

Feb. 19, 1963

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3,077,933

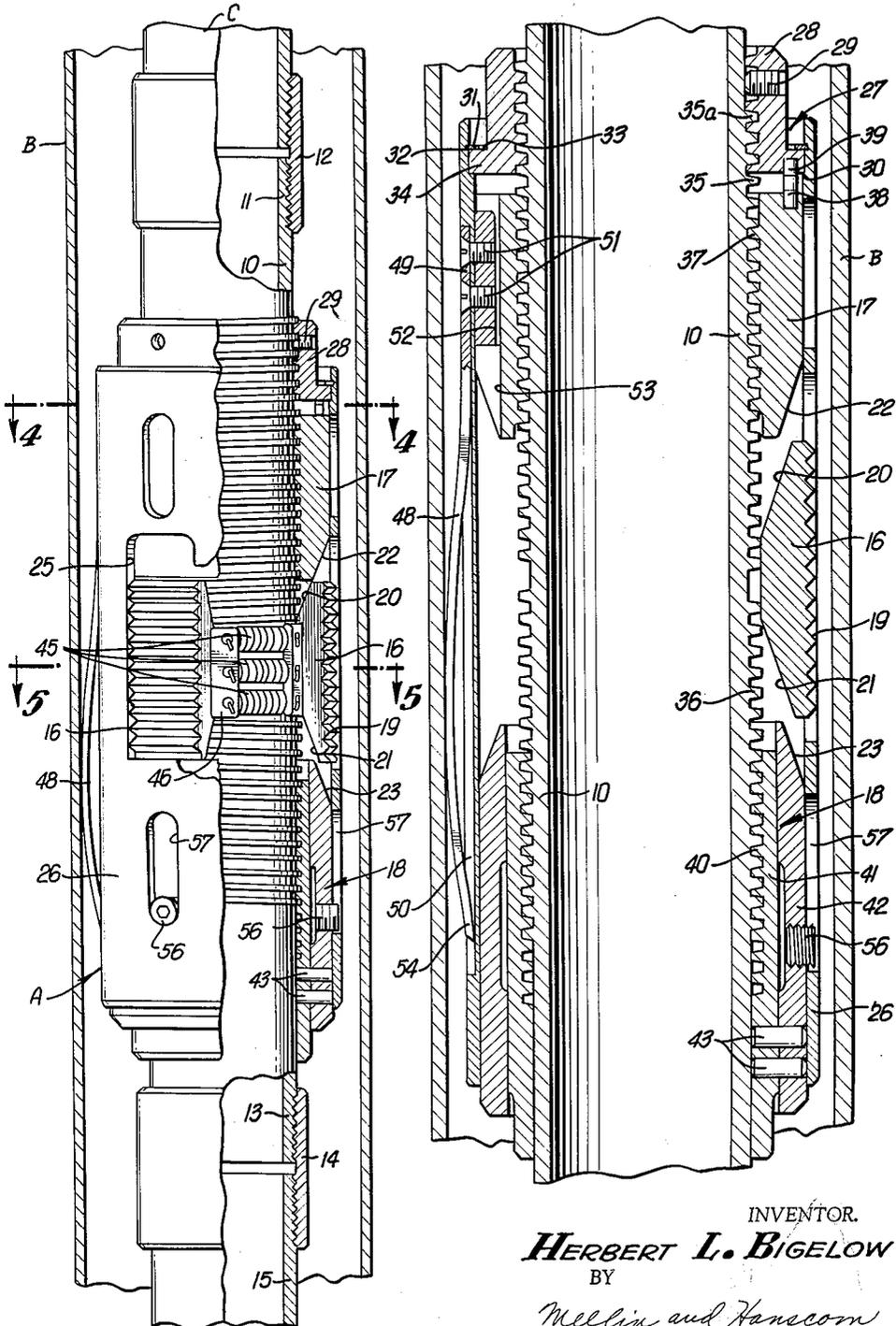
TUBING ANCHOR AND CATCHER APPARATUS

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FIG. 1.

FIG. 2.



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FIG. 3.

