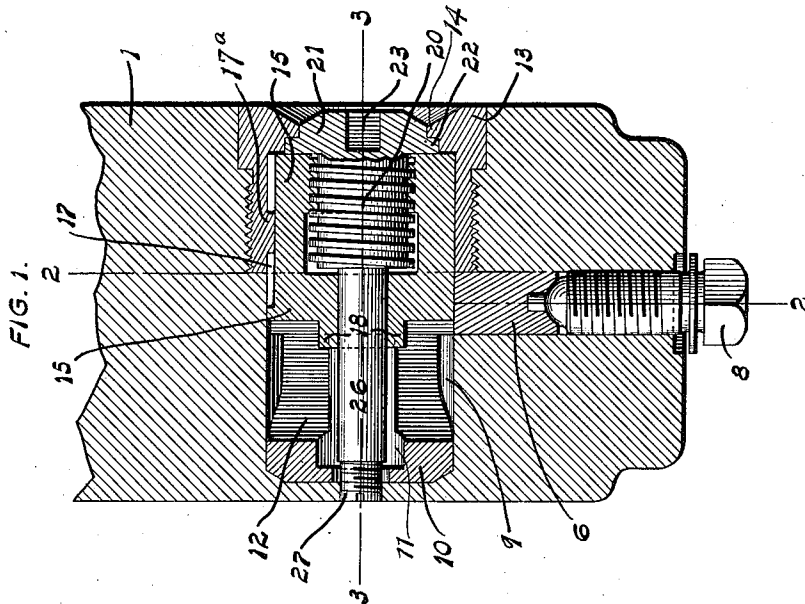
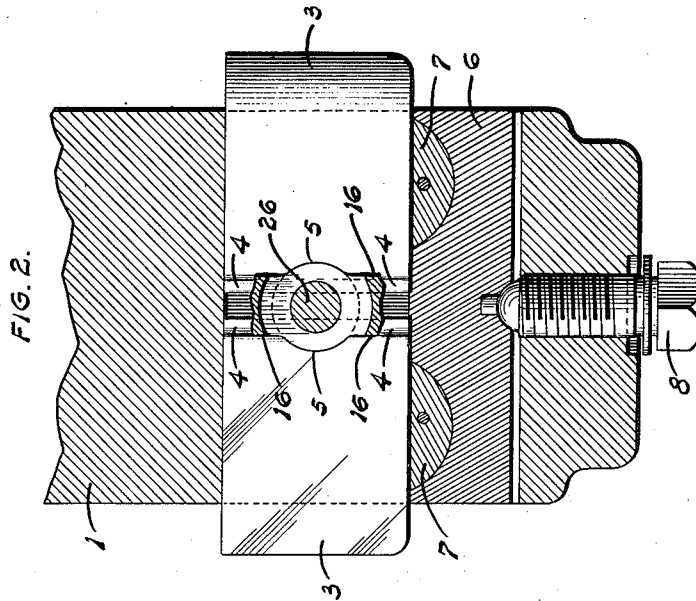


E. E. DAVIS.
BORING TOOL.
APPLICATION FILED DEC. 16, 1910.

1,046,740.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.



WITNESSES

Wm. Jannus.
E. M. Harrington.

