Nov. 4, 1952 R. G. ALFORD 2,616,749

RELEASING WASHOVER OVERSHOT

Filed Jan. 6, 1947 3 Sheets-Sheet 1

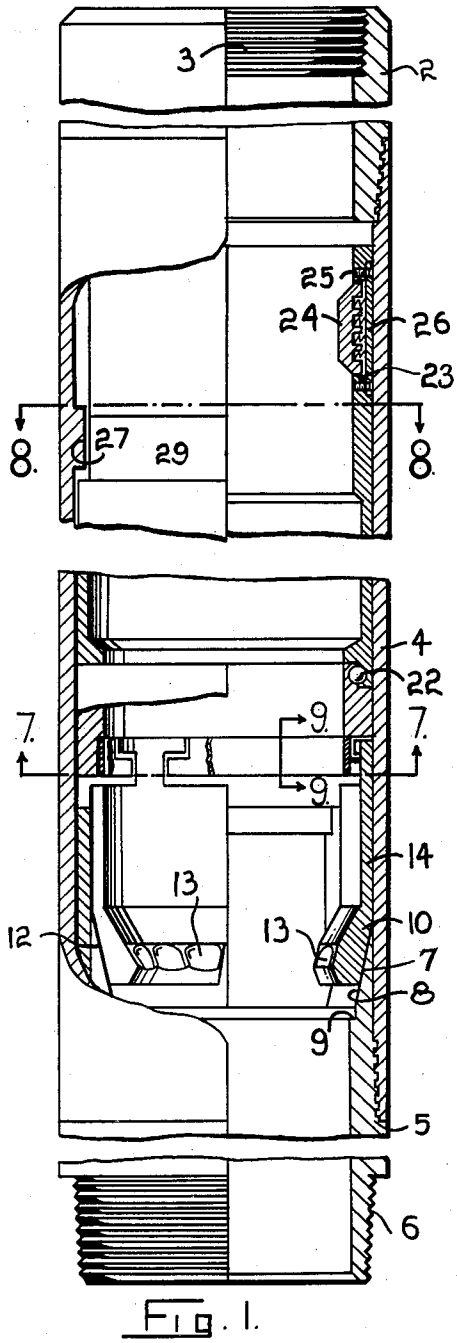


Fig. 1.

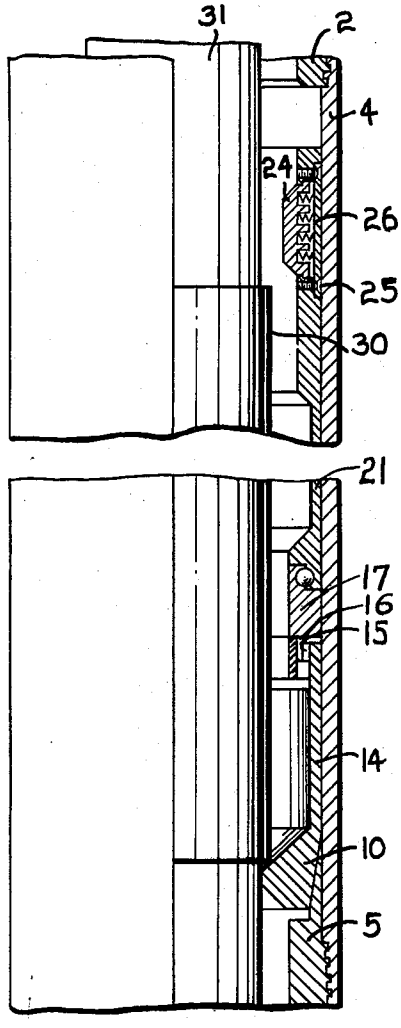


Fig. 2.