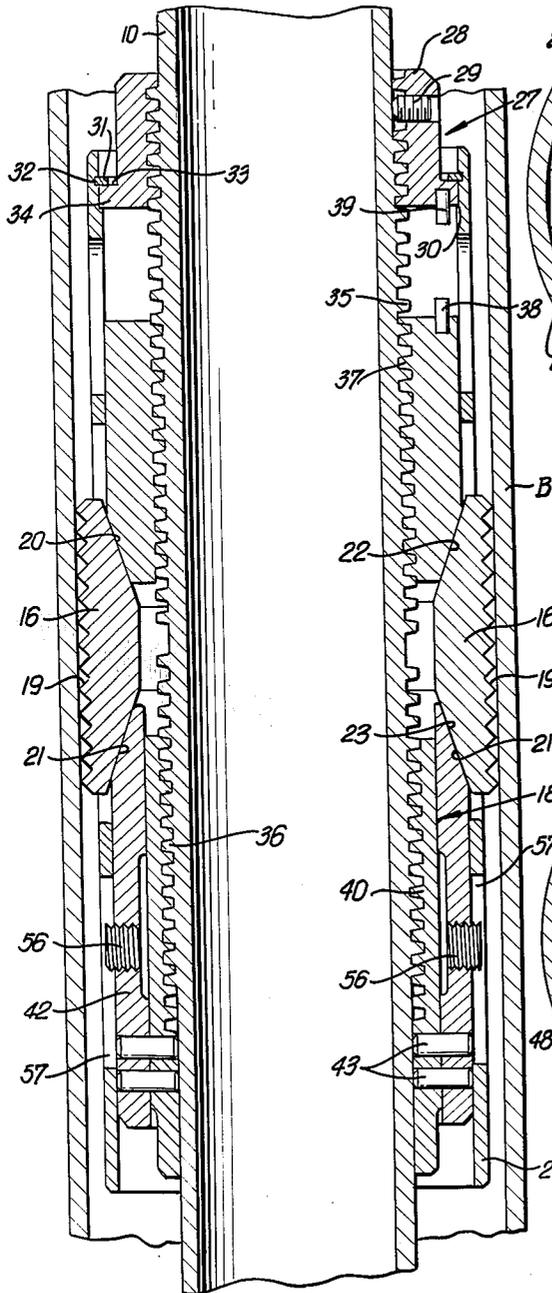


FIG. 4.

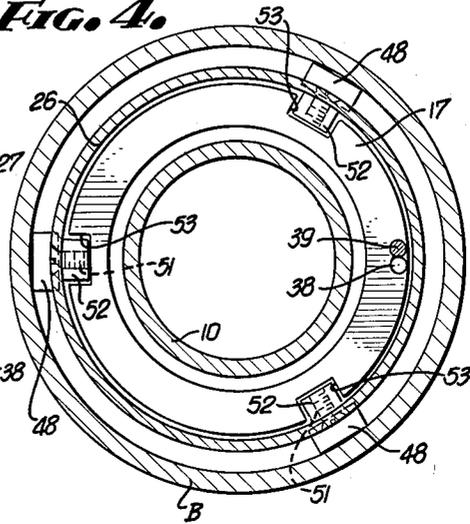
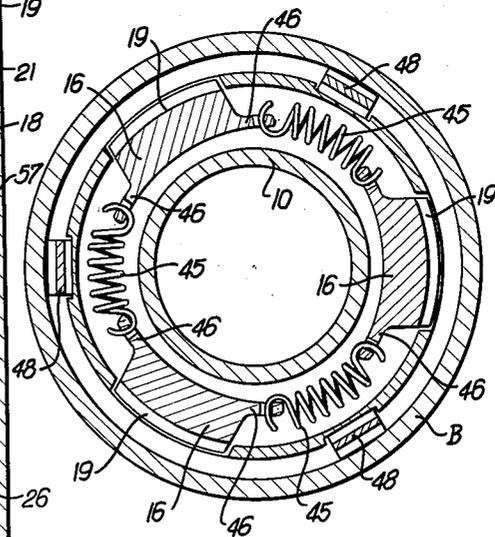


FIG. 5.