INVENTOR

EMERY E. DAVIS

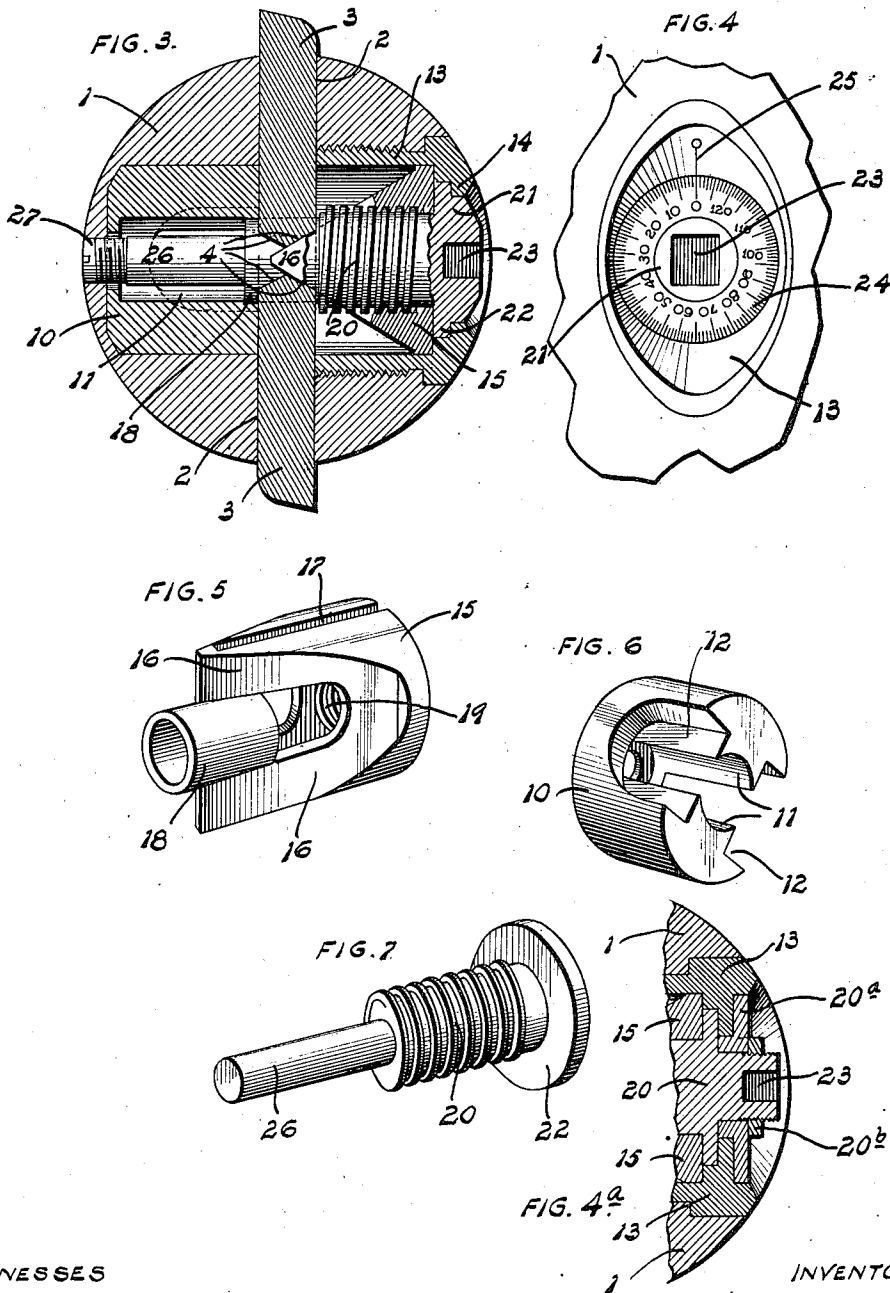
BY *J. R. Conway.*
ATT'Y.

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UNITED STATES PATENT OFFICE.

EMERY E. DAVIS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO MATTHEWS-DAVIS TOOL COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BORING-TOOL.

1,046,740.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed December 16, 1910. Serial No. 597,687.

To all whom it may concern:

Be it known that I, EMERY E. DAVIS, a citizen of the United States, residing at 3908 North Broadway, St. Louis, Missouri, have invented a certain new and useful Improvement in Boring-Tools, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view taken longitudinally through the center of one end of an expansion boring tool of my improved construction. Fig. 2 is a section taken on the line 2—2 of Fig. 1. Fig. 3 is a cross section taken approximately on the line 3—3 of Fig. 1. Fig. 4 is an enlarged elevation of a portion of the exterior of my improved expansion boring tool, and illustrating the micrometer adjustment gage. Fig. 4^a is a detail section of a modification illustrating an adjustable disk, on which is formed the graduated scale of the micrometer adjustment. Fig. 5 is a perspective view of the wedge utilized in my improved boring tool for imparting spreading movement to the bits or cutters. Fig. 6 is a perspective view of the wedge guide. Fig. 7 is a perspective view of the wedge adjusting screw.

My invention relates to an expansion boring tool of the type shown and described in the patent issued to me October 24, 1905, Number 802,737, and the principal object of my present invention is to generally improve and simplify the construction of the expansion boring tool shown in said patent.

My invention consists in certain features of novelty and arrangement of parts herein-after more fully described and claimed.

Referring by numerals to the accompanying drawings 1 designates the body of my improved boring tool, which is cylindrical in form and slotted transversely as designated by 2 in order to receive a pair of hardened metal bits or cutters 3. The inner ends of these cutters 3 are beveled in both directions as designated by 4 in order to receive the bearing faces of a wedge herein-after described. The central portions of the inner ends of the bits or cutters 3 are notched as designated by 5 to receive a sleeve carried by the forward end of the wedge.

