C. W. DODGE.

WELL BORING ROTARY BIT.

APPLICATION FILED MAR. 7, 1911.

1,017,206.

Patented Feb. 13, 1912.

2 SHEETS—SHEET 1.

FIG. 1.

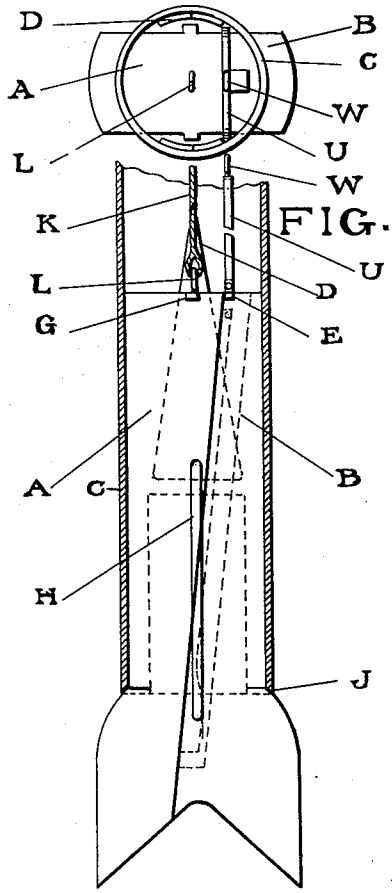


FIG. 2.

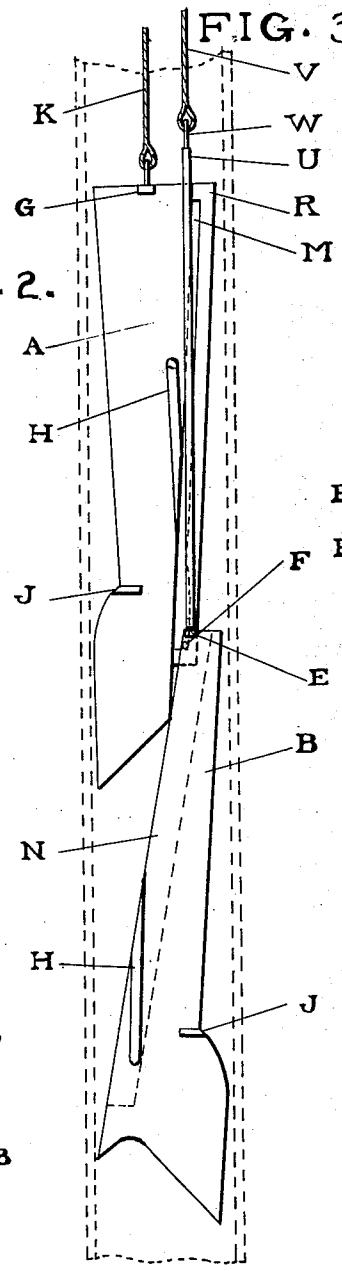


FIG. 4.

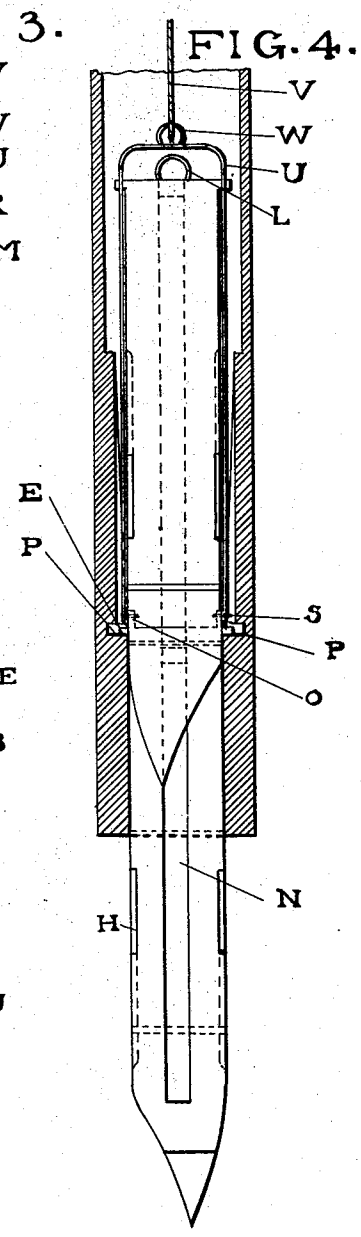
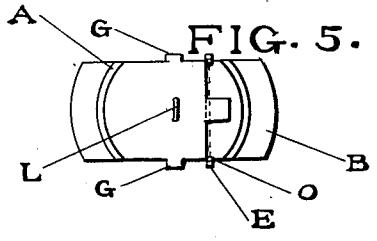


FIG. 5.



WITNESSES:

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Warren Clark

Clarence Wyth Dodge INVENTOR

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2 SHEETS—SHEET 2.

FIG. 6.

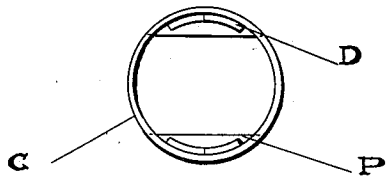


FIG. 7.

