

March 11, 1941.

D. D. ANDERSON

2,234,219

REAMER

Filed Feb. 1, 1940

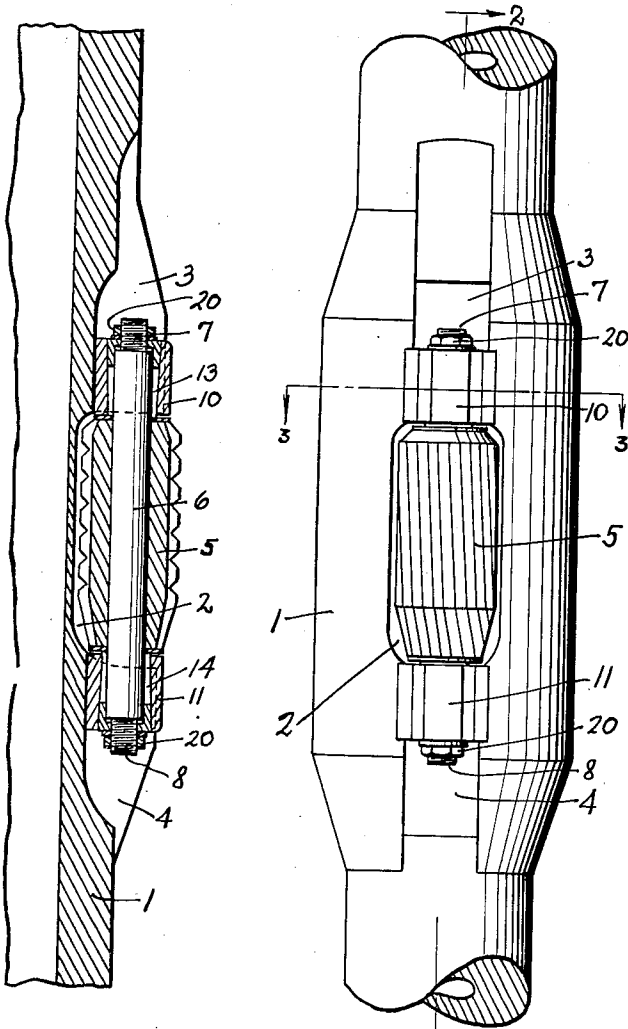


Fig. 2.

Fig. 1.

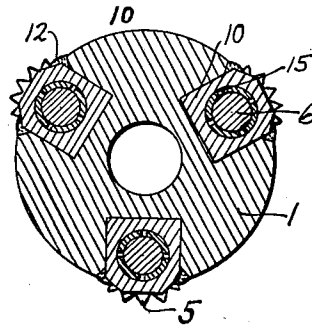


Fig. 3.

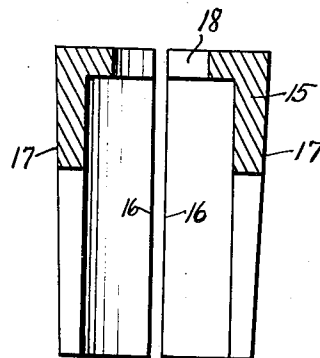


Fig. 4.

Dwight D. Anderson.
Inventor

By J. Vincent Martin
and

Ralph H. Browning.
Attorneys

UNITED STATES PATENT OFFICE

2,234,219

REAMER

Dwight D. Anderson, Houston, Tex., assignor to
Reed Roller Bit Company, Houston, Tex., a cor-
poration of Texas

Application February 1, 1940, Serial No. 316,731

6 Claims. (Cl. 255—73)

This invention relates to reamers for use in connection with the drilling of wells. It has for its general object the provision of a structure whereby a reamer cutter of the roller type may be firmly and rigidly, yet replaceably, mounted within a cutter recess in a reamer body.

In mounting reamer cutters within their recesses, it is necessary that they be mounted as firmly as possible and that there be no possibility of play between any of the parts constituting the mounting during the operation of the reamer.

It is, therefore, an object of this invention to provide a structure for mounting a reamer cutter in a recess in the side of the reamer body in such a manner as to give the greatest possible degree of rigidity to the mounting, prevent any play or lost motion between the parts of the mounting during operation, and at the same time utilize the smallest possible number of parts and eliminate any parts which might easily be broken or distorted.

It is a further object to provide a mounting in which the mounting parts are constantly urged into tighter locking engagement with the head and with the cutter shaft.

It is a further object to provide a structure which may be readily removed and replaced by unskilled labor without necessity for any factory operations or for any fine adjustments and without necessity for any special tools.

Other objects and advantages will become apparent from the following description, taken in connection with the accompanying drawing, it being understood that the same are by way of illustration and example only.

