April 19, 1927. 1,625,600

F. I. GETTY

WHIPSTOCK

Filed April 6, 1926

Fig. 1.

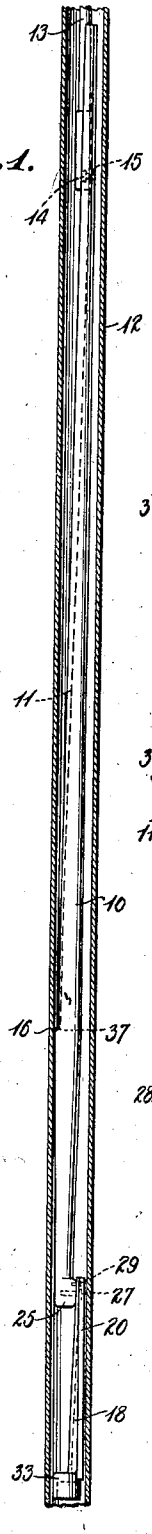


Fig. 2.

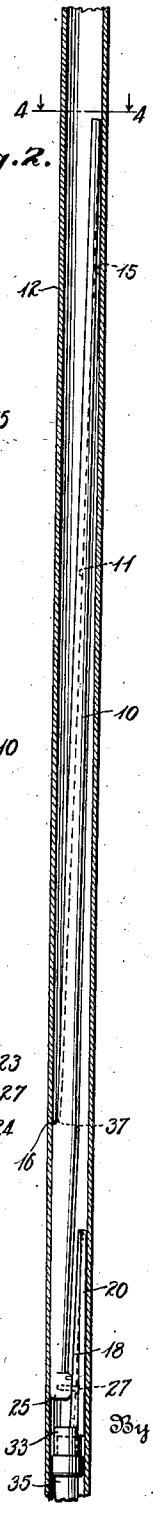


Fig. 3.

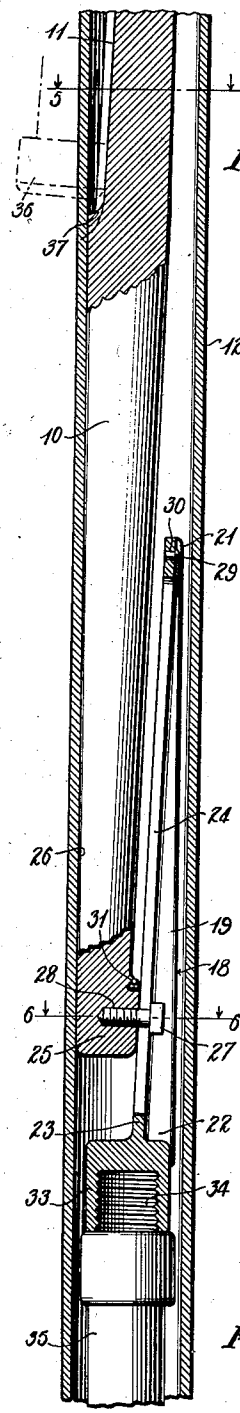


Fig. 4.

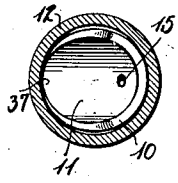


Fig. 5.

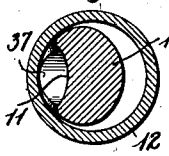


Fig. 6.

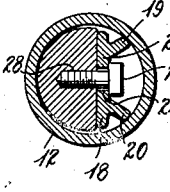
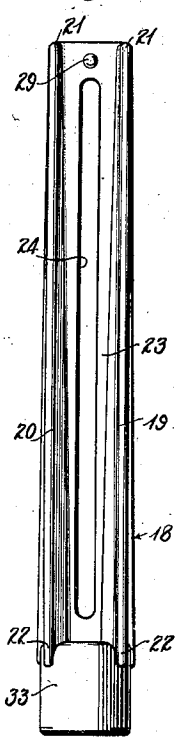


Fig. 7.



Inventor

Fred I. Getty

By Browne & Pierce

Attorneys

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UNITED STATES PATENT OFFICE.

FRED I. GETTY, OF JENNINGS, LOUISIANA.

WHIPSTOCK.

Application filed April 6, 1926. Serial No. 100,112.

The invention relates to whipstocks and has as an object to improve the form of whipstock shown by the patent granted to me July 22, 1924, No. 1,502,428. It is an object of the present invention to provide a whipstock which shall be more simple than that shown in my prior patent. It is a further object of the invention to provide a guiding surface for the cutting tool which shall result in a clean cut being formed in the wall of the well casing.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawings showing an illustrative embodiment of the invention and wherein:

Figure 1 is a vertical section of the device upon its introduction into a well casing,

Figure 2 is a like section of the device as being seated in the casing,

Figure 3 is an enlarged detail section of the device seated in the casing and showing the cutting tool adapted to cooperate therewith in dotted lines in its position adjacent the termination of the cut,

Figure 4 is a horizontal section to an enlarged scale taken on line 4—4 of Figure 2,

Figures 5 and 6 are horizontal sections respectively on lines 5—5 and 6—6 of Figure 3,

Figure 7 is a side elevation of the wedge member.

