Oct. 8, 1940. G. K. GUENTHER 2,217,545

DRILL SHARPENER ATTACHMENT

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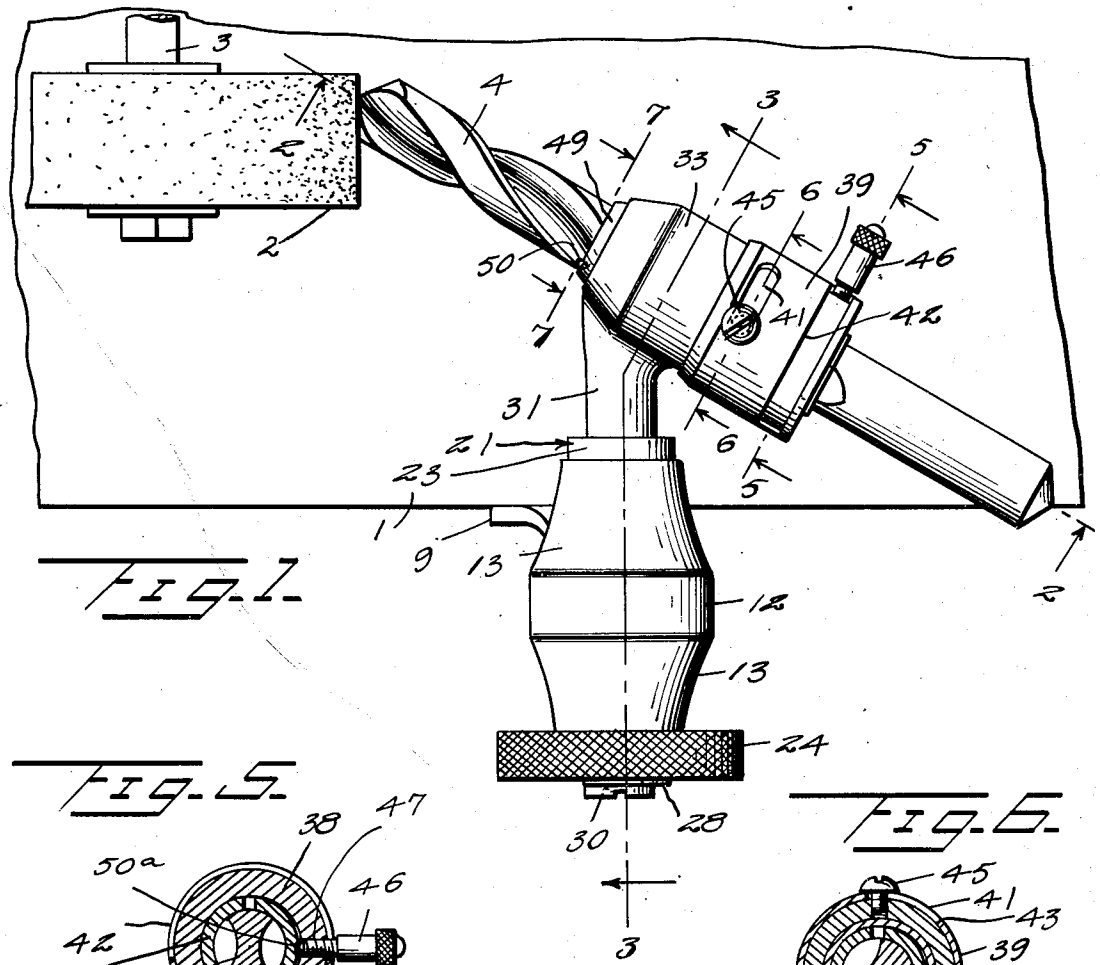


Fig. 1.

Fig. 5.

Fig. 6.

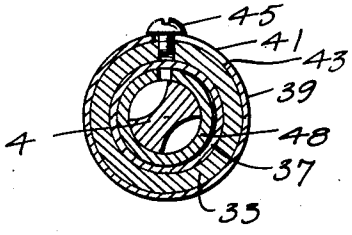
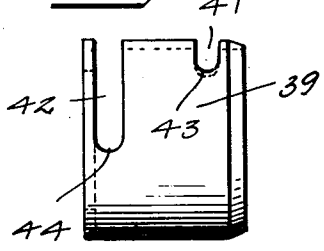


Fig. 9.