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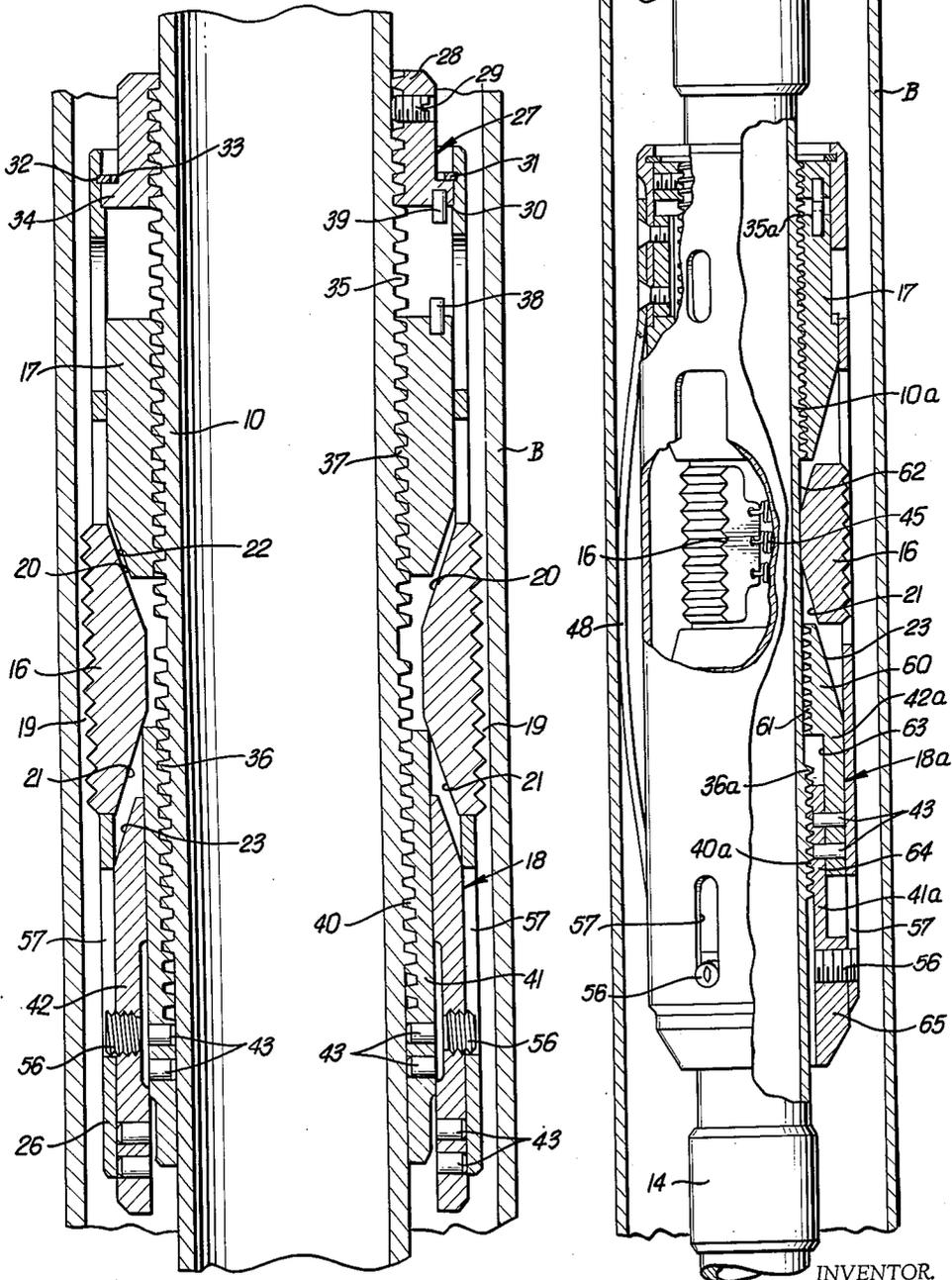
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FIG. 6.

FIG. 7.



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TUBING ANCHOR AND CATCHER APPARATUS
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11 Claims. (Cl. 166-217)

The present invention relates to subsurface well apparatus, and more particularly to apparatus capable of operating as a tubing anchor and catcher used primarily in pumping wells.

An object of the invention is to provide an improved tubing anchor and catcher apparatus which will allow the tubing string to be maintained in tension in the well casing, and which will also prevent the tubing from dropping in the event of its parting, the apparatus having no lost motion when set in the well casing, to prevent lost motion or movement of the tubing string to which it is secured.

Another object of the invention is to provide tubing anchor and catcher apparatus which is readily released from the well casing and retrieved therefrom, and in which assurance is had that its slips will be shifted from expanded to retracted position.

