Sept. 16, 1930. O. E. MURPHY 1,775,774

DRILLING APPARATUS

Filed Dec. 3, 1927 2 Sheets-Sheet 1

Fig. 1.

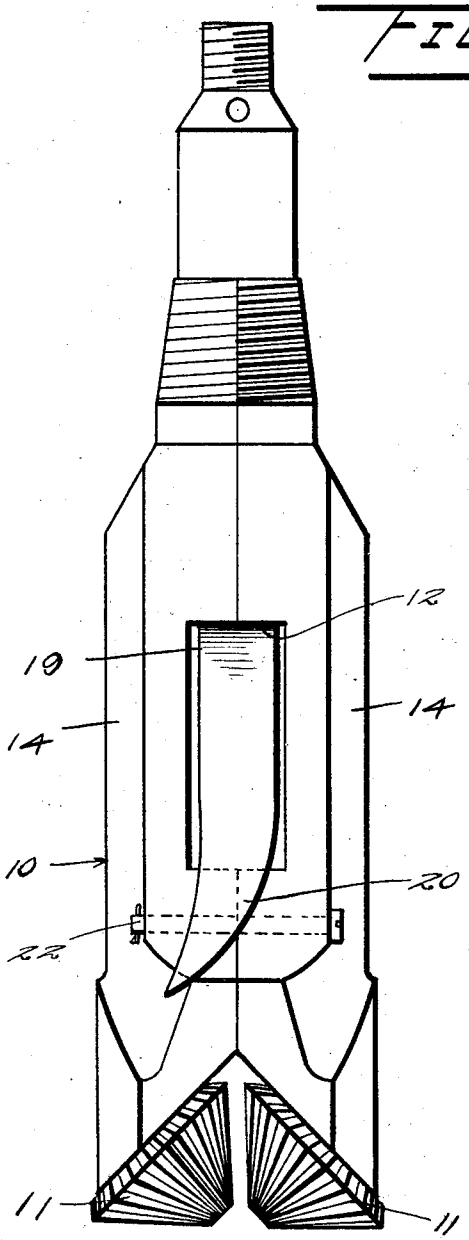
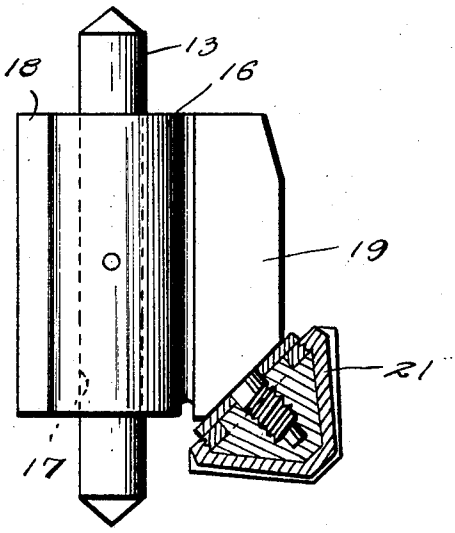


Fig. 4.



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Filed Dec. 3, 1927 2 Sheets-Sheet 2

Fig. 2.