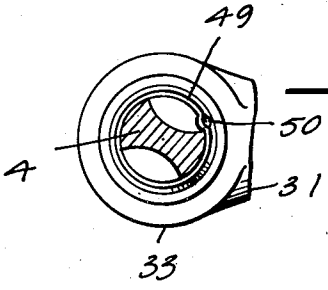
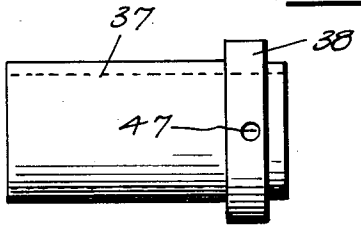


Fig. 7.

Fig. 10.



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Fig. 2.

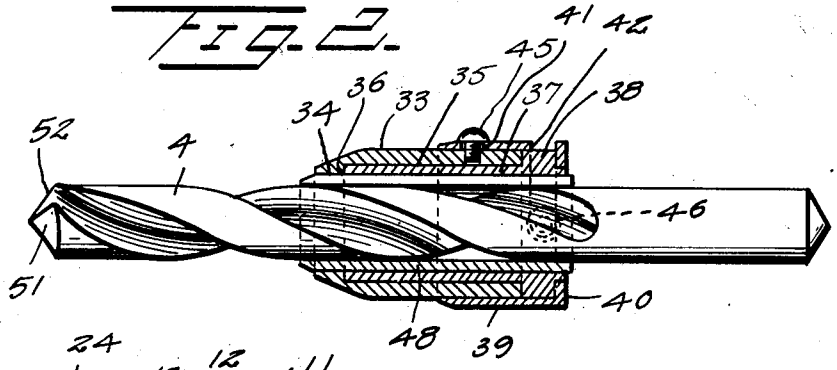


Fig. 3.

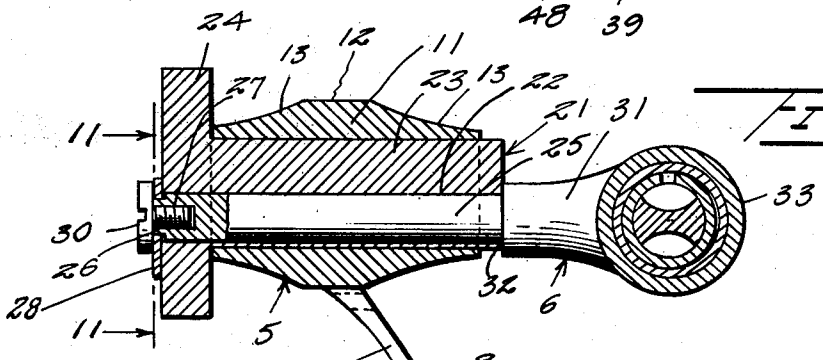
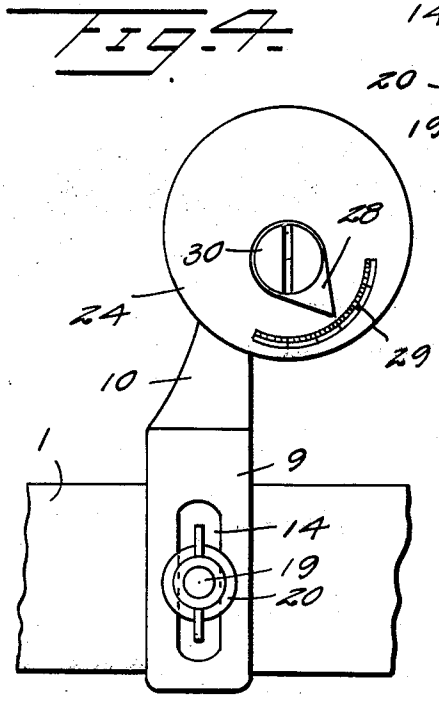


Fig. 4.



