

June 2, 1931.

F. L. SCOTT

1,808,009

CORE CATCHER FOR WELL DRILLS

Filed June 29, 1929 2 Sheets-Sheet 1

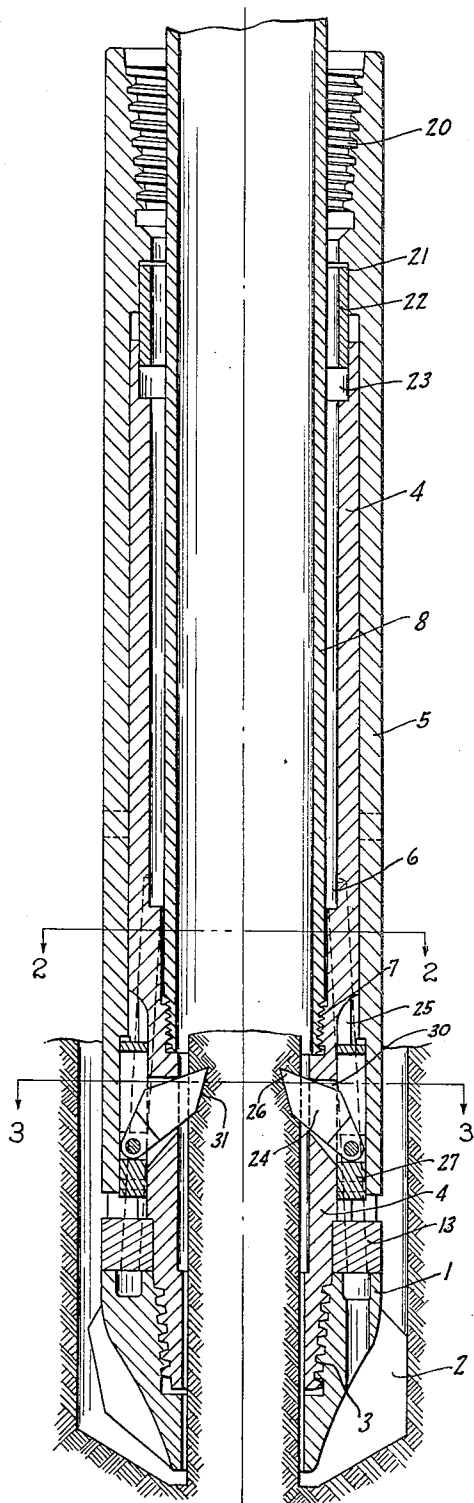


Fig. 1.

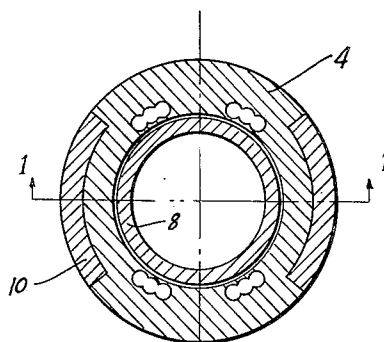


Fig. 2.

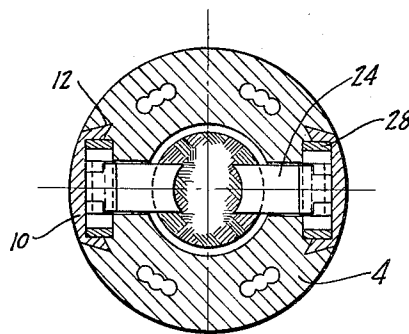


Fig. 3.

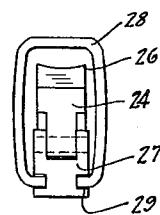


Fig. 4.

