Sept. 7, 1926. 1,599,067

A. L. SEGELHORST

FISHING TOOL

Filed May 18, 1922

Fig. 1.

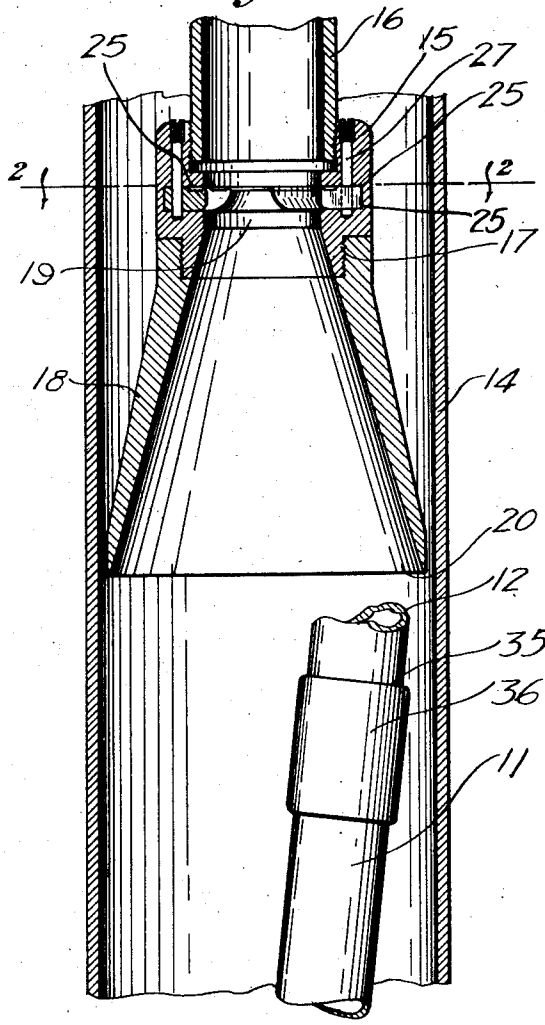


Fig. 3.

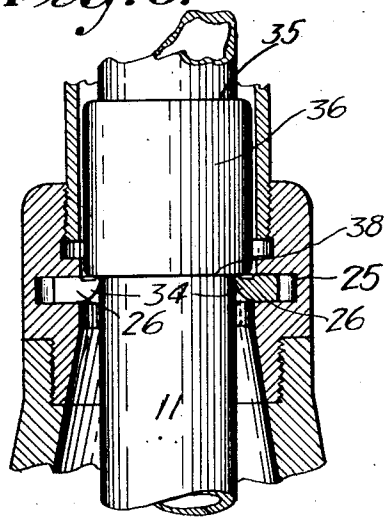


Fig. 4.

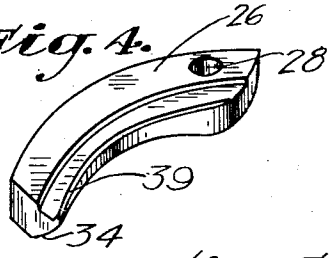


Fig. 5.

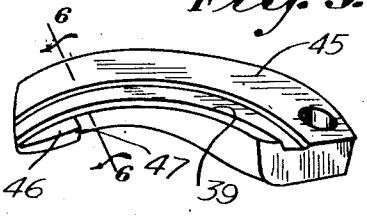


Fig. 6.

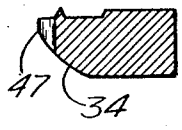
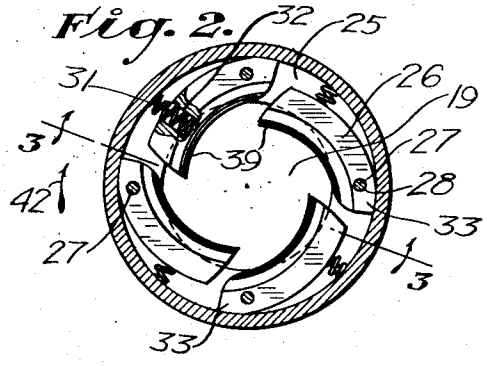


Fig. 2.



