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M. F. ALOI

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FISHING TOOL

Filed Oct. 3, 1928

Fig. 4

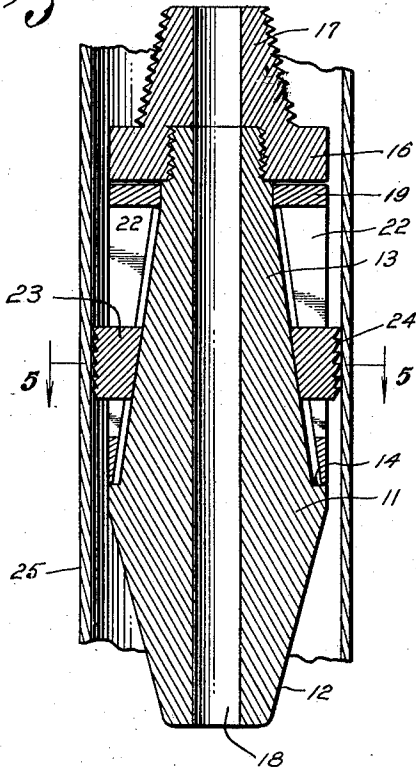


Fig. 1

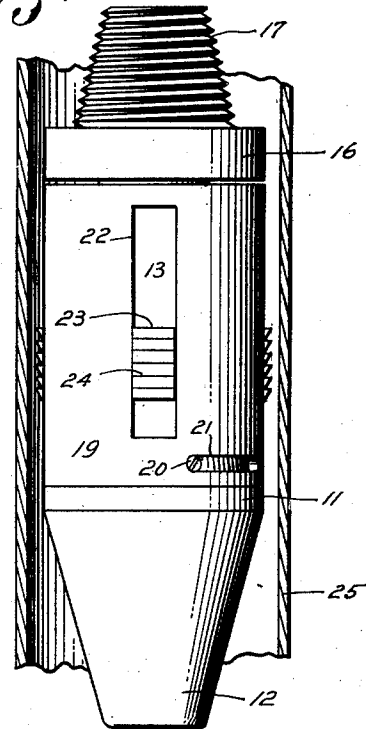


Fig. 5

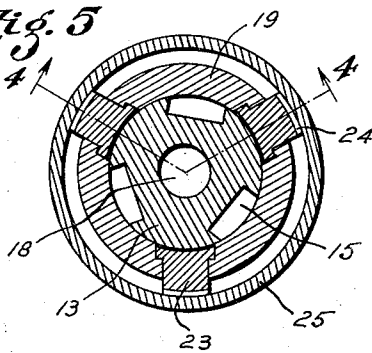


Fig. 2

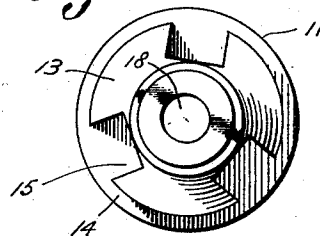
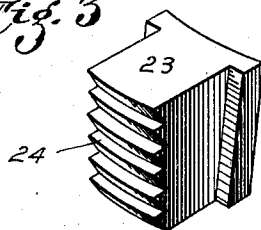


Fig. 3



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FISHING TOOL

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My invention relates to spears for deep well fishing operations, to recover tubular tools and material lost in a well.

Among its salient objects are: first, to provide an improved device of this nature adapted for entering the bore of tubular material, and for engaging the interior walls thereof to exert a powerful upward pull thereon; second, to supply a very simple and effective one-way clutch for effecting the aforesaid engagement; third, to afford simple and adequate facilities for releasing the grip of the tool underground, in case the fished-for material should prove to be immovable; and, fourth, to accomplish the above by means of simple and relatively inexpensive construction of great inherent strength.

My objects are attained in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved device within a tubular "fish".

Figure 2 is a plan view of the main body element of the device, illustrating the longitudinal grooves therein for accommodating the gripping jaws when it is desired to release them to render the tool in-operative;

Figure 3 is a perspective view, on an enlarged scale, of one of the gripping jaws;

Figure 4 is a longitudinal section of the tool, taken on the line 4—4 of Fig. 5; and

Figure 5 is a cross-section of the device, taken on the line 5—5 of Fig. 4.

Similar reference numerals refer to similar parts throughout the several views.

In the specific form of my invention selected for illustration, the main body element 11 has a penetrating nose 12, of inverted frusto-conical form, and a smaller frusto-conical upper portion 13; there being an intermediate circumferential shoulder 14 adapted for supporting the gripping portions of the device. The upper portion of the body constitutes a conical mandrel, and is formed with three equally spaced longitudinal grooves 15 in its periphery. The bottoms of these grooves are parallel to the axis of the tool, so that they become deeper at their lower ends.

