Nov. 4, 1924. 1,513,757

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SHAPING MECHANISM FOR GRINDING WHEELS

Filed Oct. 23, 1920 2 Sheets-Sheet 1

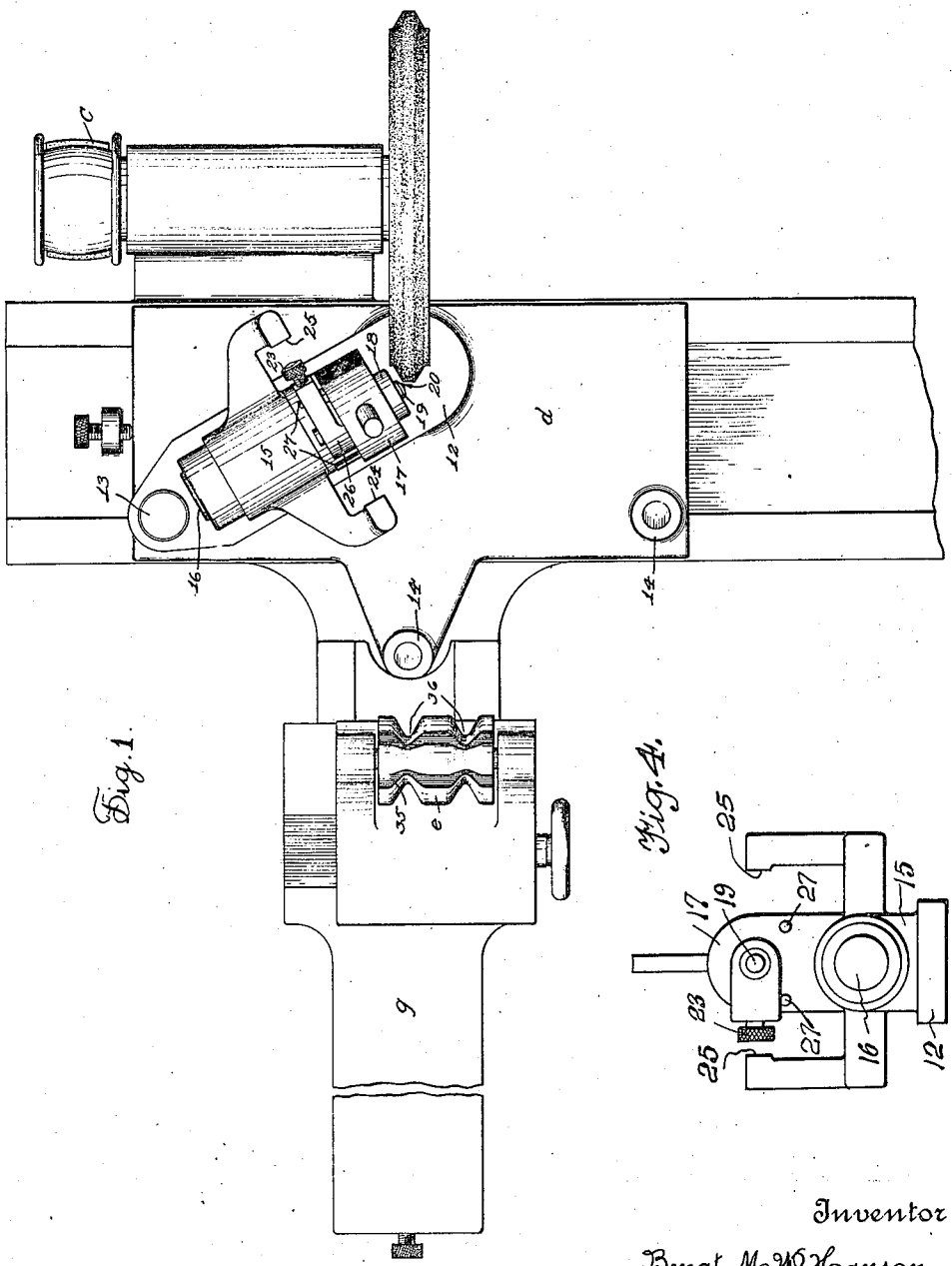


Fig. 1.

Fig. 4.