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Patented Sept. 7, 1926. 1,599,067

UNITED STATES PATENT OFFICE.

AUGUST L. SEGELHORST, OF LOS ANGELES, CALIFORNIA.

FISHING TOOL.

Application filed May 18, 1922. Serial No. 561,791.

My invention relates to the mechanical arts and consists of a device having a broad scope of application, but which is particularly adapted to use in the oil industry.

It is an object of my invention to provide a device which may be used as an overshot for removing drill pipe from a well.

It is a further object of my invention to provide an overshot which may be released from the drill pipe in the well without breakage of the gripping elements of the overshot.

It is a further object of my invention to vide a device of the character described which may be used as a cut-off tool for cutting off pipe within a well.

It is also an object of my invention to provide a device of the character described which may be used as a trip for casing cutters and fishing tools.

Other objects and advantages will be made evident hereinafter.

Referring to the drawing which is for illustrative purposes only:—

Fig. 1 is a vertical sectional view illustrating the utility of my device as an overshot for removing drill pipe or well tubing from a well.

Fig. 2 is a section through my device taken on a plane represented by the line 2—2 of Fig. 1.

Fig. 3 is a vertical section showing the manner in which the device engages the underside of a drill pipe collar in order to lift the drill pipe from the well and is taken substantially upon a plane represented by the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of one of the blades employed in the device.

Fig. 5 is a perspective view showing a blade provided with means for cutting off drill pipe within the well.

Fig. 6 is a section taken upon a plane represented by the line 6—6 of Fig. 5, showing the manner in which the blade is relieved to permit it to ride over drill pipe or tubing collars when the tool is being lowered over the pipe to the position at which it is desired to make the cut.

In the drilling of wells by the rotary system, the drill pipe 11, as indicated in Fig. 1, is sometimes twisted off as shown at 12 due to the jamming of the drill bit at the bottom of the well. The break 12 may occur at any point within the well either below or within the well casing 14. In order to remove the lower portion 11 of the drill pipe which remains within the hole, it is necessary to lower a gripping device into the well which will engage the drill pipe 11 so that it may be lifted to the surface.

In the adaptation of my invention to this utility I provide a collar 15 which may be provided with an entire or uninterrupted periphery and may be threaded to receive the end of a line of pipe 16, and also threaded at 17 so that a bell 18 may be screwed thereupon to serve as a centering means for directing the end of the drill pipe 11 into the opening 19 provided in the collar 15, this bell 18 being nearly the full diameter of the inside of the casing 14, at its lower end 20. A groove 25 formed upon the interior of the collar 15 contains a number of curved blades 26 which are maintained within the groove 25 by pins 27 which pass through holes 28, situated near one end of the blades 26. The blades are normally maintained in the position in which they are shown in Fig. 2 by springs 31 which operate in holes 32 provided in the blades and bear against the bottom of the groove 25, the distance the blades extend into the central opening 19 of the collar being limited by the engagement of the rear end 33 of each of these blades with the bottom of the groove 25. The lower inward edge of each of the blades 26 is relieved as shown at 34 in Figs. 1, 3 and 4, the extent of the relief being proportionate to the distance which the blade extends into the opening 19.

As the arrangement shown in Fig. 1 is lowered within the casing, the upper end of the drill pipe 11 is engaged by the bell 18 and is directed through the opening 19 in the collar 15. The relieved or cam faces 34 of the blades 26 come in contact with the upper shoulder 35 of the collar 36 and the blades are forced back into the grooves 25 against the action of the spring 31 and ride down over the collar 36, whereupon the action of these springs 31 causes the blades to assume their original positions of extension into the opening 19. The overshot may then be lifted so that the blades rest against the lower shoulder 38 of the collar 36, thus providing a means of engagement whereby the line of drill pipe may be lifted from the well.

