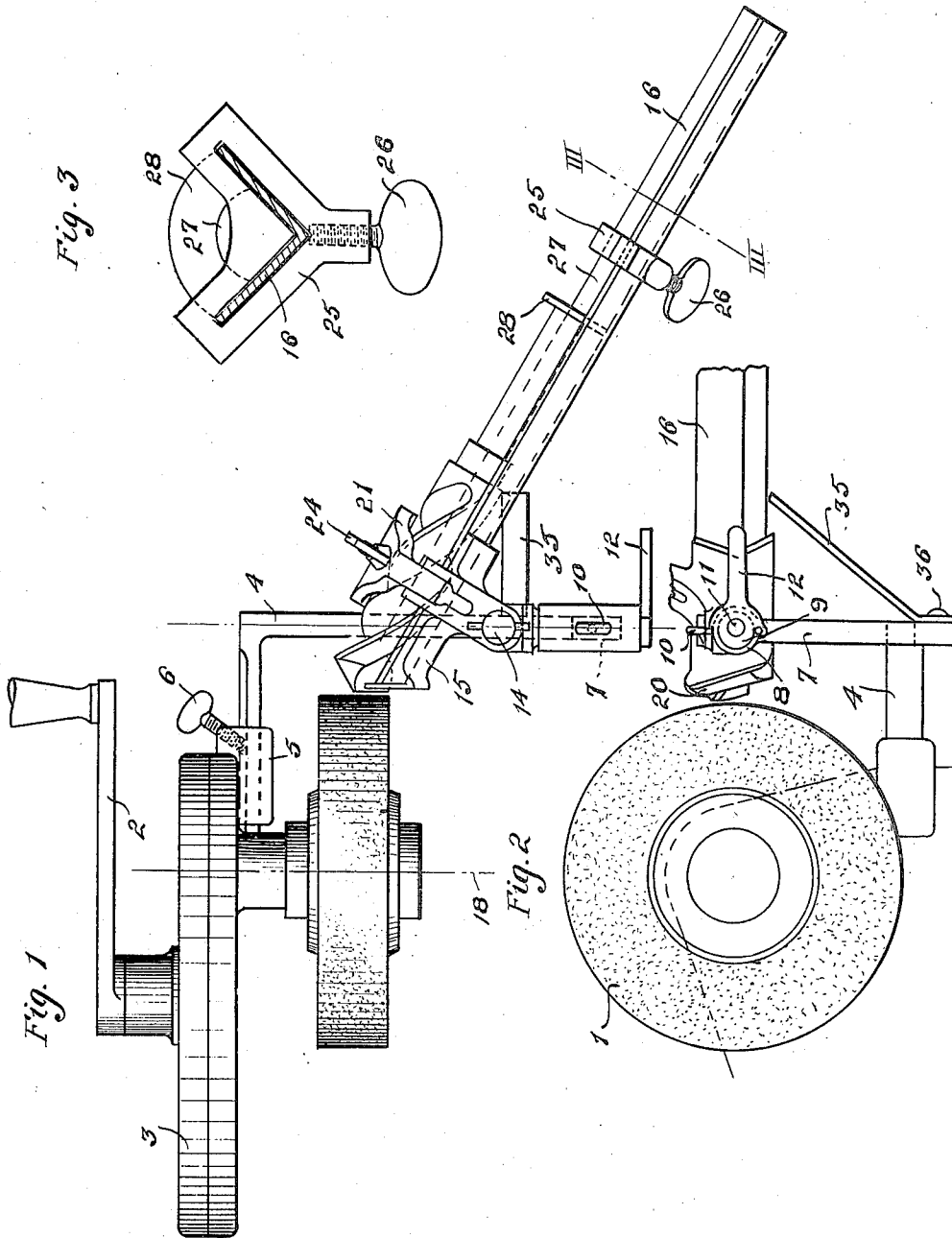


J. S. WINCRANTZ.
 TWIST DRILL GRINDING ATTACHMENT.
 APPLICATION FILED JAN. 23, 1914.

1,106,692.

Patented Aug. 11, 1914.

