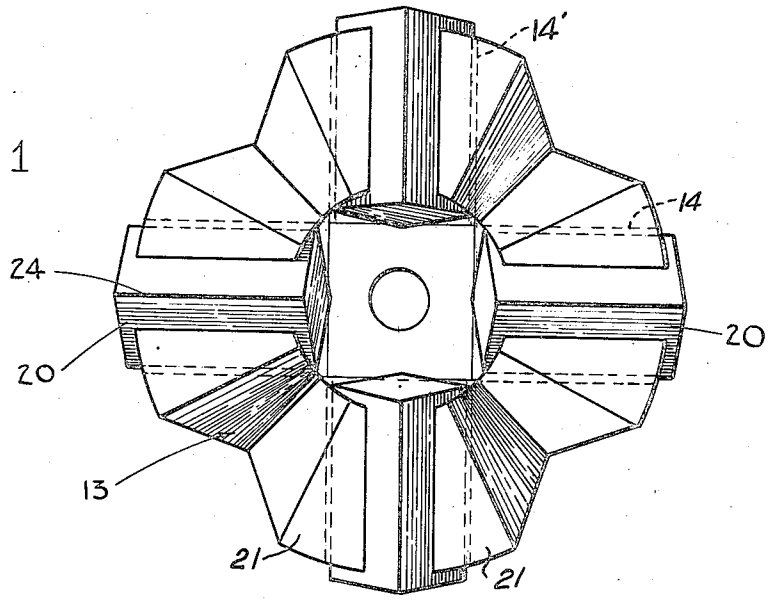
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DETACHABLE ROCK DRILL BIT WITH REPLACEABLE CUTTERS

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Fig. 1



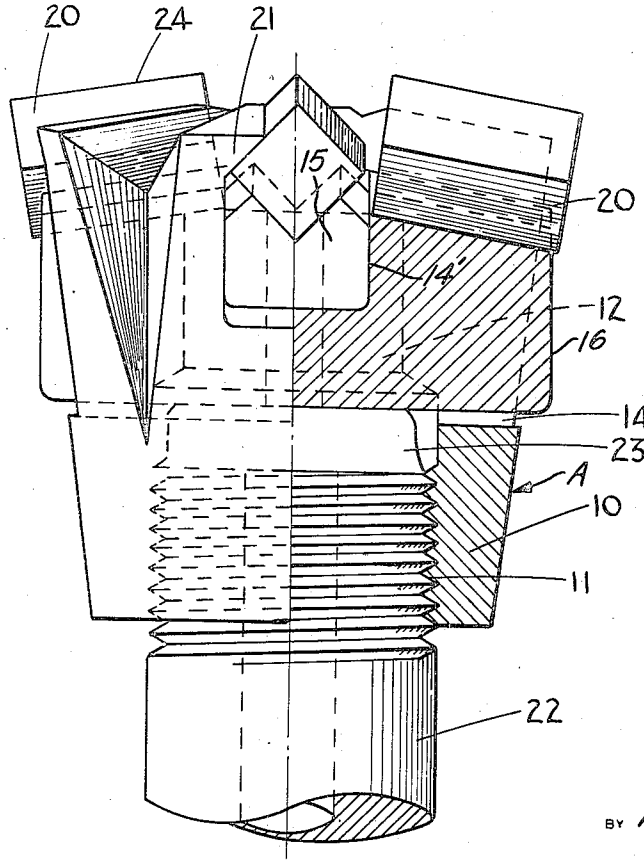


Fig. 2

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Fig. 4

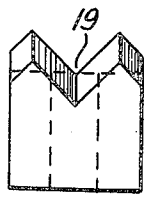


Fig. 3

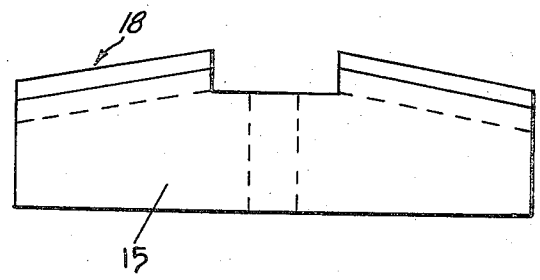


Fig. 6

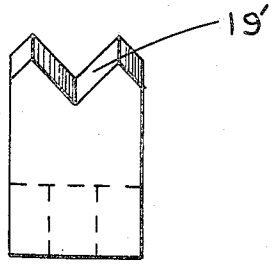
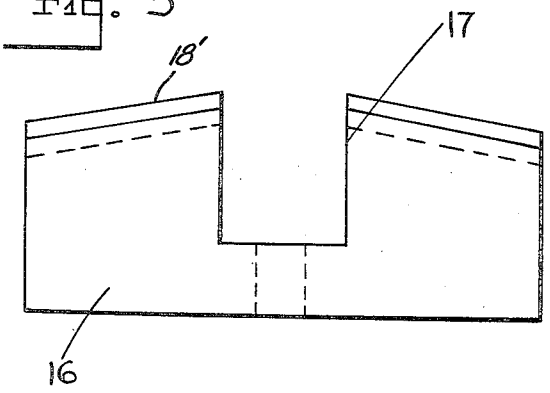


