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P. J. SWOFFORD

2,334,453

SPEED ROCK BIT

Filed April 30, 1942

Fig. 1.

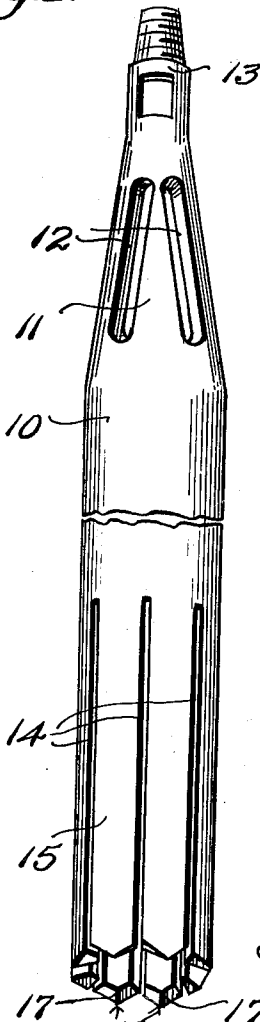


Fig. 2.

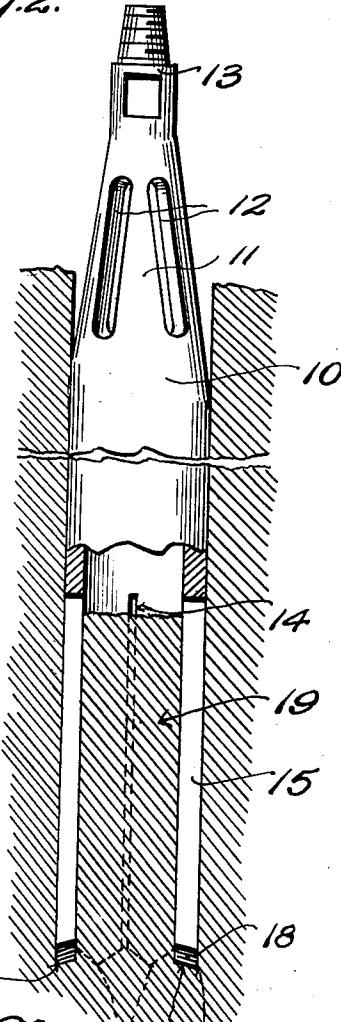


Fig. 3.

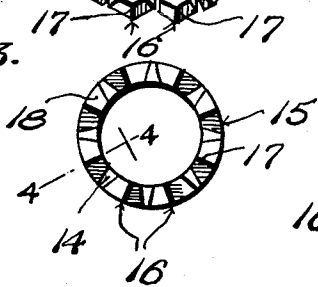
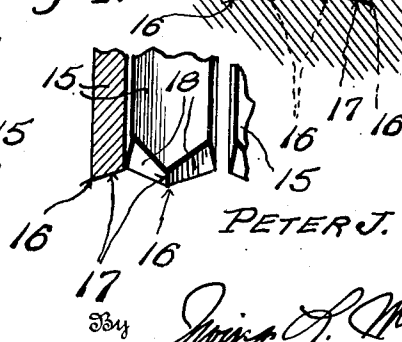


Fig. 4.



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SPEED ROCK BIT

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Application April 30, 1942, Serial No. 441,185

1 Claim. (Cl. 255—72)

This invention relates to rock bits, and more particularly to a speed rock bit for cable tools, and has for one of its objects the production of a simple and efficient bit which is so constructed as to drill an annular or ring-like socket leaving a central core, which core may be broken-off and removed intact after first removing the bit.

A further object of this invention is the production of a simple and efficient hollow bit having a plurality of cutting teeth arranged in annular formation and having cutting faces tapering inwardly and laterally from the outer face and lower edge of the bit to provide a maximum cutting action.

Other objects and advantages of the present invention will appear throughout the following specification and claim.