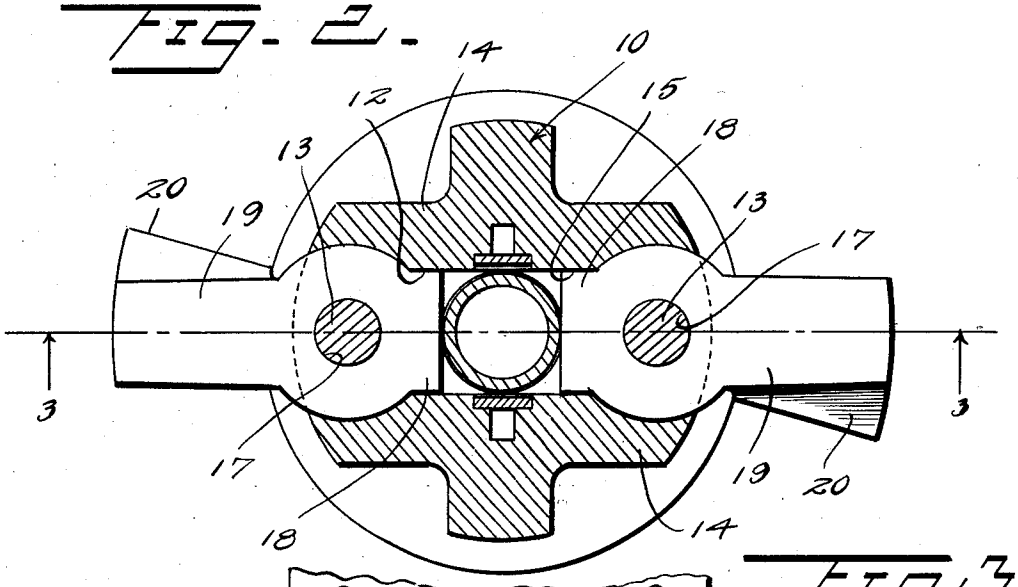
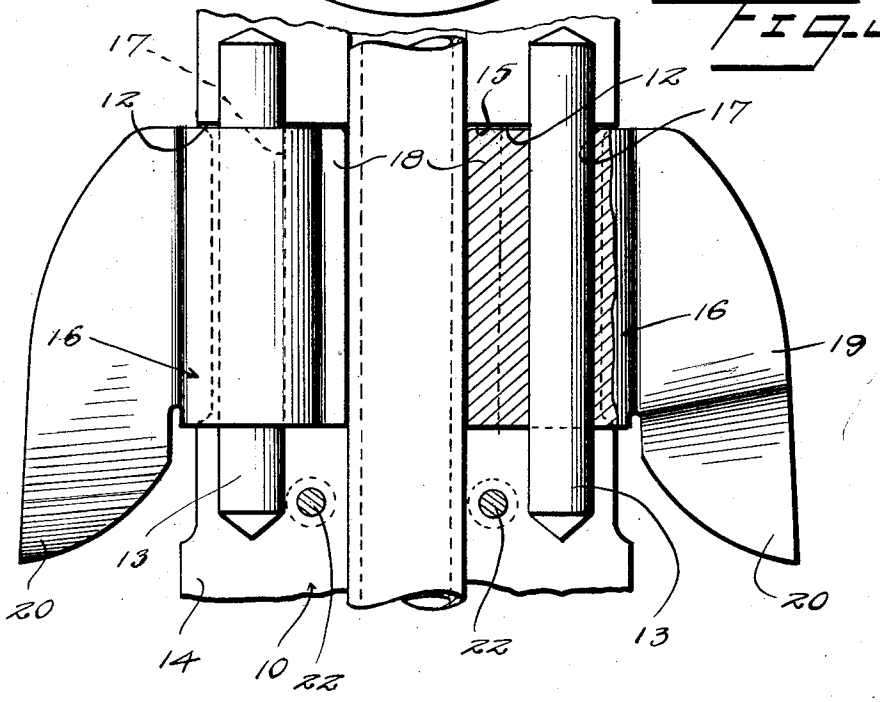


Fig. 3.



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UNITED STATES PATENT OFFICE

ORVILLE E. MURPHY, OF SHAWNEE, OKLAHOMA, ASSIGNOR OF FORTY-NINE PER CENT TO AMERICAN IRON & MACHINE WORKS, INC., OF OKLAHOMA CITY, OKLAHOMA, A CORPORATION OF OKLAHOMA

DRILLING APPARATUS

Application filed December 3, 1927. Serial No. 237,524.

This invention relates to drilling apparatus and more particularly to reaming attachments for rock bits of the roller type.

Roller rock bits are now practically universally used in rotary drilling operations. In these operations, it is often necessary that the operator be able to drill a hole of considerable size, as such increased diameter of the hole is often necessary for a short distance in the well to enable a large sized pipe to be set. Drilling such a large hole is, of course, impossible with a small rock bit and it is impractical to provide rock bits of a size for cutting these holes. Accordingly, an important object of the invention is to provide an attachment for rock bits, which may be applied to a well known rock bit structure without in any manner altering the present structure thereof other than the removal of certain parts which are not employed and which will enable the production of a hole of a desired diameter greatly increased over a hole ordinarily produceable with the bit.

A further object of the invention is to produce a device of this character which may be very readily and cheaply constructed and which may be easily applied to the bit and removed therefrom.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a side elevation showing an attachment constructed in accordance with my invention applied to a roller rock bit;

Figure 2 is a transverse sectional view therethrough;

Figure 3 is a view with the sections of the bit separated, one of the attachments being shown in partial section;

Figure 4 is a view of a slightly modified attachment removed from the drill.

Referring now more particularly to the drawings, the numeral 10 generally designates a rock bit body having at its lower end rock bits 11 for engaging the bottom of the hole. These rock bits are usually provided in their side walls at diametrically opposed points with chambers 12 for the reception of rotary reaming tools, the peripheries of which extend slightly beyond the outer face of the bit and are adapted to engage the side wall of the well bore. These rotary cutters are held in position by vertically extending pins 13 about which they rotate. In the ordinary rock bit construction, the bit is formed in two sections 14, adjacent faces of which are recessed to form one-half of the roller cutter chamber and one-half of the bearings for opposite ends of the pin 13. The chambers 12, opposed walls of which are arcuately curved, are ordinarily connected by a transverse passage 15, the walls of which are parallel and are formed by recessing adjacent faces of the sections 14.