2 SHEETS—SHEET 1.



WITNESSES
Julian H. Kending
Archibald Martin

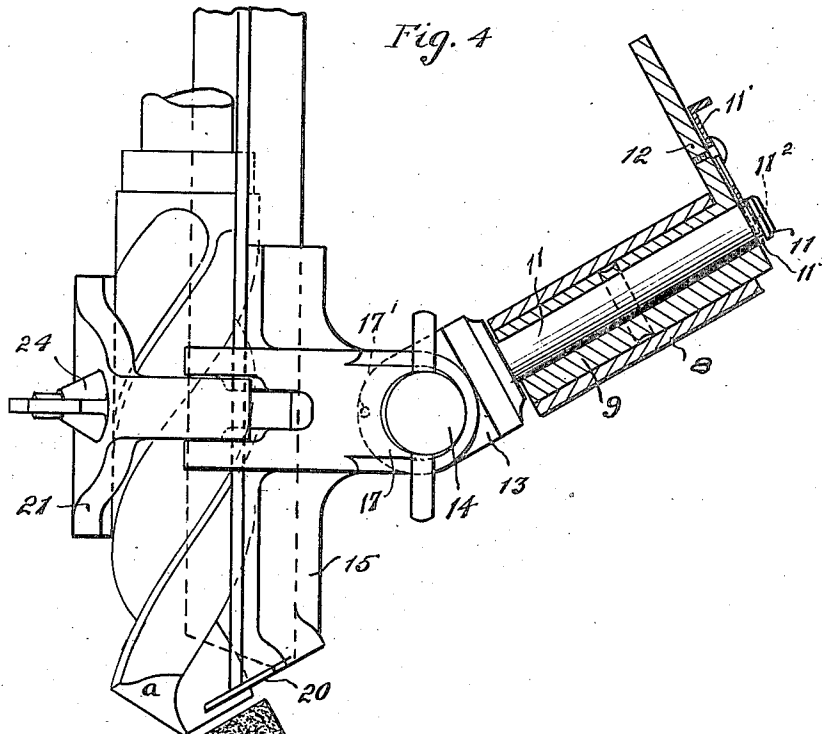
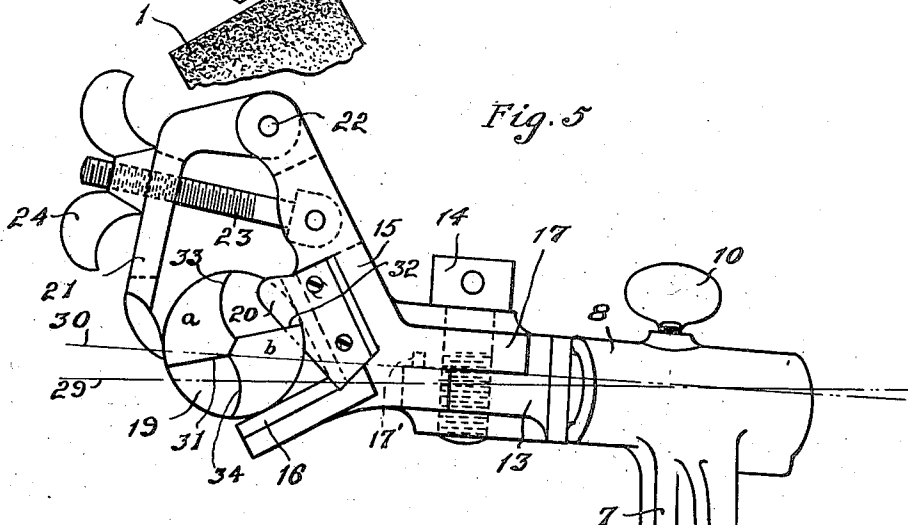
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 Att'ys.

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Archibald Martin

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UNITED STATES PATENT OFFICE.

JOHN S. WINCRANTZ, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO SAMUEL S. NEWMAN, OF PITTSBURGH, PENNSYLVANIA.

TWIST-DRILL-GRINDING ATTACHMENT.

1.106,692.

Specification of Letters Patent.

Patented Aug. 11, 1914.

Application filed January 23, 1914. Serial No. 313,887.

To all whom it may concern:

Be it known that I, JOHN S. WINCRANTZ, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Twist-Drill-Grinding Attachments, of which the following is a specification.

The invention relates to apparatus for grinding twist drills. The invention has for its primary objects; the provision of an apparatus designed to cooperate with the edge surface of the grinding machine and arranged so as to secure the necessary clearance of the point or end of the drill; the provision of an improved arrangement wherein the angle of the axis of the drill may be varied with respect to the plane of rotation of the grinding wheel, to provide for the cutting of the ends of the drills at varying angles, without shifting the position of the axis of rotation of the drill carrier, which arrangement permits the shifting of the surface being ground across the grinding surface of the wheel; the provision of a stop or support for the rear end of the drill, adapted to properly engage all sizes of drill, and one that is secure against accidental movement; and the provision of a construction adapted to handle drills having any number of grooves. One embodiment of the invention is illustrated in the accompanying drawing wherein—

Fig. 1 is a plan view of a grinding machine with my improved attachment applied thereto, Fig. 2 is a partial side elevation of the construction shown in Fig. 1, Fig. 3 is an enlarged section on the line III—III of Fig. 1, Fig. 4 is an enlarged plan view of a portion of the attachment, with some of the parts thereof in section, and Fig. 5 is an end elevation of a portion of the apparatus as illustrated in Fig. 4.