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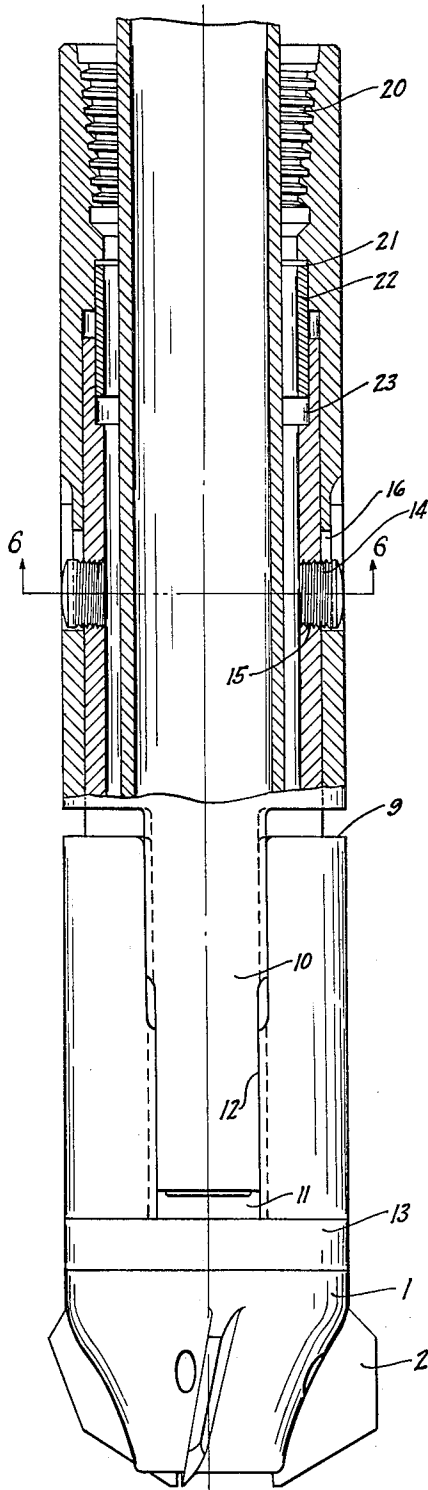


Fig. 5.

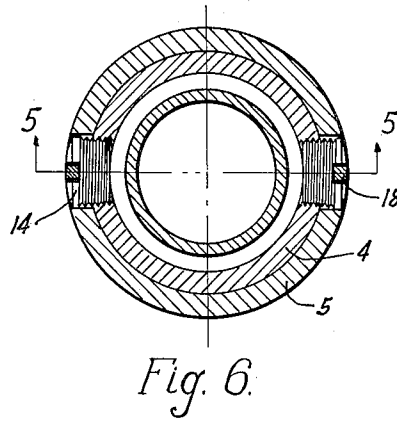


Fig. 6.

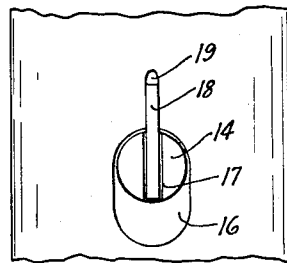


Fig. 7.

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CORE CATCHER FOR WELL DRILLS

Application filed June 29, 1929. Serial No. 374,849.

My invention relates to means to engage and break off a core cut by a core drill so that said core may be withdrawn with the drill to the surface.

5 It is an object of my invention to provide a core catcher which is normally in retracted position out of the path of the core, but which can be projected positively into engagement with the core when the drill is with-
10 drawn from the well.

It is an object to provide an effective means for mounting the core engaging dogs so that a limited frictional play may be allowed when an excessive load or shock is received
15 upon the dogs.

I desire to construct a special type of drill collar which allows a vertical play between the sections thereof to provide for the operation of the dogs, and to construct said collar
20 so that it may be cheaply and economically manufactured.

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

25 Figs. 2 and 3 are transverse sections taken on the planes 2-2 and 3-3 respectively of Fig. 1.

Fig. 4 is a detail of the dogs supporting means.

30 Fig. 5 is a side view, partly in section and partly in elevation of my device.

Fig. 6 is a transverse section on the plane 6-6 of Fig. 5.

