March 20, 1945. J. D. MacFARLANE 2,371,698

DIAMOND DRILL BIT

Filed Sept. 24, 1943 2 Sheets-Sheet 1

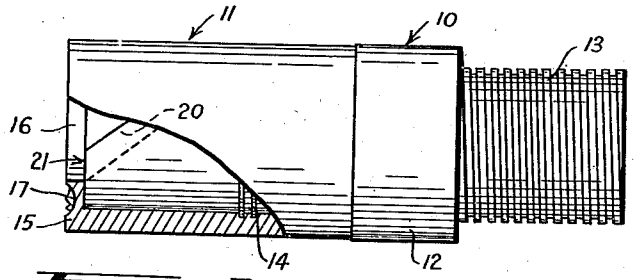


Fig. 1.

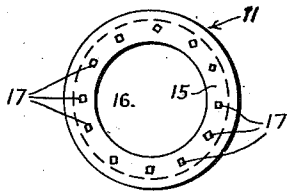


Fig. 2.

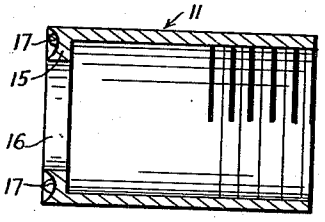


Fig. 3.

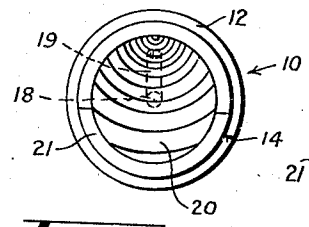


Fig. 4.

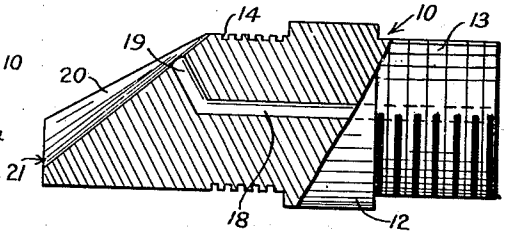


Fig. 5.

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DIAMOND DRILL BIT

Filed Sept. 24, 1943 2 Sheets-Sheet 2

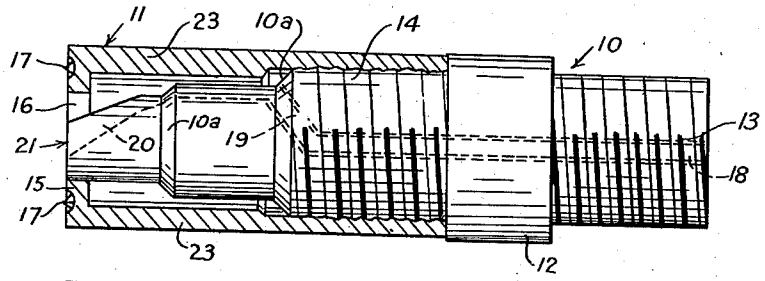


Fig. 6.

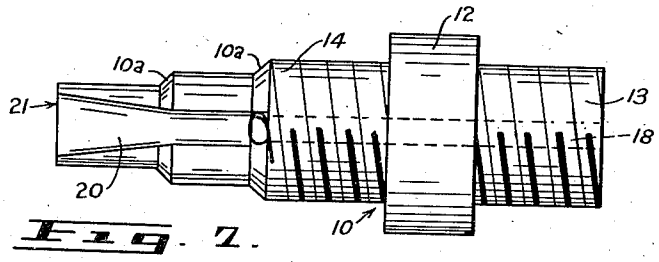


Fig. 7.

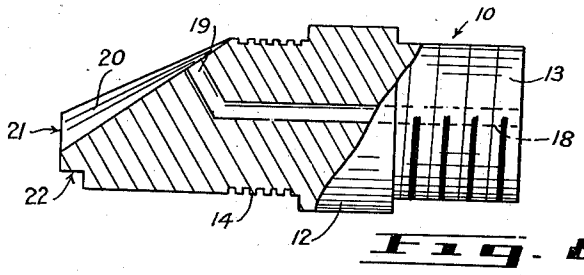


Fig. 8.

