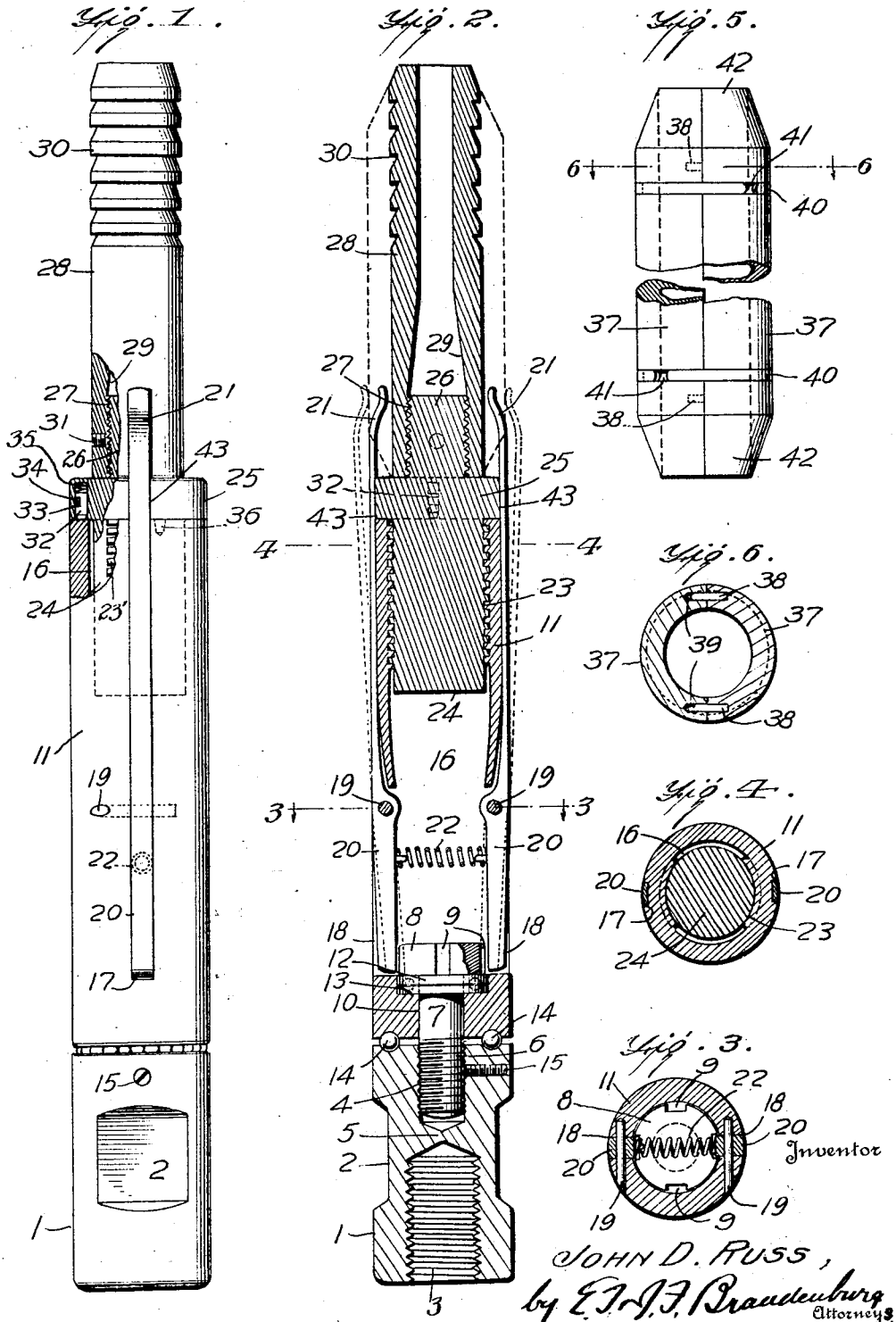


J. D. RUSS.
OIL WELL MACHINERY.
APPLICATION FILED APR. 13, 1920.

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JOHN D. RUSS, OF SPENCER, WEST VIRGINIA.

