Feb. 18, 1930. E. A. REED 1,747,907

BIT

Filed March 22, 1927

FIG. 1.

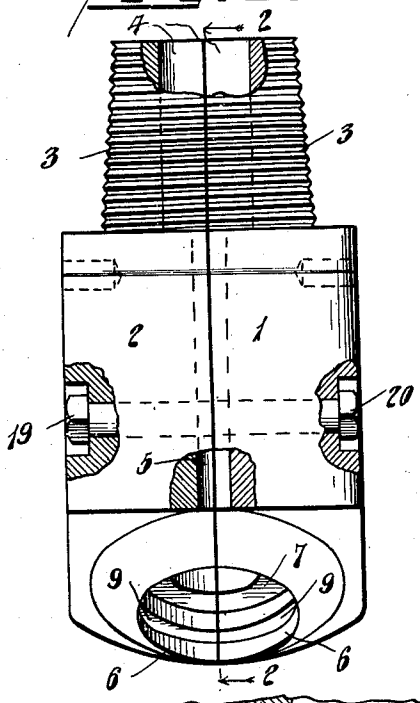


FIG. 2.

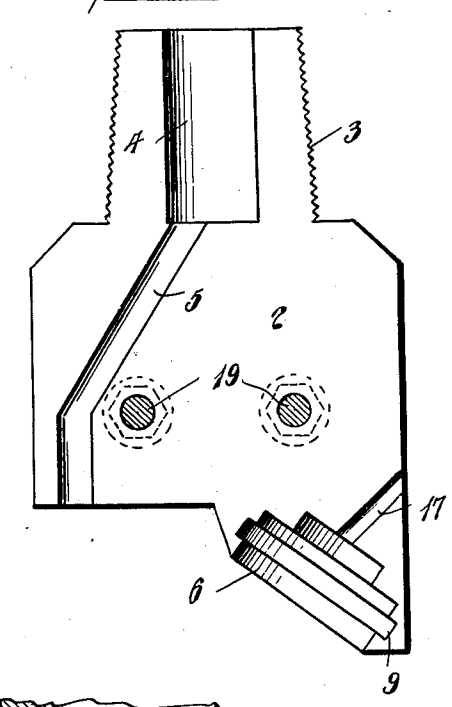
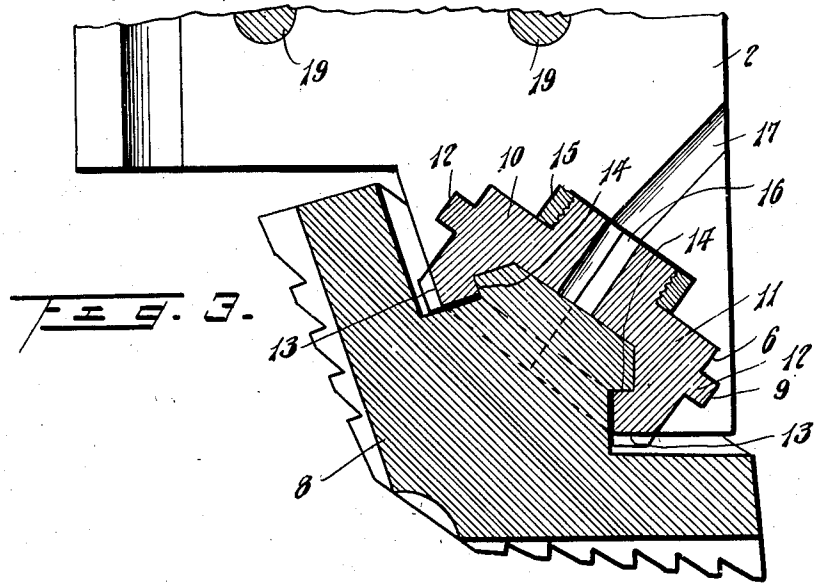


FIG. 3.



Inventor

Earl A. Reed.

By Bacon & Thomas

Attorney

Patented Feb. 18, 1930 1,747,907

UNITED STATES PATENT OFFICE

EARL A. REED, OF WICHITA, KANSAS

BIT

Application filed March 22, 1927. Serial No. 177,361.

The invention relates to improvements in earth boring drills and more particularly to that type of drill having a revolving or rotary cutter.

It is an object of the invention to provide an improved form of drill for use in the boring of oil wells and the like. In the use of boring tools of this character the cutters, after short usuage, become dull and it is necessary to frequently renew these cutters. This, of course, is true when a rock structure is being operated on. The replacement of these cutters in the past has required considerable time and it is an object of this invention to provide a construction in which the cutters can be replaced with little effort and in a very short period of time.

More specifically, the invention comprises a drill in which the head is formed of sections, each section being provided with a portion of a pocket which is adapted to detachably receive and retain a cutter preferably of the frusto-conical type. In accordance with this invention the cutter is supported in the pocket by a sectional bearing fitting within the socket formed by the sections of the head.

It is a further object of the invention to provide an improved means for lubricating the rotary cutter carried by the bit head.

In the drawings,

Fig. 1 is a view looking at one side with parts in section,

Fig. 2 is a sectional view on line 2—2 of Fig. 1, and

Fig. 3 is a sectional view through the cutter.

Referring now more particularly to the drawings wherein like reference characters indicate corresponding parts, the numerals 1 and 2 designate the sections of a bit head. The upper part of each section is threaded as indicated by the reference character 3 by means of which the head may be connected to an operating stem or the like. The threaded portions of each section are provided with semi-circular annular openings 4 through which water may pass to be delivered through the water course 5 formed in the bit head.