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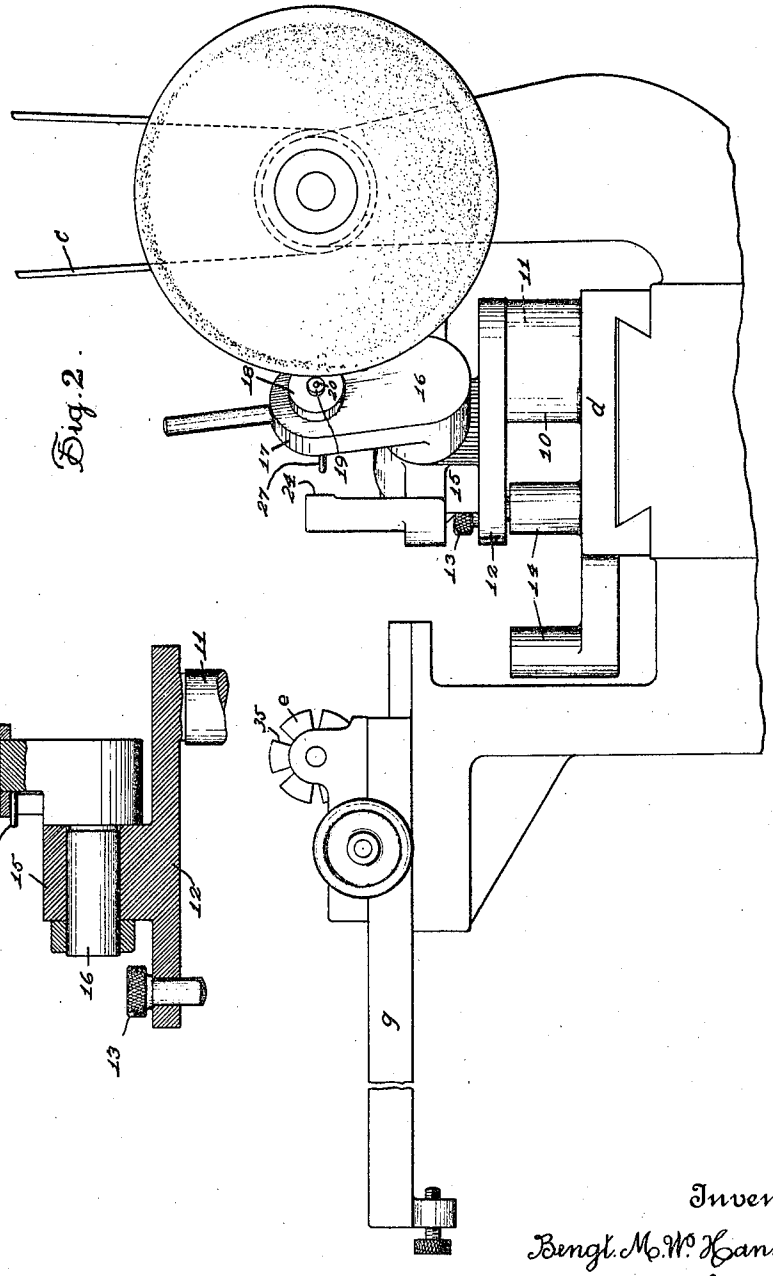


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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SHAPING MECHANISM FOR GRINDING WHEELS.

Application filed October 23, 1920. Serial No. 419,119.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of the United States, and resident of Hartford, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Shaping Mechanism for Grinding Wheels, of which the following is a specification.

This invention is designed for shaping or truing the edge of a grinding wheel.

The embodiment of the invention here selected for purposes of illustration will be described with reference to its use for shaping or retruing the edge of a grinding wheel employed in operating on a thread of the Whitworth type and to which use the present invention is peculiarly adapted; but it is to be understood that the present disclosure is by way of illustration, it not being intended to limit the invention to this particular use since it is susceptible of other embodiments than that herein shown.

An object of the invention is to provide an improved arrangement of parts for efficiently and accurately shaping the edge of a grinding wheel or the like.

A further object of the invention is to make certain improvements of novelty and advantage in a truing or shaping device of the type illustrated and described in my application Serial Number 391,013, filed June 23rd, 1920 and which type is generally characterized by an indexible cutting tool, for instance a diamond point.

In the accompanying drawings, wherein one embodiment which the invention may take is illustrated,

Fig. 1 is a top plan view of so much of a grinding wheel as is necessary to illustrate the application of my invention.

Fig. 2 is a side view of what is shown in Fig. 1, and

Fig. 3 is a sectional view taken longitudinally through the truing device.

Fig. 4 is a detail view showing the position of the pins 27, 27 on the arm 17.