At the upper end of mandrel 13 is a heavy cap-member 16, firmly screwed thereon and

comprising at the top a taper-screw pin 17 adapted for engaging a tool-joint or other similar member at the lower end of a fishing-string. Both the cap and the body element are axially bored, to afford a circulating passage 18 through the tool from end to end.

Surrounding mandrel 13 and retained between shoulder 14 and the lower end face of cap-member 16, is a floating cage 19. This cage is conically bored, and is arranged to have a slight longitudinal play. It is free to rotate between limits established by a stop screw 20, tapped into the main body of the tool and working within a circumferential slot 21 formed in the cage. The latter is also provided with three longitudinal slots 22, and its inside conical bore is subjected to a shaping operation so as to make slots 22 of T-form.

Gripping T-headed jaws 23 are provided within slots 22 and these are free to slide longitudinally therein in engagement with the conical surface of mandrel 13. The outer ends of the gripping jaws have upwardly directed circumferential teeth 24, adapted for biting into the inner wall of a tubular fish. The inner T-heads of the jaws slant downwardly and outwardly at the same angle as the conical surface of mandrel 13.

My improved spear is made use of by lowering it into the well to be fished, at the bottom end of a tool-string. The latter is manipulated until nose 12 enters the bore of the fish 25, and the tool-string is then lowered somewhat more to allow the gripping jaws to engage the interior walls thereof. Prior to lowering the tool into the well, cage 19 has been angularly positioned with respect to mandrel 13 in the manner illustrated in Figs. 1, 4, and 5. In this position the T-heads of the gripping jaws engage the conical surface of the mandrel, and tend to drop downwardly by gravity. The jaws and cage may be maintained in this relative angular position by slowly rotating the tool-string in a clockwise direction looking downwardly, the friction of the jaws against the walls of the well casing then keep the cage-slot 21 in contact with the stop screw 20, as shown in Fig. 1. As the tool descends within the bore of the fish, jaws

23 will move upwardly when necessary to permit the descent of the tool. When however, an upward pull is exerted upon the tool, after entering the fish, the jaws will be forced outwardly by mandrel 13, and their teeth will bite into the interior walls of the fish. A powerful upward pull can then be exerted for withdrawing the fish from the well.

In case the fish should prove to be immovable, and it is desired to release the grip of the tool for withdrawing the latter without breakage, this is accomplished by first slackening down slightly on the tool-string, and then rotating it counter clockwise. The friction of the jaws against the interior wall of the fish will then cause cage 19 to become angularly displaced with reference to the mandrel in such a manner that the other end of the slot 21 will engage stop screw 20. In this position the gripping jaws are free to retract within longitudinal grooves 15 of the mandrel, and the tool can then be withdrawn from the well without danger of breaking the jaws.

Having thus fully described my invention I claim:

1. A fishing tool comprising; a mandrel provided with a downwardly and outwardly tapered-surface, and with a longitudinal peripheral groove extending downwardly from the upper portion of the mandrel; a cage having a longitudinal slot therethrough, outside of the mandrel and rotatable about the axis thereof; and a longitudinally slidable jaw within said slot, normally engaging the tapered surface of the mandrel and adapted for retraction within said groove when the cage is rotated.

2. A fishing tool comprising; a conical mandrel provided with a plurality of longitudinal peripheral grooves extending downwardly from its upper portion; a sleeve having a corresponding plurality of longitudinal slots therethrough, surrounding the mandrel and rotatable about the axis thereof; and a longitudinally slidable jaw within each of said slots, normally engaging the conical surface of the mandrel and adapted for retraction within said grooves when the cage is rotated.

3. A fishing tool comprising; a conical mandrel provided with a plurality of longitudinal peripheral grooves having their bottoms parallel to the axis of the mandrel, and extending downwardly from the upper portion thereof; a taper-bored sleeve having a corresponding plurality of longitudinal slots therethrough, mounted upon said mandrel and rotatable about said axis; and a longitudinally slidable jaw within each of said slots, normally engaging the conical surface of the mandrel, adapted to variably project beyond said sleeve, and capable of being retracted within said grooves.

4. A fishing tool comprising; a conical mandrel provided with a plurality of longitudinal peripheral grooves having their bottoms parallel to the axis of the mandrel, and extending downwardly from the upper portion thereof; a taper-bored sleeve having a corresponding plurality of longitudinal slots therethrough, mounted upon said mandrel and rotatable about said axis; a longitudinally slidable jaw within each of the said slots, normally engaging the conical surface of the mandrel, adapted by its slidability to variably project beyond said sleeve, and capable of being retracted within said grooves; and means for limiting the angular motion of said sleeve so that only at one extreme thereof will the jaws be opposite said grooves.

5. A construction as set forth in claim 2, wherein means are provided for retaining the jaws within their respective slots.

6. A construction as set forth in claim 2, wherein the inner portions of the jaws are laterally extended, and the inner portions of the slots are correspondingly shaped to fit the jaws.

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