

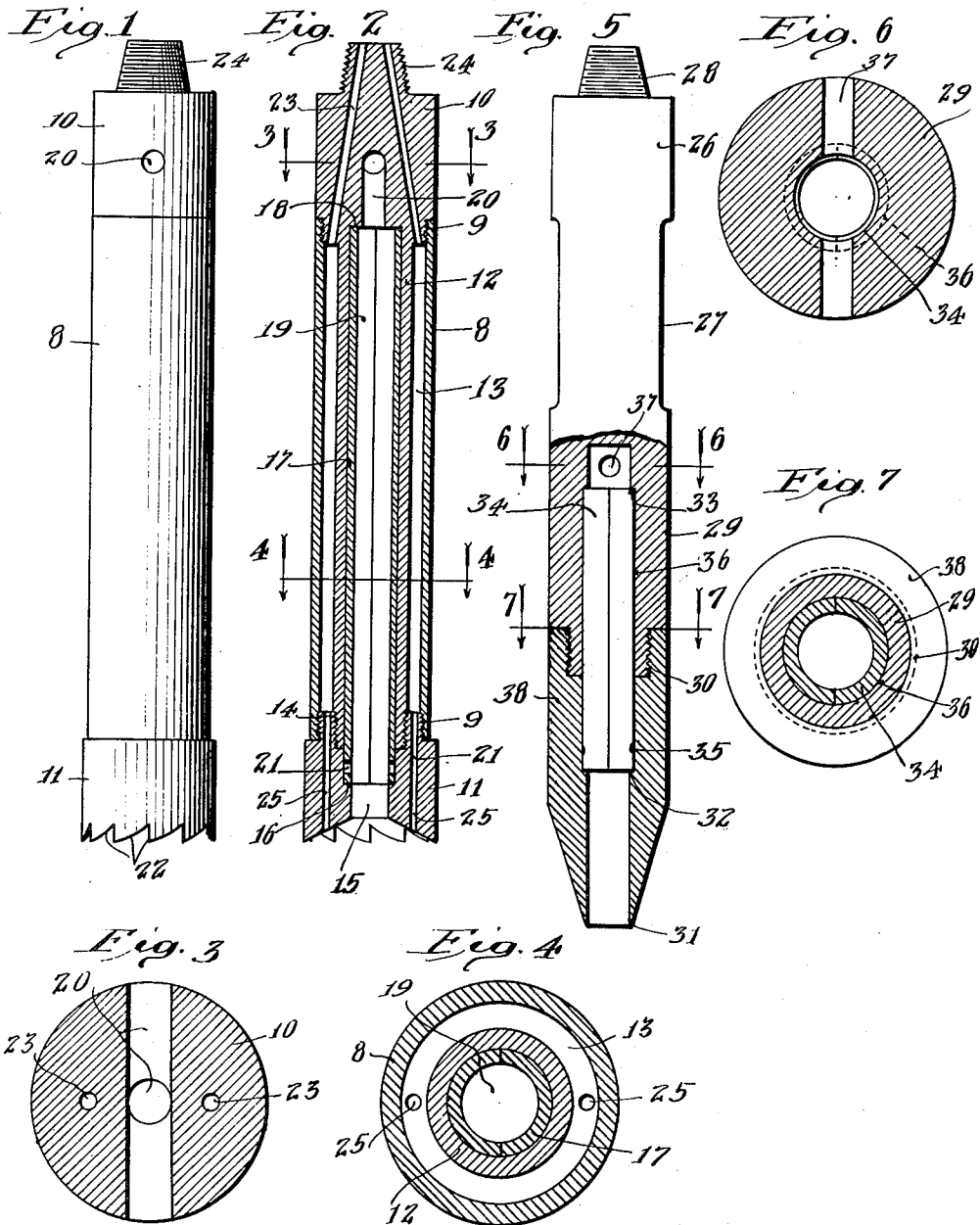
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CORE BARREL

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CORE BARREL.

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To all whom it may concern:

Be it known that I, DETREVILLE D. HILL, a citizen of the United States, residing at Huntington Beach, in the county of Orange and State of California, have invented new and useful Improvements in Core Barrels, of which the following is a specification.

This invention relates to a barrel for obtaining sample or test cores to determine the character of the strata into and through which a well is being drilled, and an object of the invention is to make provision for supplying an unbroken core which exactly duplicates in structure the stratum or strata through which the core barrel is sunk.

Another object is to construct a core barrel having a split core container.

The accompanying drawings illustrate two embodiments of the invention.

Figure 1 is a longitudinal view of a core barrel constructed in accordance with the provisions of this invention.

Figure 2 is a longitudinal mid section of Fig. 1.

Figures 3 and 4 are enlarged plan sections on lines indicated by 3—3, 4—4, Fig. 2.

Figure 5 is a longitudinal view, partly in mid-section, of a different form of core barrel embodying the invention.

Figures 6 and 7 are enlarged plan sections on lines indicated by 6—6, 7—7, Fig. 5.

First referring to Figures 1 to 4 inclusive, in describing the form of the invention therein shown, there is provided a tubular outer sleeve 8 secured at its ends by screw threads 9 to heads 10, 11 respectively. To the head 10 is secured an inner tubular sleeve 12 concentric with and spaced from the outer sleeve 8 to form an annular passage 13 for fluid. In the instance shown in the drawing, the sleeve 12 is of integral construction with the head 10, but it may be otherwise connected if so desired. The lower end of the sleeve 12 is secured by screw threads 14, or other suitable means, to the head 11.

