

May 10, 1927.

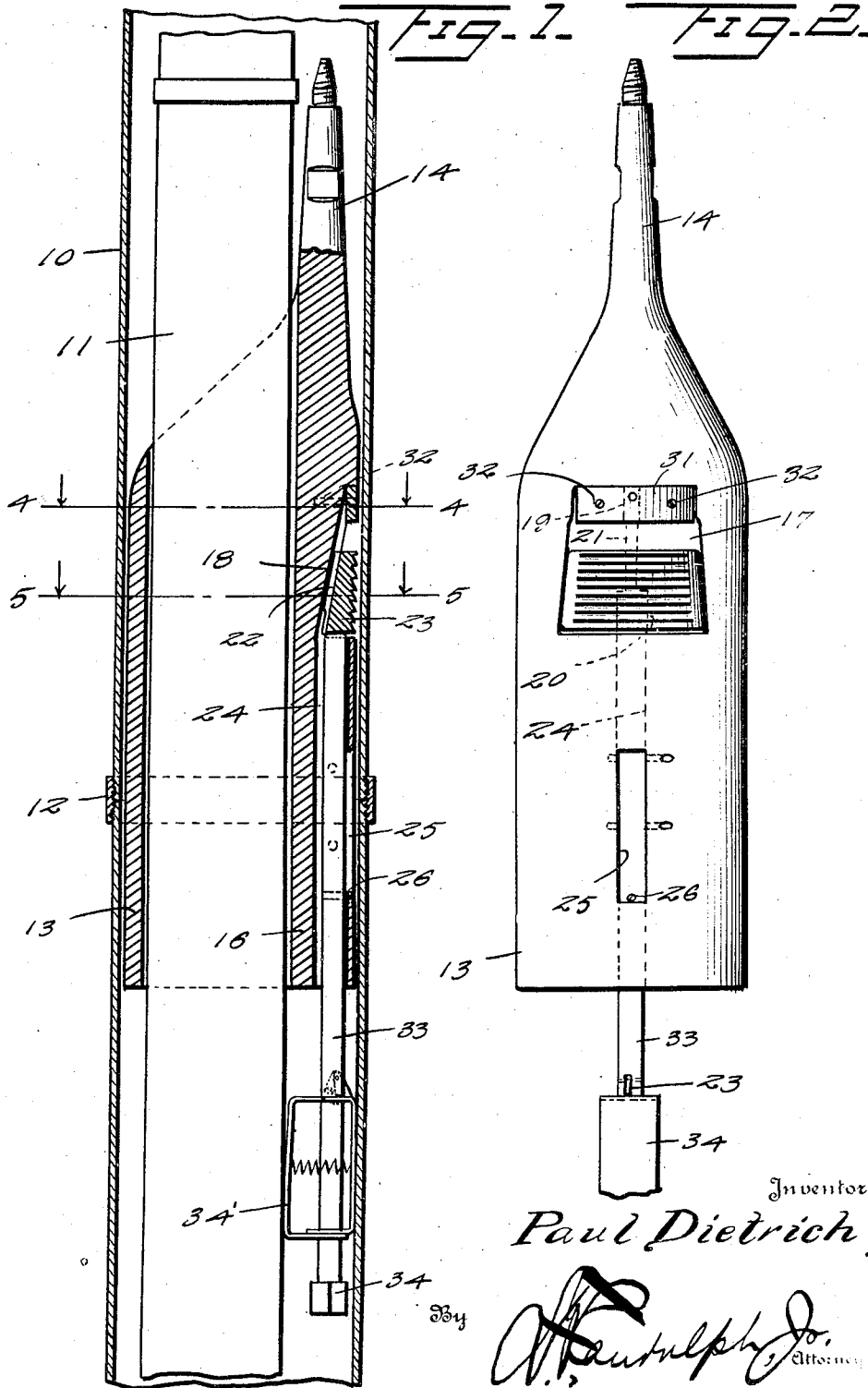
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COMBINED COLLAR BUSTER AND CASING SPEAR