In the drawing:

Figure 1 is a perspective view of the bit;

Figure 2 is a side elevational view, certain parts being shown in vertical section;

Figure 3 is a bottom plan view of the bit illustrating the cutting teeth at the bottom of the bit;

Figure 4 is an enlarged vertical sectional view taken on line 4—4 of Figure 3.

By referring to the drawing, it will be seen that 10 designates the body of the rock bit, which is provided with a tapering upper end 11 having slotted vents 12 and the conventional upper end construction 13. The body 10 is provided with a central bore thereby defining a hollow body which hollow body is preferably about eight feet in length. The body 10 is provided with spaced longitudinally extending slots 14 near the lower end of the body to provide a series of annularly arranged teeth 15, preferably about two feet in length.

The lower cutting face of each tooth 15 is shaped to provide a centrally located outer cutting point 16, and the bottom edge of each tooth is inclined upwardly and rearwardly as indicated at 17. The lower face of each tooth is also inclined rearwardly, upwardly and is also inclined laterally and inwardly from the center of the tooth toward the sides of the tooth as illustrated in detail in Figure 4 at 18.

In view of the fact that the teeth 15 are arranged annularly or in a ring-like formation, it should be understood that as the bit operates, an annular socket will be cut in the rock or hard formation through which the bit is operating for the length of the hollow body, thereby forming a core 19. The bit may then be withdrawn and a sand bucket having gripping dogs at the bottom may be lowered to grip the core 19 and break

off the core 19 close to its bottom as the bucket is lifted. The core 19 may then be brought out intact and this core will provide a "log" to demonstrate the type of formation through which the bit has been operating.

By actual experiment it has been found that the present rock bit almost equals the speed of a rotary bit. It has been found that by drilling a 22 inch hole, the cutting surface in the present bit is 1½ inches, or three inches overall, leaving a core of approximately 19 inches in diameter in the center. As stated above, the body 10 is provided with a plurality of spaced slots which run about two feet vertically of the body, from the bottom edge thereof, the body being preferably about eight feet long. The core 12 will be cut into the formation through which the bit is operating, and since the body is hollow, this core may extend for a considerable distance upwardly into the body, and when the maximum distance is reached, the bit may be withdrawn and a suitable sand bucket may be used as specified above for the purpose of removing the core intact. It has been found by actual practice that the use of this bit speeds up the conventional cable tool drilling approximately 75%.

The structure of the bit as illustrated and described also facilitates the sharpening of the bit and it has been found advantageous to place a form in the slots 14 with the nub on the end and by striking the ends of the bit by means of a blow from a sledge-hammer while the bit is hot, the bit may be reformed in the proper size and with the proper cutting surfaces. Where many sharpenings are necessary, a portable emery-stone may be utilized having a proper angle to touch-up the cutting points of the bit.

It has been found by experience that in a rotary rig a well is often lost by passing up oil and going to salt water.

The present type of bit has been designed to fit the standard drill shaft and the teeth 15 are so constructed at their lower ends so as to provide a diamond point near its lowest outer edge and these cutting faces taper inwardly or back toward the core, thereby providing all of the various cutting points necessary. It has been found that it is practically impossible for a bit of this type illustrated and described to ricochet or to cause a crooked hole, as often happens when using the standard tool.

It should be understood that certain detail changes in the construction of the device may be employed without departing from the spirit of

the invention, so long as such changes fall within the scope of the appended claim.

Having described the invention, what is claimed is:

A core bit of the class described comprising a cylindrical body having a central bore, a plurality of spaced slots extending longitudinally inward from one end of the body defining spaced cutting teeth, each tooth being bevelled on its working face from the middle to each adjacent

slot, each such bevel inclining away from the working face radially inward toward the bore and circumferentially toward each adjacent slot whereby each tooth has a central radially extending cutting edge inclined toward the central bore away from the extremity of the tooth, and a plurality of other cutting edges at varying angles with respect to each other.

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