OIL-WELL MACHINERY.

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Specification of Letters Patent.

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Application filed April 13, 1920. Serial No. 373,489.

To all whom it may concern:

Be it known that I, JOHN D. RUSS, citizen of the United States, residing at Spencer, in the county of Roane and State of West Virginia, have invented certain new and useful Improvements in Oil-Well Machinery, of which the following is a specification.

This invention relates to the type of releasable wire-rope socket for oil-wells shown, for instance, in United States Letters-Patent No. 1,190,345, granted to J. J. Varner on July 11, 1916, of which patent I am assignee of an undivided one-half interest; and the principal object of the present invention is, generally, to improve upon the construction disclosed in said patent.

The accompanying drawing clearly discloses an exemplary concrete embodiment of the underlying principles of the invention. Like reference characters denote corresponding parts throughout the several views. Briefly described:

Figure 1 is a view in elevation, partly in section, of the device of my invention,

Figure 2 is a diametric sectional view thereof,

Figures 3 and 4 are cross sectional views, on the lines 3—3 and 4—4, respectively, of Fig. 2,

Figure 5 is a view in side elevation of the gravity-wedge-member for actuating the levers to throw the same into operative position to permit release of the socket-portion of the device from the base member, and

Figure 6 is a cross sectional view on the line 6—6, Fig. 5.

Referring, now, in detail, to the drawing:

1 designates what may be termed a base member, which, as shown, is cylindrical, by preference, and is advantageously provided with diametrically opposite, flat faces 2, 2 for convenience in assembling the base with the portion of the device with which the base is normally connected. The base is, furthermore, provided with axial, threaded openings 3 and 4 extending from opposite ends thereof; and, although the adjacent or inner ends of said openings may meet, it is preferred to have them separated, as shown in Fig. 2 by a wall 5. The threaded opening 3 is adapted for the reception of the threaded upper end of an ordinary sinker-pin (not shown); while the threaded opening 4 is adapted for the reception of the

threaded portion 6 of the shank 7 of a securing bolt, having a cross-sectionally annular head 8, provided with peripheral, transversely-extending, equidistantly-spaced grooves 9, for a purpose presently appearing.

The threadless portion 7 of the shank of said bolt is adapted to be loosely disposed in an axial opening 10 in a cylindrical member 11, more particularly hereinafter described. The shank 7 of the bolt passes through, and the head 8 of said bolt rests upon, a swivel washer 12, which is disposed in an internally recessed or cut-away portion 13 in the lower portion of said member 11.

Ball bearings 14 are preferably disposed between the bottom of the member 11 and the top of the base 1.

A set-screw 15 threaded into a radial aperture in the base 1, toward the top thereof, normally bears against the threaded portion 6 of the shank of the bolt and tends to prevent accidental unscrewing or loosening of the bolt.

It will be noted, by the construction described, that the base 1 and the member 11 are swiveled with respect to each other; that is to say, each is capable of a rotary movement independent of the other.

The member 11 is hollow, as shown at 16, for the greater portion of its length, commencing at the top thereof and terminating flush with the top of the recess 13 in which the swivel washer 12 is disposed; and, said washer filling said recess, the head 8 of the securing bolt lies within said hollow portion, at the bottom thereof, as shown in Fig. 2.

The member 11 is provided, for a portion of its length, commencing at the top thereof, with two longitudinally-extending, diametrically-opposite grooves 17, 17; and extending from the lower end of said grooves to the bottom or lower end of the hollow portion 16 of the member 11 are slots 18, 18.

Toward the upper end of said slots 18, 18, pins 19, 19 are transversely disposed, said pins constituting the fulcrums of levers 20, 20, which are disposed within said grooves 17, 17 and alined slots 18, 18, and have convergently-bent upper terminals 21, 21.

