W. L. CHURCH.

SAMPLE TAKING DEVICE.

APPLICATION FILED SEPT. 9, 1918.

1,300,346. Patented Apr. 15, 1919.

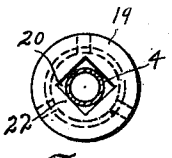


Fig. 3.

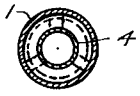


Fig. 2.

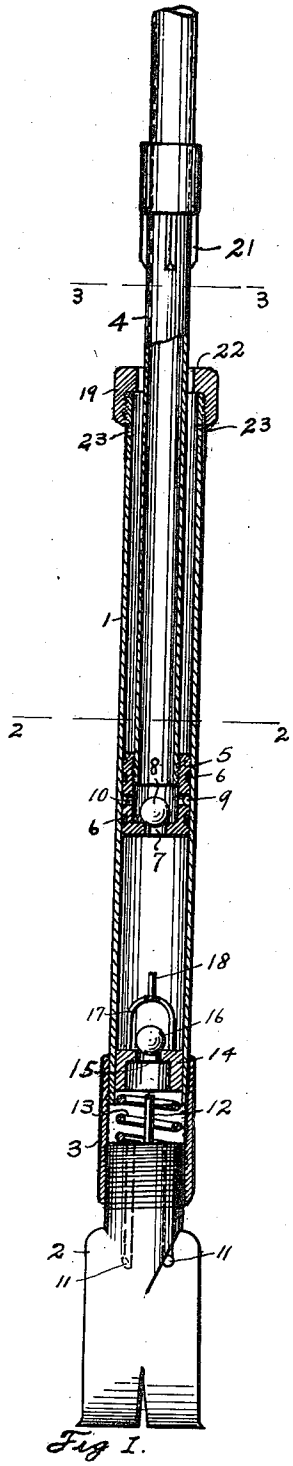


Fig 1.

INVENTOR
Walter L. Church
By
Hardway & Cathey

UNITED STATES PATENT OFFICE.

WALTER LEE CHURCH, OF HUMBLE, TEXAS.

SAMPLE-TAKING DEVICE.

1,300,346. Specification of Letters Patent. Patented Apr. 15, 1919.

Application filed September 9, 1918. Serial No. 253,203.

To all whom it may concern:

Be it known that I, WALTER L. CHURCH, a citizen of the United States, residing at Humble, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Sample-Taking Devices, of which the following is a specification.

This invention relates to new and useful improvements in a sample taking device.

The object of the invention is to provide a device of the character described, whereby samples of strata may be obtained during the process of drilling a well. In drilling wells, particularly oil wells, a drill stem is employed to the lower end of which a bit is attached, and the stem and bit are rotated from the ground surface, usually by means of a rotary. In the progress of boring, it is desirable to obtain samples of strata through which the bit passes in order to determine the presence or absence of oil or other minerals. The device herein described has been provided for the purpose indicated.

With the above and other objects in view, the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1, is a side elevation of the device, partially in section.

Fig. 2, is a transverse sectional view taken on the line 2—2 of Fig. 1, and

Fig. 3, is a transverse sectional view taken on the line 3—3 of Fig. 1.

Referring now more particularly to the drawings, wherein numerals of reference designate similar parts in each of the figures, the numeral 1, refers to a tubular barrel, to the lower end of which the bit 2, is attached by means of the usual coupling 3. The numeral 4 refers to a drill stem, the lower end of which telescopes within the barrel 1, and has the plunger 5 threaded thereon, said plunger being provided with the usual packing rings 6, 6. The lower end of the plunger is formed into a valve seat having the fluid passageway 7, which is controlled by the ball valve 8. The plunger is also provided with a peripheral groove 9, from which a plurality of openings 10 lead into the interior of the plunger and drill stem 4. The bit 2 has the fluid passageways 11, 11, leading from the upper end thereof, and terminating on opposite sides of the bit, and also has a centrally located upwardly projecting finger 12. A resilient seat 13 is mounted on the upper end of the bit 2, and surrounds said finger, and seated thereon is the valve seat 14, having the central fluid passageway 15 controlled by the ball valve 16, which is confined within the valve cage 17, carried by the seat 14. Standing up from this cage is the finger 18.

Threaded on the upper end of the barrel is a collar 19, having a square opening 20, through which the stem 4 passes. When the bit is in operation in the bore, the plunger 5 rests on the cage 17, and the weight of the stem compresses the seat 13. The fingers 12 and 18 operate to lift the corresponding valve 16 and 8, permitting water to be forced down through the stem and through the pipe 11 to the point of the bit to carry away the cuttings. When in this position, a square section 21 of the lower joint of the stem fits in the square opening 20 of the collar 19, so that when the stem is rotated from the ground surface, the barrel 1 and the bit 2 will also be rotated.

When it is desired to take a sample of the cuttings, the rotary is stopped and the stem 4 is pulled upwardly, carrying the plunger 5 up against the inwardly extending annular shoulder 22, into which the upper end of the collar is formed. As soon as the valve 8 is released by the finger 18, the passageway 7 will be closed by said valve and a vacuum thereby created in the barrel 1, and thereby the cuttings will be drawn into said barrel, from the bit through the passageway 15. As the bit is being withdrawn, the groove 9 will aline with the openings 23, in the upper end of the barrel 1, permitting all water in the stem to drain out into the bore. While the bit is being withdrawn in this manner, specimens of the strata being pierced by the bit will be trapped in the barrel and may be withdrawn to the surface of the ground for inspection.

What I claim is:

1. A device of the character described, including a drill stem, a tubular member into which the lower end of the drill stem is telescoped, interlocking means through which rotation from the stem may be imparted to said member, a drill bit carried by the lower end of the member and means within said member controlling the passage of fluid from the stem to said bit, said means being oper-

able to withdraw the cuttings from the bit into and trapping said cuttings within said member.

2. A device of the character described, including a drill stem, a tubular member into which the lower end of the drill stem extends, interlocking means, through which said member is suspended from the stem when lowering the device into, or withdrawing it from a well, said stem and member being provided with fluid passageways, which aline when said member is so suspended, interlocking means through which rotation from said stem may be imparted to said member, a drill bit carried by the lower end of the member, and means within said member controlling the passage of fluid from the stem to said bit, said means being operable to withdraw the cuttings from the bit into and trapping said cuttings within said member.

3. A device of the character described, including a drill stem, a tubular member into which the lower end of the drill stem extends, a valve seat carried by the lower end of the stem, a valve controlling the passage of fluid through said seat, a drill bit carried by the lower end of said member, a valve seat yieldingly mounted on said bit, a valve controlling the passage of fluid through said seat, said last mentioned seat being arranged to sustain the weight of the stem when the same is lowered in said member, and being depressed thereby, and fingers alined below the respective valves, which lift the same when the stem is sustained by said last mentioned valve seat.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER LEE CHURCH.

Witnesses:

W. H. ALLEN,

J. J. DEAN.