Fig. 5



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Fig. 7

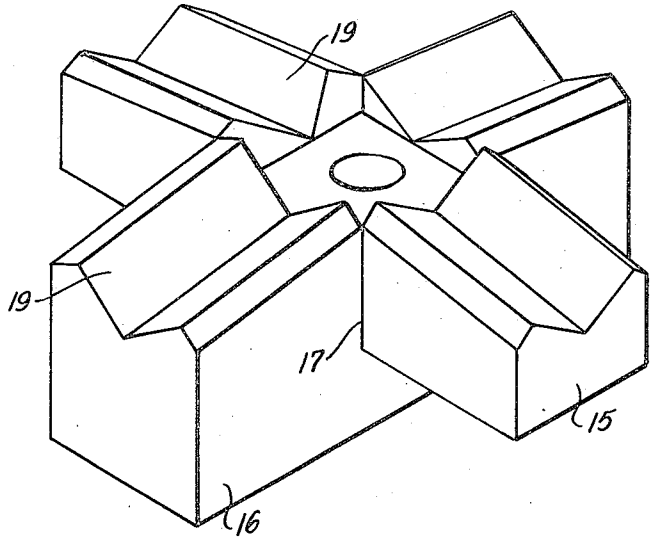
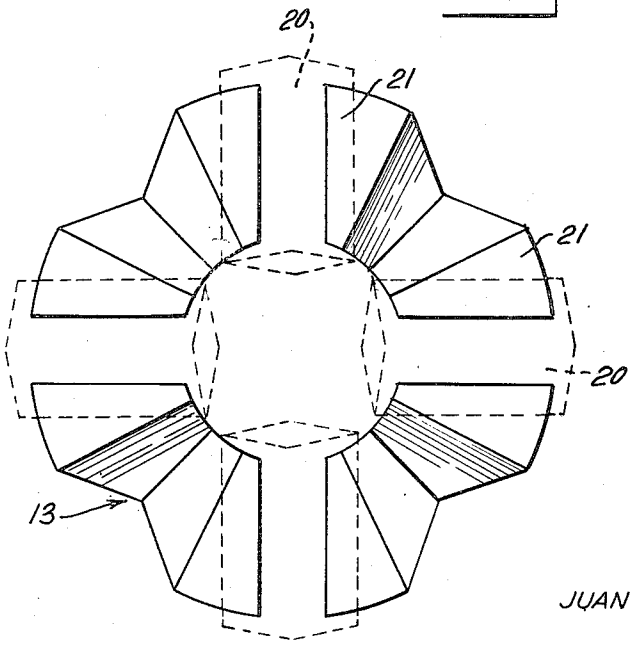


Fig. 8



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UNITED STATES PATENT OFFICE

2,494,188

DETACHABLE ROCK DRILL BIT WITH REPLACEABLE CUTTERS

Juan M. Meaney, Monclova, Mexico

Application October 17, 1945, Serial No. 622,813

1 Claim. (Cl. 255—64)

1

The invention relates to drills, and more especially to a rock drill head having detachable cutters.

The primary object of the invention is the provision of a drill head of this character, wherein the cutters are detachably mounted therein in a novel manner for cross cutting action in the use of the head for drilling, the cutters being held firmly and securely in place without liability of the same working loose to drilling, and when these are detached they may be readily sharpened or replaced by new cutters, as the occasion may require.

Another object of the invention is the provision of a drill head of this character, wherein when the points of the cutters become slightly dull they may be adjusted for continued drilling until the points are worn out for further service, then these may be resharpened or replaced by new ones, at the option of the user of the head.

A further object of the invention is the provision of a head of this character, wherein hard faced bit cutters can be conveniently and cheaply made, the cutters having a lasting quality much greater than that of the common steel cutters. Thus, for example, an operator can run the drill thirty minutes with an ordinary tempered steel bit, whereas with appliant's bit he may run the drill on each edge of four-edge cutters, thereby obtaining approximately three hundred and sixty minutes of drilling.

A still further object of the invention is the provision of a head of this character, which is simple in construction, thoroughly reliable and efficient in operation, strong, durable, readily and easily adjusted, allowing placement and removal of cutters with ease and dispatch, unique in the assembly of parts, and inexpensive to manufacture and install.

With these and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which show the preferred embodiment of the invention, and pointed out in the claim hereunto appended.