Interposed between said levers 20, 20, beneath their fulcrum point, is a helical spring 22, which functions to automatically return said levers to normal position, after move-

ment thereof into the dotted line position shown in Fig. 2, by means hereinafter described.

The hollow member 11 is provided for a portion of its length, commencing at the top thereof, with interiorly disposed, mutilated or interrupted threads 23, with which are adapted to engage corresponding, mutilated screw-threads 23' on the exterior of a plug 24 having a head 25. Obviously, by turning said plug through the arc of a circle, so that said co-operating screw-threads are disengaged, the plug may be withdrawn from the hollow member 11.

The plug 24 is provided with an axial extension or stem 26 projecting upward from the head 25 and exteriorly threaded, as shown at 27 for engagement with a correspondingly interiorly threaded portion at one end of a hollow top member 28, which is cylindrical in cross section. The bore of said top member 28 is of enlarged diameter toward its lower end, as shown in Fig. 2; and extending from the top of the threaded portion of the bore the wall of said bore is flared, as shown at 29. Normally, plug 24 is prevented from rotating independent of member 11 by the levers 20, 20 being seated in grooves 43, 43 in the head 25 of said plug.

The top member 28 is provided, toward its upper end, with exterior, stepped serrations 30, with which a "fishing" tool may be engaged in case of breakage of the wire rope (not shown) which is held, at one end thereof, within the tubular member 28. In assembling the parts, said rope is disposed with its end portion in the bore of the tubular member 28, and the latter is then screwed on the threaded nipple or stem 26 of the plug 24, which spreads and distorts the end of the rope and wedges it against the flaring wall 29 of the member 28, thereby holding the rope against withdrawal from said member 28. A set-screw 31 may be used to prevent accidental unscrewing of the parts 28 and 26.

Means may be provided for automatically arresting movement of the plug 24 at the proper point, when said plug is turned through the arc of a circle to disengage its threads from the corresponding threads 23 of the member 11. As herein shown, such means preferably comprises a plunger 32 seated in a recess extending upward from the bottom of the head 25 near the circumferential edge thereof, as shown in Fig. 1, a pin 33 extending transversely of a longitudinally-extending cutaway portion 34 in said plunger preventing rotation of the latter, independent of the head 25. A spring 35 disposed between the top of the plunger and the top of the recess occupied by the plunger functions to force said plunger downward. As the plug 24 is ro-

tated to disengage its screw-threads from those of the member 11, the plunger is brought into registry with a recess 36 in the top of the member 11, whereupon the spring 35 forces the plunger 32 downward into said recess 36, locking said plug against further rotation. The plunger rides upon the top of the member 11 until said recess 36 is reached; and the recess is so disposed relative to said plunger that they will coincide or register when the screw-threads of the member 11 and the plug 24 are disengaged.

As shown in Fig. 2, the lower ends of the levers 20, 20 are in proximity to the side of the head 8 of the securing-bolt. To rock said levers 20, 20 into the grooves 9 of said head, suitable means are provided. As herein shown, such means preferably comprise a lever-operating member, shown in Fig. 5. This member is split diametrically, so that it is in two sections 37, 37, each of which is arcuate in cross section, so that, when said sections are disposed in position with their side longitudinal edges abutting (see Figs. 5 and 6), a cross-sectionally circular bore is provided through said member. Suitable means are provided for holding said sections together, against accidental disengagement; as herein shown, said means preferably comprise dowel-pins 38, 38 carried by one section and adapted to project into openings 39, 39 in the other section, and curved leaf-springs 40, 40 disposed in circumferential grooves 41, 41 in said member, as shown in Fig. 5. The ends of said lever-operating member are wedge-shaped, as at 42, 42.