Owing to the rapid entrance of sand into the hole being drilled, it is often found that the drill pipe 11 and the tool attached to the lower end thereof are held by the sand which

has settled therearound, making it impossible to remove such tools. Under these conditions it becomes necessary to remove the overshot from the upper end of the drill pipe and to wash out the sand or portions of the sand so that the drill pipe may be divided into separate lengths by cutting off, these separate lengths being removed consecutively by the overshot tool.

The overshot tools now in use are provided with engagement members which must be broken off before the tool can be removed from the end of a drill pipe stuck in the well, the broken portions dropping into the well and later causing trouble when the drilling of the well is again proceeded with My invention provides a means whereby the overshot may be quickly released from the upper end of the drill pipe without the breakage of any parts thereof. This is accomplished by the formation of a thread or ridge 39 on the upper surface of each of the blades 26, preferably at the outer edge of the blades as shown in the illustration. From Fig. 2 it will seen that these threads 39, although shown as extending substantially parallel with edges of said blades, are, by reason of the position taken by said blades, under pressure of springs 31, or their equivalents, somewhat spiral in their extension and that when they are in forcible engagement with the shoulder 38 of the collar 36, as shown in Fig. 3, they have a tendency to form slight spiral depressions in the undersurface of the coupling. By rotating the collar 15 in the direction of the arrow 42 in Fig. 2, the threads 39 are caused to travel in the outwardly progressing spiral indentations which they have formed in the lower face of the coupling 36, with the result that they are swung into the groove 25, out of engagement with the coupling 36,-and riding over the coupling 36 permit the overshot tool to be lifted from the end of the drill pipe 11.

In Figs. 5 and 6 I show my device adapted to use as a tool for cutting off drill pipe or tubing within the well. The blade 45 is substantially the same as the blades 26 shown in the preceding views, but has a cutter projection 46 formed thereupon which provides a cutting edge 47. The blades 45 are adapted to be inserted in place of the blades 26 in the groove 25 of the collar 15 which may then be lowered over the casing which is to be cut off in the same manner as the overshot tool. When the cut-off tool thus provided has been lowered to the point at which the cut is to be made, it is rotated in a clock-wise direction so that the cutting edge 47 of the cutter projection 46 will act against the surface of the pipe due to the pressure exerted by the springs 31 and accomplish the removal of metal from the pipe. This rotation is continued until the pipe has been severed, whereupon the portion of the pipe above the blades 45 is lifted from the well with the cut-off tool.

My invention is adapted to other valuable uses in the various industrial arts and I do not desire that its use be limited to the operations shown and described hereinbefore, but intend to practice my invention to the full extent and scope of the hereafter appended claims.

I claim as my invention:

1. In a fishing tool of the class described, the combination of: a collar; a guide bell extending therebelow; curved blade members so mounted on said collar as to be inwardly projectable; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means, comprising spiral ridges, upon said members, consequent in operation upon the rotation of said collar when said members are in engagement with a shoulder, for moving said members outwardly out of engagement with said shoulder, the said ridges being substantially parallel with edges of said blades.

2. In a fishing tool of the class described, the combination of: a collar; a guide bell extending therebelow; curved blade members so mounted on said collar as to be inwardly projectable, said members being relieved so that they will ride over projections as the collar is advanced in one direction; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means comprising spiral ridges, upon said members, consequent in operation upon the rotation of said collar when said members are in engagement with a shoulder, for moving said members outwardly out of engagement with said shoulder, the said ridges being substantially parallel with edges of said blades.

3. In a fishing tool of the class described, the combination of: a collar; a guide bell extending therebelow; curved blade members pivoted at one end to said collar and adapted to be swung inwardly; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means comprising spiral ridges upon said members and consequent in operation upon the rotation of said collar when said members are in engagement with a shoulder for moving said members outwardly out of engagement with said shoulder, the said ridges being substantially parallel with edges of said blades.

4. In a fishing tool of the class described, the combination of: a collar; a guide bell extending therebelow; curved blade members pivoted at one end to said collar and adapted to be swung inwardly, said members being relieved so that they will ride over projections as the collar is advanced in one

direction; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means comprising spiral ridges upon said members and consequent in operation upon the rotation of said collar when said members are in engagement with a shoulder for moving said members outwardly out of engagement with said shoulder, the said ridges being substantially parallel with edges of said blades.