Referring first to Figs. 1 and 2, 1 is a grinding wheel driven from the handle 2 by means of a gearing inclosed in the casing 3. The support or bracket 4 is carried in the socket 5 and removably held in position therein by means of the thumbscrew 6. The bracket 4 is provided at its end with an upturned portion 7 (Fig. 5) having integral therewith the sleeve 8. Mounted rotatably in the sleeve 8 is an eccentric sleeve 9 (Fig. 4), which sleeve 9 may be clamped against

rotary movement by means of the set screw 10. A pivot rod 11 extends through the sleeve 9, and this rod may be adjusted toward and from the axis of rotation of the grinding wheel, by means of the eccentric sleeve 9, which sleeve is provided with a handle 12 to facilitate its convenient rotation.

The pivot rod 11 is provided with a head 13 through which is a perforation for the reception of the clamping screw 14. The block 15 which supports the carrier trough 16 is provided with a perforated flange 17 opposing the head 13 of the pivot rod, the head 13 having its perforation screw threaded to engage the screw threads on the clamping screw 14, so that the parts may be held fixedly in any desired position of relative adjustment. If desired, the member 13 may be provided with a pin 17' adapted to fit in recesses in the lower face of the flange 17, thus giving additional security to the adjustments and positively fixing the relative position of the two parts, the recesses being positioned so as to give certain grinding angles for the points of the drill.

It will be seen that by means of the foregoing construction an adjustment of the axis of the drill being ground, with respect to the plane of rotation of the grinding wheel is secured, thus enabling the attachment to be used to grind different angles upon the ends of the drill. It will also be noted that the adjustment is secured without altering the position of the pivot rod 11, such pivot rod occupying a position at substantially right angles to the plane of rotation of the grinding wheel. The pivot rod 11 is slidably mounted in its sleeve 9 so that when desired in the grinding operation, the drill carrier can be moved so as to carry the end of the drill across the face of the grinding wheel. The entire face of the grinding wheel can thus be utilized, and it will be seen that this would not be the case if the pivot rod 11 were shifted from its position in parallelism with the axis 18 of the grinding wheel (Fig. 1). It is therefore a distinct advantage to have the drill carrier adjustable around the vertical axis 14, without changing the position of the pivot rod 11 as is done in some prior constructions wherein the sleeve which carries the pivot rod is adjustable around a vertical axis. A slide 11'

having a fork 11² adapted to engage a groove 11³ prevents accidental withdrawal of the rod 11.

The trough which carries the drill 19 consists of a pair of plates secured in the block 15, the trough thus formed being substantially V-shaped in cross section as indicated in Fig. 3. In order to position the drill the lip or plate 20 is provided (Fig. 5) which engages one of the grooves of the drill at the end thereof, such lip also serving to prevent rotary movement of the drill during the grinding operation. The drill is held securely in position during the grinding operation, by means of the clamp arm 21, such clamp arm being pivoted to the block 15 at 22 (Fig. 5), and being operated by means of the pivoted rod 23 carrying the wing nut 24. The drill is positioned longitudinally of the trough by means of the block 25 (Figs. 1 and 3), such block being provided with a V-shaped groove to slidably receive the trough 16 and having a set screw 26 for locking the block in position. Extending forwardly from the block 25 is an extension or stem 27 provided at its front end with a stop plate 28. This stop plate 28 has a flat face for engaging the rear end of the drill, and its edges fit down into the groove of the trough and engage the inner surfaces thereof. It will be seen that this plate will properly engage drills of all sizes. The provision of the extension 27 whereby the plate 28 is gotten away from the block 25 is also advantageous inasmuch as the device is held very securely against rocking or wobbling movement, due to the fact that the points of support upon the trough are widely separated, and due to the extended V-shaped bearing secured between the device and the trough.

Another feature of construction of considerable importance, is illustrated in Fig. 5, and relates to the upward inclination given to the axis of the pivot rod 11. This axis is inclined slightly upward with respect to the axis of rotation of the grinding wheel. This is indicated graphically in Fig. 5 wherein the line 29 indicates the horizontal plane in which the axis of rotation 18 (Fig. 1) of the grinding wheel lies, and wherein the line 30 indicates the axis of the pivot rod 11. The angle between these lines is preferably between three and four degrees, and its purpose is to secure the necessary clearance at the point of the drill. The cutting edges 31 and 32 (Fig. 5), when the drill is in operation should be in contact with the work, while the surfaces *a* and *b* between the lines 31 and 33 and 32 and 34 should be clear of the work, and the inclining of the axis of the pivot rod upward as heretofore described secures a cut by the grinding wheel, giving this desired clearance.

