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W. P. MORRIS

2,495,073

WELL DRILLING GUIDE TOOL

Original Filed Aug. 22, 1942

Fig. 1.

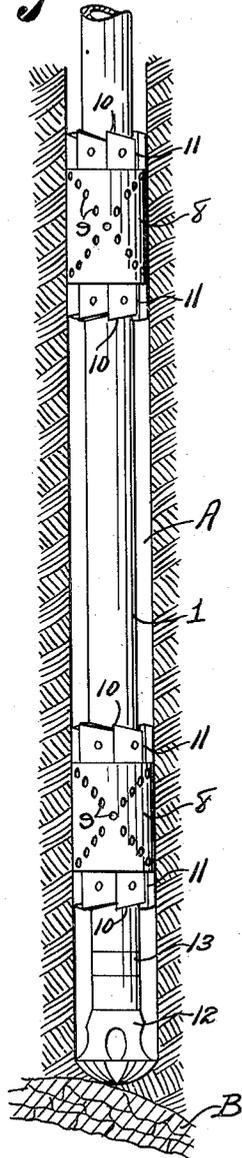


Fig. 2.

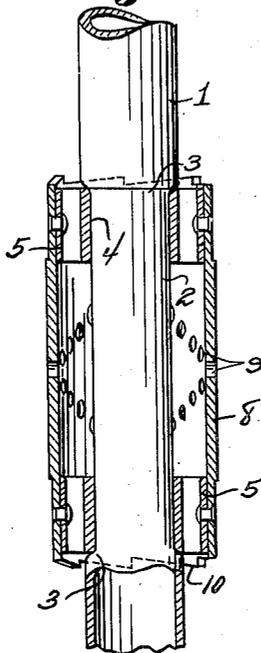


Fig. 3.

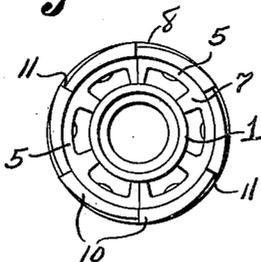


Fig. 4.

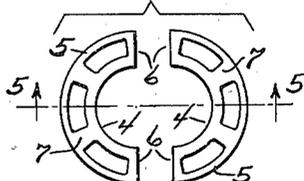


Fig. 5.

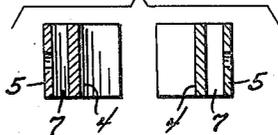
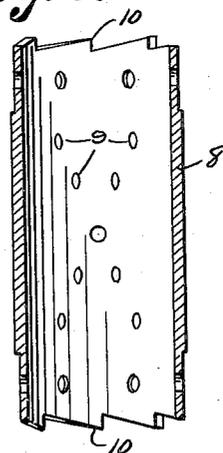


Fig. 6.



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WITNESSES:

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2,495,073

WELL DRILLING GUIDE TOOL

William P. Morris, Lovington, N. Mex.

Substituted for application Serial No. 455,767,
August 22, 1942. This application September
15, 1947, Serial No. 774,027

1 Claim. (Cl. 255—28)

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This invention relates to deep well drilling tools, and its general object is to provide a guide tool designed to eliminate lateral deflection of the bit by obstructions, such as hard irregular and slanting geological formations, thus my tool assures the drilling of a true vertical hole, and thereby overcomes many difficulties resulting from a crooked hole that not only prevents insertion of the tubing, but in many instances causes the drilling tools to stick and become broken.

This application is substituted for my prior application filed August 22, 1942, with the Serial Number 455,767 and which is now abandoned.

A further object is to provide a guide tool that may constitute the lowermost drill pipe section, stem or drill collar, and includes sleeves, and toothed and reaming means cooperating to render the hole smooth and perfectly round.

A still further object is to provide a guide tool that allows for the free passage of drilling fluid or mud to the bit, and the tool is simple in construction, inexpensive to manufacture, and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a view illustrating my device as it appears in operation in a well hole.

Figure 2 is an enlarged fragmentary view with parts broken away and in section.

