

Aug. 18, 1931.

F. L. SCOTT

1,819,484

CORE DRILL PLUG

Filed Oct. 27, 1930

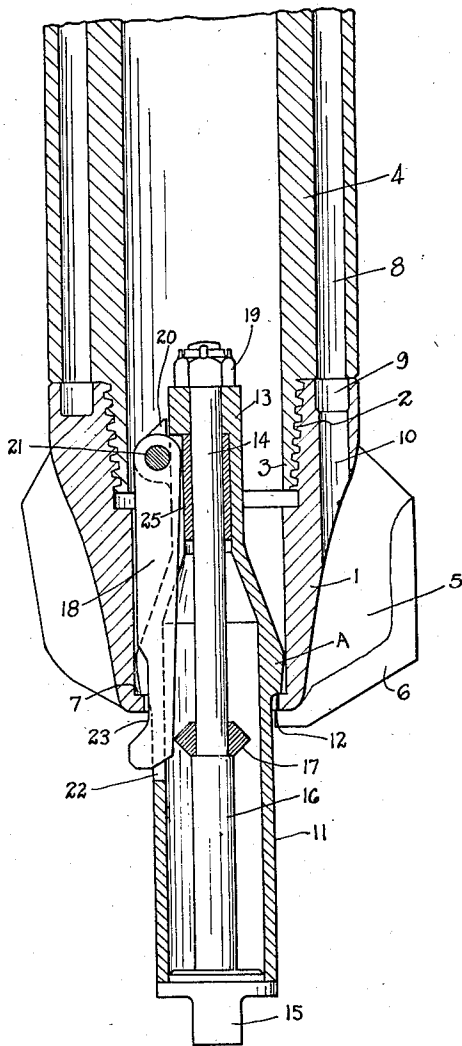


Fig. 1

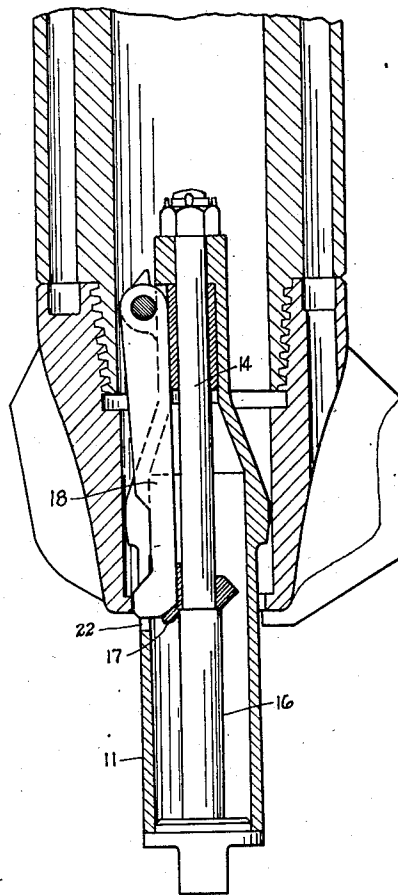


Fig. 2

Floyd L. Scott

INVENTOR

Jesse R. Stone

BY

ATTORNEY

UNITED STATES PATENT OFFICE

FLOYD L. SCOTT, OF HOUSTON, TEXAS, ASSIGNOR TO HUGHES TOOL COMPANY, OF HOUSTON, TEXAS, A CORPORATION OF TEXAS

CORE DRILL PLUG

Application filed October 27, 1930. Serial No. 491,476.

My invention relates to plugs for closing the lower end of the core barrel when the core drill is being introduced into the hole. Plugs of this general character have been employed before. The plug is commonly secured in the drill or core barrel by releasable means such as a threaded connection where disconnection is accomplished by rotation of the drill upon the bottom; or the plug may be held in place by a frangible pin which is sheared off to release the plug when the plug engages the well bottom.

There are objections to both these prior means of holding the plug in position. The bit may encounter bridges of earth and rock necessitating rotation of the drill to break through the bridge and thus the threaded plug may unscrew before the bottom is reached. With the frangible pin, the striking of a blow upon the plug by encountering a rock or other obstacle may rupture the connection and release the plug prematurely.

It is an object of my invention to provide a plug and means to retain it in position until it is desirable to release it at the bottom of the well. I provide a holding means that can only be released by a continued and heavy pressure thereon such as may be experienced by striking upon the well bottom.

I also desire to provide a convenient structure of plug which may be economically constructed; which can be readily used for repeated operations, and which will last for long periods of time.

In the drawings herewith, Fig. 1 is a central vertical section through a core drill and core barrel with my invention employed thereon.

Fig. 2 is a similar view showing the plug in released position.

