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R. I. SILVOLA

2,767,958

ROCK DRILL BIT

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Fig. 1

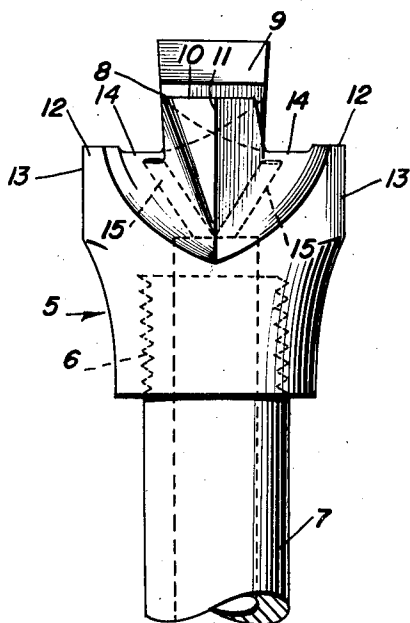


Fig. 2

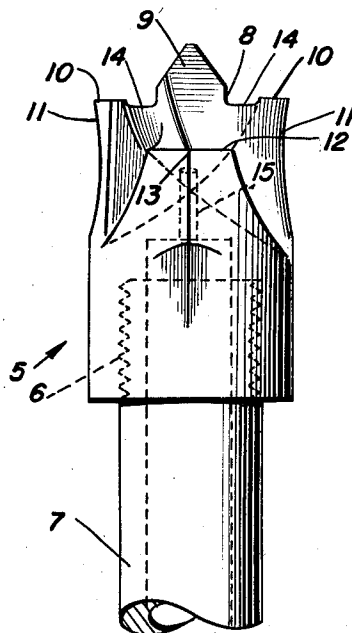
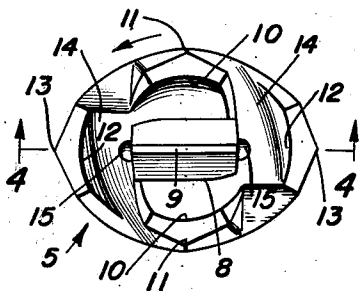
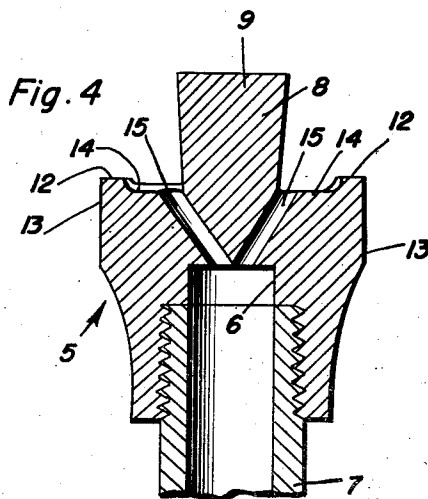


Fig. 3



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ROCK DRILL BIT

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1 Claim. (Cl. 255—61)

The present invention relates generally to new and useful improvements in rock drilling bits and has for its primary object to provide, in a manner as hereinafter set forth, a device of this character comprising a unique combination and arrangement of parts or elements for substantially increasing the drilling speed while at the same time providing a tool which will have a relatively long life.

Another very important object of the invention is to provide a rock drilling bit of the aforementioned character comprising novel means for thoroughly flushing out the broken rock as the work progresses.

Other objects of the invention are to provide a rock drilling bit which will be comparatively simple in construction, strong, durable, compact, highly efficient and reliable in use and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in front elevation of a rock drilling bit construction in accordance with the present invention;

Figure 2 is a view in side elevation of the tool;

Figure 3 is a top plan view; and

Figure 4 is a vertical section, taken substantially on the line 4—4 of Figure 3.

Referring now to the drawing in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a body of suitable metal which is designated generally by reference character 5. As shown to advantage in Figure 3 of the drawing, the body 5 is substantially oval in plan. Extending longitudinally into the body 5 from the lower end thereof is a socket 6 a major portion of which is counterbored and threaded for the reception of a conventional drill line or string, as at 7.

Formed integrally with the upper or forward end of the body 5 is a centrally located chisel-type pilot 8 comprising a substantially tapered upper end portion 9. Located in back of the pilot 8 is a pair of substantially concave initial breakers 10, the purpose of which will be presently set forth. The breakers 10, which are integral with the body 5, comprise substantially V-shaped outer face portions providing points or angles 11. Also formed

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integrally with the body 5 and located in back of and on opposite sides of the breakers 10 is a pair of substantially similar final breakers 12. The breakers 12 also include angular outer face portions provided with points or angles 13.

The breakers 10 and 12 are formed to provide substantially volute channels 14 for the reception of the broken rock. Water passages 15 from the socket 6 communicate with the channels 14.

It is thought that from a consideration of the foregoing the operation of the bit will be readily apparent to those skilled in the art. Briefly, as indicated by the arrow in Figure 3 of the drawing, the bit is rotated in a counterclockwise direction. When in operation, the chisel 8 pilots the hole and guides the direction of the tool. The breakers 10 enlarge the hole made by the chisel pilot 8, said breakers crushing the rock inwardly toward the center of the hole. Then, the function of the breakers 12 is to enlarge the hole to its ultimate diameter, said breakers 12 also crushing the rock inwardly toward the center of the hole. The free ends of the breakers 10 and 12 are flat and constitute cutting faces and the angles 11 and 13 provide cutting edges which keep the bit rotating freely by cutting away the rock not removed by said cutting faces. The crushed rock enters the channels 14 and is flushed away by water from the string 7 flowing through the passages 15. The construction and arrangement is such as to substantially eliminate gauge wear while at the same time maintaining maximum drilling speed and increasing the life of the bit.

It is believed that the many advantages of a rock drilling bit constructed in accordance with the present invention will be readily understood and although a preferred embodiment of the tool is as illustrated and described, it is to be understood that changes in the details of construction may be resorted to which will fall within the scope of the invention as claimed.

What is claimed as new is as follows:

A rock drilling bit comprising: a body of substantially oval cross-section for mounting longitudinally on one end of a drill string, a centrally located chisel-type pilot on the forward end of the body, a pair of breakers on the small diameter of the body rearwardly of the pilot, and a pair of breakers on the large diameter of the body rearwardly of the first-named breakers, said first and second-named breakers defining substantially volute channels for the reception of cuttings, said body having water passages therein communicating with the channels for flushing away the cuttings, all of said breakers including flat free ends constituting cutting faces and further comprising longitudinal angles on the outer surfaces thereof providing cutting edges.

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