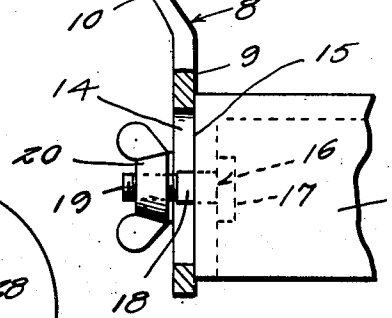


Fig. 11.

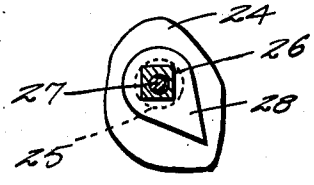
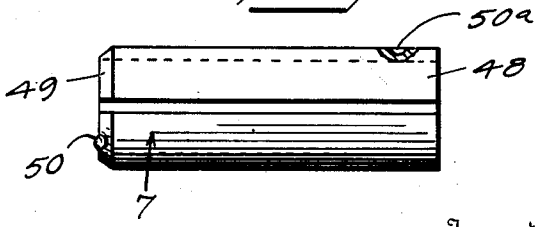


Fig. 8.



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UNITED STATES PATENT OFFICE

2,217,545

DRILL SHARPENER ATTACHMENT

Gerhard K. Guenther, Chicago, Ill.

Application July 6, 1939, Serial No. 283,108

6 Claims. (Cl. 51—219)

This invention relates to a drill sharpener attachment for abrading or grinding machines.

The object of the invention is to provide, in a manner as hereinafter set forth, an attachment of the class referred to capable of being readily connected to an abrading or grinding machine for the purpose of holding a drill for action thereon by the abrading or grinding element of the machine to sharpen the drill.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including means whereby the drill, while in position to be sharpened in juxtaposition to the abrading or grinding element of the machine may be given a half revolution to successively position the cutting edges of the drill to be acted upon without removing the drill from the attachment.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to for receiving a drill to be sharpened and including means for anchoring the drill to the attachment in selected extended relation therefrom to be acted upon by an abrading or grinding element for the purpose of sharpening the drill.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to for securing in juxtaposition relative to an abrading or grinding element, and including an oppositely shiftable holding means to provide for successively presenting the cutting edges of the drill for action thereon by said element to sharpen them.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including a holding means for clamping to the drill, which is to be acted upon and with said means capable of being shifted in opposite directions a half revolution with the drill clamped thereto to thereby present successively the outer ends of the twists or flutes of the drill to be acted upon.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including a shiftable carrier having a sleeve, and an oppositely shiftable holder for the drill arranged in the sleeve, said sleeve and carrier having coacting means to permit the holder oppositely shifting on its axis within the sleeve and to prevent the holder bodily shifting in a direction lengthwise of the carrier.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including adjustable means for arranging the beveled surfaces at the outer ends of the twists or flutes of a drill in the desired position to be acted upon by an abrading or grinding element.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including a holder for the drill, which is to be sharpened and an eccentrically mounted carrier for said holder capable of disposing the drill, while in its holder towards and from an abrading or grinding element.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including a holder for the drill and means associated with the holder for clamping it to the drill and with the holder provided with means coacting with an edge of one of the twists or flutes of the drill to prevent the revolving of the drill within the holder during the action of sharpening the cutting edges of the drill.

A further object of the invention is to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to including a structure for disposing in juxtaposition to an abrading or grinding element and having means for removably securing a drill to be sharpened by said element, a support for said structure and with the latter shiftably mounted in the support to enable the drill when being acted upon to be shifted relative to an abrading or grinding element.

Further objects of the invention are to provide, in a manner as hereinafter set forth, an attachment for the purpose referred to which is simple in its construction and arrangement, readily installed with respect to an abrading or grinding machine, strong, durable, compact, thoroughly efficient in its use, conveniently assembled, adjustable and comparatively inexpensive to manufacture.

