Sept. 27, 1932. G. E. BEHNKE ET AL 1,879,034

DRILL CUTTER MOUNTING

Filed Oct. 8, 1929

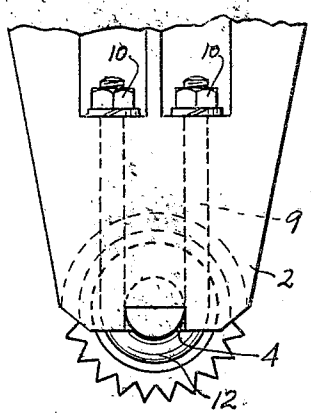


Fig. 1.

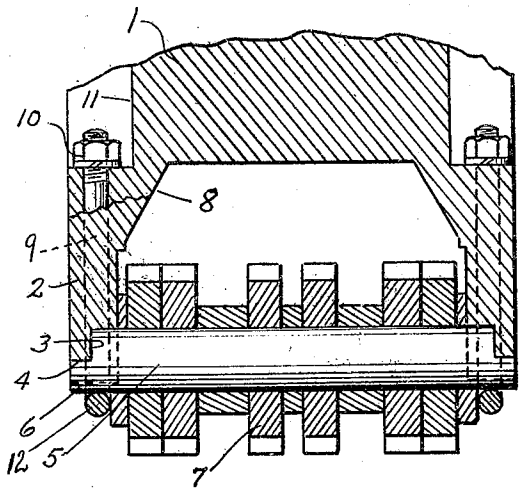


Fig. 2.

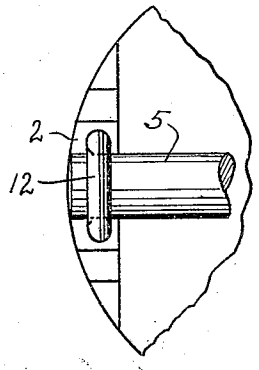


Fig. 3.

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UNITED STATES PATENT OFFICE

GUY E. BEHNKE, OF HOUSTON, TEXAS, AND RUSSELL GIESEY, OF OKLAHOMA CITY, OKLAHOMA, ASSIGNORS TO REED ROLLER BIT COMPANY, OF HOUSTON, TEXAS, A CORPORATION OF TEXAS

DRILL CUTTER MOUNTING

Application filed October 8, 1929. Serial No. 398,125.

This invention relates to drills, and more particularly to drill cutter mountings.

It will be found particularly useful in roller bits of the cross roller type. This type embodies a head with a cutter recess in the bottom thereof and oppositely disposed depending bearing projections for a cross roller pin which extends diametrically across the bottom of the head to support roller cutters in the recess. It is used principally for the penetration of hard rock formations, and so the cutters are quickly worn, and the substitution of new cutters for old must frequently be made. The lower ends of the bearing projections are also worn away at times whereupon the cutter pin falls out of the head. The repair of the bit head and the removal from the hole of the cross roller cutter assembly are difficult, costly and require a great deal of time. If the great inward pressures to which the bearing projections are subjected in deep well drilling succeed in bending the projections toward each other, the free rotation of the roller cutters is thereby prevented and the cutters are worn unevenly.

Some of the specific objects of this invention are the provision of a bit embodying new and improved means whereby new cutters may quickly and easily be substituted for old; to provide a detachable member which may be replaced when worn, to support a cutter pin in the head, and to provide means to prevent the movement of the bearing projections toward each other.

The preferred embodiment of the invention for use in a bit of the type referred to is illustrated by the accompanying drawing, of which Fig. 1 is a fragmentary elevation of the lower end of the bit with the cutters removed; Fig. 2, a fragmentary sectional elevation at a right angle to Fig. 1; and Fig. 3, a fragmentary bottom plan view with the cutters removed.

The bit head 1 is provided with the bearing extensions 2, each of which is recessed as indicated at 3 and slotted as indicated at 4 for the reception of one end of the pin 5. Each end of the pin 5 has a shoulder bearing against the side wall of the recess 3, the said shoulder being formed by the reduction of the extremity 6 of said end. The reduced extremity 6 extends into the slot 4 and has a flat face bearing against the upper wall of said slot. In the preferred embodiment the ends of the cylindrical spindle are diametrically reduced, as shown, to fit the arcuate recess 3 and rectangular slot 4.

It will be apparent from the foregoing that inward movement of the bearing projections 2 toward each other and consequent interference with the free rotation of the roller cutters 7 in the cutter recess 8 is prevented. And the construction also prevents rotation of the pin 5.

The ends of the pin 5 are slidable upwardly into the recess 3 and slot 4 and are held therein by a substantially U-shaped bolt 9. The bolt 9 extends upwardly in suitable bores in the head and is locked in place by the nuts 10, the head being recessed at 11 for the housing of the latter. The base 12 of the bolt may be treated to withstand wear.

The pin 5, cutter 7 and bolts 9 may be moved upwardly into the head as a unit and secured therein by the nuts 10. The removal thereof may easily be effected by removing the nuts 10 and pulling the assembled parts out. And so the invention provides means whereby new cutters may quickly and easily be substituted for old.

When the bases 12 of the bolts are worn, the original bolts may be replaced by new bolts and the same head repeatedly used.

It will be understood that while the invention is particularly useful in a bit of the type illustrated, its use in other bits is within the scope of the following claims.

We claim:—

1. A bit head having a bearing extension, said extension having a recess and a slot, and a pin shaped to fit said recess and having a reduced portion shaped to fit said slot, said pin and reduced portion being slidable laterally into said recess and slot, and a substantially U-shaped bolt to hold said pin in place.

2. A bit head having a pair of bearing extensions, a cutter pin, each of said extensions having an opening for the reception of

one end of said pin, and a pair of substantially U-shaped bolts to hold said ends in said openings.

3. A bit head having a cutter recess and a bearing extension, a cutter pin, said extension having an opening for the reception of said pin, a cutter on said pin, and a substantially U-shaped bolt to hold said pin in said opening, said pin, cutter and bolt being insertable in and removable from said head as a unit.

4. A bit head having a cutter recess in the bottom thereof and a pair of bearing extensions, a cutter pin, each of said extensions having an opening for the reception of one end of said pin, cutters on said pin, and substantially U-shaped bolts to hold said ends in said opening, said pin, cutters, and bolts being insertable in and removable from said head as a unit.

5. A bit head having a cutter recess in the bottom thereof and a pair of bearing extensions, each of said extensions having an outwardly opening recess and slot, a cutter pin shaped to fit the recesses in said extensions, and having reduced extremities to fit said slots, cutters on said pin, and substantially U-shaped bolts to hold said ends in said openings, said pin, cutters and bolts being insertable in and removable from said head as a unit.

In testimony whereof, we hereunto affix our signatures.

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RUSSELL GIESEY.