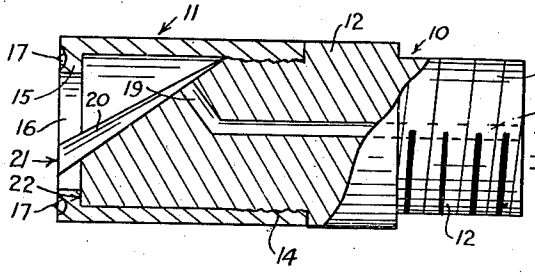


Fig. 9.

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Patented Mar. 20, 1945 2,371,698

UNITED STATES PATENT OFFICE

2,371,698

DIAMOND DRILL BIT

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Application September 24, 1943, Serial No. 503,733

6 Claims. (Cl. 255—64)

This invention relates to drill bits employed in the mining profession for drilling through the geological strata of the subsurface of the earth and more particularly to a coreless blast hole bit.

The bit is secured to the end of the drill rod and the water carried from the core of the drill rod through the core of the bit to the diamond studded face of the bit.

This invention has for its principal object the provision of an annular groove in the bit face or more properly, the face of the sleeve in which is set the diamonds, to the end that the diamonds are conserved and faster drilling is obtained.

The invention also contemplates the provision of an improved water clearance from the core of the drill rod to the face of the bit to the end that better drilling is obtained through the subsurface due to the rotation of the water spray against the area progressively entered by the drill.

Another advantage found to be inherent in the invention is the lack of vibration when the bit is in use. The reason is not obvious, nevertheless it has been observed that there is much less vibration than is customary in drill bits heretofore observed.

Other objects of a more general nature are to provide a simple, comparatively inexpensive, durable and efficient device of the character set forth.

With the above noted and other objects in view which may appear as the description proceeds the invention resides in the novel construction, combination and arrangement of cooperating parts as hereinafter more specifically set forth, claimed and shown in the accompanying drawings forming part of this application and in which:

Fig. 1 is an elevational view of one embodiment of my invention shown partly in section.

Fig. 2 is a face view of the bit.

Fig. 3 is a longitudinal sectional view of the sleeve.

Fig. 4 is a front view of the stock.

Fig. 5 is a fragmentary sectional view of the stock.

Fig. 6 is a longitudinal sectional view of a sleeve attached to a stock, shown in elevation, of another embodiment of our invention.

Fig. 7 is an elevational view taken at right angles to and of the stock of Figure 6.

Fig. 8 is a fragmentary sectional view of a still further embodiment of the core, and

Fig. 9 is a fragmentary sectional view of the core of Figure 8, and the complementary sleeve.

Referring more in detail to the drawings in which similar reference characters designate corresponding parts throughout the several views it will be seen that the invention consists of a stock indicated by the numeral 10 and a sleeve indicated by the numeral 11.

The stock 10 is provided with a homogenetic band 12, at a predetermined position intermediate the ends of the stock which has a diameter greater than the diameter of the remainder of the stock and equal to the diameter of the sleeve and the diameter of the drill rod (not shown) to which it is attached. I prefer to call the band 12 a shoulder, as which it will be hereinafter referred to.

The male screw thread 13, I prefer a square screw thread, is connected to the end of the drill rod section in the usual manner so that the periphery of the drill rod abuts shoulder 12.

On the opposite side of the shoulder and adjacent thereto is another screw thread 14, preferably a square screw thread, which receives the sleeve 11.

The sleeve 11, therefore, encloses the forepart of the stock 10, and is provided with an inwardly extending annular flange 15, which substantially reduces the opening 16, which communicates with the aforementioned stock 10. The face of the annular flange 15 is provided with an annular recess or groove in which the diamond chips 17 are set in the usual manner.

Referring again to the stock 10, it will be seen that the same is provided with a central conduit 18, which communicates with the central conduit of the drill rod. The conduit is directed angularly upward at 19, toward the surface of the stock 10, where it communicates with an inclined trough 20, leading to the opening 16, of the sleeve 11.