Embodying the aforesaid objects and others which may hereinafter appear the invention consists of the novel construction, combination and arrangement of parts as will be more fully referred to and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a top plan view of the attachment

having a twist drill secured thereto and showing the adaptation of the attachment with respect to an abrading, grinding or sharpening element and with the drill in position to be acted upon by said element,

Figure 2 is a section on line 2—2 Figure 1,

Figure 3 is a section on line 3—3 Figure 1,

Figure 4 is an elevation looking towards one end of the attachment and with the latter connected to the platform or table over which is arranged the abrading, grinding or sharpening element,

Figure 5 is a section on line 5—5 Figure 1,

Figure 6 is a section on line 6—6 Figure 1,

Figure 7 is a section on line 7—7 Figure 1,

Figure 8 is a side elevation of the drill holder,

Figure 9 is a side elevation of the stop sleeve forming an element of the carrier for the drill holder,

Figure 10 is a side elevation of the flanged supporting sleeve for the drill holder and which forms an element of the carrier for the latter, and

Figure 11 is a section on line 11—11 Figure 3.

With reference to the drawings, 1 indicates a platform or table forming an element of an abrading, grinding or sharpening machine. Revolubly mounted over the table or platform 1 is an abrading, grinding or sharpening element 2 and which will be hereinafter referred to as a sharpening element for acting on the drill to sharpen the edges of the latter. The element 2 is in the form of an emery or carborundum wheel of well known type. The element 2 is carried by the operating means 3 therefor. The drill, which is to be acted upon by the element 2 is indicated at 4 and it is disposed in angular relation with respect to the edge of the element 2.

The attachment includes a supporting means 5 for a carrier 6, in which is arranged the drill holder 7.

The supporting means 5 consists of a shank 8 formed of a lower part 9 and an upper part 10 which merges at its upper end into the bottom of a sleeve 11. The outer periphery of the latter is formed with a central part 12 of uniform diameter and a pair of oppositely disposed outer parts 13, which gradually decrease in outer diameter from the part 12. The shank 8 is of bar-like form having its lower part 9 of greater width than its upper part 10. The latter is disposed at an outward inclination from its lower to its upper end from its point of mergence with the upper end of the part 9. By this arrangement the sleeve 11 is off-set with respect to the part 9. The shank 8 in its lower part 9 is formed lengthwise thereof with a slot 14. The part 9 of shank 8 is adapted to be positioned against the side 15 of the table 1. Carried by the table 1 and extending through that side thereof against which is positioned the part 9 of the shank 8 is a bolt 16 formed of a head 17, a square shank portion 18 and a peripherally threaded shank portion 19. The shank of the bolt 16 extends through the side 15 of the table 1, also through the slot 14 and projects outwardly from the latter. The square portion 18 of the shank of the bolt 16 is mounted in the slot 14. Threadably engaging with the threaded part 19 of the shank of the bolt 16 is a wing nut 20 adapted to bind against the part 9 of the shank 8 whereby the supporting means 5 is clamped to and in upstanding relation with respect to the table 1.

Arranged within and extending from each end of the sleeve 11 is a bearing member 21 formed with a bore 22 from end to end thereof, and which is disposed eccentrically with respect to the axis of the member 21. The member 21 is formed of two parts of different diameters, the part of smallest diameter is indicated at 23 and the part of largest diameter at 24. The part 23 is arranged within the sleeve 11 and the part 24 is positioned exteriorly of one end of the sleeve 11. The part 23 of the member 21 is slidably mounted in the sleeve 11 and can also be revolved relative to said sleeve. The part 24 is of materially less length than the part 23. The member 21 constitutes a combined bearing, coupling and adjusting means for the carrier 6, as well as a means for bodily shifting the carrier 6. With reference to Figure 3, the member 21 is shown as coupling the carrier 6 to the supporting means 5.

The carrier 6 includes a shaft 25, which is mounted in the bore 22 and projects outwardly from the part 24 of the member 21. That part of the shaft 25 which projects from part 24 is indicated at 26 and is of reduced diameter with respect to the remaining portion of the shaft 25. The latter is formed with a threaded socket 27 opening through the part 26 of the shaft 25. Mounted on the said portion 26 is a pointer 28 which correlates with a scale 29 formed on the outer face of the part 24 of the member 21. The shaft 25 is locked from shifting relative to member 21 by a releasable holding screw 30, which has threaded engagement with the socket 27 and is adapted to bear against the pointer 28.