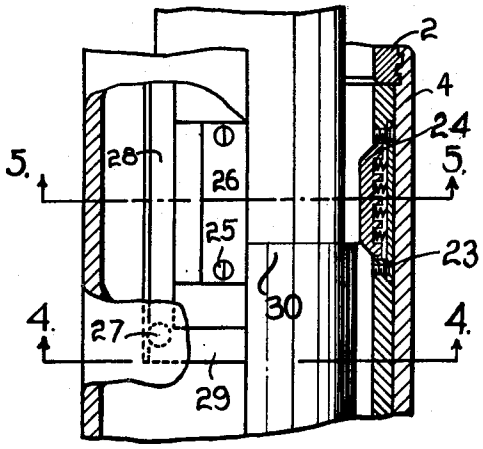
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RELEASING WASHOVER OVERSHOT

Filed Jan. 6, 1947 3 Sheets-Sheet 2



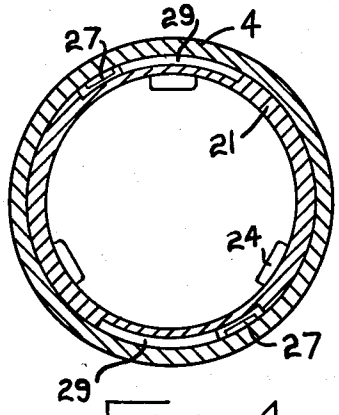


Fig. 4.

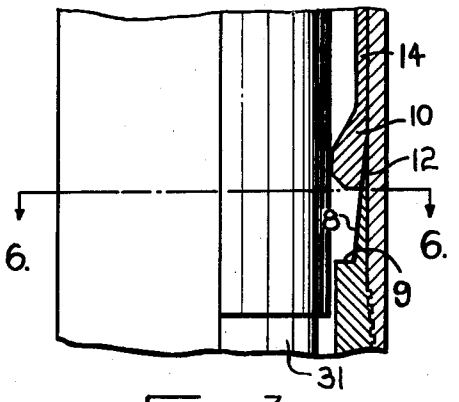


Fig. 3.

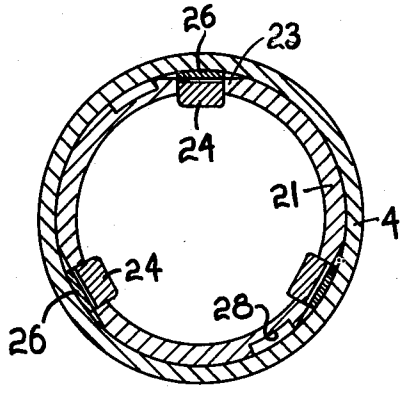


Fig. 5.

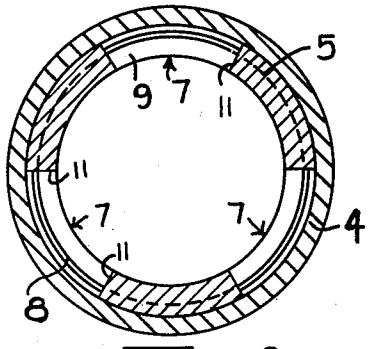


Fig. 6.

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Nov. 4, 1952 R. G. ALFORD 2,616,749

RELEASING WASHOVER OVERSHOT

Filed Jan. 6, 1947 3 Sheets-Sheet 3

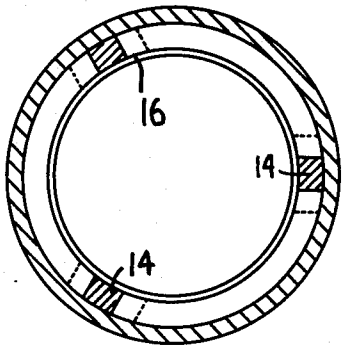


Fig. 7.

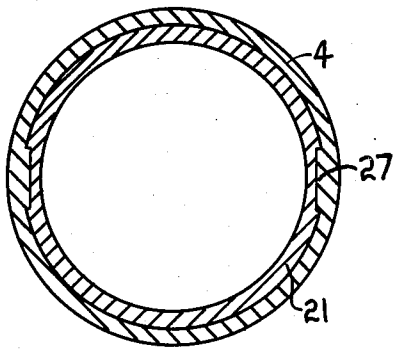


Fig. 8.

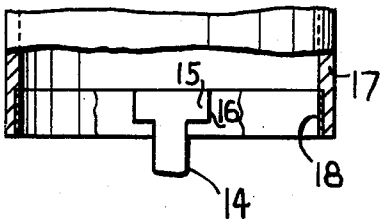


Fig. 9.