In the drawing:

Figure 1 is a side elevation of a reamer body constructed in accordance with this invention showing the reamer cutters in place therein;

Figure 2 is a vertical cross section through one wall of the reamer body illustrated in Figure 1 and through one of the cutters mounted therein, the same being taken along the line 2—2 of Figure 1;

Figure 3 is a horizontal cross section taken along the line 3—3 of Figure 1; and

Figure 4 is a vertical sectional view of the split bushing member employed in each of the mounting blocks.

In accordance with this invention, a reamer body 1 is formed with a major recess 2 and with a pair of auxiliary or minor recesses 3 and 4, respectively, at opposite ends of and in communication with the major recess. Disposed

within the major recess is the reamer cutter 5, the same being rotatably mounted upon a cutter shaft or pin 6, said cutter shaft being provided with threaded extremities 7 and 8.

Blocks 10 and 11 are fixedly secured into their respective minor or auxiliary recesses 3 and 4, preferably by welding the same to the reamer body as shown at 12. In Figure 3 it will be seen that each block conforms to the cross-sectional dimensions of the auxiliary recess and that after welding, each block is fixedly and firmly held therein. Each of the blocks 10 and 11 are provided with openings 13 and 14, said openings extending through the blocks and being circular and tapering toward a smaller dimension in a direction toward said major recess. These openings are larger than is the diameter of the cutter shaft or pin. However, a split bushing, shown at 15 in Figure 4, is fitted into each of the openings 13 and 14, said split bushing being correspondingly tapered to conform to the tapered inner walls of the blocks 10 and 11. The bushing 15 is split longitudinally along the edges 16, 16 and tapered along the outer surfaces 17, 17. The bushing is provided with an opening 18, or rather half openings, through which extends the threaded extremity of each end of the cutter shaft or pin.

It will be seen from the foregoing that, in mounting the cutter or reamer in the major recess, the blocks are first secured in position in the auxiliary recesses and the cutter shaft with the cutter thereon is then inserted into the openings in first one of the blocks and then the other. In this operation it will be seen that one end of the shaft may be inserted into its block beyond its normal position, and then the other end inserted and the shaft moved back to its normal position. Thereupon the split bushings are inserted in the openings in the blocks and around the extremities of the cutter shaft or pin. Nuts 20 are then threaded upon the extremities of the shaft and tightened whereupon the split bushings will be moved toward each other within the openings in the blocks, and due to their tapered form and the taper of the walls of the block openings, the bushings will form a tight wedging engagement between the cutter shaft and the blocks.

It will be seen from the foregoing that a means has been provided whereby a reamer cutter may be mounted in a reamer body in such a manner that jolts, jars and vibrations incident to the operation of the reamer will not be able to dislocate or loosen the reamer cutter from its po-

sition on the body. Due to the manner of securing the blocks, this obviously will in all cases prevent the blocks from becoming loosened in their recesses, providing a permanently tight mounting, when necessary, a readily detachable mounting for the reamer cutter.

I claim:

1. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, a block in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer cutter in said major recess, a cutter shaft threaded at its extremities extending through said split bushings, and nuts on said threaded extremities adapted to be tightened to draw said split bushings tightly within the tapered openings and into proper position to rotatably mount said cutter in said major recess.
2. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, a block fixedly secured in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer cutter in said major recess, a cutter shaft threaded at its extremities extending through said split bushings, and means on said threaded extremities adapted to be tightened to draw said split bushings tightly within the tapered openings and toward each other into proper position to rotatably mount said cutter in said major recess.
3. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, a block fixedly secured in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer cutter in said major recess, a cutter shaft threaded at its extremities extending through said split bushings, and means on said threaded extremities adapted to be tightened to draw said split bushings tightly within the tapered openings and toward each other into proper position to rotatably mount said cutter in

said major recess, and to form a tight wedging engagement between said shaft and said blocks.

4. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, a block fixedly secured in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer cutter in said major recess, a cutter shaft extending through said split bushings and means for drawing said split bushings tightly within the tapered openings and toward each other into proper position to rotatably mount said cutter in said major recess and to form a tight wedging engagement between said shaft and said blocks.

5. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, each of said auxiliary recesses being of the same lateral and longitudinal dimensions throughout, a block fixedly secured in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer cutter in said major recess, a cutter shaft extending through said split bushings and means for drawing said split bushings tightly within the tapered openings and toward each other into proper position to rotatably mount said cutter in said major recess and to form a tight wedging engagement between said shaft and said blocks.

6. In a reamer construction, a reamer body having a major recess in its outer surface and a smaller auxiliary recess at each end of said major recess, a block fixedly secured in each of said auxiliary recesses having an opening therethrough tapering toward a smaller dimension in a direction toward said major recess, a correspondingly tapered split bushing in each of said blocks, a reamer pin having its ends carried by said blocks respectively, and extending through said major recess, a reamer cutter rotatably mounted about said pin within said major recess, and means for forcing said split bushings tightly within the tapered openings and toward each other to form a tight wedging engagement between said reamer pin ends and said blocks.

DWIGHT D. ANDERSON.