



Sept. 17, 1935.

W. L. PEARCE

2,014,909

DRILL

Filed Oct. 15, 1934

2 Sheets-Sheet 2

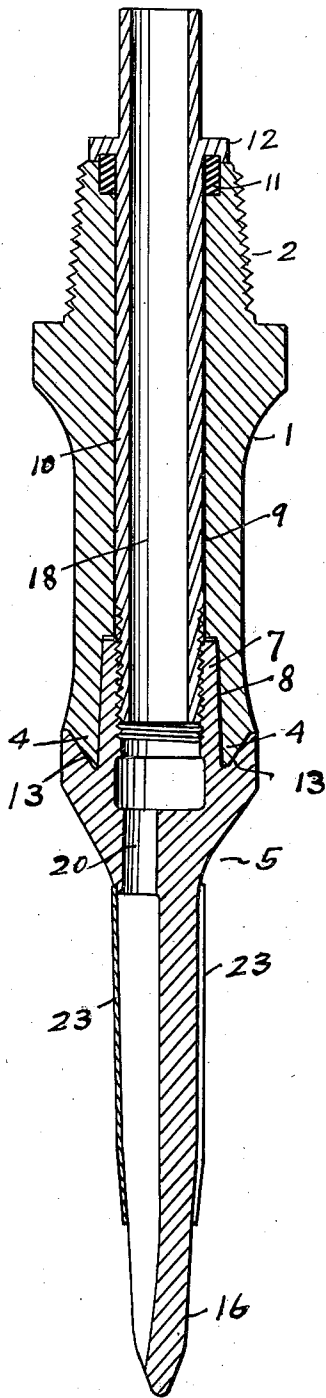


Fig. 3.

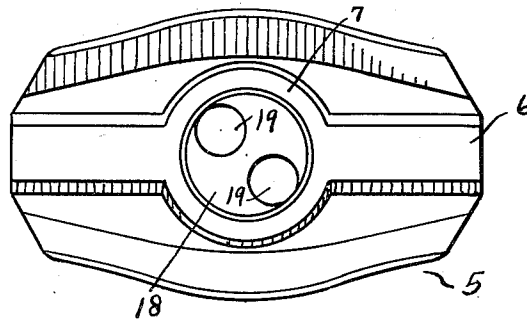


Fig. 4.

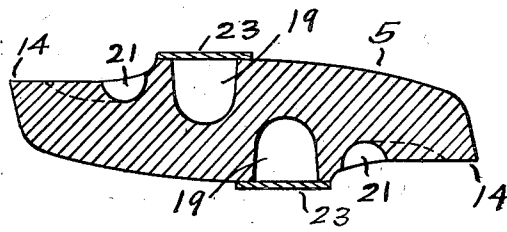


Fig. 5.

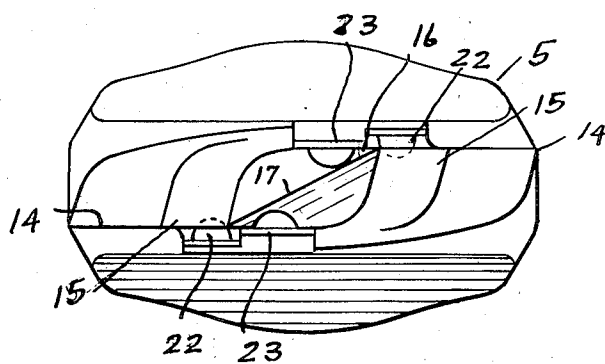


Fig. 6.

Inventor

William L. Pearce

Hardway Tathery  
Attorneys

334

# UNITED STATES PATENT OFFICE

2,014,909

## DRILL

William L. Pearce, Houston, Tex.

Application October 15, 1934, Serial No. 748,355

4 Claims. (Cl. 255—61)

This invention relates to a drill.

An object of the invention is to provide a drill having a drill head and a novel type of cutter detachably secured to the head.

Another object is to provide novel means for securing the drill cutter to the head.

A further feature is to provide, in a drill, a novel type of cutter.

A still further feature is to provide a drill having novel channels for supplying the drilling fluid to the cutting blades.

It is another object to provide a drill having cutting blades arranged in stepped formation whereby an approximately straight bore will be formed in drilling a well.

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 drawings wherein:—

Figure 1 shows a side view of the drill.

Figure 2 shows an edge view.

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

Figure 4 shows a top end view of the cutter.

Figure 5 shows a cross-sectional view taken on the line 5—5 of Figure 1, and

Figure 6 shows a bottom end view of the drill.

In the drawings the numeral 1 designates the drill head which terminates, at its upper end, in the outwardly threaded shank 2 to receive a drill stem or other driving member. Beneath the shank the head is preferably cylindrical and the lower end of the head is preferably widened and flattened.