A further object of the invention is to provide tubing anchor and catcher apparatus which is readily releasable and retrievable from the well casing through a normal releasing procedure, and in which its release and retrieval can still be obtained in the event the normal releasing procedure is ineffective.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of several forms in which it may be embodied. Such forms are shown in the drawings accompanying and forming part of the present specification. These forms will now be described in detail for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

FIGURE 1 is a combined side elevational view and longitudinal section of one form of tubing anchor and catcher apparatus, with its parts in retracted position and disposed within a well casing;

FIG. 2 is an enlarged longitudinal sectional view of the major portion of the apparatus illustrated in FIG. 1;

FIG. 3 is a view similar to FIG. 2 illustrating the apparatus anchored against the well casing;

FIG. 4 is an enlarged cross-section taken along the line 4-4 on FIG. 1;

FIG. 5 is an enlarged cross-section taken along the line 5-5 on FIG. 1;

FIG. 6 is a longitudinal section similar to FIGS. 2 and 3 illustrating the apparatus released from the well casing when the normal releasing procedure is ineffective;

FIG. 7 is a combined side elevational view and longitudinal section, with parts broken away, of another embodiment of the invention with portions in retracted position.

Tubing anchoring and catching apparatus A is illustrated in the drawings, which are adapted to be lowered in a string of well casing B on a tubular string C, such as a tubing string, extending to the top of the well bore and to be anchored in the well casing against movement in both longitudinal directions. When desired, the apparatus A can be released from the well casing and withdrawn entirely therefrom. In the event that normal releasing procedure is ineffective, the apparatus can still

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be released from anchoring engagement with the well casing and withdrawn therefrom.

As illustrated, the tubing anchor and catcher A includes a central tubular body or mandrel 10 having an upper threaded pin 11 for threaded attachment to a coupling 12, which, in turn, is threadedly secured to the lower portion of the tubing string C extending to the top of the well bore. A suitable pump and sucker rod mechanism (not shown) may be disposed in the tubing string C above the apparatus, or it may be located in the tubing string below the apparatus. A lower pin end 13 of the tubular body 10 is threaded into a coupling 14, which, in turn, is threadedly secured to a lower portion 15 of the tubing string C, which may contain the pump mechanism. When the pump mechanism is disposed in the tubing string below the apparatus, the body 10 of the apparatus preferably has a diameter sufficient to allow passage through of the pump mechanism.

The apparatus is anchored in the well casing by means of slips 16 and an upper expander structure 17 and a lower expander structure 18 disposed on opposite sides thereof. A single set of circumferentially spaced slips 16 can be anchored against the wall of the well casing B to prevent movement of the apparatus A in both an upward and a downward direction. Each slip 16 has external wickers or teeth 19 adapted to be embedded in the wall of the well casing, and also an upper inner tapered surface 20 which is inclined in a downward and inward direction and a lower inner tapered surface 21 inclined in an upward and inward direction. The upper expander 17 has a frusto-conical tapered surface 22 companion to the tapered surfaces 20 at the upper ends of the slips 16, in order to urge the slips laterally outwardly; whereas the lower expander 18 has a frusto-conical tapered surface 23 companion to the tapered surfaces 21 on the lower portions of the slips 16 and adapted to expand the slips laterally outwardly and to hold them in such outward position.

Each slip 16 is disposed in an opening or window 25 in a housing or outer tubular member 26 encompassing the body 10 of the tool and its upper and lower expanders 17, 18. The width of each opening 25 conforms to the width of each slip 16, whereas the length of each opening is greater than the length of each slip. The housing 26 is carried by the body 10 of the tool through a swivel connection 27. Thus, a coupling or nut member 28 is threaded on the body 10 of the tool and is secured thereto by a set screw 29. The upper portion of the housing has a lower shoulder 30 engaging the lower end of the coupling 28 to prevent upward movement of the housing 26 along the body 10 of the tool, downward movement of the housing relative to the body of the tool being prevented by a split snap ring 31 disposed within an internal groove 32 in the housing 26 engaging an upper surface 33 of the nut or coupling flange 34.

The body 10 of the tool is provided with an external upper right-hand thread 35 and with an external lower left-hand thread 36. The upper portion 35a of the upper right-hand thread may be employed for securing the coupling 28 and housing 26 to the body 10 of the tool. The right-hand thread 35 engages a companion internal right-hand thread 37 on the upper expander 17, the upper expander initially occupying an upper position on the body 10 of the tool, determined by engagement of a rotational stop pin 38 on the upper portion of the upper expander 17 with a companion stop pin 39 secured to and depending from the coupling 28.

