 introduced between top and bottom flange portions 26 on the inner end of the sleeve and the rear face of the member 4. The trailing angle of the tool for each direction of traverse is determined by contact between the peripheral edges of the flange portions 26 and vertical faces 27 at each side of the housing. The said flange portions are also formed with flats 28, see Figures 16 and 17, so that when the top plate 6 is assembled in position to close the upper side of the housing 5, the sleeve is prevented from rotation. Otherwise the construction is similar to that above described with reference to Figures 1-8, the housing 5 being provided with trunnions 13 pivotally mounted in slots 14^a in the jaws of the yoke of the holder and arranged for angular adjustment and locking in a manner similar to that above described.

As will be understood the improved tool in either of the forms above described operates in both directions of traverse with a trailing cut so that by repeated angular adjustment of the slug or mount about its own axis in the aforesaid member 4, or in the sleeve 22, as the case may be, the diamond or the like cutting element develops a conical point.

I claim:

1. A tool of the character described comprising a holder adapted for reciprocation across

the operative surface of an abrading wheel, a member free to turn therein, a sleeve free to slide in said member, a mount fixed in said sleeve and carrying at least one cutting element and means for limiting the extent of the turning movement of said member and for controlling the sliding movement of said sleeve.

2. A tool of the character described comprising a holder adapted for reciprocation across the operative surface of an abrading wheel, a member free to turn therein, a sleeve free to slide in said member, a mount fixed in said sleeve and carrying at least one cutting element, and co-operating surfaces on said member and sleeve for controlling and limiting their respective movements.

3. A tool of the character described comprising a holder, a housing pivotally mounted therein and having internal part spherical seatings connected by a parallel portion, and a cam surface, a part spherical member free to turn and to move bodily between said seatings, and having a projection co-operating with the cam surface of said housing, and a mount fixed in said member and carrying at least one cutting element.

4. A tool of the character described comprising a holder, a housing angularly adjustable therein and having an integral part spherical seating and a cam surface, a part spherical member free to turn in the seating of said housing, a sleeve slidably mounted in said member and having a projection co-operating with the cam surface of said housing, a spring for maintaining said co-operating parts in contact with each other, and a mount fixed in said sleeve and carrying at least one cutting element.

5. In a tool for dressing grinding wheels wherein a diamond mounting is free to rock from one trailing position to the other as the tool is traversed across the face of the grinding wheel; a holder, a member adapted to receive said diamond mounting and capable of simultaneous oscillating and sliding movements relatively to said holder, and means for controlling the movements of said member so that during the rocking motion of said mounting the point of the diamond describes a straight line path parallel with the face of the grinding wheel.

6. In a tool for dressing grinding wheels wherein a diamond mounting is free to rock from one trailing position to the other as the tool is traversed across the face of the grinding wheel; a holder, a member capable of an oscillating movement therein, a sleeve slidably mounted in said member and carrying said diamond mounting, and co-operating parts on said holder and sleeve whereby during the rocking motion of said mounting the point of the diamond is caused to describe a straight line path.

7. In a tool for dressing grinding wheels wherein a diamond mounting is free to rock from one trailing position to the other as the tool is traversed across the face of the grinding wheel; a holder, a member adapted to receive said diamond mounting, said member being free to oscillate in said holder and to have a simultaneous sliding movement relatively thereto, and co-operating surfaces on said holder and member whereby the point of the diamond is caused to describe a straight line path during the rocking movement of said mounting.

8. In a tool for dressing grinding wheels wherein a diamond mounting is free to rock from one trailing position to the other as the tool is traversed across the face of the grinding

wheel; a holder, a block angularly adjustable therein, a spherical member free to oscillate in said block, a sleeve carrying said diamond mounting and free to slide in said member, and means for controlling the sliding movement of said sleeve so that during the oscillation of said member the point of the diamond describes a straight line path parallel with the face of the grinding wheel.

9. In a tool for dressing grinding wheels wherein a diamond mounting is free to rock

5 from one trailing position to the other as the tool is traversed across the face of the grinding wheel; a holder, a block angularly adjustable therein, a member carrying said diamond mounting and free to oscillate in said block, and cooperating surfaces on said block and member adapted as the tool is traversed across the face of the grinding wheel to cause the point of the diamond to describe a straight line path parallel with the surface of the grinding wheel.

10 EDWIN LAURENCE MEESON.