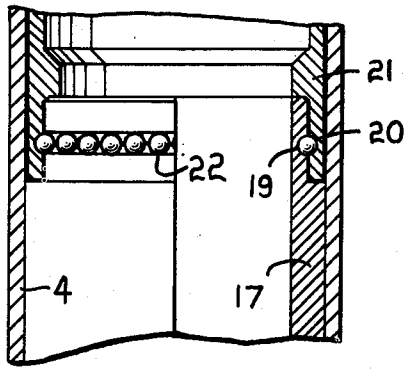


Fig. 10.

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UNITED STATES PATENT OFFICE

2,616,749

RELEASING WASHOVER OVERSHOT

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Application January 6, 1947, Serial No. 720,324

9 Claims. (Cl. 294—86)

1

The invention relates to a releasable overshot gripping device for fishing pipe from wells.

An object of the invention is to provide an overshot for retrieving stuck pipe from a well bore.

Another object of the invention is to provide a gripping device capable of being released from the member gripped.

Another object of the invention is to provide a gripping device capable of being released from the member gripped wherein the releasing mechanism is of simple construction and positive in action.

A further object of the invention is to provide an overshot for gripping a fish having an improved mechanism for releasing the overshot from the fish gripped which eliminates the use of threads in the releasing mechanism, thereby reducing the possibility of the overshot becoming fouled during its operation.

A still further object of the invention is to provide a releasable overshot assembly having a minimum of operative parts.

Other objects and advantages will become apparent with a consideration of the following description and drawings wherein:

Fig. 1 is a vertical sectional view of the device showing an arrangement of the parts thereof;

Fig. 2 is a vertical quarter sectional view of the device in engagement with a pipe which is shown in elevation;

Fig. 3 is a partial quarter, partial vertical sectional view of the device showing the friction anchors in contact with the pipe being gripped and the preferred means of retaining the slip holder and slips in disengagement from the pipe gripped;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3 showing a J slot or keyway on the outer periphery of the upper friction carriage assembly and the corresponding key on the body of the overshot;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view on the line 6—6 of Fig. 3, showing the slip cage with the slip guides therein;

Fig. 7 is a sectional view on the line 7—7 of Fig. 1 showing the method of supporting the slips in the slip holder;

Fig. 8 is a sectional view on the line 8—8 of Fig. 1 showing the keys on the body of the device;

Fig. 9 is an elevational, part sectional view showing the method of retaining the slips in the slip holder; and

2

Fig. 10 is a vertical sectional view of the body of the device showing the upper portion of the slip holder and the swivel connection to the sleeve or friction anchor carriage in elevation.

In Fig. 1 the tool is shown as being suspended from a collar 2 threaded internally at 3 to be connected to a string of pipe (not shown) by which the device is lowered into the well bore. Such pipe may be of suitable diameter to telescope over the stuck pipe or fish, so that liquid circulated down through the pipe will wash over the stuck pipe tending and assisting in effecting its release.

The body 4 of the tool, enclosing the inner assembly, extends downwardly and is connected at its lower end to a slip cage 5 which is in turn externally threaded at 6 for connection thereto of an extension if desired. This thread 6 may receive a rotary shoe to help cut away material about the stuck pipe.

The slip guides 7 formed adjacent the upper inner end of the slip cage 5 are provided with inwardly tapered bearing surfaces 8, the inner end of these surfaces ending in the annular shoulder 9 which affords a stop means for the slips 10. The vertical radial shoulders 11 form a dove tail to retain the slips 10 in correct longitudinal alignment as they slide downwardly onto the surfaces 8 of the slip guide 7.

The slips 10 have an outer slide surface 12 complementary to bearing surfaces 8. Teeth 13 on the inner surfaces of the slips 10 afford better gripping action of the slips with the fish. The stems 14 extend upwardly from each of the slips and each is formed at its top with the lateral extensions 15 adapted to fit into the similarly cut slot 16 of the slip holder 17.

The slips are retained in position in the slip holder by the inner surface of the body 4 on one side, Fig. 1, and the slip retainer ring 18, Fig. 9, on the other side. Any number of slips and slip guides may be provided.

The annular groove 19 on the outer portion of the upper end of the slip hanger or holder 17, and corresponding groove 20 on the inner periphery of the lower end of the sleeve or wiper cage 21, are arranged to receive swivel balls 22. Adjacent the upper end of the sleeve, or wiper cage 21, spaced windows 23 are provided therethrough to receive the friction anchors or wipers 24 secured thereat by suitable means such as the screws 25 and the cover plate 26.