Filed Sept. 16, 1924

2 Sheets-Sheet 1



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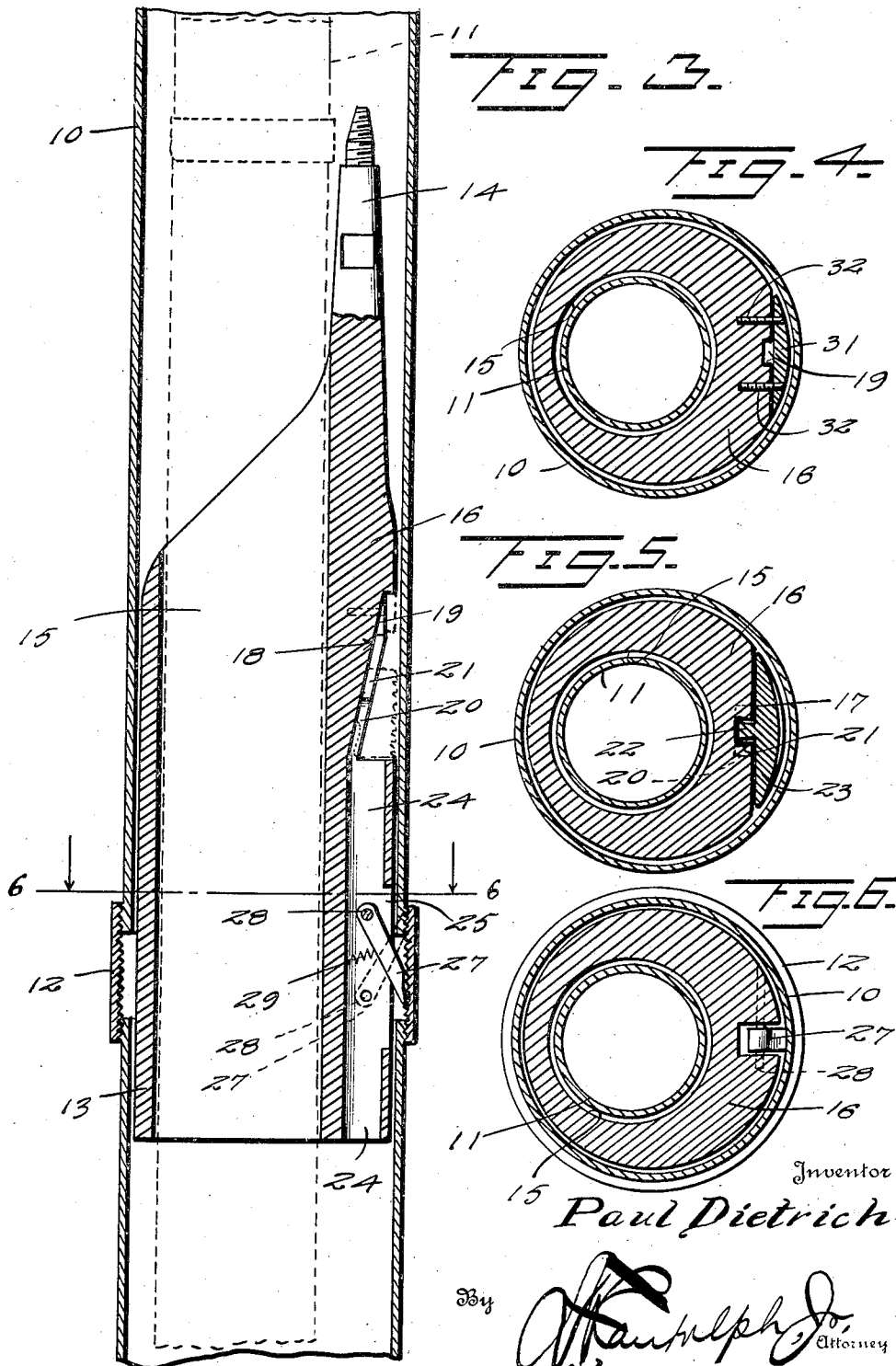
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UNITED STATES PATENT OFFICE.

PAUL DIETRICH, OF APPERSON, OKLAHOMA.

COMBINED COLLAR BUSTER AND CASING SPEAR.

Application filed September 18, 1924. Serial No. 738,089.

The present invention relates to deep well tools and more particularly to a casing tool whereby the same may be cut when required or jarred back into place when partly withdrawn, said tool being constructed to slip over the main pipe passing through the casing thereby preventing the tool from sticking in the well and causing trouble when removing the casing.

10 The invention furthermore provides a tool which will operate equally well upon being jarred upwardly or downwardly when cutting a collar to admit of the casing being removed in sections, said tool also operating effectively as a casing spear when 15 it is required to jar the casing back to place when stuck after being partly withdrawn.

Other objects and advantages will be apparent and suggest themselves as the nature 20 of the invention is understood.

While the drawings illustrate an embodiment of the invention it is to be understood that in adapting the same to meet 25 different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings 30 forming a part of the specification,

Figure 1 is a vertical central sectional view of a combined well tool embodying the invention showing the same adapted for use as a casing spear, the casing being 35 shown in section and the small pipe passing therethrough in full lines,

Figure 2 is a front elevational view of the tool as adapted for use as a casing spear,

40 Figure 3 is a view similar to Figure 1 showing the tool adapted for use as a collar buster, the full lines showing the bit operatively arranged for a downward jar of the tool, and the dotted lines indicating the position of the bit when the tool is adapted 45 for operative use by an upward jar,

Figure 4 is a horizontal sectional view on the line 4—4 of Figure 1,

Figure 5 is a similar sectional view on the line 5—5 of Figure 1, and

50 Figure 6 is a horizontal sectional view on the line 6—6 of Figure 3.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings 55 by like reference characters.

