

Jan. 24, 1950

N. B. BRIMBLE
SIDEWALL SAMPLE TAKER

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Filed Aug. 8, 1945

2 Sheets-Sheet 1

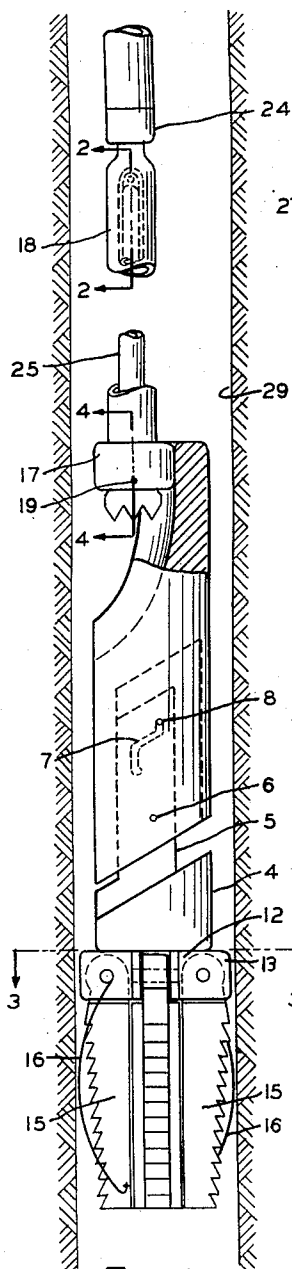


FIG. 1

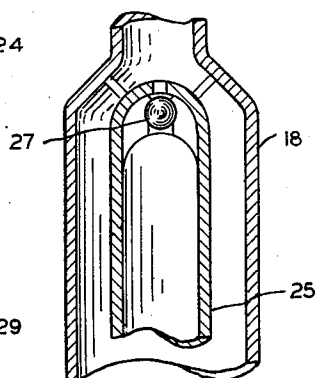


FIG. 2

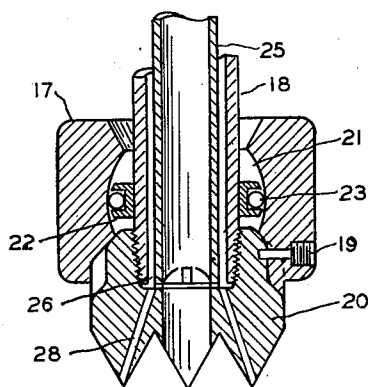


FIG. 4

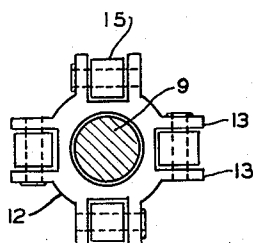


FIG. 3

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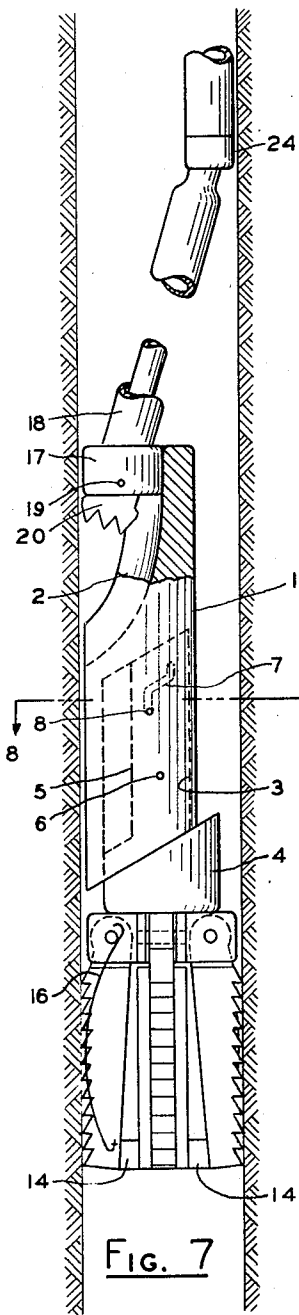
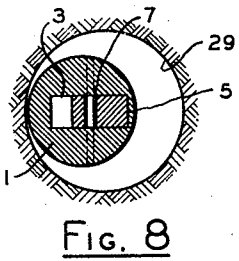
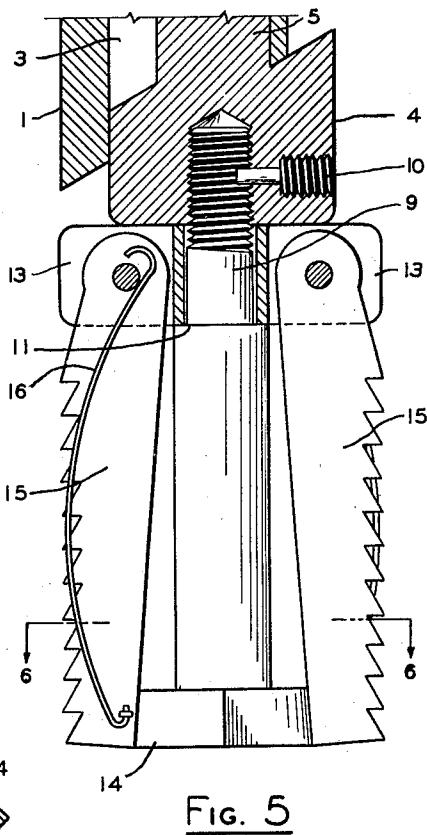
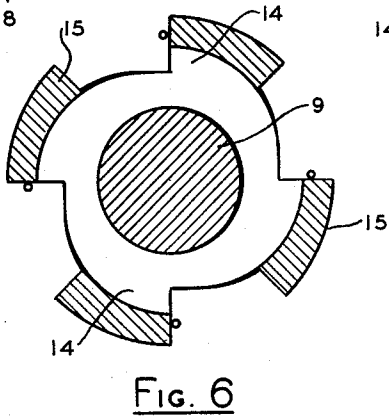
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UNITED STATES PATENT OFFICE