The friction anchors 24 are arranged to extend inwardly from the wiper cage 21 so as to engage the member gripped, as will be more fully described.

The body 4 is provided with the keys 27 on its inner surface to fit into the corresponding keyways 28 which are on the outer surface of wiper cage 21. The keyways 28 are shown as extending longitudinally of the wiper cage with the lower ends 29 thereof extending laterally from the keyways 28, as best seen in Fig. 3. The construction affords longitudinal movement of the wiper cage 21 and slip hanger 17 with respect to the body 4, while at the same time, slip holder 17 and slip cage 21 are rotatable with respect to each other. While only a single key 27 is illustrated in Fig. 1, for ease of illustration, in practice, ordinarily two or more keys 27 are utilized, as best seen in Fig. 8.

In operation of the tool, it is run into a well bore on the lower end of a string of wash pipe. The sleeve, or anchor cage 21, the slip hanger 17, and slips 10 are free to move relative to the longitudinal axis of the body 4 of the tool as the tool passes over the fish to be gripped. The slips 10 are pushed upwardly by the fish or any couplings or tool joints thereon to allow the tool to pass downwardly thereover. As soon as the overshot has passed the tool joint 30, Fig. 3, the slips 10 immediately drop back into the slip guides 7, to engage the pipe 31 below the tool joint 30 in order to frictionally engage and grip the pipe upon upward movement of the tool.

When the overshot has telescoped over the desired length of the fish, an upward pull may then be exerted on the connecting pipe (not shown) to produce relative movement between the body 4 and the slips 10, thereby moving the slips inwardly to frictionally grip the fish. Inasmuch as the slips engage the fish while the tool is lowered and telescoped over the fish, upward movement of the body 4 causes the slip guides 8 to move upwardly relative to the slips 10 thereby moving the slips inwardly to frictionally grip the fish. Thus, an upward pull on the connecting pipe (not shown) causes an inward movement of the slips to frictionally grip the fish and thereby fix the fish relative to the body 4 and thus permit the fish to be pulled to the surface. If the fish 31 cannot be removed, or if for some reason the operator desires to disengage the tool from the pipe 31, the tool is again lowered over the pipe until the friction anchors 24 engage a projection of the pipe 31 such as the tool joint 30 as best seen in Fig. 3.

When the friction anchors come in contact with the projection 30, this positions the sleeve, or anchor cage 21, and the slip hanger 17 with respect to the body 4 of the tool. The body 4 will continue to move downwardly moving the slip guides 18 downwardly relative to the slips 10 and thereby permitting outward movement and release of the slips from the fish. The downward movement of the body 4 also moves keys 27 along the keyways 28. Rotation of the string of pipe connected to the tool moves keys 27 into lateral projecting keyways 29 locking wiper cage 21 and slip hanger 17 in elevated position away from slip cage 5. The tool may then be pulled upwardly from the fish 31.

Broadly the invention contemplates a releasable wash over gripping device for pipes which contains a minimum of moving parts in its releasing and engaging mechanism.

What is claimed is:

1. A washover overshot adapted to be lowered into a well and manipulated therein to engage a fish comprising a body, a slip cage on the lower end thereof having guide surfaces thereon, a slip hanger thereabove, releasable supporting slips with slide surfaces thereon to cooperate with the guide surfaces of said cage, a wiper cage above said slip holder having spaced friction anchors thereon, said friction anchors being spaced from said fish but engageable by projections thereon, and said wiper cage and slip hanger being rotatably connected and slideably mounted in said body.

2. A device for gripping pipe comprising, a body, a slip cage thereon with inwardly tapered guide surfaces therein, a slip holder slidable in said body, a sleeve rotatably connected to said slip holder and slidable in said body, releaseable supporting slips with slide surfaces thereon to cooperate with said guide surfaces of said slip cage whereby downward movement of said slip holder and said said sleeve relative to said body moves the slips onto the guide surfaces of said slip cage and inwardly into contact with the member to be gripped, and friction means on said slip holder spaced from said pipe but engageable by projections thereon.

