

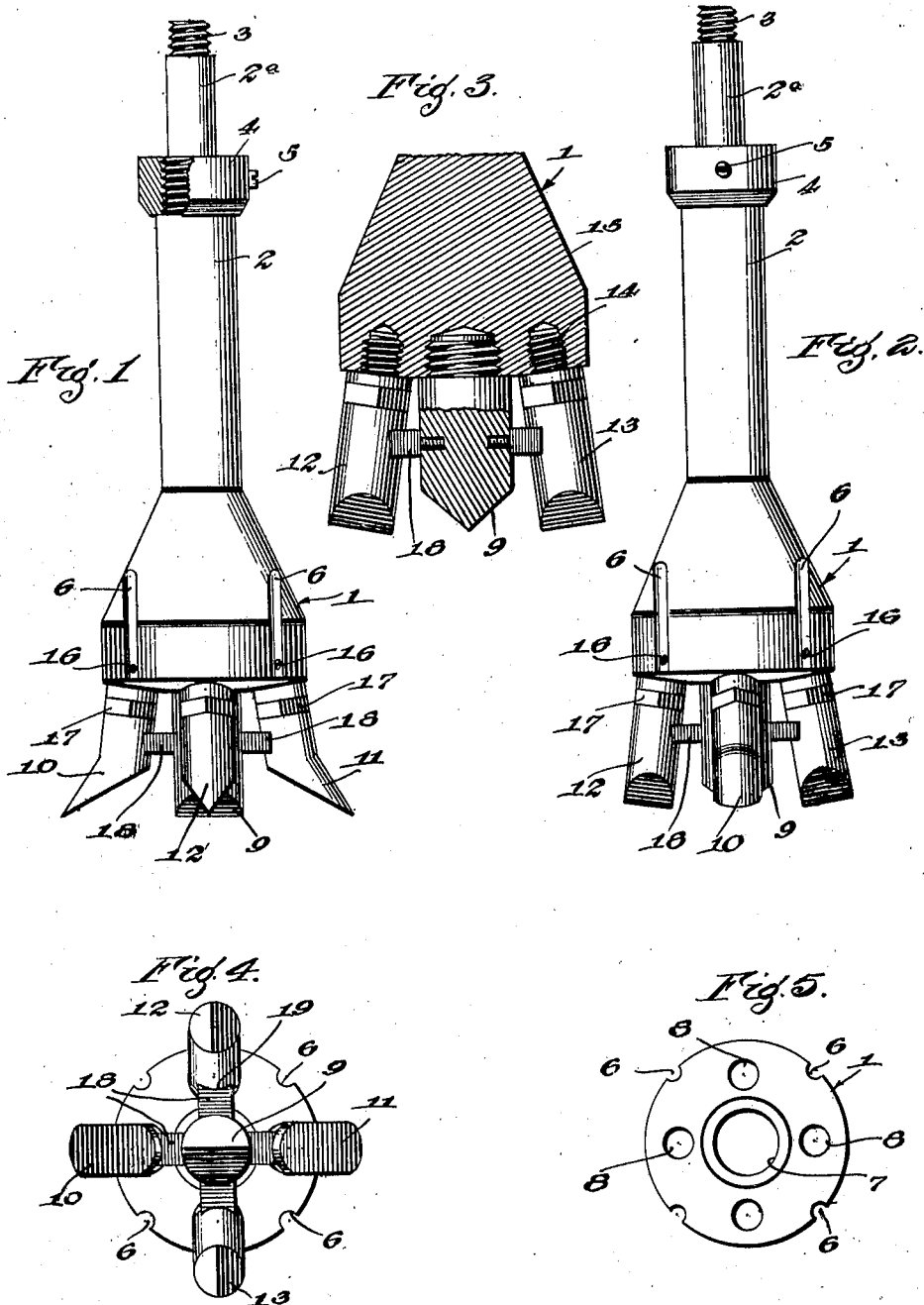
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DRILL FOR OIL AND GAS WELLS

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DRILL FOR OIL AND GAS WELLS

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This invention relates to drills and more particularly to cable rock drills used in boring oil and gas wells.