The head 11 is provided with a bore 15 and the wall of said bore forms a shoulder 16 adapted to seat against the lower end of a longitudinally split tubular core container 17, which fits throughout the greater portion of its length within the inner sleeve 12. The upper end of the container 17 seats against a shoulder 18, terminating the bore of the inner sleeve 12. Communicating with the bore 19 of the container is a duct 20 which

extends longitudinally at the axis of the head 10 and also divides into branches extending transversely of said head, such duct 20 opening at opposite points to the periphery of the head 10.

Near its lower end the container 17 is provided with perforations 21 formed in that portion of the container which projects beyond the lower end of the sleeve 12. These perforations 21 may be engaged by a nail or any other suitable tool, after the head 11 has been removed, so as to the more readily extract the container from the sleeve 12.

In the drawing the head 11 is shown provided with teeth 22 at its lower end thus constituting it a drilling head so that rotation of the core barrel will cause the core barrel to drill into or through the stratum or strata from which a test core is to be removed. It is to be understood that the teeth 22 may be omitted, when not required. The head 10 is provided with longitudinally extending ducts 23 which communicate with the annular space 13 and which open through the upper end of the head 10. The head 10 forms a screw threaded coupling pin 24 adapted to engage the coupling box, not shown, of a drill stem, not shown.

To use the invention described above the core barrel will be connected with the drill stem, in place of the usual rotary drill or underreamer, and the drill stem will be rotated so as to cause the core barrel to penetrate the strata under examination. The material of the strata will pass through the bore 15 into the bore 19 of the container, and air within the container will be expelled through the duct 20. As the core barrel penetrates deeper into the strata, some of the material may discharge through the duct 20.

After operating the core barrel for a shorter or longer period of time, it will be withdrawn from the hole, the head 11 will be unscrewed from the sleeves 8, 12, and the container will be withdrawn from the sleeve 12. Care will be used while withdrawing the container from the sleeve so that the halves of the container do not fall apart and then one-half of the container will be lifted off of the core so that the exact formation drilled into or through, represented by the core, can be observed.

In the event of the core barrel being operated in rock or other relatively hard formation, where it is customary to employ

water to wash away the débris water will be supplied through the drill stem, not shown, to the ducts 23 and will pass through the annular space 13 and discharge through longitudinal ducts 25 formed in the head 11, the ducts 25 discharging the water adjacent the teeth 22. The water prevents overheating of the head 11 and at the same time carries away the débris from adjacent the teeth.

Another form of the invention, illustrated in Figures 5, 6, and 7, is constructed as follows: This core barrel is of a form suitable for use with "Standard" tools, that is to say jars are employed in sinking the core barrel through the strata. There is provided a body 26 having a wrench seat 27 and forming at its upper end a screw threaded pin 28 for connection with the coupling box, not shown, of a drill stem. The lower end of the body 27 forms a sleeve 29 and screw threads 30, or other suitable means, couple said sleeve to a head 38. The lower end of the head 38 may be provided with a cutting edge 31 so as to better penetrate the strata, and thus the head constitutes a drilling head. Within the sleeve 29 and head 38 are shoulders 32, 33, respectively. The shoulders 32, 33, seat against the opposite ends of a longitudinally split tubular container 34 which fits within the bores of the sleeve and head so as to hold the halves of the container against separation. The container 34 is of substantially the same construction as the container 17, hereinbefore described, and is provided with perforations 35 which serve the same purpose as the perforations 21.

Communicating with the bore 36 of the sleeve, near the upper end thereof, is a transverse duct 37, which opens to the periphery of the body 26, in the same way and for the same purpose as the duct 20 above described.

The form of the invention shown in Figures 5, 6, and 7 is used in the same way as the form shown in Figures 1 to 4 inclusive, excepting that the core barrel is not rotated but is sunk into the strata by the action of drilling jars which are well understood in the well drilling art.

From the foregoing it will be clear that I am enabled, by the use of this invention, to secure a core of the material at different levels in the well being drilled; and that the core accurately represents, not only the material and the proportions thereof

which go to make up the strata, but an exact duplicate of the formation as regards the relative arrangement of different strata.

I claim:

1. In a core barrel, the combination of a sleeve, a tubular head detachably secured to the sleeve, and a longitudinally split core container mounted in the sleeve and projecting therefrom, there being a shoulder in the bore of the head and the sleeve seating against said shoulder.

2. In a core barrel, the combination of heads, a longitudinally split core container having its ends slidably engaging the heads respectively, and a sleeve surrounding and spaced from the core container, the heads having ducts communicating with the interior of the sleeve, and the upper head having a duct communicating with the upper end of the core container and opening to the outside of the sleeve.

3. In a core barrel, the combination of an inner sleeve, a longitudinally split core container in the sleeve, an outer sleeve surrounding and spaced from the inner sleeve, and heads at opposite ends of the sleeves provided with ducts communicating with the space between the sleeves and opening to the outer ends of said heads.

4. In a core barrel, the combination of a sleeve provided with a duct opening into the upper end of the bore thereof, the junction of the bore with the duct forming a shoulder, a longitudinally split core container fitting the bore and having one end engaging the shoulder and its other end projecting from the bore, and a tubular drilling head screw-threaded to the sleeve and provided in its bore with a shoulder engaging the projecting end of the core container.

5. In a core barrel, the combination of a sleeve having its bore contracted to form an internal shoulder, there being a duct opening from the contracted portion of the bore to the atmosphere, a longitudinally split core container in the bore having one end engaging the shoulder, and means to detachably hold the core container in the sleeve.

Signed at Los Angeles, California, this 19th day of September, 1921.

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Witnesses:

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