My plug may be used with any ordinary type of core drill. I have illustrated a scraping core bit of common construction having a head 1 with a threaded socket 2 thereon to receive the threaded pin 3 upon the drill collar or barrel 4. The drill has a plurality of outwardly extending blades 5 which may have a hard facing thereon indicated at 6. The head is tubular and has an inner upwardly-presented shoulder 7 upon which the plug A

may be supported. Flushing fluid for the drill is conducted to the forward sides of the blades through passages 8 in the collar connecting with an annular channel 9 in the drill head. Discharge ports 10 in the head are formed to connect with the channel 9.

The plug A comprises a cylindrical body 11 which is preferably hollow. Its upper portion has its outer diameter increased slightly to form a shoulder 12 to seat upon the shoulder 7 in the bit. The upper extremity of the plug is tapered to a reduced portion 13 through which a bolt or pin 14 may pass. Said pin 14 has a lower head 15 closing the lower end of the plug. The pin has an elongated neck 16 with a shoulder at the upper end of the same to form a seat for a ring 17 of soft material such as lead. Said ring is beveled from its ends toward the middle to provide a sharp edge to bear against the pivoted dog 18. The upper end of the pin 14 has a nut 19 thereon to hold said pin assembled in the plug.

I have shown one dog 18 pivoted at its upper end to lugs 20, but it is to be understood that several such dogs may be used. Said dog is an elongated blade pivotally supported upon a pin 21 supported in the lugs 20, and depending downwardly into a slot 22 in the side wall of the plug. The inner side of the dog bears against the ring 17. The outer side projects slightly from the plug and has a beveled notch or recess 23 formed therein to receive the lower shouldered portion 7 of the drill.

By reference to Fig. 1 it will be seen that when the dog engages the ring 17, the blade will be held outwardly to latch the plug in position, the movement of the plug being limited by the length of the notch 23. The upper end of the pin may have a sleeve 25 thereon to limit the inward movement of the dog when it has been depressed to release the plug.

When the drill is going into the hole, the accidental engagement of the plug with an obstruction may serve to indent the soft metal ring 17 slightly but not sufficiently to release the plug. The action of the pumps will flush away accumulations from in front of the bit.

When the bottom is reached, the plug will strike the bottom first, and repeated hammering of the bit upon the bottom will act to force the beveled end of the notch 23 against the bit and finally indent the dog into the ring as shown in Fig. 2 sufficiently to force the dog past the shouldered end 7 of the bit and allow the plug to move upwardly ahead of the core formed by the drill in the subsequent drilling operations.

The advantage of the plug thus formed lies in the fact that the same is not easily released through accidental blows thereon. The lead ring is crushed only by repeated heavy blows such as may be experienced by contact with the well bottom. Further, the plug may be easily repaired for subsequent use by withdrawing the pin 14, removing the ring 17 and substituting a new one. In fact, the same ring may be employed a second time by rotating the same to a new position on the pin relative to the dog or dogs.

What I claim as new is:

1. A core drill having a central core passage therethrough, a shoulder on the inner wall of said passage, a plug in said passage, a laterally projecting pivoted dog on said plug having a beveled notch therein to receive said shoulder, and means holding said dog extended to engage said notch with said shoulder compressible by repeated blows to allow said dog to be disengaged from said shoulder.

2. A core drill having a central core passage therethrough, a shoulder on the inner wall of said passage, a plug in said passage, a laterally projecting pivoted dog on said plug having a beveled notch therein to receive said shoulder, and means in said plug positioned to bear against said dog to hold it in engagement with said shoulder, said means being compressible under high pressure to allow said dog to move inwardly and be released from said shoulder.

3. A core drill having a central core passage therethrough, a plug in said passage, latching means on said plug engaging said drill to latch said plug in said passage, and means engaging said latching means to hold it in operative position compressible under strain to release said latching means.

4. A core drill having a central core passage therethrough, a plug in said passage, latching means on said plug engaging in said passage to limit longitudinal movement of said plug, and means to hold said latching means in drill-engaging position compressible under shock to release said latching means and said plug.

5. A core drill having a core passage therethrough, a plug in said passage, and means holding said plug in said passage compressible to release said plug under longitudinal strain upon said plug.

6. A core drill, a plug closing the core pas-

sage therethrough, latches engaging said plug in said passage and a ring of compressible material normally holding said latches in operative position releasable under shocks exerted thereon.

7. A core drill, a plug closing the core passage therethrough, latches engaging said plug in said passage and a soft metal ring normally holding said latches in operative position, said latches being adapted to indent said ring under shock and release said plug.

In testimony whereof, I hereunto affix my signature, this the 20th day of October, A. D. 1930.

FLOYD L. SCOTT.

70

75

80

85

90

95

100

105

110

115

120

125

130