In the drawings Figures 1 to 5, inclusive, disclose a bit substantially as disclosed above in which the semi-circular periphery 21 of the stock abuts the inside face of the flange 15 (Fig. 1) when the sleeve is tightened on the stock. The water coming through the conduit 18 races out trough 20 past the annular opening 16 to the subsoil.

Figures 8 and 9 disclose a bit similar to the bit of Figures 1 to 5, inclusive, with the exception of a shoulder 22, at the semicircular periphery of the stock. The shoulder 22 is recessed substantially equal to the size of the flange 15, so that the peripheral edge 21 is in the same plane as the face of the sleeve when the said sleeve is tightened on the stock as shown most clearly in Figure 9.

Figures 6 and 7 disclose my preferred embodiment of the invention wherein the forepart of the bit is stepped down as indicated at 10a, and the peripheral edge 21 is in the same plane as the face of the sleeve 11. It will be noticed that the sleeve 11 is thickened at 23, to strengthen the same and to assist the direction of the water down the trough rather than against the inner face of the flange.

It is believed that the construction and advantages of the structure shown may be apparent from the foregoing paragraphs taken in conjunction with the accompanying drawings, without further detailed description.

While the preferred embodiment of the invention has been disclosed it is understood that minor changes in the details of construction, combination and arrangement of cooperating parts may be resorted to within the scope of what is claimed without departing from the spirit of the invention.

I claim:

1. A bit for diamond drilling, a stock, a homogenetic shoulder intermediate the ends of the stock, means on one side of the shoulder for attachment to a drill rod, a sleeve attached to the stock on the other side of the shoulder, a conduit centrally through the stock, said conduit communicating with an inclined trough cut in the stock, an annular groove in the face of the sleeve and diamonds set in the groove, arranged so that water escaping from the trough passes the face of the sleeve.

2. A bit for diamond drilling, a stock, a homogenetic shoulder intermediate the ends of the stock, a screw thread on one side of the shoulder for attachment to a drill rod, a screw thread on the other side of the shoulder to receive a sleeve, an inclined trough cut in the sleeve receiving end of the stock and a conduit through the stock communicating with the top of the trough, the whole arranged so that the peripheral edge of the stock abuts the inner surface of a flange and the sleeve when the two are secured, an annular groove in the face of the flange and diamonds set in the groove.

3. A bit for diamond drilling, a stock, a homogenetic shoulder intermediate the ends of the stock, a screw thread on one side of the shoulder for attachment to a drill rod, a screw thread on the other side of the shoulder to receive a sleeve, an inclined trough cut in the sleeve receiving end of the stock and a conduit through the stock communicating with the top of the trough, a semicircular shoulder in the peripheral edge of the stock, the whole arranged so that the face of the stock is in the same plane as the face of the sleeve when the two are secured, an annular groove in the face of the flange and diamonds set in the groove.

4. A bit, consisting of a stock, a homogenetic shoulder intermediate the ends of the stock, a screw thread on one side of the shoulder for attachment to a drill rod, a screw thread on the other side of the shoulder to receive a sleeve, an inwardly extending annular flange at the free end of the sleeve diamonds set in an annular groove in the flange face, the said stock being stepped down from the shoulder to the end, the whole arranged so that the peripheral edge of the end of the stock is in the same plane as the face of the bit, a conduit from the drill rod end of the bit to the source of an inclined trough cut inward from the opposite end of the stock.

5. A diamond drill, a bit having a central conduit communicating with an inclined trough cut in the forward end of the bit, a sleeve fitted over the forward end of said bit having an inwardly directed flange at its outer end, and diamonds set in the outer face of said flange, said trough being arranged to direct a flow of water over the outer face of said flange.

6. A diamond drill, a bit having a central conduit communicating with a downwardly and forwardly inclined trough in the forward end of said bit, a sleeve fitted over the forward end of said bit with its outer end disposed adjacent the lower end of said trough and diamonds set in the outer end face of said sleeve.

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