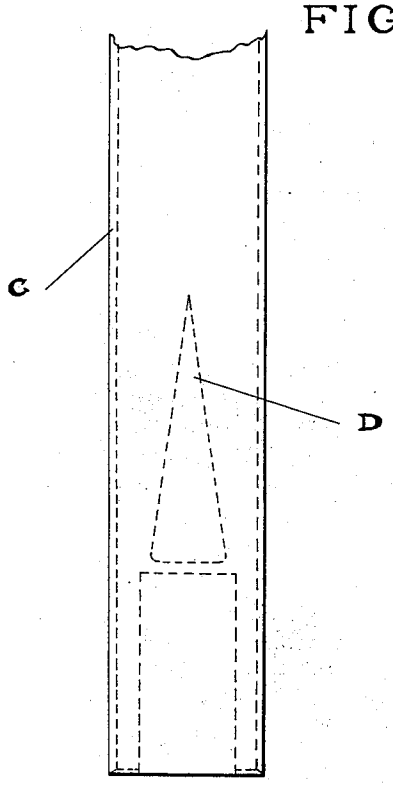
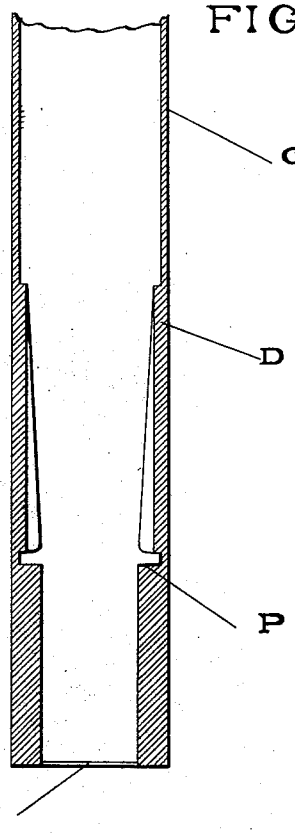


FIG. 8.



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UNITED STATES PATENT OFFICE.

CLARENCE WYTHE DODGE, OF TAFT, CALIFORNIA.

WELL-BORING ROTARY BIT.

1,017,206. Specification of Letters Patent. Patented Feb. 13, 1912.

Application filed March 7, 1911. Serial No. 612,979.

To all whom it may concern:

Be it known that I, CLARENCE WYTHE DODGE, a citizen of the United States, residing at Taft, in the county of Kern and State of California, have invented a new and useful Well-Boring Rotary Bit Especially Adapted to Oil-Well Boring, of which the following is a specification.

The primary object of this invention is to so form rotary well-boring bits as to enable them to be removed without the necessity of withdrawing the casing from the well.

The invention will be hereinafter fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the casing and bit. Fig. 2 is an elevation of the bit, with the casing in section. Fig. 3 shows the sections of the bit in the positions they occupy in passing through the casing. Fig. 4 shows one section of the bit lowered to its extreme position in the casing and the other section raised, the casing being in section. Fig. 5 is a plan view of the bit. Fig. 6 is a similar view of the casing with the bit removed. Fig. 7 is an elevation of the casing with parts in dotted lines. Fig. 8 is a longitudinal section of that portion of the casing shown in Fig. 7.

Referring to the drawings, A and B designate the two sections of the bit, the former being larger or wider at the top and smaller or narrower at the bottom, while the section B is smaller or narrower at its upper end and larger or wider at the bottom. Each section has a diagonal face which is designed to bear against the corresponding face of the other section, and the section B in its diagonal face is formed with a longitudinally extending groove N which is designed to accommodate a tongue R extending longitudinally of the diagonal face of section A. This tongue has a longitudinal slot M formed therein through which projects a cross pin F of section B, thus forming a sliding connection between the two sections.

To the section A is secured the lower end of a cable K, and to an eye W of a bail or strap U of section B is connected a second cable V.

In the opposite sides of the bit, extending partly through contiguous portions of the two sections, are formed grooves or channels H to allow the passage of the water which carries upwardly the cuttings.

The casing C is, as customary, circular in cross-section, and at a point near its lower end I form an internal stop shoulder P, and immediately above the latter are oppositely disposed triangular guides D with their pointed ends upward, such guides serving to direct the bit sections into place when being lowered through the casing, the lower end of which, beneath the shoulder P, is flattened to conform to the flattened sides of the bit sections. The extreme lower end of the casing is slightly beveled at T (Fig. 8) to conform to bevels J at the upper ends of the widened portions of the bit sections so that when the latter are in working position, as shown in Fig. 2, the bevels J of the widened portions of the bit sections will bear against the lower end of the casing.

The bit section A is provided at its upper end with laterally extending lugs G, and the bit-section B with similar lugs E, which, when the bit is to be removed from or is being inserted into the casing, are designed to rest on shoulder P.

In practice, the wide cutting end of the bit is beneath the lower end of casing C, as shown in Fig. 2. To remove the bit, without the necessity of withdrawing the casing, the latter is drawn upwardly a few feet. The cables K and V are then slackened sufficiently to allow the bit to descend until lugs G of bit section A and lugs E of bit section B rest on shoulder P. This releases the restraining influence of the casing which ordinarily holds the two sections of the bit firmly together during the boring operation. A pull is then exerted on cable K, drawing upwardly section A until the lower wall of slot M engages cross pin F (which slot is slightly enlarged at its lower end), and further pull on cable K will cause the two bit sections to move in tandem through the casing, the normal size of the bit being considerably reduced by the relative movement between the two bit sections.

To insert a new or a re-sharpened bit, it is lowered through the casing, as shown in Fig. 3, and the cutting ends of the two sections are turned by the guides D. When the bit reaches that point where lugs E of section B rest on shoulder P, cable K of section A is further slackened sufficiently to allow said section to descend until lugs G also rest on shoulder P. The two bit sections being then in alinement with their diagonal faces abutting, the bit is raised by