As shown the device comprises an elongated generally cylindrical body 10 having an elongated concave surface 11 extending throughout a great portion of its length, the whipstock when the device is seated in the casing 12 forming an inclined surface extending from side to side of the casing.

To seat the whipstock in the well casing, the same is adapted to be suspended as by means of the drill stem, having at its bottom end a rod 13 secured to the whipstock by means of a bolt 14 engaging a threaded opening 15 in the whipstock. When the whipstock has been lowered to its seating position it may be firmly seated and the bolt 14 may be sheared by lowering the whole device into place, whereupon the weight of the rod 13 and the drill stem will cause shearing of the bolt 14. The end of the rod 13 may be formed for purposes of retrieving the shearing portion of the bolt 14 in the manner shown by my former patent above referred to.

The whipstock as a whole is so formed in outline that the portion thereof below the point 16 where the concave surface 11 terminates is inclined away from that side of the whipstock in order that when the whipstock is seated the portion 16 will first contact with the wall of the casing in order to draw the upper end of the whipstock into close engagement with the opposite side of the interior of the casing.

To cause the engaging action above referred to there is shown a wedge-shaped member 18 preferably formed with spaced ribs 19 and 20 of less height at their upper ends 21 than at their lower ends 22, the wedge also comprising a web portion 23 having a longitudinal slot 24 formed therein.

To coact with the wedge 18 the lower end of the whipstock is shown as enlarged at 25 and flattened at its rear portion, the flattened portion being upwardly inclined away from the forward surface 26 thereof. A cap screw 27 is shown loosely engaging the slot 24 and taking into a threaded socket 28 in the end 25 of the whipstock. To hold the wedge in its extended position during the operation of lowering the device into a well casing a relatively weak cap screw 29 may be provided passing through an opening 30 in the end of the wedge 18 and taking into a threaded opening 31 in the end of the whipstock. In the action of the seating of the device this cap screw also will be sheared allowing the cap screw 27 to pass downwardly in the slot 24 thus wedging the lower end of the whipstock over in the casing by coaction of the inclined surface 32 of the whipstock with the face of the wedge 18.

For an engagement with a pipe or other object in place in the well and to provide resistance to bring about the wedging action described, the lower end of the wedge 18 is shown with an enlarged head 33.

At times it is desired to seat the whipstock in the well at some distance above the packer or liner of the well, the head 33 is therefore shown provided with an internal socket 34 adapted to be placed into screw-threaded engagement with a coupling member to which is suspended a string of pipe 35 of any desired length in accordance with the location at which it is desired to seat the whipstock.

In the form of device shown by my former patent the concave surface corresponding to the surface 11 of the present invention is

shown as sloping uniformly from side to side of the well casing. With this form of wedge it is found that the cutting tool such as shown in dotted lines at 36 of Figure 3 is liable to jump when the cut is almost completed whereby to leave a rough margin to the opening upon which a liner or strainer which it is desired to lower through the opening will catch. According to the present invention this difficulty is avoided by the form of surface shown in Figure 3 wherein the lower termination of the surface 11 is in the form of an abrupt curve 37. When so formed it is found that the cutting tool will be held in firm engagement with the whipstock until the opening in the casing has been cleanly cut through with no resulting difficulties in the passage of the liner or strainer.

The provision of the ribs 19 and 20 provide in connection with the flattened rear surface of the portion 25 a three point bearing of the wedging means whereby the whipstock will be accurately forced toward the desired side of the well casing.

Minor changes may be made in the physical embodiment of the invention without departing from its spirit.

I claim:

1. A whipstock comprising an elongated body adapted to be rigidly seated in a well casing, said body comprising a tapered portion, a concave surface carried by said tapered portion extending substantially from side to side of the interior of the casing when the tool is seated therein, said surface terminating at its lower end in an abrupt outward curve whereby to maintain contact with the cutting tool.

2. A whipstock comprising, in combination, an elongated body having a tapered upper portion provided with a concave tool engaging surface, and an oppositely tapered lower portion, a wedge coacting with said lower portion, separated upwardly diminishing ribs carried by said wedge adapted to contact with the interior of a well casing and means for slidably associating said wedge with said lower portion.

3. A whipstock comprising in combination an elongated body having a tapered portion provided with a concave tool engaging surface, a wedge surface carried by the lower extremity of said body, a wedge slidably associated with said last named surface, an enlarged head carried by the lower end of said wedge provided with an internally screwthreaded socket, said wedge provided with spaced upwardly diminishing rearwardly directed ribs.

4. A whipstock comprising, in combination, an elongated body having a tapered portion provided with a tool-engaging surface, a wedge surface carried by the lower extremity of said body, a wedge slidably associated with said last named surface, the said wedge having an enlarged head inwardly offset from the body of the wedge.

5. A whipstock comprising, in combination, an elongated body having a tapered portion provided with a tool engaging surface, a wedge surface carried by the lower end of said body, a wedge slidably associated with said last named surface and means to attach said wedge to a string of pipe.

6. A whipstock comprising, in combination, an elongated body having a tapered portion provided with a tool engaging surface, a wedge surface carried by the lower end of said body, a wedge slidably associated with said last named surface, the said wedge being threaded at its lower end.

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