Oct. 25, 1932. L. M. PEARCE ET AL 1,884,182

DRILL

Filed April 14, 1931

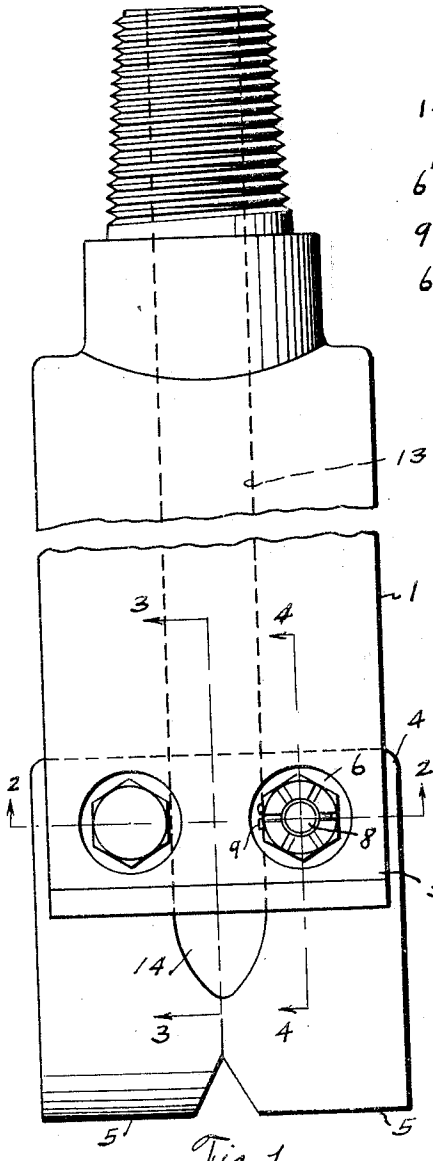


Fig. 1

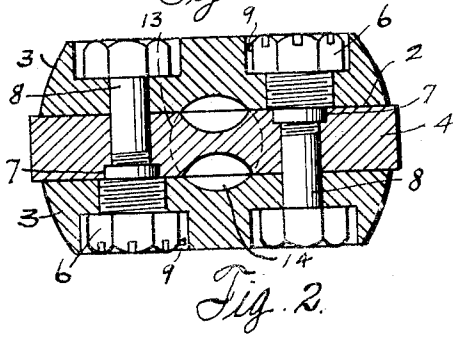


Fig. 2

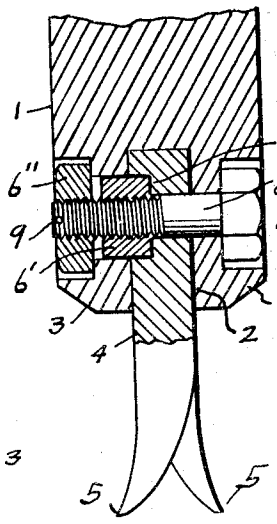


Fig. 5

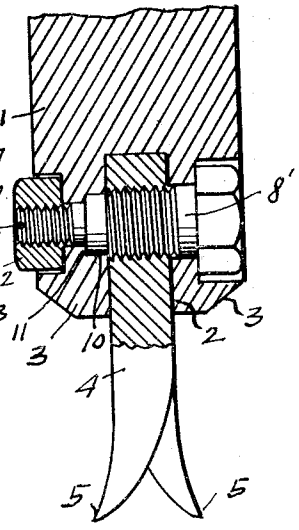


Fig. 6

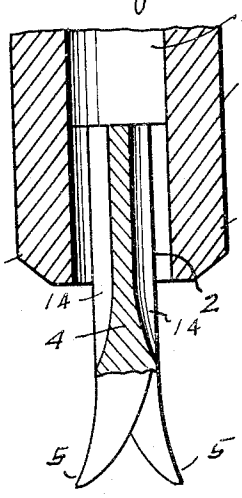


Fig. 3

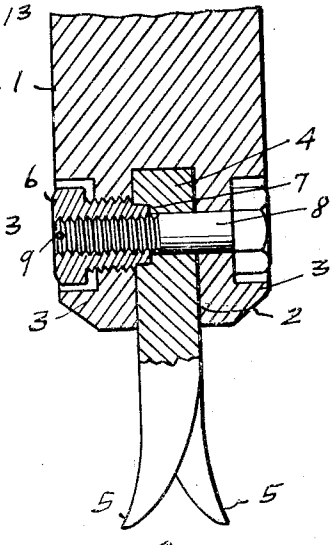


Fig. 4

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UNITED STATES PATENT OFFICE

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DRILL

Application filed April 14, 1931. Serial No. 529,930.

This invention relates to a drill.

One object of the invention is to provide a drill having a head and a detachable blade, or other cutter, detachably secured to the head in a novel manner.

Another object of the invention is to provide novel means for securing the blade, or cutting member, in the head whereby the play of said cutting member in the head, due to wear or otherwise, may be taken up so that said cutting member may be secured immovably in the head.

With the above and other objects in view this invention has particular relation to certain novel features of construction, arrangement of parts and use, an example of which is given in this specification and illustrated in the accompanying drawing, wherein:—

Figure 1 shows a side view of the drill.

Figure 2 shows a transverse sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a fragmentary sectional view taken on the line 3—3 of Figure 1.