The truing device to which the present invention particularly relates is carried by the slide *d* which is provided with upstanding boss 10 into which is fitted a stud 11 on the underside of the carrier 12, thus providing means by which the carrier may be indexed into different positions to bring the shaping tool carried thereby into position to operate on different faces of the grinding wheel. As here shown, there are three different positions into which the carrier can be indexed, and means are provided for locking the carrier in each of its indexed positions as by the plunger 13 and the bosses 14 recessed to receive the plunger. The axis about which the carrier is indexed is properly positioned relative to the tool (in this place the grinding wheel) so that the three indexing positions will always bring the carrier and tool into proper positions relative to the wheel.

On the upper face of the carrier is a bearing 15 in which is mounted a shaft 16 at the forward end of which there is formed an arm 17 in which is rotatably mounted a bushing 18 carrying a holder 19 for the diamond point 20. This arm 17 which is oscillated through the shaft 16 turning in the bearing 15, is referred to in some of the claims as an indexible member for it supports the diamond point, and in the present instance is indexed through being mounted on the carrier 12.

By reference to Fig. 1 it will be clear that as the shaft 16 is rocked in its bearing 15 the diamond point mounted at the outer end of the arm 17, which is either fixed to or is a part of the shaft 16, will be caused to oscillate back and forth across a face of the wheel, and by indexing the carrier to either of the three indexed positions here illustrated it will be apparent that the sides and the edge of the wheel can be shaped.

There are instances, as in the preliminary shaping of a wheel intended to produce a Whitworth thread, where it is necessary to move the diamond point up to a shoulder, and it is not only advisable but in some cases necessary that a stop should be provided to limit the oscillating motion of the diamond point in the direction towards the shoulder. For this purpose the bearing 15 is provided with a pair of symmetrical branching arms having at their ends stop faces 24, 25 which cooperate with a stop pin 26 adjustably mounted on the rear end of the bushing 18. This stop pin can be adjusted so that it will contact with one of the stop faces, as 25, to precisely limit the extent of the oscillation of the diamond point up to the shoulder of the wheel.

It will be apparent that if the diamond point be slightly off center a proper setting or limiting of its oscillatory movement for one side of the wheel will not be correct for

the other side and, in order to eliminate this difficulty, the bushing 18, in which the diamond point holder 19 is mounted, is made rotatable so that it can be turned through an angle, let us say, of 180°, means being provided, as the pins 27, 27, to hold the bushing in either of these positions. This means that if the stop pin 26 be adjusted with reference to one of the stop faces 25 (as shown in Fig. 1) so as to establish the proper limitation of the oscillatory movement of the shaft 16 and its arm 17 toward the shoulder, then by turning the bushing 18 one half of a complete revolution the stop pin 26 will be brought into the same relation to the stop face 24 as it had with the stop face 25 and in consequence, when the diamond point is operating on the opposite face of the wheel from that upon which it is operating as shown in Fig. 1, the oscillation of the shaft 16 and its arm 17 will be limited so as to produce the same amount of cutting or shaping action on this face of the wheel, it being of course understood that the carrier is indexed to the opposite position from that shown in Fig. 1.

By thus providing for turning the diamond point into a new position any necessity for accurately positioning the diamond point in its holder or in the bushing is eliminated and the identical shaping of each side of the wheel is insured.

Th adjustable stop pin 26 may well serve as a handle for turning the bushing 18 on the arm.

In operation, it will be seen that with the parts shown in the position of Fig. 1, upon oscillation of the diamond point to operate on an angular face of the grinding wheel, the screw 23 will cooperate with the stop 25 to limit the extent of movement of the diamond point towards the shoulder at the base of the edge of the grinding wheel. To surface the other angular face of the wheel the carrier is indexed to its other extreme position and the bushing 18 with its diamond point holder is turned in the arm 17 to rest on the other pin 27 and then the diamond point is oscillated, the extent to which this angular face is cut back being limited by the engagement of the screw 23 against the stop 24. The cutting edge of the wheel may then be truncated by indexing the carrier to a central position and oscillating the diamond point.

After the grinding wheel has been preliminarily shaped as just described, the slide *d* together with the truing device thereon may be moved out of the way and then the slide *g* is moved forward to bring the roller *e* into operative position relative to the grinding wheel. This roller is longitudinally fluted as at 35 and it is provided with one or more circumferential grooves 36 conforming in size and shape precisely to that of the cut to be taken, which cut, in the present instance, is a Whitworth thread. The roller is mounted for free longitudinal movement so that upon engagement of the grinding wheel with the walls of one of the grooves 36, the roller will be brought into proper position. During the final shaping operation, the grinding wheel is slowly rotated as by manually pulling the belt *c*, the result being that the roller will rotate in the opposite direction at approximately the same peripheral speed. The walls of the groove 36 will have a picking or crushing action on the edge of the grinding wheel quickly bringing the same to the final shape desired. For a detail description of this shaping wheel reference may be had to a copending application filed of even date herewith.

