Nov. 5, 1929. C. L. HARRALSON 1,734,672

HYDRAULIC ROTARY DRILL BIT

Filed Aug. 9, 1924

Fig. 1.

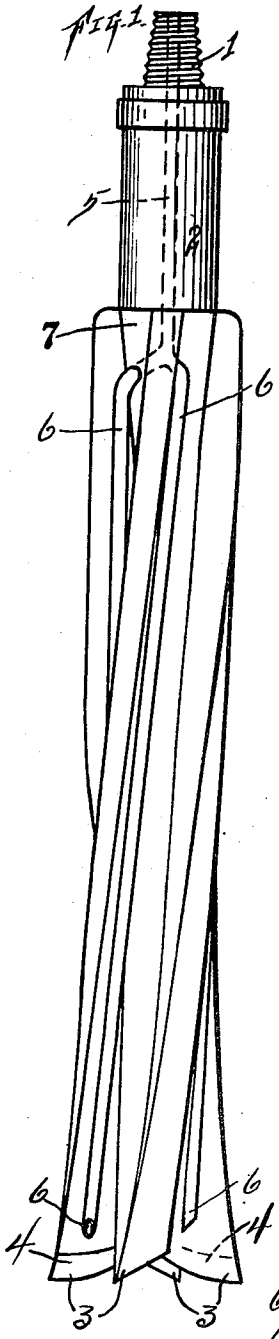


Fig. 3.

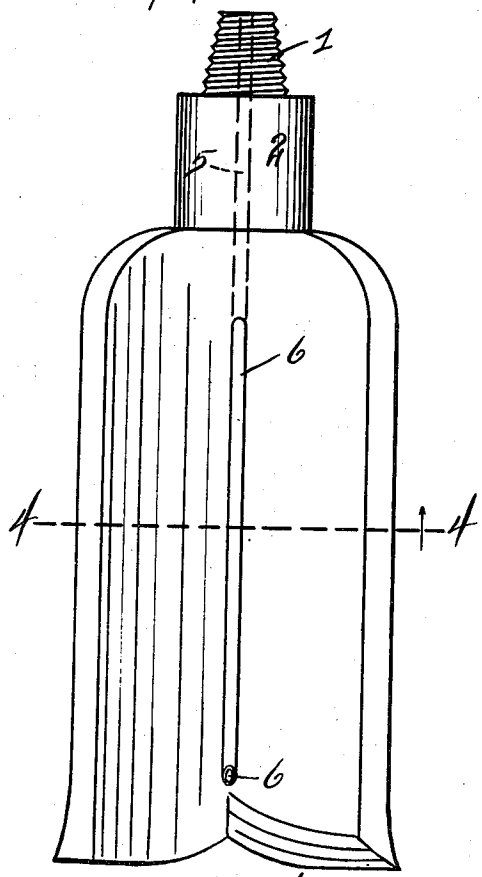


Fig. 4.

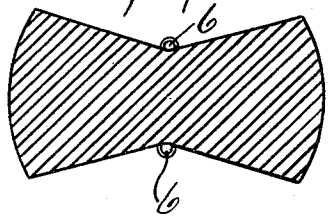
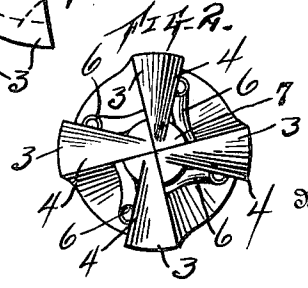


Fig. 2.



Inventor

CHARLES L. HARRALSON.

By A. D. Jackson

Attorney

Patented Nov. 5, 1929 1,734,672

UNITED STATES PATENT OFFICE

CHARLES L. HARRALSON, OF CASPER, WYOMING, ASSIGNOR, BY MESNE ASSIGNMENTS, OF FORTY-SEVEN AND ONE-HALF PER CENT TO THE LEIDECKER TOOL COMPANY, OF MARIETTA, OHIO, A CORPORATION OF OHIO

HYDRAULIC ROTARY-DRILL BIT

Application filed August 9, 1924, Serial No. 731,010.