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SIDE WALL SAMPLE TAKER

Neville B. Brimble, Houston, Tex.

Application August 8, 1945, Serial No. 609,610

3 Claims. (Cl. 255-1.4)

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This invention relates to a side wall sample taker.

An object of the invention is to provide equipment of the character described adapted to be lowered into a well and operable to take a sample of the formation from the side wall of the bore and to withdraw the same to the ground surface for inspection.

Another object of the invention is to provide a tool of the character described which may be anchored at any desired elevation in the well and which embodies a core barrel and a core forming drill with a deflector for directing the drill into the side wall of the bore for drilling a substantial core or sample which will be entrapped in the core barrel for withdrawal to the ground surface.

The invention also embodies novel means for holding the deflector closely against the side wall of the bore from which the sample is to be taken.

The invention also embodies novel means for connecting the drill stem to the whipstock, or the deflector, which will allow the core forming tool to be deflected at the required angle into the side wall of the bore.

The invention also embodies novel means for anchoring the deflecting tool in the well bore.

Other advantages will be apparent from the following description which is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of the tool as being lowered into the well and shown partly in section.

Figure 2 is an enlarged, fragmentary, vertical sectional view taken on the line 2-2 of Figure 1.

Figure 3 is a cross-sectional view taken on the line 3-3 of Figure 1.

Figure 4 is an enlarged vertical sectional view taken on the line 4-4 of Figure 1.

Figure 5 is an enlarged, fragmentary, side view, partly in section of the anchoring device.

Figure 6 is a cross sectional view thereof taken on the line 6-6 of Figure 5.

Figure 7 is a side elevation of the tool, partly in section and in position in a well for taking a sample, and

Figure 8 is a cross-sectional view taken on the line 8-8 of Figure 7.

In the drawings the numeral 1 designates a whipstock, or deflector, whose upper end has the arcuate deflecting face 2 which is concaved in cross-section.

The lower end of the deflector 1 is formed with a deep mortise 3, as illustrated in dotted lines in Figure 1, and also as shown in Figure 8.

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The numeral 4 designates an anchor block which has an elongated tenon 5 which fits up into the mortise 3 but is somewhat narrower in width than said mortise, as illustrated in dotted lines in Figure 1. The tenon is pinned to the deflector 1 by means of a frangible pin 6 in position so that the lower end of the deflector will be spaced above the upper end of the anchor block 4. These opposing ends are correspondingly pitched, or tapered, as shown in Figures 1 and 7.

The tenon 5 has a diagonal slot 7 cut there through which is pitched to substantially correspond to the pitch of the lower end of the deflector with its forward end turned downwardly and its other end turned upwardly; and a pin 8 has its ends anchored to the sides of the deflector and extends through the slot 7.

Screwed into the lower end of the anchor block 4 there is a spindle 9 which is securely held therein against unscrewing by the set screw 10 which is screwed into said block and whose inner end projects into the spindle.

Beneath the anchor block 4 the spindle is thickened in diameter forming an external, annular shoulder 11 and surrounding the upper end of the spindle and supported on the shoulder 11 there is a collar 12 which has the pairs of radial spaced lugs as 13, 13.

The lower end of the spindle 9 is formed with the spaced cams 14 which are correspondingly pitched.