Figure 3 is a top plan view of the tool.

Figure 4 is a detail view of one of the sectional spacing collars for the sleeve, with the sections thereof separated.

Figure 5 is a sectional view taken approximately on line 5—5 of Figure 4, looking in the direction of the arrows.

Figure 6 is a longitudinal sectional view taken through one of the guiding, cutting and reaming sleeves.

Referring to the drawings in detail, the letter A indicates the well hole, and B a hard slanting rock formation which ordinarily causes the bit to turn aside and results in a crooked hole, but by the use of my tool the bit will be held against lateral deflection and therefore will drill vertically through the formation, as will be apparent from Figure 1.

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My tool in the form shown includes a tubular stem 1 which takes the place of the usual stem, drill collar or lowermost pipe section, and the stem 1 is formed with relatively long upper and lower circumferentially reduced portions, each providing a seat 2 for one of the guiding units, as best shown in Figure 2, and having shoulders 3 at the ends thereof.

Each unit is identical, therefore the description of one will suffice, and it will be noted that each includes upper and lower collars formed by segments or sections, each section having spaced inner and outer semi-circular walls 4 and 5 respectively, end walls 6 and equidistantly spaced intermediate walls or webs 7 bridging the walls 4 and 5. The inner walls are fixed to the seats in surrounding relation thereto and in bearing engagement with the shoulders for rotation of the units with the stem, the end walls being in contact with each other for the walls 4 and 5 to form concentrically arranged ring members, and the vertical spaces or slots between the walls provide passages for drilling fluid or mud.

Riveted or otherwise fixed to the outer walls 5 for disposal between the collars is a sleeve 8 of a length to extend slightly outwardly beyond the collars, as shown in Figure 2. The sleeve is provided with diagonally arranged rows for apertures 9, preferably arranged in pairs, with the rows of each pair crossing each other, and the apertures provide passages for the drilling mud.

Each end of the sleeve is notched in a manner, so that one of the walls of the notches is relatively long and disposed at an inclined angle and the other wall is vertical, for the notches to provide ratchet like teeth 10. The inclined walls of the notches are gradually reduced in width from one vertical wall to the other, as shown in Figure 2, and the outer face of the sleeve for a portion of its length from the toothed ends is fluted to provide longitudinal reaming edges 11.

The bit 12 in the form shown is of the radial toothed type. However, any type can be used with my tool, including the fishtail and the wing type. In any event, the bit is fixed to the stem by the usual coupling 13 and it will be noted from Figure 1 that the sleeves 8 are of the same diameter as that of the bit, so that the units substantially fit the hole, thus preventing lateral deflection of the bit regardless of the formation encountered thereby. The units not only provide guides for the bit, but the teeth 10 and the reaming edges 11 act to shape the hole and cut away any obstructions that may project therein. The teeth 10 also act to break up solid matter that

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may fall from the wall of the hole, so that such matter in a more or less pulverized form can be carried through the passages of the collars, by drilling mud, thus preventing the solid matter from wedging the parts. The sleeves also act to plaster up any cavities, with the result it will be seen that my tool makes it possible to drill a true vertical hole that is smooth and perfectly round.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

What I claim is:

In a well drill guide, the combination which comprises a drill stem having sections of reduced diameter at spaced points in the length thereof providing comparatively short sections of reduced diameter therein with shoulders at the ends of said section, perforated guide and bearing sleeves having rings at the ends the peripheral surfaces of which are of less diameter than the peripheral surfaces of the sleeves and said rings having teeth at the outer ends thereof, said sleeves positioned around the said drill stem at points corresponding with the sections of reduced diameter, substan-

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tially semi-circular segments providing mounting elements in the ends of the sleeves including inner and outer walls connected by webs providing longitudinally disposed passages through the segments, and means connecting the said segments to the ends of the sleeves with the ends of the segments positioned against the shoulders at the ends of the sections of reduced diameter of the drill stem, whereby guides and supporting means are provided at spaced points along the said drill stem.

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REFERENCES CITED

The following references are of record in the file of this patent:

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