The external left-hand thread 36 meshes with a companion internal left-hand thread 40 on a lower sleeve 41 of the lower expander structure 18, which is encompassed by the outer expander portion 42 of the structure 18 and which is secured thereto by one or a plurality of

shear pins 43 so that the outer expander member 42 and sleeve 41 normally coact and function as a lower expander member 18. Both the upper and lower expander members 17, 18 are spaced apart sufficiently to be out of operative engagement with the companion upper and lower tapered surfaces 20, 21 on the slips 16, which can occupy a retracted position relative to the body 10 of the tool A and its housing 26. Retraction of the slips 16 is insured by a plurality of helical tension springs 45 extending between and secured to side wings 46 that project from opposite sides of each slip, as disclosed most clearly in FIGS. 1 and 5. These springs 45 normally tend to pull the slips 16 inwardly to their retracted position, but will stretch or expand to allow the upper and lower expanders 17, 18 to shift the slips 16 outwardly into anchoring engagement with the wall of the well casing B.

The slips 16 are expanded outwardly against the well casing by rotating the tubing string C and the body 10 to the left, while preventing the upper and lower expanders 17, 18, and the slips 16 themselves, from rotating. To prevent rotation of the expanders and slips, outwardly bowed circumferentially spaced leaf springs 48 are provided, the upper ends 49 of which are received within the upper portions of longitudinal grooves 50 in the exterior of the housing, being secured to the housing by screws 51 which extend inwardly into keys 52 within the housing disposed in longitudinal keyways 53 in the upper expander 17. The lower ends 54 of the springs are free and are disposed in the lower portions of the longitudinal grooves 50, being slidable along the base of the latter. The intermediate portions of the springs 48 frictionally engage the wall of the well casing B, for the purpose of resisting rotation of the housing 26. In view of the key and keyway connection 52, 53 of the housing 26 with the upper expander 17, rotation of the latter is also resisted by the friction drag springs 48.

Rotation of the lower expander structure 18 is also resisted by a key and keyway or slot connection. As disclosed, pins or screws 56 are secured to the lower expander member 42, extending within longitudinal slots 57 in the housing 26. When the lower expander 18 is in its initial position, in which the slips 16 are retracted, the pins or screws 56 are located in the lower portions of the slots 57.

In the use of the apparatus, the upper expander 17 is disposed initially in its uppermost position illustrated in FIGS. 1 and 2, with the rotational stop pins 38, 39 in engagement. The lower expander structure 18 is disposed in its lowermost position along the body 10 of the tool. The apparatus A is connected to the tubing string C and lowered in the well casing B to the desired location therewith at which the tubing anchor and catcher is to be set. When such location is reached, the tubing string C and the body 10 of the tool are rotated to the left, as through use of hand tongs (not shown) at the top of the well bore. The friction drag springs 48 prevent the housing 26, upper and lower expanders 17, 18 and slips 16 therebetween from turning, because of the resistance afforded by the springs 48 against the wall of the casing B. However, the nut or coupling 28 can turn with the body 10 since its connection with the upper portion of the housing 26 is a swivel one, in that the flange 34 of the coupling 28 can turn between the housing shoulder 30 and the split snap or coupling ring 31. Rotation of the body 10 of the tool relative to the expanders 17, 18 will result in the upper expander 17 threading relatively downwardly along the body 10, and the lower expander structure 18 threading relatively upwardly along the body of the tool, the upper and lower expanders engaging the upper and lower tapered surfaces 20, 21 of the slips 16 and shifting the latter radially outwardly through the housing openings 25 into engagement with the wall of the well casing B.

After the slips 16 contact the casing, a strain may be placed on the tubing string C and left-hand torque ap-

plied thereto. Downweight is then imposed on the tubing string C and left-hand torque maintained thereon. The alternate pulling of a strain and setting down of weight on the tubing string C insures that all play or lost motion has been removed from the apparatus A, so that the upper expander 17 is firmly wedged behind the upper portion of the slips 16 and the lower expander structure 18 is firmly wedged behind the lower portion of the slips. The proper amount of tension can then be taken on the tubing string C and maintained to prevent elongation or "breathing" of the tubing string during reciprocation of the pump (not shown).

In the event it is desired to release the anchor and catcher apparatus A from the well casing B, such action can be performed with the tubing string C in tension, in compression, or in a neutral position. However, releasing with the tubing string C in compression (that is, downweight imposed thereon) is preferred since it allows further retraction of the lower expander device 18 and prevents the slips 16 from becoming dull when the tubing string C and the anchor A are moved upwardly in the well casing B, to remove the apparatus therefrom. To effect release of the apparatus from the well casing, right-hand torque is imposed to the tubing string C, the latter being turned a sufficient number of turns, which, for example, may be about four to five turns. The expanders 17, 18 are prevented from rotating by virtue of the resistance offered by the friction drag springs 48 against the wall of the well casing. Right-hand rotation causes the upper expander 17 to move upwardly on the body 10 of the tool and the lower expander structure 18 to move downwardly on the body of the tool, the upper and lower expanders being removed from wedging engagement behind the slips 16, allowing the latter to retract. As the expanders 17, 18 are moved longitudinally relative to the slips, the tension springs 45 shift the slips 16 inwardly from the well casing B and back toward their initial retracted position. Following release of the slips 16, the tubing string C and the apparatus A can be elevated in the well casing B and the apparatus removed entirely therefrom.