5. In a tool of the class described, the combination of: a collar having a circular groove formed in the interior surface thereof; blades pivoted at one end within said groove; resilient means for partially rotating said blades upon their pivots so that portions thereof extend into the opening through said collar, thread means formed upon the upper surface of said blades adapted to so engage the plane surface of a body resting upon said extended blades that said blades will travel spirally outwardly when said collar is rotated in a forward direction.

6. In a tool of the class described, the combination of: a collar having a circular groove formed in the interior surface thereof; blades pivoted at one end within said groove; springs operative between said blades and said collar for partially rotating said blades upon their pivots so that portions thereof extend into the opening through said collar, thread means formed upon the upper surface of said blades adapted to so engage the plane surface of a body resting upon said extended blades that said blades will travel spirally outwardly when said collar is rotated in a forward direction.

7. In a tool of the class described, the combination of: a collar having a circular groove formed in the interior surface thereof; blades pivoted at one end within said groove, said blades having their lower inward edges relieved so that they will ride over projections; resilient means for partially rotating said blades upon their pivots so that portions thereof extend into the opening through said collar; thread means formed upon the upper surface of said blades adapted to so engage the plane surface of a body resting upon said extended blades that said blades will travel spirally outwardly when said collar is rotated in a forward direction.

8. In a tool of the class described, the combination of: a collar having a circular groove formed in the interior surface thereof; blades pivoted at one end within said groove, said blades having their lower inward edges relieved so that they will ride over projections; springs operative between said blades and said collar for partially rotating said blades upon their pivots so that portions thereof extend into the opening through said collar; thread means formed upon the upper surface of said blades adapted to so engage the plane surface of a body resting upon said extended blades that said blades will travel spirally outwardly when said collar is rotated in a forward direction.

9. In a fishing tool of the class described the combination of: a collar; a guide bell extending therebelow; curved blade members so mounted by said collar as to be inwardly projectable by rotation on fixed pivots; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means for retracting said members, said means being operative by rotating said collar and comprising spiral ridges adapted to engage surfaces cut thereby, the said ridges being substantially parallel with edges of said blades.

10. In a fishing tool of the class described, the combination of: a collar; a guide bell extending therebelow; curved blade members so mounted by said collar as to be inwardly projectable, said members being relieved so that they will ride over a projection as the collar is advanced in one direction; means for resiliently projecting said members so that portions thereof extend into the opening through said collar; and means comprising spiral ridges on said members and consequent in operation upon the rotation of said collar for retracting said members, the said ridges being substantially parallel with edges of said blades.

11. In a fishing tool of the class described, the combination of: an entire and rotatable body; a guide bell extending therebelow; curved blade members so mounted relatively to said body as to be projectable; means for resiliently projecting said members; and means comprising spiral ridges on said blade members for retracting said members by a rotation of said body when it is required to pass over an obstruction, the said ridges being substantially parallel with edges of said blade members.

12. In a fishing tool of the class described, the combination of: an entire and rotatable collar a guide bell extending therebelow; curved blade members so mounted relatively to said collar as to be concentric with respect to said collar and swingable in a plane perpendicular to the axis of said collar; resilient means for swinging said members into projecting position relative to said collar; and retracting means therefor comprising spiral ridges thereon, the said ridges being substantially parallel with edges of said blades.

13. In a fishing tool of the class described, the combination of: an entire and rotatable collar a guide bell extending therebelow; curved blade members so mounted relatively

to said collar as to be concentric with respect to said collar and swingable in a plane perpendicular to the axis of said collar; and cam means for swinging said members to or from projecting position relative to said collar.

14. In a tool of the class described, the combination of: a bell; a collar having a circular groove formed in the interior surface thereof; blades pivoted at one end within said groove, said blades arranged to extend substantially tangentially with respect to an opening through said collar; and spring means operative between said blades and said collar for partially rotating said blades upon their pivots so that portions thereof extend into the opening through said collar.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 12th day of May 1922.

AUGUST L. SEGELHORST.