I claim as my invention:—

1. In a device for shaping the active edge of a grinding wheel, an indexible member, means for oscillating it in its indexed positions, means for limiting the extent of oscillatory movement of said member in its indexed positions, a tool holder carried by said member, and means for positioning said holder at like distance from and at either side of a predetermined center on said member.

2. In a device for shaping the active edge of a grinding wheel, an indexible member, means for oscillating it in its indexed positions, means for limiting the extent of oscillatory movement of said member in its indexed positions, a tool holder carried by said member, and means for turning said tool holder in said member through an angle of 180°.

3. In a truing device for shaping the active edge of a grinding wheel, a member indexible to operate on the opposite side faces of the wheel, means for oscillating said member in its indexed positions, means for limiting the oscillatory movement of said member towards the base of the cutting edge of said wheel to a like extent on each side thereof, a diamond point carried by said member, and means for positioning said point at diametrically opposite sides of a predetermined center on said member.

4. In a device for shaping the active edge of a grinding wheel, a member indexible to operate on the opposite side faces of the wheel, means for oscillating said member in its indexed positions, stops for limiting the movement of said member towards the base of the cutting edge of the wheel and to a like extent on each side thereof, a tool rotatably carried by said member, and means for limiting the rotary movement of said tool to an angle of 180°.

5. In a device for shaping the active edge of a grinding wheel, a member indexible to operate on the opposite side faces of the

wheel, means for oscillating said member in its indexed positions, a tool carried by said member, means for positioning said tool from one side of a predetermined center on said member to a like distance on the other side thereof, and means cooperating with said positioning means for limiting the extent of movement of said member towards the base of the cutting edge of the wheel and to a like extent on each side thereof.

6. In a device for shaping the active edge of a grinding wheel, an indexible member, means for oscillating the same, a pair of stops, a tool carried by said member, and means for rotating said tool through an angle of 180° relative to said member and adapted to cooperate with said stops to limit the oscillation of said member.

7. In a device for shaping the active edge of a grinding wheel, an indexible member, means for oscillating the same in its indexed positions, a tool carried by said member, an adjustable handle for rotating said tool through an angle of 180° relative to said member, and a pair of stops cooperating with said handle for limiting the oscillation of said member.

8. In a truing device an indexible carrier, a shaft journalled thereon, an arm on said shaft, means for oscillating said arm, a tool holder rotatably carried by said arm, an adjustable handle for turning said holder 180° in said arm, and a pair of opposed stops arranged on said carrier to cooperate with said handle to limit the oscillation of said arm.

9. In an apparatus of the character described, a support, a grinding wheel journalled thereon, means on said support for shaping the cutting edge of the grinding wheel to the approximate shape of a Whitworth thread, and means on said support for then finishing the edge of the wheel to the exact shape of a Whitworth thread, both of said means being supported on said support for movement into and out of operative relation to said wheel.

10. In an apparatus of the character described, a support, a grinding wheel journalled thereon, a slide mounted on said support; a truing device on said slide including a diamond point, means for indexing it to opposite sides of the wheel and into a position for truncating the edge thereof, means for oscillating said diamond point in its indexed position, means for limiting the movement of said diamond point inwardly of the wheel to a like extent on each side thereof; means for positioning said slide with said diamond point in proper relation to the grinding wheel, a second slide, means on said second slide for rounding off the corners between the plane surfaces formed by said diamond point, and means for moving said second mentioned slide so as to bring said means for rounding off the corners into operative relation with said grinding wheel.

11. In an apparatus of the character described, a support, a grinding wheel journalled thereon, a slide; a truing device on said slide including a diamond point, means for indexing it to opposite positions of a wheel and into a position for truncating the edge thereof, means for oscillating said diamond point in its indexed positions, and means for limiting the movement of said diamond point inwardly of the tool to a like extent on both sides thereof; means for positioning said slide with said diamond point in proper relation to said grinding wheel, a second slide on said support, a longitudinally fluted roller journalled on said second slide and having a circumferential groove corresponding in size and shape to the Whitworth thread to be cut, and means for moving said second mentioned slide for bringing said roller into operative engagement with said grinding wheel.

BENGT M. W. HANSON.