Sometimes, the sinker, which is screwed into the base 1, becomes sand fast in the bottom of the well, and it becomes necessary, therefore, to disengage the members 24 and 28 from the member 11. To effect this, the operator places the two sections 37, 37 of the lever-operating member around the wire rope, which is secured, at one end thereof, in the top member 28, and then places the curved leaf-springs 40, 40 around said sections. The lever-operating member is then released, and it falls, by gravity, down the wire rope until the conical end 42 thereof moves between the convergent terminals 21, 21 of the levers 20, 20 and comes to rest upon the top of the head 25 of the plug 24. The conical end 42, as it enters between the terminals 21, 21, moves the latter in a direction away from each other, thus moving said levers out of the grooves 43, 43 and rocking them on their fulcrums 19, 19, whereby the lower ends of said levers are thrown into engagement with the grooves 9 of the head 8 of the securing-bolt. In this position, it will be seen that the member 11 is held against rotation, since it is, through the engagement of said levers with the head

8 of the securing-bolt 7, rigid with the base 1, which is immovable because the sinker which it carries is fast in the bottom of the well. The levers 20, 20 thus function as
 5 clutches to engage the bolt-head 8, as described. The wire rope is now twisted, thereby rotating the plug 24 until the screw threads thereof become disengaged from the
 10 co-operating screw threads 23 of the member 11 and the plunger 32 moves into the recess 36, thus arresting further movement of the plug and thus notifying the operator that the top member 28 is disengaged from the central member 11; whereupon the wire
 15 rope, with the top member 28 and plug 24, may be drawn upward out of the well.

While I have described with great particularity, in accordance with the sections of the Revised Statutes of the United States
 20 relating to Letters-Patent for mechanical inventions, a physical embodiment of the underlying principles of my invention, it is to be understood that various changes and modifications may be made, within the scope
 25 of the appended claims, without departing from the spirit and purview of the invention, or necessarily sacrificing any of its advantages.

Having thus fully described my invention, 30 what I claim as new and desire to secure by Letters Patent is:

1. A releasable device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member rotatable on said base-part, a member releasably carried by said cylindrical member, and means carried by said cylindrical member and normally engaging said releasable member to lock the same against release, and
 35 movable to lock the cylindrical member against rotation.

2. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member, a bolt carried by said base-part and on which said cylindrical member is rotatable, a member releasably carried by said cylindrical member, and means normally engaging said releasable member to lock the same against release, and movable into engagement with said bolt to lock the cylindrical member against rotation.

3. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member rotatable on said base-part, a member releasably carried by said cylindrical member, and members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable to lock the cylindrical member against rotation.

4. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member, a connec-

tion between said base-part and said cylindrical member, on which the latter is rotatable, said connection being provided with a series of grooves, a member releasably carried by said cylindrical member, and members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable into said grooves to lock the cylindrical member against rotation.

5. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member, a connection between said base-part and said cylindrical member, on which the latter is rotatable, said connection being provided with a series of grooves, a member releasably carried by said cylindrical member, members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable into said grooves to lock the cylindrical member against rotation, and a wedge-member for actuating said pivoted members.

6. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member rotatable on said base-part, a member releasably carried by said cylindrical member, members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable to lock the cylindrical member against rotation, and a wedge-member for actuating said pivoted members.

7. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member rotatable on said base-part, a member releasably carried by said cylindrical member, members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable to lock the cylindrical member against rotation, a sectional wedge-member for actuating said pivoted members, and means for yieldingly holding said wedge-sections against accidental displacement.

8. A releasing device for the cable line of oil well machinery, comprising a cylindrical base-part, a cylindrical member rotatable on said base-part, a member releasably carried by said cylindrical member, members pivoted to said cylindrical member and normally engaging said releasable member to lock the same against release, and movable to lock the cylindrical member against rotation, a sectional wedge-member for actuating said pivoted members, and curvilinear springs encircling said wedge-member for holding the sections thereof against accidental displacement.