There are the legs 15 whose upper ends are pivoted between the respective pairs of lugs 13 and whose lower ends are free and are held in contact with the cams 14 by the outwardly bowed wiper springs 16. The outer margins of the legs 15 are formed with ratchet teeth so as to readily engage the sidewalls of the bore when the legs are spread by the cams 14.

Fastened to the upper end of the deflector, or whipstock, 1 and on the tapering face thereof there is a collar 17 through which the lower section 18 of the drill stem extends said section of the drill stem being pinned to the collar 17 by a frangible pin 19.

Beneath the collar 17 and screwed on to the lower end of the drill stem there is a core forming drill 20.

Within the collar 17 there is a spherical cavity 21 and within this cavity there is a ring 22 through which the drill stem 18 extends and this ring has external antifriction bearings 23 which ride against the wall of the cavity 21 and the passageway through the collar 17 for the drill stem

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section 18 is larger, in diameter, than the external diameter of said drill stem section so as to give the drill stem section 18 the required range of movement to allow the core drill to follow the angular course of the deflecting face 2 and, for this purpose, the section 18 of the drill stem is connected to the adjacent section above by means of the universal coupling 24.

A tubular core barrel 25 is located in the drill stem section 18 and is supported on the upper end of the drill 20 and has the conventional core catcher 26 within its lower end and an outlet port controlled by the outwardly opening check valve 27 at its upper end.

Drilling fluid may be forced down through the drill stem and around the core barrel 25 and on through the ducts 28 in the drill 20 so as to conduct drilling fluid to the cutting points of the drill.

In operation the tool may be lowered into the well bore 29 to the desired location with the wiper springs 15 in contact with the walls of the bore and with the cross pin 8 in the upwardly turned end of slot 7. When the desired location has been reached the tool may be turned but the wiper springs will hold the collar 12 and the legs 15 against rotating so that the cams 14 will operate against the lower ends of said legs and force the legs outwardly into contact with the walls of the bore so that said legs will support the tool as shown in Figure 7. Additional weight from above will then be applied and the pin 6 will be sheared and the deflector will move on downwardly relative to the anchor block 4 but the cross pin 8 moving on the diagonal slot 7 will cause the deflector to move forwardly into the position indicated in Figures 7 and 8 and in contact with the walls of the bores and with the tapering lower end of the deflector resting upon the tapering upper end of the anchor block 4. The pin 8 will then be seated in the downwardly turned end of slot 7 to maintain the parts in said position. Additional weight from above may be then applied and the pin 19 will be sheared and the core drill will then be lowered and as lowered will be deflected by the face 2 into the side wall of the bore.

As lowered the drill should, of course, be rotated and it will drill out into the sidewall of the bore and will form a core which will pass by the core catcher 26 into the core barrel 25 and will be retained therein. The contents of the core barrel ahead of the entering core may escape past the valve 27. When a sufficient sample has thus been obtained the entire tool may be withdrawn from the bore to the ground surface and broken up for access to, and inspection of, the sample.

What I claim is:

1. A sample taking device comprising, an anchor having means thereon engageable with the walls of a well bore to support the anchor there-

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in, a deflector connected to the anchor and downwardly movable relative thereto, said deflector and anchor being provided one with a diagonal slot and the other with a cross pin movable in the slot and forming means for moving the deflector laterally relative to the anchor, and adjacent one side of the bore, upon such downward movement, a core forming tool containing a sample chamber and having a universal connection with the deflector and arranged to be deflected by said deflector into said side of the bore and means having a universal connection with the tool for rotating said tool to form a core from said side wall.

2. A device for taking samples from the side wall of a well bore comprising, an anchoring device engageable with the wall of the well bore, a deflector mounted on the anchoring device having a diagonal slot and movable downwardly and laterally relative to the anchoring device, a cross pin on the anchoring device which works in said slot to cause such lateral movement, a coring tool having a universal sliding connection with the deflector and arranged to be deflected thereby into the side wall of the bore, means having a universal connection with the coring tool for rotating the coring tool to form a core of the wall formation and a sample receiver in the device for receiving and retaining the core.

3. A sample taking device comprising, an anchor having means thereon engageable with the walls of a well bore to support the anchor therein, a deflector connected to the anchor and downwardly movable relative thereto, the connected parts of the deflector and anchor being provided one with a diagonal guideway and the other with a projection which extends into the guideway thus forming means for moving the deflector laterally relative to the anchor and adjacent one side of the bore, upon such downward movement, a core forming tool containing a sample chamber and having a universal connection with the deflector and arranged to be deflected by the deflector, into the side wall of the bore and means for rotating said tool to form a core of the wall formation.

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