A primary object of the invention is to provide a drill of this character having a one piece head provided with a plurality of bits or cutters of different types so arranged as to effectively cut across each other's path through the rock and so produce a round hole without necessitating the use of other tools, and which cutters are adapted to be changed frequently to provide for drilling a hole of uniform size throughout.

Another object is to so mount the bits or cutters in the head that they may be readily removed by the operator for sharpening or replacing when dulled, thus saving expense and time.

In carrying out these objects, the invention is susceptible of modification without departing from the spirit or sacrificing any of the advantages of the claimed invention; there being shown in the drawings for illustrative purposes a preferred and practical form in which,

Figure 1 represents a side elevation of a drill constructed in accordance with this invention,

Fig. 2 is a similar view taken in a plane at right angles to Fig. 1,

Fig. 3 is a transverse vertical section through the head of the drill with the shank broken off for convenience in illustration,

Fig. 4 is a bottom plan view of the tool with the bits in place, and

Fig. 5 is a similar view of the head with the bits removed.

In the embodiment illustrated a solid substantially cone-shaped head 1 is shown which merges at its apex into a shank or stem 2 provided at its upper end with a reduced threaded terminal 3 for connection with the drilling apparatus. A plumb or guide ring 4 is mounted on the upper end of the shank 2 being seated on a shoulder 4a formed at the inner end of a reduced portion 2a of the shank. This plumb ring is secured in position by a set screw 5 passing radially there-through and engaging the shank.

The outer face of the head 1 is provided

with a plurality of longitudinally extending peripherally spaced sand grooves 6 between which in the head are formed sockets 8 arranged obliquely as shown in Fig. 3 to receive the threaded shanks 14 of the cutters or bits, four of which are here shown and which have said shanks extended in longitudinal alignment with the bodies of the cutters. A central socket 7 is larger in size than those and is designed to receive a master cutter 9 which is made in the form of a bull bit, with a reduced threaded rear end for insertion in the socket 7. The sockets 8 are inclined upwardly and inwardly as shown in Fig. 3 so that the bits 10, 11, 12 and 13 which are mounted therein are inclined outwardly at their cutting edges to provide a clearance for the four cutters while drilling. This arrangement of the bits 8 and their sockets adapts the cutting strain to be borne by the head 1 and not at the junction of the bits with the head such as would be liable to shear off the bits at this point. These cutters are arranged in pairs, those of each pair being diametrically opposite each other two of said cutters being chisel cutters and two bull bits. The cutters or bits are held in their sockets by set screws 16 as shown clearly in Fig. 3 and are preferably each provided with an angular portion 17 to receive a wrench for screwing them into and out of the sockets. The two chisel bits 10 and 11 are set opposite each other with cutter edges on two sides of the head and the two bull bits 12 and 13 are set with their cutting corner edges from the center to the outer edge of the drill base on two sides as is shown clearly in Figs. 1 and 4 while the master drill bit 9 is set with the cutting corner edges to the center of the two chisel bits so that all of the rock will be cut out since these bits cut across each other's paths thereby insuring the formation of a round hole without necessitating the use of any other tools.

The master bit 9 has mounted in the periphery thereof four screws arranged at diametrically opposite points so that the heads 18 thereof fill the spaces between the master bit and the other bits and said heads are made concave on their outer faces to fit the shanks of the cutting bits as shown at 19 in Fig. 4.

These screws 18 which are threaded into the master bit 9 operate to hold the bits 10, 11, 12 and 13 rigidly in cutting position and thus insure the operation of the bits in unison.

5 From the above description, it will be obvious that this drill has its head and shank constructed from a single piece whereby strength and durability are provided and the cone-shaped or beveled construction of the head
10 with the bit receiving sockets arranged at an incline provide a clearance for the bits while drilling.

Without further description, it is thought that the features and advantages of the invention will be readily apparent to those
15 skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention or its scope as claimed.

20 I claim:—

A multi-bit drill comprising a substantially cone-shaped head having a shank extending from the apex thereof, and grooves arranged
25 in the outside walls of said head, a central socket opening through the base of the head and surrounded by a plurality of concentrically arranged sockets, the central socket being larger than the others, a master drill bit
30 inserted in said central socket and pairs of chisel and bull bits mounted in the other sockets, these bits being arranged in pairs diametrically opposite each other, and locking elements arranged between said master
35 bit and the adjacent bits.

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