35 Fig. 7 is a broken side elevation of the drill collar showing the means of securing the drive pins in position.

I have shown my invention as applied to a soft formation core drill but it is to be understood that it is applicable to any preferred type of core drill. The head 1 of the drill has a plurality of cutting blades 2 thereon to cut clearance for the head. The head has a threaded central socket 3 to connect with an interior sleeve 4, the upper end
40 of which telescopes within an outer drill collar 5. The sleeve 4 has its interior diameter increased at 6 below which is a socket 7 threaded to receive the core barrel 8.

50 The drill collar 5 telescopes over the upper end of the sleeve 4 down to a shoulder 9

formed on the sleeve. From this shoulder downwardly, the collar is provided with arms 10 adapted to fit within channels or grooves 11 in the said sleeve. The lower portion of the channels 11 are undercut at their edges
55 as shown at 12 in Fig. 3 to provide a dovetailed engagement of the arms in the channels, and prevent disengagement. Between the ends of the arms 10 and the head 1 of the drill, when the said arms are down, is
60 a ring 13, which is, in fact, a wear ring with openings therethrough for the flushing fluid and replaceable to take up for wear when necessary.

The sleeve 4 and the drill collar are se-
65 cured together so as to allow a slight vertical play by radial pins 14 screwed into the body of the sleeve at 15 and projecting radially outward so as to engage within slots 16 in the drill collar. Said slots are understood
70 from Fig. 7. They allow a slight vertical movement of the pins to cause the operation of the dogs as will be noted later. Each pin 14 has a groove 17 therein to receive a locking key or bar 18 which fits in a recess 19 in
75 the wall of the drill collar and extends into the groove 17 which is aligned therewith. The edges of the recess 19 are upset or peened over the edge of bar 18, and secure it in locking position, but allowing the said bar to be
80 removed later by the use of a chisel. As arranged, it will be seen that the bar or key 18 does not interfere with vertical movement of the pin 14 in slot 16.

The drill collar extends beyond the upper
85 end of the sleeve 4 and has a threaded socket 20 for engagement with a drill stem. Below the socket, the drill collar and sleeve are recessed somewhat on their inner sides at 21 and 23 respectively to receive a packing collar 22 which is allowed a slight sliding movement in the recess permitting the required
90 vertical play. This collar may be of expandible material tending to expand under fluid pressure to preserve a seal between the sleeve
95 4 and the drill collar.

The core-engaging dogs 24 are mounted within chambers 25 formed partly in the outer surface of the sleeve 4, and partly in the inner face of the drill collar 5. Said dogs
100

are broadest between their ends, the forward end 26 being pointed to engage the core and the inner end being tapered so as to allow for swinging of the dog in the chamber. The dogs are of uniform thickness as seen in Fig. 4, and are pivoted at their inner ends within blocks 27. Each block has a somewhat U shaped spring 28 which acts as a housing and attaching means for the block 27 and the dog. The open ends of the spring are curved inwardly to engage within recesses 29 in the sides of the block 27. As will be seen from Fig. 4, the side arms of the spring are slightly bowed to resiliently engage the side walls of the chamber 25 into which it is formed to fit.

Thus, when the drill is operating and the weight of the drill stem is downward upon the drill, the collar will be downward from the position shown in the drawings and the dogs 24 will be withdrawn through the openings 30. In that position, the forward face 31 of the dog will fill the opening. When the drill collar is raised, the frictional engagement of the spring 28 with the wall of the chamber 25 will raise the dog and it will be moved upwardly the length of the slot 16 in the drill collar. During this movement, the dog will swing on its pivot and be projected against the core in an obvious manner. During this movement, the dogs will assume different angular positions in the chamber and, due to the shape of the dogs, the openings 30 will be closed by the dogs at all times. The relative movements of the drill collar and sleeve 4 will cause sufficient play to allow the projecting of the dogs to about the position shown in Fig. 1, and allow the breaking off and withdrawal of the core with the drill. The frictional engagement of the spring 28 with the walls of the chamber 25 allows a slight sliding of the dog in the said chamber to provide against breakage from shock or strain and prevents damage to the mechanism.