In the accompanying drawings—

Figure 1 is a plan view of the drill head constructed and assembled in accordance with the invention.

Figure 2 is a side view, partly in vertical section thereof.

Figure 3 is a side view of the upper cutter holder detached from the drill head.

Figure 4 is an end view of Figure 3.

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Figure 5 is a view similar to Figure 3 but showing the lower cutter holder detached from the drill head.

Figure 6 is an end view of Figure 7.

Figure 7 is a perspective view of the upper and lower cutter holders in their relative assembled position, the cutters being shown removed from the drill head.

Figure 8 is a plan view of the drill head with the positions occupied by the cutters being indicated by dotted lines therein.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, the drill constituting the present invention, comprises a head denoted generally at A, and involves a chuck body 10, which is of substantially circular inwardly tapered contour, having a centrally located internally threaded bore 11 in its smaller end, which bore merges with a central reduced passage 12 aligned therewith and opening through the outer larger end of such body.

The body 10, at its outer working face, is provided with clearance areas 13. Intersecting the body 10 at diametrically opposed points are intersecting cross ways 14 and 14', which intersect at the center of such body 10 for continuous communication of those portions of such ways lying at opposite sides of the center of the body.

Interfitting the ways 14 and 14' are interlocked cutter or bit holders 15 and 16, respectively, the holder 15 being nested within the holder 16, as illustrated in Figures 2 and 7. Cutter holder 16 is provided with a groove for receiving the cutter holder 15. The holders 15 and 16 have outwardly and downwardly sloping end portions 18 and 18', which are provided with substantially V-shaped channels 19 and 19' longitudinally therein providing seats for cutters or bits 20, each being of substantially diamond-shape in cross section. The cutters or bits 20, when seated in the channels 19 and 19' in the holders 15 and 16, on assembly of the latter in the body 10, are impinged by clamping claws 21 struck from the area 13 to overhang such cutters or bits 20, as shown in Figure 2, whereby these can be firmly and securely held in place within the body 10 when the hollow drill stem or shank 22, which is threaded in the bore 11, is turned inwardly of the body 10 causing the end 23 of such stem or shank to be driven against the holder 16, which in turn forces it and holder 15 upwardly to detachably lock the cutters or bits 20 against the claws 21 of the body 10.

The cutters or bits 20, at their outer faces, are provided with knife-like cutting edges 24, which protrude beyond the area 13 and claws 21 for cross cutting operation of the drill head in the use thereof.

In the assembling of the device, holder 16 is fitted cross way 14', then holder 15 is slid through cross way 14 to seat in groove 17 of the holder 16. The cutters or bits 20 are slipped into between the claws 21 and the seats 19 and 19' within the holders, it being understood that the stem or shank 22 has been loosened for this purpose. By turning the stem 22 inwardly in the body, the end 23 forces the holders and cutters or bits to become locked in such body, preparing the head for drilling.

During the use of the drill head if the edges 24 become blunt, the operator loosens the stem or shank 22, and turns any or all four cutters or bits in their seats 19 or 19' through 90 degrees, thereby presenting fresh cutting edges, and then tightening the stem or shank 22 whereupon the head is ready for drilling until another cutting edge of each cutter or bit is worn out. The foregoing operation is repeated until all edges of each cutter or bit have been worn out, when a new set of cutters or bits is used to replace the same. This will avoid the necessity for constantly resharpening the cutters or bits as in drill heads employing but a single cutting edge to each cutter or bit.

What is claimed is:

A drill head comprising a chuck body having a central longitudinal bore, a portion of said bore being threaded, a pair of diametrical cross ways in said chuck body and extending from side to side of the chuck body, said cross ways intersecting each other at right angles thereto with the center of the intersection coinciding with the axis of said longitudinal bore, clamp claws comprising a part of said chuck body and overhanging said cross ways from opposite side walls thereof, a first cutter holder having a groove therein slidably mounted in one of said cross ways, a second cutter holder supported by and positioned in the groove of the said first cutter holder and slidably mounted in the other of said cross ways, a plurality of bits of substantially square cross section and having the edges thereof forming cutting portions, each said cutting holder having a plurality of seats for supporting said bits, each said seat and pair of clamping claws adjacent thereto adapted to slidably receive a bit to present a cutting edge beyond the clamping jaws, and a threaded stem screw threaded into said longitudinal bore and having a head portion adapted to contact said first cutter holder whereby rotation of said stem in one direction will cause said head portion to force said cutter holders, bits and clamping claws together to form a rigid cutting structure, and whereby rotation of said stem in a reverse direction will loosen said cutting structure to permit said bit to be removed and reinserted to selectively present one of its cutting edges for cutting action.

JUAN M. MEANEY.

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