The means employed for locking the bits

or cutters in the tool after adjustment comprises a plate or gib 6, loosely positioned in the slot 2 beneath the cutters. Seated in the top of this plate or gib are auxiliary gibs 7, which bear directly against the lower faces of the cutters 3. The plate or gib 6, carrying the auxiliary gibs is forced against the cutters 3, for the purpose of clamping and locking the same after adjustment, by means of a screw 8 seated in the end of the body of the tool, the point of which screw bears against the central portion of the plate or gib 6.

Formed in the body 1 of the tool at the inner end of the slot 2 and intersecting the same is a pocket 9 occupied by the wedge adjusting means. Positioned within the inner end of this pocket is a wedge guide 10 in the form of a cylindrical block provided with an axial bore or passageway 11, and formed in said wedge guide on opposite sides thereof are recesses 12 adapted to receive the forward end of the wedge when the same is moved forward. Screw seated in the outer portion of the pocket 9 is a bushing 13 and formed around the opening in the outer end thereof is an annular flange 14.

The wedge utilized for spreading the bits or cutters apart comprises a cylindrical member 15 provided with a pair of oppositely disposed beveled faces 16, adapted to engage the beveled faces 4 on the inner end of the bits or cutters. This wedge is mounted to move longitudinally in the bushing 13 and formed in the outer face of the body of said wedge is a longitudinally disposed groove 17 which receives a lug 17^a formed on the inner face of the bushing 13. This construction permits the wedge to move longitudinally within the bushing and holds it against rotation therein.

Carried by the forward end of the wedge 15 is a pilot sleeve 18 which fits snugly within the bore 11 and slides freely therethrough when the wedge is moved forward to spread the cutters apart. The wedge 15 is arranged in the bushing 13 so that when said wedge is moved forward its forward end moves into the notches 12 formed in the opposite sides of the wedge guide 10.

The body of the wedge is hollow and threaded as designated by 19 in order to receive the threaded body of a wedge adjusting screw 20. The head 21 of this wedge adjusting screw occupies the open-

ing through the outer end of the bushing 13 and formed on said head is a flange 22, which occupies the groove behind the flange 14 in said bushing. Formed in the head 21 is a non-circular recess 23 adapted to receive a suitable tool whereby the screw can be rotated to move the wedge longitudinally within the bushing. Formed on the outer face of the head 21 around the edge thereof is a series of radially arranged marks forming a circular scale 24 and formed on the face of the head of the bushing 13 adjacent the edge of this scale is a single mark 25, thus forming a micrometer adjustment to gage the movement imparted to the bits or cutters when accurate adjustment of the same is desired.

Formed integral with the wedge adjusting screw 20 and projecting forwardly therefrom is a stem or shank 26 which bears in the pilot sleeve 18 and projects forwardly through the bore or passageway 11 in the wedge guide. A bearing for the forward end of this stem or shank is formed by an adjusting screw 27 seated in the wall of the body of the tool at the end of the pocket 9 and which screw normally bears against the end of said stem or shank.

When it is desired to move the bits or cutters of my improved tool outward and adjust the same to bore an opening of the desired size the screw 8 is loosened to relieve the pressure of the gibs 7 against the bits or cutters after which a suitable tool is inserted in the recess 23 and rotary motion is imparted to the adjusting screw 20. As the adjusting screw is thus rotated the wedge 15 mounted on said screw will be moved longitudinally thereon and the forward end of said wedge will move between the inner ends of the bits or cutters with the beveled faces 16 bearing against the corresponding beveled faces 4.

Accurate adjustment of the cutters is obtained by gaging the movement imparted to the adjusting screw, and which movement is readily ascertained by means of the circular scale 24 and the guide mark 25. After the bits or cutters have been moved outward and adjusted as desired the set screw 8 is tightened to move the plate 6 and gibs 7 into engagement with the under sides of said bits or cutters, and thus the same are locked in position during the boring operation. The screw 27 can be adjusted so as to hold the adjusting screw against free rotary movement, and said screw 27 and the flange 22 take up any end thrust upon said adjusting screw as the same is rotated in adjusting the bits or cutters.

The central portion of the screw 20 is supported by its bearing in the pilot sleeve 18, and which latter is supported within the bore or passage way 11.

In Fig. 4^a I have illustrated a construc-

tion wherein a disk 20^a is loosely mounted on the reduced outer end of the screw 20, and said disk is provided with the graduated marks 24 forming the micrometer scale. A nut 20^b is arranged on the screw threaded forward end of the screw 20 and is arranged to clamp the disk 20^a and hold the same in position after adjustment. Such construction enables the circular scale 24 to be shifted in either direction independent of the rotary motion of the screw 20.

