G. CAVENEY.

ADJUSTABLE WELL DRILLING BIT.

APPLICATION FILED FEB. 7, 1921.

1,407,927. Patented Feb. 28, 1922.

Fig. 1

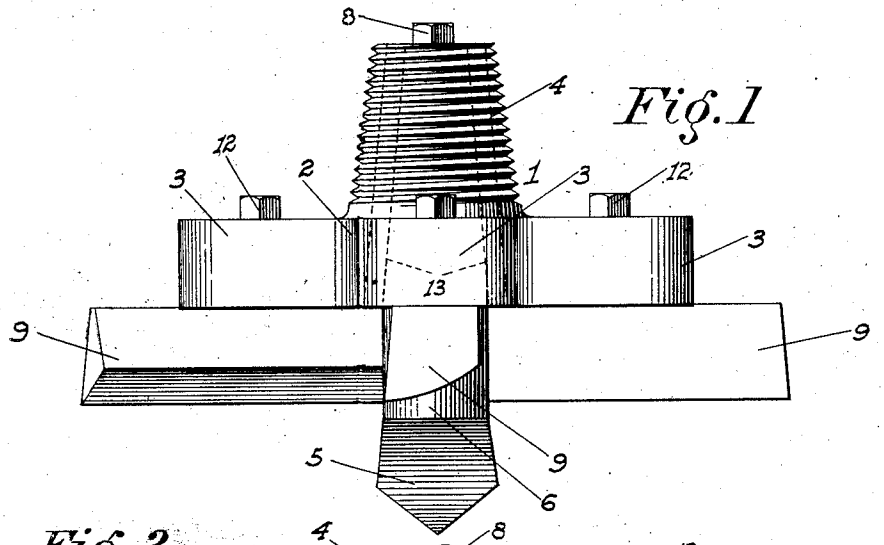


Fig. 2

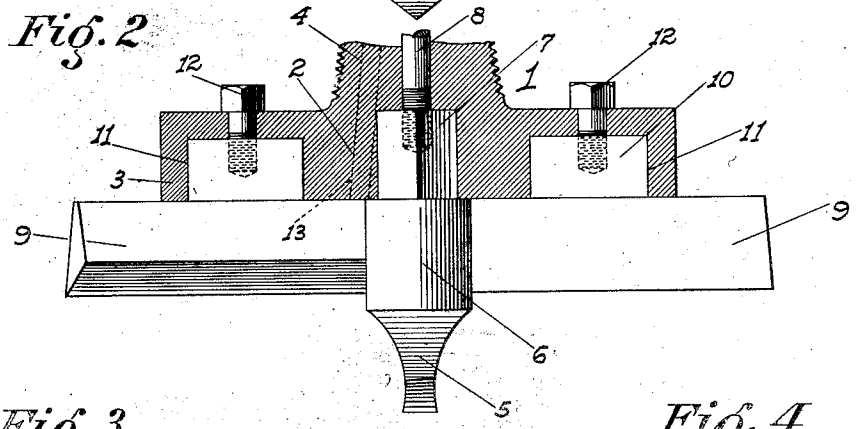


Fig. 3

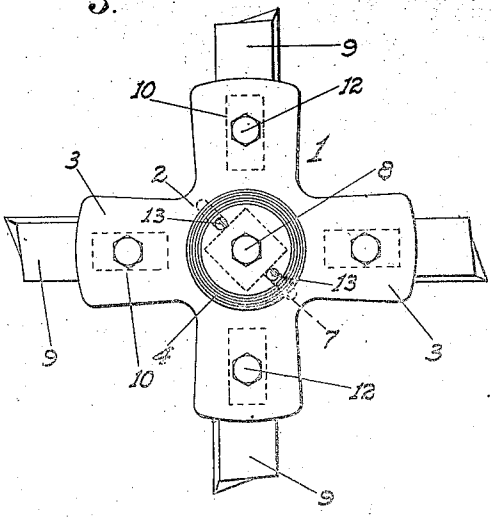
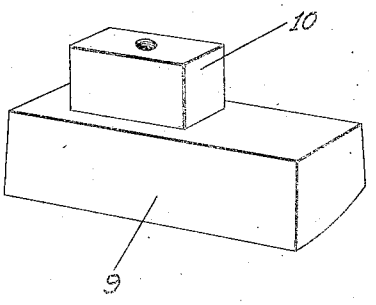


Fig. 4



INVENTOR.

Geo. Caveney

BY

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE CAVENEY, OF OAKLAND, CALIFORNIA.

ADJUSTABLE WELL-DRILLING BIT.

1,407,927. Specification of Letters Patent. Patented Feb. 28, 1922.

