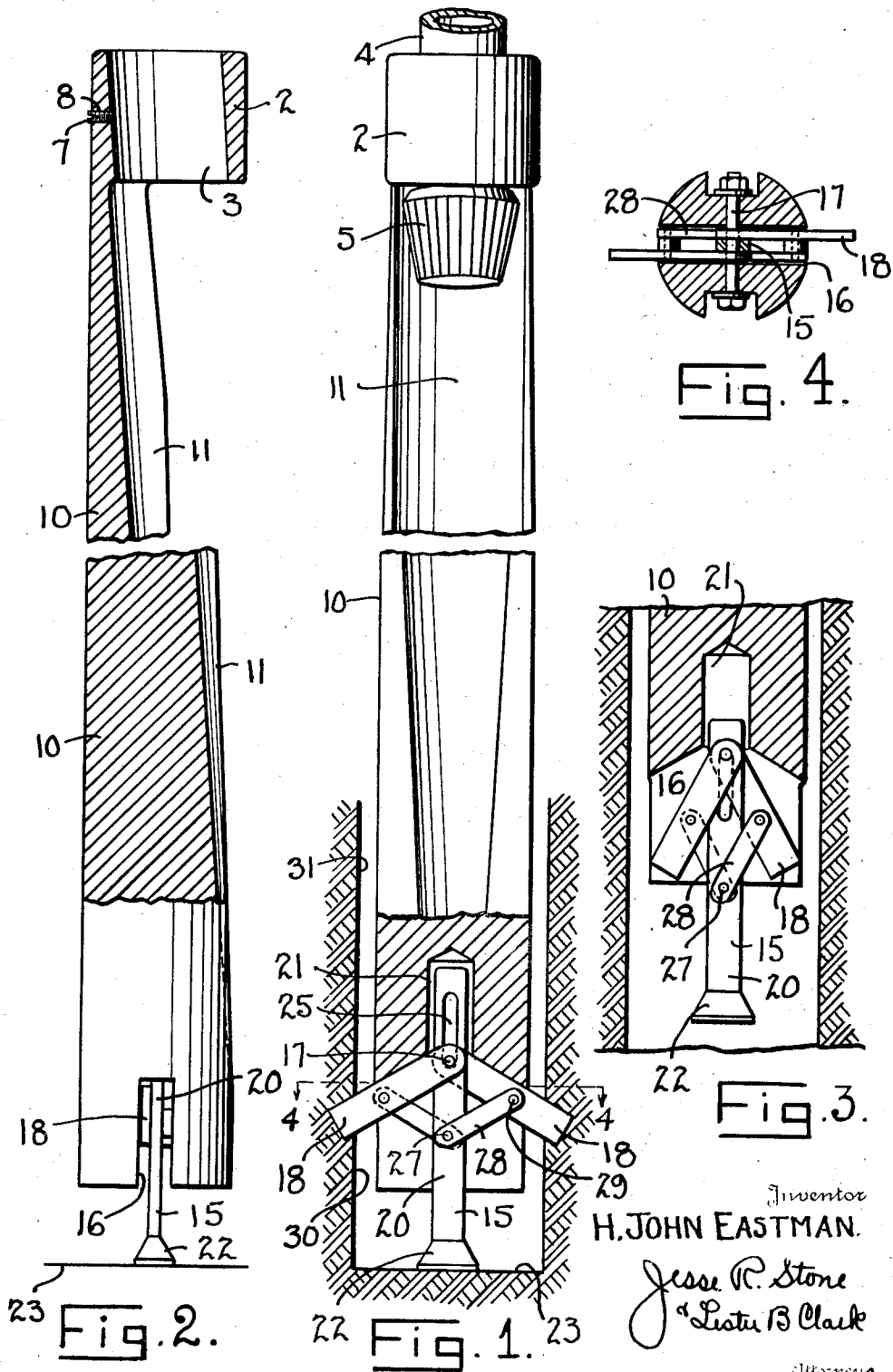


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WHIP STOCK BOTTOM
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WHIP-STOCK BOTTOM

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1 Claim. (Cl. 255—1)

The invention relates to a whipstock of the removable type which can be anchored in the well bore.