An expansion boring tool of my improved construction is comparatively simple, comprises but few parts and the adjustment of the bits or cutters can be very easily and quickly accomplished. The micrometer gage permits of a very accurate adjustment of the cutters and said cutters are moved and adjusted by the manipulation of a single screw.

It will be readily understood that minor changes in the size and construction of the various parts of my improved tool can be made and substituted for these herein shown and described without departing from my invention, the scope of which is set forth in the appended claims.

I claim:

1. In a boring tool, a body provided with a transverse slot and having a pocket formed at right angles to the slot, a wedge guide seated in the inner end of the pocket, a bushing seated in the outer portion of the pocket, a pair of cutters positioned in the slot between the wedge guide and the bushing, a wedge arranged to slide and held against rotation within the bushing, and a wedge adjusting screw bearing in the socket, extending through the wedge into the wedge guide.

2. In a boring tool, a body provided with a transverse slot and there being a pocket formed at right angles to the slot, a wedge guide seated in the inner end of the pocket, a bushing in the outer end of the pocket, a pair of cutters arranged in the slot between the wedge guide and the bushing, a wedge arranged to move lengthwise through the bushing, which wedge is held against rotary movement in said bushing, a sleeve on the forward end of the wedge which sleeve bears in the wedge guide, a wedge adjusting screw extending through the wedge, a head on said adjusting screw, and a bearing in the bushing for a portion of the head.

3. In a boring tool, a transversely slotted body having a pocket formed at right angles to the slot, a pair of cutters positioned in the slot, a bushing in the pocket, a wedge arranged to slide and held against rotation within the bushing, an adjusting screw cooperating with the wedge for moving the same through the bushing, the head of which screw operates in a bearing formed in the outer portion of the bushing, a circular scale

formed on the outer face of the head of the adjusting screw, and there being a guide mark formed on the outer face of the bushing adjacent the edge of the adjusting screw head.

4. In a boring tool, a transversely slotted body having a pocket formed at right angles to the slot, a pair of cutters positioned in the slot, a bushing in the pocket, a wedge arranged to slide and held against rotation within the bushing, a wedge adjusting screw extending through said wedge, a head on said adjusting screw which head bears in the bushing, and the outer face of the head of which adjusting screw bears a circular scale.

5. In a boring tool, a transversely slotted body having a pocket formed at right angles to the slot, a pair of cutters positioned in the slot, a bushing in the pocket, a wedge arranged to slide and held against rotation within the bushing, a wedge adjusting screw extending through said wedge, a head on said adjusting screw, a bearing in the bushing for a portion of the head, a sleeve on the forward end of the wedge which sleeve forms a bearing for the central portion of the adjacent screw, and an adjustable bearing at the inner end of the pocket for the forward end of said adjusting screw.

6. In a boring tool, a transversely slotted body having a pocket formed at right angles to the slot, a pair of cutters positioned in the slot, a bushing in the pocket, a wedge arranged to slide and held against rotation within the bushing, a wedge adjusting screw extending through said wedge, a head on said adjustable screw which head bears in the bushing, and an adjustable bearing for the forward end of the wedge adjusting screw.

7. In a boring tool, a transversely slotted body having a pocket formed at right angles to the slot, a pair of cutters positioned in the slot, a bushing in the pocket, a wedge

arranged to slide and held against rotation within the bushing, a wedge adjusting screw extending through said wedge, a head on said adjusting screw, a bearing in the bushing for a portion of the head, and an adjustable bearing for the forward end of the wedge adjusting screw.

8. In a boring tool, a body provided with a transverse slot and having a pocket formed at right angles to the slot, a wedge guide seated in the inner end of the pocket, a bushing seated in the outer portion of the pocket, a pair of cutters positioned in the slot between the wedge guide and the bushing, a wedge arranged to slide and held against rotation within the bushing, a wedge adjusting screw bearing in the bushing and extending through the wedge into the wedge guide, and a disk bearing a circular scale adjustably mounted on the head of the adjusting screw.

9. In a boring tool a slotted body in which is formed an opening that intersects the slots at right angles, cutters seated in the slots, a member adapted to be moved through the opening to separate the cutters, a bushing seated in the slotted body, a rotary member having its head journaled in said bushing and which is held against longitudinal movement, which rotary member is adapted to impart movement to the cutter moving member, and is provided with a micrometer scale whereby the movement imparted to the cutters can be regulated, and there being an indicating mark on the face of the bushing, which mark serves as a guide for the micrometer scale.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 14th day of December, 1910.

EMERY E. DAVIS.

Witnesses:

M. P. SMITH,
ALMA GEBHART.