The carrier includes a leg 31 which is integral with one end of shaft 25. The leg 31 is of greater diameter than shaft 25 and at the junction of the latter with the leg 31 a shoulder 32 is formed, which abuts against an end of the part 23 of member 21. The shoulder 32, in connection with the screw 30 secures the carrier to the member 21. The leg 31 merges into one end of a stationary sleeve 33, which is disposed at an obtuse angle with respect to said leg 31. The sleeve 33 extends rearwardly from the leg 31. The inner face of the sleeve 33 is upon two different diameters, the smaller of which is designated 34 and the larger of which at 35. The portion of smallest inner diameter is of materially less length than the portion 35. At the junction of portions 34, 35 the sleeve 33 is provided with an internal shoulder 36. Arranged within the sleeve 33, abutting the shoulder 36 and extending outwardly from the portion 35 of largest inner diameter of the sleeve 33 is an oppositely revoluble supporting sleeve, tubular member or tubular element 37 provided on that portion thereof which extends from the sleeve 33 with a peripheral annular flange 38. The sleeve 37 abuts the shoulder 36. The flange 38 on sleeve 37 abuts the rear end of the sleeve 33. Encompassing the sleeve 33 and the flange 38, as well as abutting the latter is an adjustable normally stationary oppositely revoluble stop sleeve or tubular member 39 having an inwardly extending flange 40 at its rear end, which abuts the flange 38. The sleeve 39 is arranged on the rear portion of the sleeve 33 and also on the rear portion of the sleeve 37. The sleeve 39 is formed in proximity to its forward end with a circumferentially extending slot 41. The sleeve 39 in proximity to its rear end is formed with a circumferentially extending slot 42 of greater length than the slot 41. The slot 42 exposes the flange 38. The end walls 43 of the slot 41 provide stops. The end walls 44 of the slot 42 provide stops.

Extending through the sleeve 39 and threadedly engaging the sleeve 33 and extending through the

slot 41 is a binding screw 45 for the sleeve 39. The sleeve 39 not only constitutes a stop for a purpose referred to, but also an adjuster for the drill. Threadably engaging with the sleeve 37, extending through the latter and also extending outwardly through the slot 42 is a clamping screw 46, which also acts as a shifter for the oppositely revoluble sleeve 37. The screw 46 engages in the flange 38 of the sleeve 37. A threaded opening 47 for the passage of the screw 46 is formed in the flange 38.

The holder 7 for the drill is in the form of a split cylinder, tubular member or tubular element 48 of resilient material. The cylinder 48 at one end is beveled, as at 49 and at such end it is formed with a receiving means 50 for a purpose to be referred to. The holder 7 is mounted in the carrier 6 and projects forwardly from the sleeve 33 and rearwardly from the flange 40 of the sleeve 39. The holder 7 is for encompassing the drill, such as shown in Figure 2 and the said means 50 receives an edge of a twist or flute to arrest the revolving of the drill relative to the holder 7. The holder 7 is arranged in the carrier before the drill is passed therethrough. It will be assumed that the drill has been extended through the carrier 7 and after which the screw 46 is screwed home for the purpose of clamping the holder 7, drill 4 and sleeve 37 bodily together, and when clamped together the screw 46 will permit the revolving a half revolution in opposite directions of the drill 4, holder 7 and sleeve 37. The revolving in opposite directions of said clamped together elements of the attachment is arrested at the extent of the half revolution in opposite directions by the end walls 44 of the slot 42. This manner of revolving the drill in opposite directions to the extent of a half revolution permits of the shifting of a beveled surface 51 at the end of one twist from the sharpening element 2 to position the beveled end 52 of the other twist to be acted upon without disconnecting the drill 4 from the carrier.

It will be assumed that when the drill is mounted to be sharpened that the beveled surfaces 51, 52 are to be in proper position against the sharpening element 2 and to properly position such surfaces the screw 45 is released and the sleeve 39 shifted to the desired extent on sleeve 33 to change the position of the end walls 44 of the slot 42 relative to the screw 46. After the sleeve 39 has been adjusted to a desired extent the screw 45 is screwed home thereby maintaining the sleeve 39 in a desired position. The screw 46 is then used to revolve the drill to an extent to position the surface 51 or 52 against the sharpening element 2 so it will be properly acted upon. The walls 43 of the slot 41 act as stops to limit the adjusting of the sleeve 39 in opposite directions.