9. In a releasing device for the cable line of oil well machinery, a cylindrical member, a member rotatably carried by said cylin-

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dricul member, locking arms pivoted to said cylindrical member and normally engaging said rotatable member to prevent rotation thereof, a sectional wedge-member for rocking said pivoted members on their pivots out of engagement with said rotatable member, and means for yieldingly holding the wedge-member sections against accidental displacement.

10 10. In a releasing device for the cable line of oil well machinery, a cylindrical member, a member rotatably carried by said cylindrical member, locking arms pivoted to said cylindrical member and normally engaging
15 said rotatable member to prevent rotation thereof, a sectional wedge-member for rocking said pivoted members on their pivots out of engagement with said rotatable member, one of said wedge-member sections carrying
20 sockets and the other of said wedge-member sections pins entering said sockets, and means for yieldingly holding said sections against accidental displacement.

25 11. A releasing device for the cable-line of oil-well machinery, comprising a base-member adapted for engagement with a "sinker", a socket-member axially aligned with said base-member, a connection between
30 said base-member and said socket-member, said socket-member being swiveled on said connection, a plug-member rotatably engageable with said socket-member, and means
35 carried by said socket-member and normally engaging said plug-member for normally preventing rotation of the latter in said socket-member.

40 12. A releasing device for the cable-line of oil-well machinery, comprising a base-member adapted for engagement with a "sinker", a socket-member axially aligned with said base-member, a connection between
45 said base-member and said socket-member, said socket-member being swiveled on said connection, a plug-member rotatably engageable with said socket-member, means carried
50 by said socket-member and normally engaging said plug-member for normally preventing rotation of the latter in said socket-member, and a wedge-member for disengaging said means from said plug-member to permit rotation of the latter.

55 13. A releasing device for the cable-line of oil-well machinery, comprising a base-member adapted for engagement with a "sinker", a socket-member axially aligned with said base-member, a connection between
60 said base-member and said socket-member, said socket-member being swiveled on said connection, a plug-member rotatably engageable with said socket-member, pivoted members carried by said socket-member and normally engaging said plug-member for nor-

mally preventing rotation of the latter in said socket-member, and a wedge-member for rocking said pivoted members out of engagement with said plug-member.

14. A releasing device for the cable-line of oil-well machinery, comprising a base-member adapted for engagement with a "sinker", a socket-member axially aligned
70 with said base-member, a connection between said base-member and said socket-member, said socket-member being swiveled on said connection, a plug-member rotatably engageable with said socket-member, pivoted members carried by said socket-member and normally engaging said plug-member for normally preventing rotation of the latter in
80 said socket-member, and means for simultaneously rocking said pivoted members out of engagement with said plug-member and into engagement with said connection, whereby rotation of the plug-member is permitted and swivel movement of said socket-member is prevented.

85 15. A releasing device for the cable-line of oil-well machinery, comprising a base-member adapted for engagement with a "sinker", a socket-member axially aligned with said base-member, a connection between
90 said base-member and said socket-member, said socket-member being swiveled on said connection, a plug-member rotatably engageable with said socket-member, pivoted members carried by said socket-member and normally engaging said plug-member to prevent
95 rotation of the latter, and normally out of contact with said connection, and a wedge-member for simultaneously rocking said pivoted members out of engagement with
100 said plug-member to permit rotation thereof, and into locking engagement with said connection to prevent swivel movement of said socket-member.

16. A releasing device for the cable-line of oil-well machinery, including a socket-member, a plug-member rotatably engageable therewith, and automatically-operable movable means carried by said plug-member for limiting rotary movement of said plug-member in a direction to release the same from said socket-member.

17. A releasing device for the cable-line of oil-well machinery, including a socket-member, a plug-member rotatably engageable therewith, and a spring-pressed plunger carried by said plug-member for automatically limiting movement of the latter in a direction to release it from said socket-member.

In testimony whereof, I affix my signature.

JOHN D. RUSS.