June 2, 1931. R. O. ANDERSON 1,807,953

CORE ENGAGING DEVICE

Filed June 17, 1929

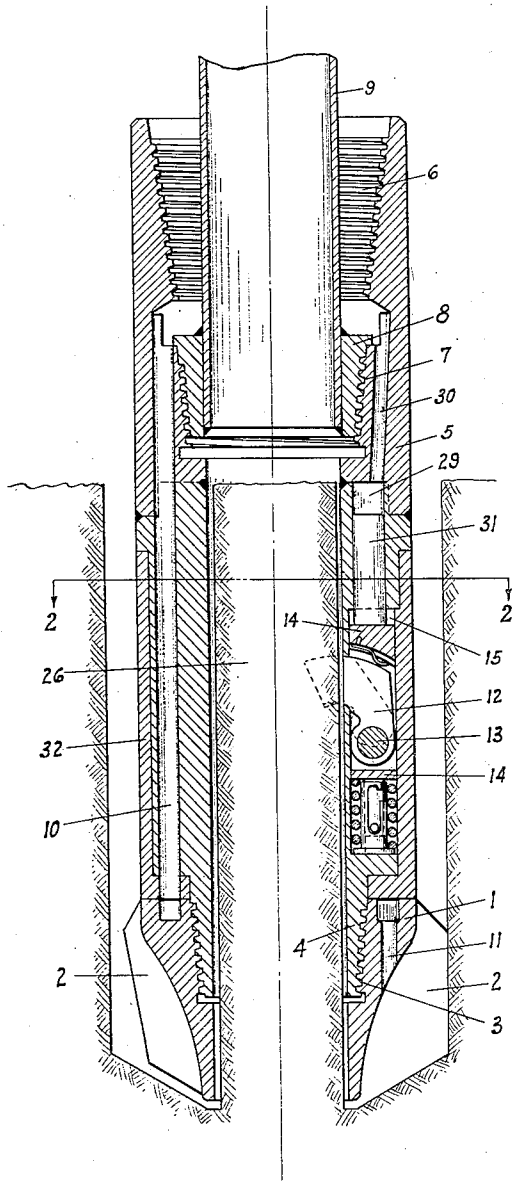


Fig.1

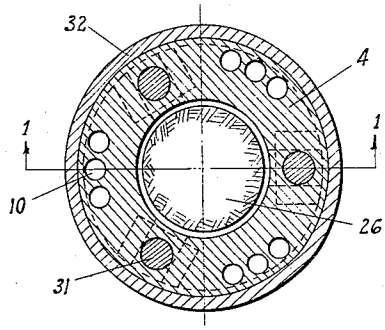


Fig.2

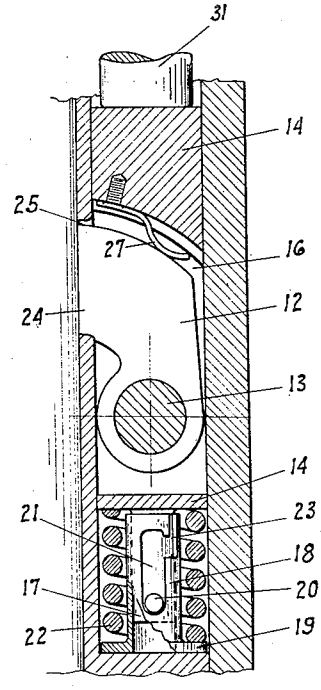


Fig.3

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UNITED STATES PATENT OFFICE

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CORE ENGAGING DEVICE

Application filed June 17, 1929. Serial No. 371,348.

My invention relates to core catches such as are employed on core drills in well drilling operations to engage and break off the core, and carry it with the drill to the surface.

The usual construction of core drill has spring-pressed arms or slidable jaws to engage the core, but the difficulty with these types of core catchers is that the jaws are in engagement with the core while the drill is rotating and wear materially so that when they are used to break the core, they sometimes fail to function or become broken.

It is an object of my invention to provide a core catcher having jaws held normally withdrawn during the operation of the drill, but capable of being forced into core engaging position when drilling is stopped.

I desire to employ the hydraulic pressure of the flushing fluid to hold the core engaging means retracted in use and separate means to advance the said core engaging means when the fluid circulation is stopped.

Referring to the drawings herewith, Fig. 1 is a central longitudinal section through a core drill having my invention thereon. Fig. 2 is a transverse section on the plane 2—2 of Fig. 1. Fig. 3 is an enlarged detail of the core engaging dog.

The core drill upon which I have shown my device is a scraping type of soft formation drill, but my invention is adapted to be used upon any ordinary type of core drill. The bit head 1 has lateral blades 2 to cut the hole. Said head has a threaded socket 3 to engage a pin or shank 4 of a special drill collar 5.