The lower end of each section of the bit head is provided with a semi-circular open-ended pocket 6, which when the bit head is assembled forming the annular pocket 7 in the lower part of the bit head which is adapted to receive the cutter.

The cutter is represented by the reference character 8 and may be of any well known conical type. The cutter is, of course, held in the bit head in such a way that it is permitted to rotate or oscillate.

It is an object of the invention to provide an improved means for supporting the cutter and for permitting this cutter to be replaced by a minimum effort. It will be observed that the semi-circular pockets formed in the bit head are provided with annular grooves 9, the function of which is to receive and retain sectional bearing devices. The bearing for the cutter 8 is formed from the bearing sections 10 and 11, each section having a flange 12 which fits within the complemental grooves 9 in the sections of the bit head. Each bearing is also formed with lugs 13 adapted to fit over and engage a shoulder 14 formed at the head of the cutter 18. The bearing sections may be secured together by a circular screw cap 15. It will also be observed that the bearing sections have passing therethrough a water passageway 16 through which water is introduced through the line 17 passing to one side of the bit head.

From the foregoing description it is apparent that if it is desired to place a cutter in the bit head the sections 1 and 2 are separated by the removal of the fastening bolts 19. The bearing sections 10 and 11 are then placed around the forward end of the cutter and this assembly inserted between the semi-circular pockets 7 in the sections 1 and 2 of the bit head. The sections are then drawn together by the tightening of the nut 20 on the fastening bolt 19 so that the bearing sections are clamped therebetween. When in this position the cutter is free to rotate and when it is to be removed for replacement it is only necessary to again loosen the nut 20, separate the sections 1 and 2, remove the cutter 8 with its sectional bearings 10 and 11, insert between these bearings the head of a new cutter, and then insert this assembly in the bit head as described.

Having thus described my invention what I claim is:

1. In a device of the class described, a drill head comprising separable sections, the respective sections having complemental bearing receiving pockets formed therein, said complemental pockets forming an annular recess when the sections of said head are secured together, the inner peripheral wall of said recess being formed with an annular groove, an annular sectional bearing member adapted to be positioned within the said recess and having an annular rib for coaction with said groove, and a rotary cutter having a bearing spindle adapted to be received within said bearing, the contour of the bearing surfaces of said spindle and sectional bearing being such as to prevent separation thereof in an axial direction when the said parts are in assembled relation.

2. In a device of the character described, a drill head comprising separable sections, the respective sections having complemental bearing receiving pockets formed therein, said complemental pockets forming an annular recess when the sections of said head are secured together, the inner peripheral wall of said recess being formed with an annular groove, an annular sectional bearing member adapted to be positioned within the said recess and having an annular rib for coaction with said groove whereby to prevent axial separation of said bearing and drill head, and a rotary cutter having a bearing spindle adapted to be received within said bearing, the bearing surfaces of said spindle and bearing being of irregular contour in an axial direction whereby to prevent axial separation thereof.

3. In a device of the character described, a drill head comprising separable sections, the respective sections having complemental bearing receiving pockets formed therein, said complemental pockets forming an annular recess when the sections of said head are secured together, the inner peripheral wall of said recess being formed with an annular groove, an annular sectional bearing member adapted to be positioned within the said recess and having an annular rib for coaction with said groove whereby to prevent axial separation of said bearing and drill head, and a rotary cutter having a bearing spindle adapted to be received within said bearing, said cutter spindle having a substantially frusto conical bearing surface with a reduced portion adjacent the base and said sectional bearing having an internal bearing surface of corresponding contour, whereby to prevent axial separation of said spindle and bearing.

4. In a device of the class described, a drill head comprising separable sections, the respective sections having complemental bearing receiving pockets formed therein, said complemental pockets forming an annular recess when the sections of said head are secured together, the inner peripheral wall of said recess being formed with an annular groove, an annular sectional bearing member adapted to be positioned within the said recess and having an annular rib for coaction with said groove, and a rotary cutter having a bearing spindle adapted to be received within said bearing, the contour of the bearing surfaces of said spindle and sectional bearing being such as to prevent separation thereof in an axial direction when the said parts are in assembled relation and a ring surrounding said sectional bearing member and having threaded engagement therewith.

5. In a device of the character described, a drill head comprising separable sections, the respective sections having substantially semi-cylindrical pockets formed therein, said pockets terminating at one end in a lower surface of the respective drill head sections and being substantially closed at their opposite ends, whereby to form a substantially cylindrical pocket having a bottom wall when the drill head sections are assembled, a sectional bearing member adapted to be received within said pocket, cooperating means on the periphery of said bearing and the cylindrical wall of said pocket serving to prevent axial separation of said bearing member and drill head, and a roller cutter having a bearing spindle adapted to be received within said bearing member, the bearing surfaces of said spindle and bearing member being such as to prevent separation thereof in an axial direction when the said parts are in assembled relation.

6. In a device of the character described, a drill head comprising separable sections, the respective sections having complemental bearing receiving pockets formed therein, said complemental pockets forming an annular recess when the sections of said head are secured together, the inner peripheral wall of said recess being formed with an annular groove, an annular sectional bearing member adapted to be positioned within the said recess and having an annular rib for coaction with said groove whereby to prevent axial separation of said bearing and drill head, and a rotary cutter having a bearing spindle adapted to be received within said bearing, said cutter spindle terminating in a substantially frusto conical end portion and having a portion of reduced diameter adjacent the base of said frusto-conical end and said sectional bearing member having bearing surfaces matching and engaging both the end and peripheral surfaces of said spindle.

In testimony whereof I affix my signature.

EARL A. REED.