Application filed February 7, 1921. Serial No. 443,017.

To all whom it may concern:

Be it known that I, GEORGE CAVENEY, a citizen of the United States, residing at Oakland, county of Alameda, State of California, have invented certain new and useful Improvements in Adjustable Well-Drilling Bits; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in well-drilling tools, and particularly to a form of bit especially suited for oil-well drilling.

The principal object of my invention is to provide a built-up structure, that is, the actual drilling or cutting members are separated from the holder, so that they may be readily removed and replaced when worn out or broken.

By so doing, the expense of replacement when necessary is greatly reduced, since but a small part of the entire structure need ever be discarded, the remainder being permanent.

Further, the same size holder may be used for different sized wells, it being only necessary to remove one set of the cutters and replace them with others which with the holder make a greater or lesser diameter of bit, as may be required.

Another object is to provide a plurality of cutters each an independent and removable member by itself, so spaced that each cutting edge is clear of the other, and giving no chance for the dirt to clog up.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Fig. 1 is a side elevation of the assembled structure.

Fig. 2 is a cross section thereof.

Fig. 3 is a top plan view of the same.

Fig. 4 is a perspective view of a radial cutter.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the cathead or spider comprising a central hub 2, radial arms 3 and a threaded and upwardly projecting and axial shank 4 adapted to fit into the drilling stem.

A center bit 5 of any desired form but preferably of the type shown is provided with a shank 6 which bears against the under side of the hub 2, said shank having a polygonal sided tang 7 formed therewith adapted to removably seat in a similar shaped orifice provided in the hub axially thereof.

This bit is held in position by a cap-screw 8 extending through the shank 4 into the tang 7.

Positioned under the arms 3 and bearing at their inner ends against the shank 6 are radial cutters 9 projecting therebeyond and formed so as to provide suitable cutting and clearing edges. Each cutter has a lug 10 formed therewith and projecting upwardly therefrom, being adapted to seat in a socket 11 in its arm 3, cap-screws 12 being employed to hold the cutters from falling out, and which may be removed at will.

The radial cutters are all interchangeable and are of course all symmetrical and of equal length. It will thus be evident that by removing one set of these cutters and replacing them with another set of a different length, various sized wells may be bored, the only requirement for any set being that the cutters shall project beyond the ends of the spider arms.

The center bit, which of course projects below the radial cutters, may also be replaced at will, and by having the radial cutters bear thereagainst, all the cutters are braced and wear on the sockets and lugs is lessened.

I preferably employ four of the spider arms and radial cutters, but any number desired may be used.

I also provide water holes 13 drilled through the shank 4 and hub 2, and terminating at the bottom of said hub alongside the center-bit shank 6. Water under pressure is forced through the drilling stem and the above mentioned holes all the time the drill is in operation, this water keeping the cutters clear and forcing all refuse away from the spider.

From the foregoing description it will be

readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to and do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A well drilling bit comprising a spider adapted for connection to a drilling stem, a removable center bit and removable radial cutters secured to the spider and projecting therebeyond.

2. A drilling bit comprising a spider adapted for connection to a drilling stem, said spider having radial arms, a center bit positioned axially of the spider, and a radial cutter under each arm extending the full length thereof.

3. A well drilling bit comprising a spider adapted for connection to a drilling stem, said spider comprising a hub and radial arms, a center bit positioned axially of the hub and thereunder and removably secured thereto, and radial cutters under the arms and projecting therebeyond and removably secured thereto.

4. A well drilling bit comprising a spider adapted for connection to a drilling stem, said spider having radial arms, a center bit positioned axially of the spider and thereunder and removably secured thereto, radial cutters under the arms and bearing thereagainst, and lugs on the radial cutters socketed into the arms and removably secured therewith.

5. A well drilling bit comprising a spider adapted for connection to a drilling stem, said spider having radial arms, a center bit positioned axially of the spider and thereunder and removably secured thereto, radial cutters under the arms and bearing thereagainst, and lugs on the radial cutters socketed into the arms and removably secured therewith, the radial cutters extending beyond the ends of the arms and their inner ends bearing against the shank of the center bit.

6. A drilling bit comprising a spider adapted for connection to a drilling stem, said spider having radial arms, a center bit positioned axially of the spider, and a radial cutter under each arm extending from the center bit to a point beyond the outer end of said arm.

7. A drilling bit comprising a spider adapted for connection to a drilling stem and having radial arms, a center bit mounted axially of the spider thereunder and having a shank portion, and a radial cutter mounted under each arm, the inner end of each cutter bearing against the shank of the center bit.

In testimony whereof I affix my signature.

GEORGE CAVENEY.