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CORE BIT PLUG

Filed Feb. 16, 1929

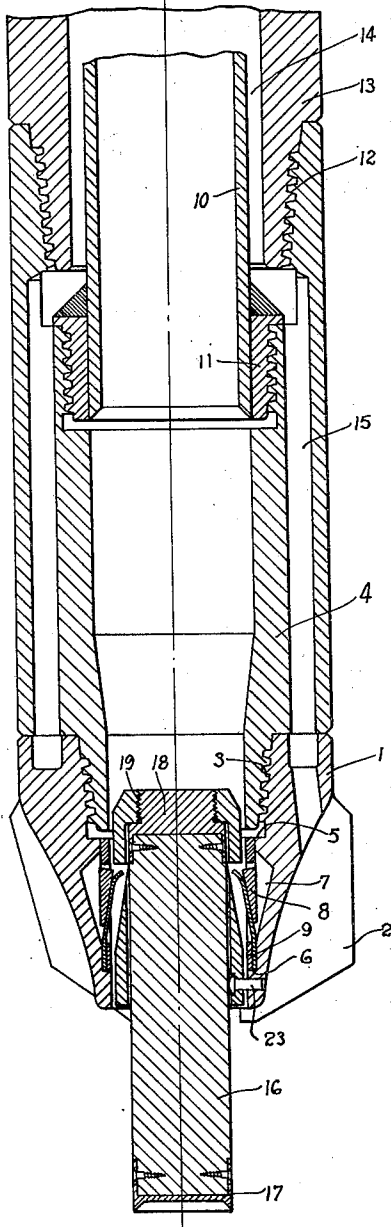


Fig. 1.

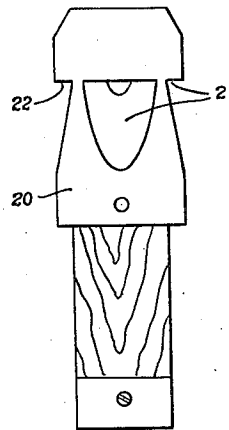


Fig. 2.

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CORE BIT PLUG

Application filed February 16, 1929. Serial No. 340,561.

My invention relates to means for closing the lower end of a core barrel and bit while the said bit is being introduced into the hole.

Where a core is to be taken by the drill so as to obtain a sample of the formation which is being drilled, it is desirable to have both the core barrel and the bottom of the hole clean and uncontaminated by cavings from above or from slush and mud not obtained directly from the well bottom.

I contemplate keeping the barrel clean by plugging up the lower end thereof while the drill is lowered into the hole so that no foreign material can lodge therein until the drill is ready to start taking the core.

It is an object of the invention to provide a plug for the lower end of the core barrel which may be moved from its position closing the lower end thereof by a straight downward thrust upon the drill stem and drill.

I desire to provide a core barrel plug that will not release upon the rotation of the drill, but which will only be forced from its closing position by a comparatively heavy weight exerted upon the plug and its holding means.

I also desire that the plug be of light construction easily broken up by a drill if lost in the hole, and which will float in the slush of the hole.

Referring to the drawings herewith, Fig. 1 illustrates a central vertical section through a core drill equipped with my invention.

Fig. 2 is a side elevation of the plug which I employ.

The plug which is used may be attached to various types of core drills, and I have shown a soft formation core drill having a head 1, tapered at the lower end and having lateral blades 2 thereon to cut the formation. The interior of the upper end is threaded at 3 to engage with the drill body 4. The interior of the head is recessed from the upper end to provide shoulders at 5 and 6; and below the upper shoulder, a downwardly tapered recess 7 provides space for the fingers 8 of the core catcher 9 shown by my prior application Serial No. 331,034 filed January 8, 1929.

The core catcher 9 is made up of a sleeve of metal resting upon the shoulder 6 and held from upward movement by the lower end of

the body 4. The core engaging fingers 8 are normally held resiliently inwardly to engage a core, but are adapted to be forced outwardly by the core into the recess 7 in the drill head.

The core barrel 10 is engaged with the head 4 through a collar 11, welded thereto and threaded to engage within the head. Above the point where the core barrel is engaged, the body 4 is attached at 12 to a collar or joint 13. The flushing fluid passes from the space 14 outside the core barrel to the cutter head, through channels 15, where it is discharged upon the bottom of the hole.

The plug which provides a temporary closure for the interior of the bit while going into the hole has a cylindrical body 16 of wood or other light and rigid material. It has a metal cap 17 on its lower end to protect it from being broken or splintered. At its upper end, is a top cap 18 which is extended upwardly and threaded at 19 to engage a sleeve 20.

The sleeve 20 extends downwardly over the upper portion of the plug. It has a plurality of notches or recesses 21 therein, as shown best in Fig. 2. Said notches have an upper shoulder 22 below which the notch is beveled outwardly.

These notches are adapted to receive the arms 8 of the core catcher, and register therewith. Adjacent the lower end of the sleeve 20 are openings to receive the shear pins 23 which may extend radially from the sleeve into recesses in the inner wall of the bit head, as seen in Fig. 1. I contemplate the use of several of these pins 23 although one may suffice in some formations.

In the use of my invention, the plug is assembled in the bit head as follows: The sleeve 20 is introduced upwardly into position in the head as shown in Fig. 1, with the arms 8 of the core catcher in the recesses 21. The shear pins 23 are then used to secure the sleeve to the head. When this is done, the plug 16 is inserted upwardly and screwed into the seat 19 in the sleeve. This prevents the shear pins from coming out. When in this assembled position, the plug projects well in advance of the head.

When the bit is introduced into the hole, the shear pins will prevent the plug from moving from its position closing the lower end of the barrel. If a "bridge", or cave-in, is encountered before the bottom is reached, the bit may be rotated to cut the same away to let the drill go by. When the bottom of the hole is reached, the flushing fluid will wash the bottom clean and then the weight of the drill stem may be rested upon the plug, shearing off the pins 23, and the plug will be forced upwardly into the barrel 10, ahead of the core which is cut by the drill.

The plug will prevent shale and gumbo from the formation from entering the core barrel until the bottom is reached. Rotating the bit for drilling will not release the plug, and when the bottom of the hole is reached, the plug will be positively forced into the head, as described, by the great weight of the drill stem above. It cannot fail in operation as do threaded plugs and will maintain the core barrel free of foreign material.

What I claim as new is:

1. In a core drill, a tubular cutter head, and a plug closing the lower end thereof, adapted when released to float in the liquid in the well.

2. In a core drill, tubular cutter head, a plug therein, comprising a cylindrical body, a cap sleeve thereon releasable therefrom, and frangible means securing said sleeve to said head.

3. In a core drill, a cutter head having an axial opening therein, a plug in said opening comprising a cylindrical body, a sleeve secured thereto, and frangible pins securing said sleeve to said head.

In testimony whereof, I hereunto affix my signature this 8th day of February, A. D. 1929.

FLOYD L. SCOTT.

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