In accordance with my invention, I provide a body 16 fitting the curved walls of the chambers 12 and having an axial aperture 17 for the passage of the pin 13. Along one side, this body has a vertically extending rib 18 which, when the body is in position in the chamber 12, fits between confronting walls of the transverse passage 15, so that the body is held from rotating upon the pin. An outer structure 19 is provided at the opposite side of the body which is of just the same thickness as the width of the opening at the outer end of the chamber and through which the roller cutters ordinarily project. This outer structure supports a cutter 20 which, in Figure 1, is disclosed as a blade resembling one of the blades of an ordinary fish tail bit and in Figure 4 has a rock bit cutter 21 similar to the rock bit cutters employed at the lower end of the bit.

It will be obvious that in order to change over a bit to enable the same to cut a bore of greater diameter with the use of my invention, all that is necessary is to remove the retaining bolts 22 by means of which the sections 14 of the bit are held in assembled relation, separate the sections of the bit, remove the rollers from the pins 13 and substitute therefor the body structure 16 produced in accordance with my invention when the bit may be reassembled. It will also be obvious that any suitable type of blade might be provided and that the structure employed might be altered in any suitable manner just

as long as the feature of preventing oscillation of the installed cutter is prevented and a rigid mounting therefor provided. I accordingly do not limit myself to the specific structure hereinbefore set forth except as hereinafter claimed.

I claim:

1. The combination with a roller rock bit having chambers in its side walls and pins extending through said chambers and having their ends mounted in the upper and lower walls of the chambers, of bodies having apertures for the passage of the pins fitting within said chambers and having engagement with the walls thereof maintaining the bodies rigid to the bit, the bodies having portions extending to the exterior of the bit and cutters carried by said portions.

2. The combination with a roller rock bit having substantially cylindrical chambers in its side walls and pins extending through said chambers and having their ends mounted in the upper and lower end walls of the chambers, of cylindrical bodies having longitudinal apertures for the passage of the pins fitting within the chambers and having portions extending to the exterior of the bit and cutters carried by said portions.

3. The combination with a roller rock bit having chambers in its side walls, the chambers having sockets in their upper and lower ends and pins having their ends fitted in said sockets and extending through the chambers, the body of the bit having a transverse passage connecting the chambers, of bodies fitting within the chambers having apertures for the passage of said pins and having portions extending into the adjacent ends of the transverse passage whereby they are held from oscillation upon the pins, said bodies having further portions extending to the exterior of the bit and provided with cutters.

4. The combination with a roller rock bit having diametrically oppositely positioned longitudinally extending chambers formed therein and opening through the wall thereof, the chambers having sockets at their upper and lower ends and pins extending longitudinally therethrough and having their ends fitted in said sockets, of cylindrical bodies each designed to fit within one of said chambers with a portion of the periphery thereof projecting therefrom, each of said bodies having a longitudinal passage for the reception of a pin, means carried by each of said bodies and engaging the bit for holding the bodies against oscillation upon the pins, and a cutter element carried by each body upon the projecting peripherial portion thereof.

5. The combination with a roller rock bit having diametrically oppositely positioned longitudinally extending chambers formed therein and opening through the wall thereof, the chambers having sockets at their upper and lower ends and pins extending longitudinally therethrough and having their ends fitted in said sockets, the body of the bit having a transverse passage connecting said chambers, of cylindrical bodies designed to fit within said chambers, each having a longitudinal passage formed therethrough for the reception of a pin, a portion of the periphery of each of said bodies projecting through the open portion of the chamber beyond the wall of the bit, a longitudinally extending rib formed upon each of said bodies and extending into said transverse passage for preventing oscillation of the bodies upon their pins, and cutter elements formed upon the projecting peripherial portion of the bodies.

6. The combination of a bit head made up of two connected sections, and having oppositely arranged pockets entering from the sides thereof and communicating with each other, each of said pockets having its side walls, at approximately the center thereof, concaved and the outer passage of each of the pockets being wider than the inner passage thereof, blocks shaped complemental to the walls of the pockets and received therein and projecting therefrom, and a bit carried by each block and having its cutting surface disposed outwardly with respect to the block.

7. The combination of a bit head made up of two connected sections, and having oppositely arranged pockets entering from the sides thereof and communicating with each other, each of said pockets having its side walls, at approximately the center thereof concaved and the outer passage of each of the pockets being wider than the inner passage thereof, the upper and lower walls of the pockets being centrally formed with round openings, blocks shaped complemental to the pockets and received in the pockets, bearing pins on the ends of the blocks received in the rounded openings of the pockets, interchangeable bits received in the blocks and having their cutting edges projecting therebeyond and binding means passing through the blocks for holding the bits therein.

In testimony whereof I hereunto affix my signature.

ORVILLE E. MURPHY.