In the grinding of drills having four grooves instead of two the swing of the drill carrier must be limited, and in order to secure this result the stop 35 shown in Fig. 2 is employed. This stop is held removably in place by means of a screw 36 and serves to limit the movement of the carrier, positively stopping it when it reaches the position indicated in Fig. 2, with the axis of the drill substantially radial with respect to the grinding wheel. By the use of this attachment it is possible to use the one mechanism with either two groove or four groove drills, the attachment being removed when it is desired to grind the ordinary two groove drill.

The operation of the device is as follows. The drill is placed in the trough and moved along until its end engages the surface of the grinding wheel, the stop plate 28 at this time being in engagement with the rear end of the drill. The thumbscrew 26 is then operated to secure the stop plate 28 in position, and the clamping member 21 is screwed down into position by means of the wing nut 24 (Fig. 5). At this time the handle 12 of the adjusting sleeve 9 is in the position illustrated in Fig. 2. After the grinding wheel has been started the handle 12 is rotated in a counter clockwise direction a short distance, and the set screw 10 operated to hold the sleeve 9 (Fig. 4) against rotation. The operator then grasps the trough carrying the drill and rotates it about the pivot rod 11, thus carrying the point of the drill along the surface of the grinding wheel. After this operation the handle 12 is given another movement of rotation as before and the operation is repeated. These adjustments of the pivot rod by means of the handle 12 and its sleeve 9 are continued until the operator is satisfied that a sufficient amount of metal has been removed from the point of the drill. The clamp 21 is then loosened and the drill rotated 180° to grind the other lip of the drill, the member 20 serving to position the drill in both of its positions. After the drill has been adjusted to this new position, the grinding operation is repeated as heretofore described.

What I claim is:

1. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, and a drill carrier mounted for rotation on an axis transverse to the plane of rotation of the grinding wheel and positioned so as to bring the drill in engagement with the edge surface of the wheel, the said axis of rotation being inclined upwardly with respect to the axis of rotation of the grinding wheel.

2. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, and a drill carrier mounted for rotation on an axis transverse

to the plane of rotation of the grinding wheel and positioned so as to bring the drill in engagement with the edge surface of the wheel, the axis of rotation of the wheel and carrier lying in substantially parallel planes but with one axis inclined with respect to the other.

3. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, and a drill carrier mounted for rotation on an axis transverse to the plane of rotation of the grinding wheel and positioned so as to bring the drill in engagement with the edge surface of the wheel, the axis of rotation of the wheel and carrier lying in substantially parallel vertical planes with the axis of the wheel substantially horizontal and the axis of the carrier as it approaches the plane of rotation of the wheel inclined upwardly.

4. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, a drill carrier mounted for rotation on an axis transverse to the plane of rotation of the grinding wheel and positioned so as to bring the drill in engagement with the edge surface of the wheel, and a movable stop which when in operative position limits the normal swing of the carrier.

5. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, a drill carrier mounted for rotation on an axis transverse to the plane of rotation of the grinding wheel and positioned so as to bring the drill in engagement with the edge surface of the wheel, an eccentric sleeve for adjusting the drill carrier toward the wheel as the grinding progresses, an operating handle for the sleeve and means for clamping the eccen-

tric sleeve in any desired position of adjustment.

6. In combination in an attachment for use with a grinding wheel, a support for the attachment, a drill carrier, a pivot rod supporting the carrier, a sleeve mounted rotatably on the support and carrying eccentrically thereon the pivot rod, a handle for adjusting the sleeve and a set screw for clamping the sleeve in position.

7. In combination in a drill carrier for a grinding machine, a trough V-shaped in cross section for supporting the drill, a block on the trough with a V-shaped groove therein fitting the trough slidably, a clamping means for securing the block against movement along the trough, an extension projecting forwardly from the block, and a plate at the front end of the extension having a substantially flat face and having its lower portion of V shape to fit the interior of the trough.

8. The combination in an attachment for use with a disk grinding machine, of a support for the attachment, and a drill carrier having a drill supporting trough V-shape in cross-section and mounted for rotation on an axis transverse to the plane of rotation of the grinding wheel and positioned so as to bring the drill into engagement with the edge surface of the wheel, the said axis of rotation being inclined so that such axis extended passes above the line of juncture of the sides of the trough.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

JOHN S. WINCRANTZ.

Witnesses:

JAMES C. BRADLEY,
ARCHWORTH MARTIN.