The eccentric mounting of the carrier permits of its shifting the drill 4 towards and from the sharpening element 2. In this connection it is to be stated that when it is desired to adjust the carrier for the purpose of moving the drill towards or from the sharpening element 2, the member 21 is revolved in a desired direction thereby moving the carrier 6 therewith to an extent to position the drill in the desired relation with respect to the sharpening element 2. The scale 29 which correlates with the pointer 28 will enable one to ascertain in what direction and to what extent the member 21 is adjusted to provide for the carrier 6 positioning the drill 4 in the desired relation with respect to the sharpening element 2.

The slot 14 in connection with the bolt 16 and nut 20 will permit of vertically adjusting the attachment relative to the grinding element 2.

When the drill 4 is being acted upon it is disposed at an obtuse angle with respect to the edge of the grinding element 2. As the carrier 6 may be bodily shifted relative to the sleeve 11, during the operation of sharpening the drill, it prevents the edge of the grinding element from being grooved from the drill during the sharpening operation.

The part 24 of the member 21 has its edge knurled to facilitate the turning of the member 21 when desired.

When the screw 46 is screwed home to bind against the holder 7 it provides for disposing said holder 7 in encompassing clamping relation with respect to the drill 4.

The part 24 of the member 21 in connection with the shoulder 32 of the carrier 6 connects the member 21 and the carrier 6 to the sleeve 11.

The slot 14 is rectangular and which prevents the turning of the shank 8 relative to the side 15 of the table 1.

The cylinder 48 of the holder 7 is formed in proximity to that end opposite the end in which the cut-out 50 is arranged with a recess or cavity 50^a. The screw 46, when screwed home engages in the cavity 50^a thereby preventing the lengthwise shifting of the holder 7 relative to the sleeve 37 and further when the screw is in engagement with the cavity 50^a, it prevents the revolving of the holder relative to the sleeve 37 and also relative to the drill 4.

What I claim is:

1. In a structure for the purpose set forth, a support, a shaft, a stationary sleeve connected with one end of and disposed at an obtuse angle to said shaft, a revolubly adjustable combined bearing, coupling and adjusting means for said shaft arranged within and extended from said support, said shaft being eccentrically mounted in and extended from said means, an oppositely revoluble tubular element arranged within and extended rearwardly from said sleeve, an adjustable oppositely revoluble stop sleeve encompassing said stationary sleeve and element and formed circumferentially thereof with a forward and a rear slot, the latter being of greater length than said forward slot, an oppositely revoluble resilient tubular drill holder arranged within said element and extended from said sleeves, means correlating with said forward slot and with the stationary sleeve for releasably securing said stop sleeve in its adjusted position to the stationary sleeve, and an oppositely shiftable adjustable member for moving in an acuate path, said member extending through said rear slot into said element and engaging said holder to bind the latter against the drill whereby on the shifting of said member in opposite directions the tool, the holder and said element bodily move together.

2. In a structure for the purpose set forth, a support, a shaft, a stationary sleeve connected with one end of and disposed at an obtuse angle to said shaft, a revolubly adjustable combined bearing, coupling and adjusting means for said shaft arranged within and extended from said support, said shaft being eccentrically mounted in and extended from said means, an oppositely revoluble tubular element arranged within and extended rearwardly from said sleeve, an adjustable

oppositely revoluble stop sleeve encompassing said stationary sleeve and element and formed circumferentially thereof with a forward and a rear slot, the latter being of greater length than said forward slot, an oppositely revoluble resilient tubular drill holder arranged within said element and extended from said sleeves, means correlating with said forward slot and with the stationary sleeve for releasably securing said stop sleeve in its adjusted position to the stationary sleeve, and an oppositely shiftable adjustable member for moving in an arcuate path, said member extending through said rear slot into said element and engaging said holder to bind the latter against the drill whereby on the shifting of said member in opposite directions the tool, the holder and said element bodily move together, said stationary sleeve including an internal shoulder in proximity to its forward end, said element having its forward end abutting said shoulder and provided at its rear end with a peripheral flange abutting the rear end of said stationary sleeve.