The numeral 10 designates the casing or

upper enlarged pipe section of an oil well and 11 the smaller pipe passing there-through and this casing comprises sections which are coupled by means of a collar 12. 60

The tool comprises a tubular body 13 having a shank 14 to which the jarring rod is adapted to be attached in a manner well understood and the opening 15 of the body is of a size to receive the smaller pipe 11 65 of the well so that the tool may be slipped thereover when lowered into the well for use as a casing spear or as a collar buster by being jarred upwardly or downwardly. The opening 15 is disposed to one side of 70 the center of the body whereby to provide a thickened portion 16 in which is formed an opening and cut away portions for the several operating parts. A portion of the outer side of the thickened part 16 is cut 75 away as indicated at 17 and its inner wall is inclined as indicated at 18. A groove is formed in the bottom of the inclined wall 18 and comprises enlarged end portions 19 and 20 and an intermediate constructed 80 portion 21, the side walls of which are undercut to coact with a wedge-shaped rib 22 on the rear side of a dog 23 whereby the latter is retained within the cut away portion 17 and prevented from casual detach- 85 ment. The dog 23 is of wedge form and its rear side is inclined to correspond with and ride upon the inclined wall 18 whereby a longitudinal movement of the dog also results in a lateral movement thereof. 90

The outer face of the dog 23 is toothed so as to bite into the inner wall of the casing 10 and firmly engage the same when the tool is jarred downwardly to return the casing after being lifted a short distance. An 95 opening 24 is formed in the thickened part 16 and communicates at its upper end with the cut away portion 17 and the lower enlarged portion 20 of the groove formed in the bottom thereof. A slot 25 is formed in 100 the outer side of the thickened part 15 and communicates with the opening 24 and is adapted to receive the outer end of a peg 26 and the active portion of a pivoted bit 27.

The bit 27 is pivoted at one end to the 105 body 13 as indicated at 28 and may be arranged to incline outwardly and downwardly as indicated by the full lines in Figure 3 or upwardly and outwardly as designated by the dotted lines in said figure, 110 the active end of the bit being tapered to a chisel edge so as to cut a collar 12 of the

casing when it is required to separate the latter into sections to facilitate its removal. A spring 29 normally urges the active end of the bit 27 outwardly so as to engage and cut the collar when the tool is jarred upwardly or downwardly according to the arrangement of the bit and the adaptation of the tool to operate by an upward or a downward jar. The pivot pin 28 for the bit is removable and adapted to be inserted through an upper or a lower opening 30 intersecting the opening 24. When the tool is adapted for use as a casing spear the bit 27 and pivot pin 28 are removed and the dog 23 is placed in position and retained in place by means of a keeper 31 which extends across the upper part of the cut away portion 17 and made fast to the body 13 by machine screws 32 or analogous fastening means. The keeper 31 prevents registering of the wedge-shaped rib 18 with the upper enlarged portion 19 of the groove in the bottom of the cut away portion 17 when the dog 23 is at the limit of its upward movement. However, when it is required to remove the dog 23 the keeper 31 is detached so that when the dog is moved upwardly to bring its rib 22 in register with the enlarged portion 19 of the said groove, the dog may be drawn forwardly and disconnected from the body.

A trip 33 is loosely fitted within the opening 24 and consists of a bar having an enlargement 34 at its lower end to form a stop, and terminating at its upper end about in line with the bottom of the cut away portion 17. This trip or bar 33 is formed with an opening to receive the peg 26 which is adapted to engage the lower end of the

slot 25 and prevent downward displacement of the trip. A slide grip 34' is mounted upon the lower portion of the trip 33 and is upwardly tapered so as to move upwardly freely with the trip and tool but which grips the inner pipe 11 and the casing 10 when the tool and trip are moved downwardly whereby to hold the trip 33 so that it may have a relative upward movement in the opening 24 to engage and move the dog 23 upwardly into operative position so as to initially grip the casing 10 and operate to lower or return the casing after being limited in its upward movement so that it may be possible to remove the casing by a repeated jarring action before having recourse to the separation thereof into sections by adapting the tool for use as a buster for the collars.

What is claimed is:—

A well tool of the character specified comprising an eccentric bore to slip over the inner pipe and having a relatively thick side portion, a shank attachable to a jarring rod and extending from said side portion and disposable between the inner pipe and well casing, said body having a side portion being cut away and the bottom of the cut away portion inclined and provided with a groove having an end portion enlarged and a portion with its opposite walls under cut, a dog having a rib to enter the enlarged portion of said groove and engage the under cut portion thereof, and a keeper applied to the body to prevent registering of the rib of the dog with the enlarged portion of the said groove to prevent casual displacement of the dog.

In testimony whereof I affix my signature.
PAUL DIETRICH.