Across the lower end of the head there is an upwardly converging mortise 3 and on opposite sides of the mortise there are the transverse tenons 4, 4, whose outer sides converge downwardly. The lower end of the head is slightly thickened or flared outwardly, immediately above the tenons 4.

The numeral 5 designates the cut, as a whole. The upper end of the cutter has a transverse, upwardly tapering, tenon 6 shaped to fit snugly into the mortise 3 and the central portion of the mortise 6 is formed tubular, as at 7, and said tubular portion is internally threaded and fits snugly up into the enlarged lower end 8 of the axial bearing 9 which extends on up through the head and shank to the upper end of the shank. Fitted through this bearing 9 there is a tube 10 whose lower end is screwed into the extension 7. The upper end of the tube is extended above

the shank 2 to receive a wrench for turning the tube. Seated in the upper end of the shank there is a packing 11 around the bearing 9 and on the tube 10 there is an annular flange 12 which clamps the packing closely in place when the tube is screwed home. The tube 10 forms means for securely anchoring the cutter to the head.

The abutting parts of the head and cutter are shaped to form a flush exterior surface and the upper end of the cutter has the transverse mortises 13, 13, on opposite sides of tenon 6 and extension 7 to receive the tenons 4, 4, of the head which fit snugly therein. The tenon and mortise structure forming the joint between the head and cutter effectively prevents any relative rotary movement between them.

Beneath the head the cutter 5 is reduced in width, forming oppositely curved upper, side cutter-blades, 14, 14, and beneath the cutter-blades 14, the cutter is again reduced in width, forming the lower side cutter blades 15, 15, and the central pilot 16. The lower end of the pilot has a diagonal downwardly converging cutting edge 17.

The channel 18 through the tube 10 continues on down into the upper end of the cutter 5 and there branches forming the side channels 19, 19, which emerge on opposite sides of the cutter and continue, on down on opposite sides of the cutter, in the form of grooves, and terminate on opposite sides of the pilot 16 just above the cutting edges 17 thereof. Branch channels 20, 20, diverge downwardly from the side channels 19 and emerge in the form of trough-like depressions on the forward faces of the upper cutter-blades 14.

The grooves forming the downward continuations of the channels 19 separate, forming the side grooves 22, 22, which terminate on the forward faces of the lower side-cutter blades 15, 15. The groove-like extensions of the channels 19 and the side grooves 22 are covered, except at their lower ends, by the side plates 23, 23, which may be welded to opposite sides of the cutter 5.

The particular shape of the cutter will cause the drill to follow an approximately straight course and ample drilling fluid will be supplied to the blades to flush and keep the blades cool.

When the cutter becomes dull it may be re-dressed and sharpened, and when it becomes worn out, it may be discarded and a new one furnished and the head thus from time to time reused.

What I claim is:—

1. A drill comprising a head having an axial

channel leading downwardly from its upper end, a cutter on the lower end of the head, said cutter being reduced in width beneath the head and formed with upper side cutter blades and being further reduced in width beneath said upper blades and formed with lower side cutter-blades, said cutter terminating at its lower end in a pilot, said channel separating into branches, and continuing on down on opposite sides of the cutter, in the form of grooves, to the pilot, said grooves separating and leading also onto the forward faces of the lower blades, plates on the cutter covering said grooves except at their lower ends, said cutter also having channels leading from said branches onto the forward faces of the upper side cutters.

2. A drill comprising a head having an axial channel leading downwardly from its upper end, a cutter on the lower end of the head, said cutter being reduced in width beneath the head and formed with upper side cutter blades and being further reduced in width beneath said upper blades and formed with lower side cutter blades, said cutter terminating at its lower end in a pilot, said channel separating into branches and continuing on down on opposite sides of the cutter, in the form of grooves to the pilot, said grooves separating and leading also onto the forward faces of the lower blades, plates on the

cutter covering said grooves except at their lower ends, said cutter also having channels leading from said branches onto the forward faces of the upper side cutters, said cutter being detachable from the head and means for securing the cutter to the head.

3. A drill comprising a head having an axial bore whose lower end is enlarged, said head having a transverse mortise, a detachable cutter on the head whose upper end is provided with a transverse tenon fitted into said mortise, said tenon being formed with a tubular extension fitted into the enlarged lower end of the bore, a tube in the bore whose lower end is threaded to the extension.

4. A drill comprising a head having an axial bore whose lower end is enlarged, said head having a transverse mortise, a detachable cutter on the head whose upper end is provided with a transverse tenon fitted into said mortise, said tenon being formed with a tubular extension fitted into the enlarged lower end of the bore, a tube in the bore whose lower end is threaded to the extension, a packing in the bore around the tube and means on the tube which clamps the packing in place when the tube is screwed home.

WILLIAM L. PEARCE.