3. In a structure for the purpose set forth, a support, a shaft, a stationary sleeve connected with one end of and disposed at an obtuse angle to said shaft, a revolubly adjustable combined bearing, coupling and adjusting means for said shaft arranged within and extended from said support, said shaft being eccentrically mounted in and extended from said means, an oppositely revoluble tubular element arranged within and extended rearwardly from said sleeve, an adjustable oppositely revoluble stop sleeve encompassing said stationary sleeve and element and formed circumferentially thereof with a forward and a rear slot, the latter being of greater length than said forward slot, an oppositely revoluble resilient tubular drill holder arranged within said element and extended from said sleeves, means correlating with said forward slot and with the stationary sleeve for releasably securing said stop sleeve in its adjusted position to the stationary sleeve, and an oppositely shiftable adjustable member for moving in an arcuate path, said member extending through said rear slot into said element and engaging said holder to bind the latter against the drill whereby on the shifting of said member in opposite directions the tool, the holder and said element bodily move together, said holder being split from end to end and formed with a peripheral cavity near its rear end for the reception of the inner end of said member and with means at its forward end for receiving the edge of a twist of the drill to arrest revolving of the latter relative to said holder.

4. In a structure for the purpose set forth a supported revolubly adjustable horizontally disposed bearing, a non-slidable shaft connected to, extending from and eccentrically mounted in said bearing lengthwise of the latter, a stationary sleeve connected to and disposed at an obtuse angle relative to said shaft, oppositely bodily revoluble coaxially arranged tubular elements mounted in the sleeve and one fixed to the other, means for oppositely revolving said elements bodily, said means carried by the outer one of said elements and engaging in the inner one of said elements for maintaining them in fixed relation, the inner one of said elements constituting a drill holder, an adjustable oppositely revoluble slotted sleeve encompassing a portion of said stationary sleeve and outer element, said means extending outwardly through said slotted sleeve, and means for normally maintaining said slotted sleeve in fixed relation with respect to said stationary sleeve.

5. In a structure for the purpose set forth a supported revolubly adjustable horizontally disposed bearing, a non-slidable shaft connected to, extending from and eccentrically mounted in said bearing lengthwise of the latter, a stationary sleeve connected to and disposed at an obtuse angle relative to said shaft, oppositely bodily revoluble coaxially arranged tubular elements mounted in the sleeve and one fixed to the other, means for oppositely revolving said elements bodily, said means carried by the outer one of said elements and engaging in the inner one of said elements for maintaining them in fixed relation, the inner one of said elements constituting a drill holder, an adjustable oppositely revoluble slotted sleeve encompassing said outer element, said means extending outwardly through said slotted sleeve, means for normally maintaining said slotted sleeve in fixed relation with respect to said stationary sleeve, the said stationary sleeve having an internal shoulder, the said outer element bearing at its forward end against said shoulder and formed with a peripheral flange on its rear portion bearing against the rear end and a portion of the inner face of said stationary sleeve, and said slotted sleeve being formed at its rear end with an inwardly extending flange bearing against the rear end of the said outer element and against the outer periphery of the said inner element.

6. In a structure for the purpose referred to, a horizontally disposed stationary sleeve having its its inner face formed of two portions of different diameters and at the junction of said diameters with an internal shoulder, said shoulder being disposed between the vertical median and forward end of the sleeve, a resilient tool holder of tubular form extending through said sleeve and bearing against said inner face portion of smallest diameter, a tubular member for opopsitely revolving said holder, said member encompassing said holder, bearing against said shoulder and the inner face portion of the sleeve of largest diameter, said member extended rearwardly from said sleeve and formed with a flange on its outer periphery abutting the rear end of and flush with the outer periphery of said sleeve, a revoluble normally stationary oppositely adjustable slotted tubular stop sleeve encompassing a part of the stationary sleeve and said flange, and an adjustable oppositely shiftable means secured to and extending through the flanged portion of said member and engaging in said holder for disposing the latter in fixed relation to said member and providing when shifted to bodily revolve said holder and member together, said means extending outwardly from said member through said stop sleeve and correlating with the latter for limiting the extent of the shift of said means in opposite directions.

GERHARD K. GUENTHER.