3. A device for gripping pipe comprising, a body, a slip cage thereon with inwardly tapered guide surfaces therein, a slip holder slideable in said body, a sleeve rotatably connected to said slip holder and slideable in said body, releasable supporting slips with slide surfaces thereon connected to said slip holder to cooperate with said guide surfaces of said slip cage so that upward movement of said body relative to said slip holder and sleeve moves the slips onto the guide surfaces of said slip cage and inwardly into contact with the member to be gripped, friction means on said sleeve spaced from said pipe but engageable by projections thereon whereby said friction means moves into contact with said projections on the pipe upon lowering of the body so that said sleeve and said slip holder are frictionally held against movement as the body is lowered so as to disengage the slips from the member gripped.

4. A device for gripping pipe comprising, a body, a slip cage thereon with inwardly tapered guide surfaces therein, a slip holder slideable in said body, a sleeve rotatably connected to said slip holder and slideable in said body, releasable supporting slips with slide surfaces thereon to cooperate with said guide surfaces of said slip cage so that downward movement of said slip holder and sleeve relative to said body moves the slips onto the guide surfaces of said slip cage and inwardly into contact with the member to be gripped, friction means on said sleeve spaced from said pipe but engageable by projections thereon, said friction means moving into contact with projections on the pipe upon lowering of the body so that said sleeve and slip holder are frictionally held against movement as the body is lowered so as to disengage the slips from the member gripped, and means operable upon rotation of said body to retain said sleeve and said slip holder in spaced elevation from said slip cage to maintain disengagement of the slips from the member gripped.

5. In a washover overshot for gripping pipe, a body, a slip cage and slip means having cooperating bearing and slide surfaces respectively, a slip holder slideable relative to said body to effect passage of the slips downwardly over the member to be gripped, friction anchors on the upper portion of said slip holder to contact projecting portions of the member gripped so as to hold the slip holder against movement during lower-

ing of said body to effect disengagement of the slips with the member grip, a key on said body, a cooperating keyway on said slip holder so that relative rotation of said body and said slip holder retains said slip holder in inoperative position.

6. In a washover overshot to be lowered into a well and manipulated therein to grip a member, a pair of parts relatively movable to manipulate the washover overshot, upper and lower friction anchors on one part, said lower friction anchors adapted to engage a surface on the other part so as to retain said lower friction anchors in sliding engagement with the member to be gripped as the washover overshot is lowered, said lower friction anchors gripping said member when an upward pull is exerted on the second mentioned part, said upper friction anchors being spaced from such member but engageable by projections thereon whereby said upper friction anchors engage such projections on lowering the washover overshot thereby disengaging such lower friction anchors from the gripped member.

7. In a washover overshot to be lowered into a well and manipulated therein to grip a fish, a pair of parts relatively movable to manipulate the washover overshot, upper and lower friction anchors on one part, said lower friction anchors adapted to engage a surface on the other part so as to retain said lower friction anchors in sliding engagement with said fish to be gripped as the washover overshot is lowered, said lower friction anchors gripping the fish when an upward pull is exerted on the second mentioned part, said upper friction anchors being spaced from such fish but engageable by projections thereon whereby said upper friction anchors move into frictional contact with such projections on said fish when the washover overshot is lowered relative thereto to hold the first mentioned part against movement and to disengage the lower friction anchors from the fish gripped.

8. In a washover overshot to be lowered into a well and manipulated therein to grip and recover fish, first and second parts relatively movable to manipulate the washover overshot, upper and lower friction anchors on said first part, said lower friction anchors adapted to engage a surface on the second part so as to retain said lower friction anchor in sliding engagement with said fish as the washover overshot is lowered, said lower friction anchors gripping the fish when an upward pull is exerted on the second part, said upper friction anchors moving into frictional contact with the fish to be gripped when the device is lowered relative thereto to hold said first part against movement, and to disengage the lower friction anchors from the fish gripped, said first and second parts having respectively a keyway and a cooperating key to engage upon relative rotation of said first and second part to retain the lower friction anchors in disengagement from the fish gripped.

9. In a washover overshot to be lowered in a well and manipulated therein, a pair of parts relatively movable to manipulate the tool, upper and lower friction anchors on one part adapted to move inwardly into engagement with a member to be gripped, said upper friction anchors being limited in such inward movement with respect to the lower friction anchor whereby such upper friction anchors are spaced from said member to be gripped but engageable by projections thereon on lowering the device thereby disengaging said lower friction anchors from said gripped member.

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