The advantages obtained through the use of my device lie in the fact that the dogs are withdrawn out of the way of the core during the time the core is being cut. The core is not damaged and the dogs are not worn. The cutters may be positively projected against the core to engage the same and break it off in a most effective manner, without damage to the apparatus. There will be a minimum of failures of the device in use thus contributing to economy of operation.

What I claim as new is:

1. A core drill, a sleeve thereon, a drill collar telescoping over said sleeve, means to secure said sleeve and said drill collar together to allow a limited relative longitudinal play between them, a chamber formed between said sleeve and drill collar, a block in said chamber, a core engaging dog pivoted to said block, and means on said block friction-

ally engaging the walls of said chamber to support said block.

2. A core drill, a sleeve thereon, a drill collar telescoping over said sleeve, means to secure said sleeve and drill collar together to allow a limited relative longitudinal play between them, a chamber formed between said sleeve and drill collar, a block in said chamber, a core-engaging dog pivotally connected to said block and adapted to fill an opening from said chamber through said sleeve, said dog being formed to close said opening when it is moved through said opening to engage a core, said dog being thus moved when said collar is raised.

3. A core drill, a sleeve thereon, a drill collar telescoping over said sleeve, means to secure said sleeve and drill collar together to allow a limited relative longitudinal play between them, a chamber formed between said sleeve and drill collar, a block in said chamber, a core-engaging dog pivotally connected with said block and means on said block frictionally engaging the walls of said chamber for the purpose stated.

4. A core drill, a drill collar, a telescopic connection between said drill collar and said drill, including an outer collar and an inner sleeve, a chamber between said collar and said sleeve, a block slidable therein, a core engaging dog pivotally connected with said block and adapted to be projected inwardly, and frictional means on said block engaging the walls of said chamber.

5. A core drill, a drill collar, a telescopic connection between said drill collar and said drill, including an outer collar and an inner sleeve, means securing said collar and sleeve together to permit a limited longitudinal play between them, a chamber between said collar and said sleeve, a block slidable therein, a core engaging dog pivotally connected with said block and adapted to be projected inwardly, and frictional means on said block engaging the walls of said chamber.

6. A core drill, a drill collar, a telescopic connection between said drill collar and said drill, including an outer collar and an inner sleeve, a chamber between said collar and said sleeve, a block slidable therein, a core engaging dog pivotally connected with said block and adapted to be projected inwardly and frictional means on said block engaging the walls of said chamber, including a bowed spring on said block resiliently wedged within said chamber.

7. In a core drill, a drill bit, a sleeve thereon, a drill collar telescoping over said sleeve, arms projecting downwardly from said drill collar slidable within external grooves in said sleeve, means to limit the longitudinal play between said collar and sleeve, and core engaging means actuated by said longitudinal play to be moved through an opening in said sleeve to engage said core.

8. In a core drill, a drill bit, a sleeve there-
on, a drill collar telescoping over said sleeve,
arms on said drill projecting downwardly
therefrom and slidable within grooves in the
5 outer face of said sleeve, means to limit the
longitudinal play between said collar and
sleeve, core engaging dogs adapted to be
moved by said longitudinal play inwardly to
contact with the core, and means to pivotally
10 support said dogs relative to said sleeve and
said collar.

9. In a core drill, a drill bit, a sleeve there-
on, a drill collar telescopically engaging
therewith, a block housed between said drill
15 and collar, a core-engaging dog on said block
adapted to be projected inwardly to engage
the core, a bowed spring connected with said
block and frictionally engaging the walls of
the collar and sleeve, so as to have a limited
20 movement therein, for the purpose described.

In testimony whereof I hereunto affix my
signature, this 22nd day of June A. D. 1929.

FLOYD L. SCOTT.

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