In directional drilling it is desirable to set the whipstock in the well bore in a predetermined and oriented position so as to direct the well bore in the desired manner. The practice has, therefore, grown up of inserting the drill bit and the whipstock into the well bore as a unit and orienting the whipstock so that the deflecting face will direct the drill bit in the desired manner. It is, of course, necessary to anchor the whipstock so that when the drill bit is released therefrom to perform the drilling operation the whipstock may be securely anchored in position. The present invention contemplates an expanding anchor for the base of the whipstock so that the whipstock can be set in a desired predetermined position and thereafter readily released after it has served its purpose so that it may be removed from the well bore.

It is one of the objects of the invention to provide a pivoted blade anchor construction for whipstocks.

Still another object of the invention is to provide an anchor for whipstocks which will be automatically set when the weight of the whipstock is positioned on the well bottom or against a suitable obstruction.

Still another object of the invention is to provide a removable whipstock and an automatically setting and releasing anchor therefor.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawing wherein:

Fig. 1 is a front elevation of the whipstock anchored in position in the well bore and showing the whipstock broken away to illustrate the anchoring mechanism.

Fig. 2 is an elevation taken at right angles to Fig. 1 with the drill bit removed.

Fig. 3 is a broken sectional view showing the anchor mechanism set in retracted position.

Fig. 4 is a section taken on the line 4—4 of Fig. 1.

The upper end of the whipstock is of the general type shown in the patent to McVicar No. 1,970,761, granted August 21, 1934, and includes a collar 2 which has a passage 3 therethrough to receive the drill stem 4. The drill stem has a drill bit 5 connected thereto. A pin 7 is arranged to pass through the opening 8 in the collar 2 and in this manner the whipstock is fastened to the drill stem so that the assembly may

be lowered into the well bore. This pin prevents relative rotation of the whipstock with respect to the drill stem so that if it is desired to orient the drill stem into position the operator is assured that the whipstock will be fixed in a desired and predetermined direction when his orientation has been completed. Of course, the pin 7 is arranged to shear when a sufficient weight is placed upon the drill stem so that the drill bit may advance to cut away the side of the well bore. The whipstock includes a body portion 10, which has the inclined deflecting face 11 thereon and has the collar 2 fixed integrally therewith at its upper end. The body 10 may be of any desired length or configuration and the angle of the deflecting face 11 may be varied for different whipstocks depending upon the angle of deflection which is desired.

In order that the whipstock may be readily anchored in position when it reaches the desired elevation an anchoring mechanism indicated generally at 15 has been arranged at the lower end thereof. This mechanism is disposed in a slot or groove 16 which extends transversely across the bottom of the body 10. A transverse shaft 17 is carried by the body and extends across the upper end of the slot. Pivoted on this shaft are the blades or anchor members 18, two of which have been illustrated. These members are of a length to project laterally from the bottom when they are in the raised position shown in Fig. 1 and to be confined within the slot when they are retracted, as seen in Fig. 3.

In order to actuate these blades to anchor the whipstock a plunger or stem 20 has been slidably arranged within the socket 21 which extends above the top of the groove 16 in the base of the whipstock. This stem has a foot 22 thereon to engage the bottom 23 of the well bore or to engage any other suitable obstruction in the well bore at an elevation where it is intended to set the whipstock. This stem is slotted at 25 so that it may move relative to the pins 17, and also carries a pivot pin 27 to which the links 28 are connected. These links are also pivoted at 29 to the blades 18. It seems obvious therefore that as the foot 22 engages the well bottom any further downward movement of the whipstock will carry the shaft 17 downwardly so as to cause outward pivoting movement of the blades 18. In this manner the blades will be driven into the formation 30 at the sides of the well bore 31 and the whipstock securely anchored.

In operation, as pressure is applied to the drill stem this pressure will be transmitted to the body

of the whipstock and the anchor will be securely set. Additional pressure will cause shearing of the pin 7 so that the drill bit may be rotated and lowered along the deflecting face 11 as desired.

- 5 When the deflecting operation has been completed the drill stem 4 is raised until the whipstock is picked up on top of the drill bit. Upward movement causes the blades 18 to be collapsed to the position shown in Fig. 3, so that the whip-
- 10 stock is readily removable.

What is claimed is:

A removable type whipstock including a collar, a body, a deflecting face, a plurality of blades carried by said body, a plunger connected to said blades, a foot on said plunger to contact the bot- 5 tom of the well bore, said plunger being slidable to extend said blades, said plunger connection including links.

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