My invention relates to hydraulic rotary drill bits; and the object is to provide improvements on the drill bits shown in my application for a patent for drill bits, filed Aug. 28, 1922, Ser. No. 584,917, and the improvements include means for supplying water at or very near the bottom of the drill bits; and further these improvements are particularly for use in auger rotary drill bits and the advantage is that the holes or wells are drilled straight by reason of the uniformity in the radial projection of the blades and the possibility of making long bits and this can be done by reason of supplying water to the bottom of the bits at the cutting points. Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application.

Fig. 1 is a side elevation of the improved bit, showing the means for supplying water. Fig. 2 is a bottom plan view of the same. Fig. 3 is a side elevation of the bit, showing a variation in the design. Fig. 4 is a horizontal section of the same, taken on the line 4—4 of Fig. 3.

Similar characters of reference are used to indicate the same parts throughout the several views.

The bit is provided with the usual connection 1 and shank 2. The bit is provided with spiral blades 3 which are beveled one way at the lower edge, indicated at 4. The blades are formed on a cylindrical core 7 and made in the form of a maltese cross, being thicker at the outer edges than at the junction with the core. This gives the greater thickness at the outer edges which do the greater part of the work. The blades may be made six feet in length and the sizes of the bits may vary from six hundred pounds to eighteen hundred pounds more or less and vary in length as well as diameter as may be required.

The water is supplied through a duct formed in the connection 1 and the shank 2 and centrally into the upper part of the body of the bit. Openings are then tapped into the central opening 5 for connecting water distribution pipes or tubes 6. The pipes or tubes 6 are inserted in the openings and extended down between each pair of blades and brazed to the metal of the blades and on the back side of the blades. The tubes 6 are protected because the bits are rotated in one direction only while drilling. Water is continually supplied during drilling under hydraulic pressure which may be above or below two thousand pounds pressure. The terminals of the blades at the bottom are of greater radius than the main body of the blades so that there will be no friction on the body of the blades.

The variation shown in Figs. 3 and 4 consists principally in variation of design in the fish-tail or paddle bit. The blades are beveled at the lower edges and the terminals at the bottom are of greater radius than the body of bit, as in the previously described blades. Water is supplied in the same manner. Various changes in the sizes, proportions, construction and arrangement may be made without departing from my invention.

The discharge of water under hydraulic pressure on the terminals of the blades will keep the blades cool and also keep the mud cleaned from the blades and also keep fresh surface below the blades and the hydraulic pressure on the water will make the water cut the earth, co-operating with the blades.

What I claim, is,—

1. A drill bit having more than two integral blades, the adjacent blades having the sides thereof extending at acute angles to each other to form channels between the blades, a water tube positioned and entirely enclosed in each of said channels and being secured to a side of the blade adjacent the rear face thereof, and extending substantially to the cutting end of the blade, and a central water duct communicating with the tubes for supplying water under pressure thereto.

2. A drill bit having a plurality of radial blades having the sides thereof extending at acute angles to each other to form channels between the blades, a water tube positioned and entirely enclosed in each of said channels and being secured to and extending along a side of the blade adjacent the rear face

thereof substantially to the cutting end of the blade, and a central water duct terminating in a plurality of laterally arranged ducts connected with the water tubes for supplying water under pressure thereto.

3. A drill bit having a plurality of radial blades formed thereon and having the sides thereof extending at acute angles to each other to form channels between the blades, and water tubes positioned and entirely enclosed in said channels and extending approximately throughout the length thereof to the cutting end, said tubes extending along the sides of the blades adjacent the rear face thereof.

4. A drill bit having a plurality of radial blades formed thereon and having the sides thereof extending at angles to each other to form channels between the blades, and a water tube positioned and entirely enclosed in at least one of said channels, and extending toward the cutting end, said tube extending along the blade on the rear face thereof.

In testimony whereof, I set my hand, this 22nd day of September, 1923.

CHARLES L. HARRALSON.