Figure 4 shows a fragmentary sectional view taken on the line 4—4 of Figure 1.

Figure 5 shows a fragmentary vertical sectional view of a modified form of the drill, and

Figure 6 shows a fragmentary vertical sectional view of another modification thereof.

Referring now more particularly to the drawing, wherein like numerals of reference designate similar parts in each of the figures the numeral 1 designates the head whose upper end may be threaded for attachment of a drill collar, or drill stem, thereto. The head may be of any desired contour and length and has a transverse mortise 2 across its lower end separating said end into the prongs 3, 3. A suitable cutting, or abrading, member 4 is provided whose lower end may have any selected type of boring members, the cutting blades 5, 5 being shown, which have cutting edges forwardly curved in opposite directions.

The upper end of the member 4 is fitted into the mortise 2. In the form shown in Figures 1 to 4 inclusive there are the externally threaded, internally tapped, bushings 6, 6, which are threaded through the respective prongs 3, 3 on opposite sides of the head. The inner ends of these bushings bear against the cutting member 4 above the respective blades 5, 5 and said member 4 may have shallow recesses 7, 7, if desired to receive the inner ends of the bushings. There are the bolts 8, 8 to hold the prongs against spreading and also to hold the cutting member 4 and the bushings 7 in place. The free end of each bolt is provided with external threads which are preferably pitched a direction the opposite of that of the external threads of the corresponding bushing and each bolt is passed through one prong and threaded through the opposite bushing. The heads of the bolts and bushings are countersunk into the corresponding prongs and the heads of the bushings are castellated to receive the cotter keys 9 which pass also through the corresponding ends of the bolts.

The bolts 8 will prevent the prongs from spreading and in case the member 4 becomes loose in its mortise from wear or other cause the bushings 6 may be tightened up to force the member 4 firmly against the inside face of the opposite prong so as to take up the play and to hold the blades against any movement relative to the head.

In the form shown in Figure 5 the bushings are each formed of two parts, the inner ends 6′ thereof seating against the member 4 in the same manner as shown in Figures 1 to 4 and the outer ends, or heads, 6″ thereof seating in the sockets of the corresponding prongs. The bolts 8, of this form are threaded through these sectional bushings, and secured, as hereinabove described, and bushings of this type are not necessarily screwed to the prongs 3.

In the form shown in Figure 6 the bolts 8′ are fitted through the prongs 3 and are threaded through the cutting member 4 and their free ends are reduced, forming the external shoulders, as 10, which abut the opposing annular shoulder 11 in the corresponding prong 3 and beyond the shoulder 10, each bolt 8′ is externally threaded to receive the nut 12 which is counter-sunk in its prong. The bolts 8, 8′ of Figures 5 and 6

are secured in place by cotter keys 9 as in Figures 1 to 4.

In case the cutting member 4, of Figure 5, becomes loose from wear, or other cause, the bolts 8′ may be tightened up to draw said member closely against the adjacent prong 3 to take up the play.

The head has an axial water course 13 and the boring member has the said channels 14, 14 through which a flushing fluid may be delivered from the course 13 onto the forward sides of the blades.

In the forms shown in Figures 1 and 5 should the bolt 8 become broken the bushing 6, or 6′, as the case may be, will hold the cutting member 4 against dropping into the bore and interfering with further drilling operations. In the form shown in Figure 6 the bolt 8′ is made large so that it is not liable to break and has a threaded connection with the cutting member 4 so that should the reduced end of said bolt 8′ become broken off the cutting member 4 will still be held in the head against dropping in the bore.

The drawing and description disclose what is now considered to be preferred forms of the invention by way of illustration only while the broad principle of the invention will be defined by the appended claims.

What we claim is:

1. A drill comprising a head having prongs spaced apart forming a mortise between them, a boring member in said mortise, a bushing through each of the prongs on opposite sides of the axis of the head whose inner ends abut said member and bolts through said prongs and boring member from opposite sides of the drill and having threaded connections with said bushings.

2. A drill comprising a head having spaced prongs forming a mortise between them, a boring member inserted into said mortise, a bushing through each prong and operative against opposite sides of the boring member, said bushings being arranged on opposite sides of the head, and bolts through the head and boring member, said bolts having threaded connections with said bushings.

3. A drill comprising a head having a transverse mortise, a boring member inserted into said mortise, bolts through the head and boring member from opposite sides, bushings threaded onto said bolts and being operative against opposite sides of said boring member.

4. A drill comprising a head having a transverse mortise, a boring member inserted into said mortise, bolts through the head and boring member, bushings threaded onto said bolts and being operative against opposite sides of said boring member, said bushings being formed of sections.

5. A drill comprising a head having a transverse mortise, a boring member inserted into said mortise, bolts through the head and boring member, bushings threaded onto said bolts and being operative against opposite sides of said boring member, said bushings also having threaded connections with the head.

6. A drill comprising a head, a boring member at the lower end thereof, said head and boring member being provided one with spaced prongs and the other being shaped with a tenon fitted between said prongs, a bushing through each of the prongs on opposite sides of the axis of the head whose inner ends abut said tenon and bolts through said prongs and tenons from opposite sides of the drill and having threaded connections with said bushings.

In testimony whereof we have signed our names to this specification.

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WALTER L. CHURCH.