The said drill collar is of tubular construction, the upper end being internally threaded at 6 to engage with a drill stem. Below the socket 6 there is a smaller threaded seat 7 to receive a collar 8 welded into fixed position upon the lower end of the core barrel 9. There are longitudinal channels 10 in the drill collar leading to passages 11 in the drill head, so that flushing fluid may be discharged upon the cutters at the bottom of the hole.

The core engaging device includes a plurality of dogs 12, each pivoted upon a pin 13, mounted in a small housing 14 fitted slidably within one of the recesses 15 in the wall of the drill collar. The housings 14 are shaped to fit said recesses, and have a central opening 16 therein to receive the dog 12. At the lower end, the housing has a small downwardly projecting post 17 which is slidable within a sleeve 18 having a base 19, supported upon the bottom of the recess 16. The post 17 has a radial pin 20 thereon fitting within a bayonet slot 21 in said sleeve 18. The post and housings are normally held upwardly in the recess by a spring 22 compressed between the lower end of said housing and the base 19 of said sleeve 18. The pin 20 is movable vertically in said slot 21, but if the housing is removed from the collar, the post may be rotated into the lateral branch 23 of the slot and removed therefrom.

The dogs 12 are formed with an inwardly curved nose 24 adapted to extend through an opening or window 25 in the inner wall of the recess 15, so as to engage the core 26. Above the dogs in the housing is a friction spring 27 secured to the upward wall of the opening 16 and adapted to bear against the curved upper end of the dog, and tend to move said dog inwardly against the core.

Above the housing 14 is a cylindrical passage 29 connecting with the watercourse 30 in the collar 5. For purposes of construction, the drill collar is made in sections welded together along the upper line of the cylinder 29. Said cylinder receives a piston 31 which is slidable therein and bears against the upper end of the housing 14.

When the drill is in use the spring 22 below the housing 14 tends to move the said housing, and the dogs 12 upwardly so as to move the said dog into core engaging position as shown in dotted lines in Fig. 1. But the pressure of the flushing fluid upon the piston 31 is exerted upon the housing, depressing spring 22, and holding the dogs withdrawn. When the core is to be broken off, and brought to the surface, the pumps are stopped and when the pressure upon the piston 31 is thus removed, the spring 22 acts to force the dogs 12 upwardly and the spring 27 moves the dog inwardly so that the nose thereof engages into the core as shown in

Fig. 1, and the core is thus broken off and withdrawn. There may be any desired number of core engaging dogs. I have shown three in Fig. 2 and ordinarily this number will be satisfactory.

This device will not be subject to material wear and as the dogs are resiliently mounted, little likelihood of breakage will be experienced. The housings for the dogs are mounted in their recesses in any desired manner. I have shown an outer detachable sleeve 32 upon the drill collar which may be removed to obtain access to the dogs, but I do not wish to be confined to the details of construction described.

What I claim as new is:

1. A core drill including a core bit and a drill collar thereon in combination with housings mounted to slide vertically in said drill collar, dogs on said housings adapted to be held retracted by liquid pressure and means to move said housings to project said dogs into core engaging position.

2. A core drill including a core bit and a drill collar thereon, in combination with housings mounted to slide vertically downwardly in said drill collar, dogs on said housings adapted to project inwardly to contact with a core, means to move said housings upwardly to project said dogs into core engaging position, and means actuated by liquid pressure to hold said dogs in position withdrawn from core engagement while the said drill is rotating.

3. In a core drill having a tubular head and drill collar thereon, the combination of core engaging dogs mounted for vertical movement relative to said drill, means to project said dogs inwardly when they are raised, and hydraulically operated means to hold said dogs depressed.

4. In a core drill having a tubular head and drill collar thereon, the combination of core engaging dogs mounted for vertical movement relative to said drill, means operated through pump pressure to hold said dogs depressed when said drill is operating.

5. In a core drill having a tubular head and drill collar thereon, the combination of core engaging dogs mounted for vertical movement relative to said drill, resilient means tending to raise said dogs relative to said drill, means to project said dogs inwardly when they are raised, and hydraulically operated means to hold said dogs depressed.

6. In a device of the character described, core-engaging dogs housed out of the path of the core, resilient supports for said dogs, tending to move said dogs upwardly, and means to project said dogs inwardly when said dogs are moved upwardly.

7. In a device of the character described, core-engaging dogs housed out of the path of the core, hydraulically operated means to move said dogs downwardly, resilient supports for said dogs, tending to move said dogs upwardly, and means to project said dogs inwardly when said dogs are moved upwardly.

In testimony whereof, I hereunto affix my signature this 11th day of June A. D. 1929.

REXFORD O. ANDERSON.