In the event that the normal releasing procedure just described does not result in release of the slips 16 from the well casing, so that the apparatus can be removed, the shear pins 43 enable an emergency release procedure to be followed. The apparatus is in anchored position, such as illustrated in FIG. 3. The tubing string C is pulled upwardly sufficiently, the upward strain being transferred from the tubing string to the body 10 of the tool, and from the latter to the lower expander sleeve 41, passing through the shear pins 43 to the lower expander member 42 and then to the slips 16 and into the well casing B. When the strain exceeds the shear value of the pins 43 securing the outer expander portion 42 to the inner expander sleeve 41, which is purposely selected so as to be substantially greater than the normal tension to be maintained on the tubing string with the pump in operation, the shear pins are disrupted or sheared, which will then allow the body 10 to move upwardly, carrying the upper expander 17 upwardly of the slips 16 and the lower sleeve 41 upwardly within the lower expander member 42. The removal of the upper expander 17 from its wedging position behind the slips 16 effects a release of the wedging force on the slips and also allows the lower expander member 42 to drop downwardly along the housing 26, such as illustrated in FIG. 6, the springs 45 then pulling the slips 16 laterally inwardly from the casing, or toward a releasing position. The tubing string C can now be elevated, to remove the anchor and catcher apparatus A from the well casing B.

In the form of apparatus disclosed in FIG. 7, a modification has been made in its lower expander portion 18a so as to enable a larger passage to be provided through the tubular body 10a in relation to the external diameter of the apparatus. As disclosed, the outer expander portion 42a, that has the upper taper 23 for coaction with

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the companion tapered surfaces 21 on the slips 16 thereabove, has an inwardly directed portion 60 provided with an internal left-hand thread 61, which is initially disposed above the external left-hand threaded portion 36a of the body of the tool. As disclosed, the upper external right-hand thread 35a on the body of the tool and the lower external left-hand thread 36a on the body of the tool are longitudinally spaced from each other to allow the slips to lie closely adjacent the intervening periphery 62 of the body of the tool, and also to allow the threaded expander portion 60 to be disposed contiguous such unthreaded periphery. The lower expander portion has a counterbore 63 in which the upper portion 64 of the threaded sleeve 41a is provided, the internal left-hand threads 40a on this sleeve meshing with the external left-hand threads 36a on the body of the tool. The sleeve 41a has a lower enlarged diameter portion 65 spaced initially downwardly from the lower end of the outer expander portion 42a, the lower pins or keys 56 being secured to this enlarged portion and received within the longitudinal slots 57 in the housing. The shear pin or pins 43 extend between the threaded portion 64 of the sleeve 41a and the lower portion of the outer expander member 42a.

The upper portion 60 of the lower expander member 42a is threaded to enable the lower expander structure 18a to be assembled upon the body 10 of the tool. Thus, the lower expander structure 18a, with the shear pins 43 intact, can be placed over the lower end of the body 10a and the expander threads 61 threaded along the lower body member threads 36a until the threaded expander portion 60 is disposed above the threads 36a, at which time the internal threads 40a of the sleeve 41a will be in proper threaded mesh with the left-hand threads 36a on the body 10a, as shown in FIG. 7.

The apparatus disclosed in FIG. 7 is lowered in the well bore with the slips 16 in their retracted position, the upper expander 17 being disposed in its upper position, and the lower expander structure 18a in its lower position. When the location in the well casing B is reached at which the expander is to be set, the tubing string C and the body 10a of the tool are rotated to the left, in the same manner as in the other form of the invention, to feed the upper and lower expander structures 17, 18a toward each other, thereby causing the expanders to wedge behind the slips 16 and shift them laterally outwardly into anchoring engagement with the wall of the well casing. Full anchoring can occur and all lost motion between the parts eliminated in the same manner as in the other form of the invention.

In the event the apparatus disclosed in FIG. 7 is to be released from the well casing, the tubing string C and body 10a of the tool need merely be turned to the right, which will effect an upward feeding of the upper expander 17 and downward feeding of the lower expander structure 18a along the body 10a, the expanders being shifted from wedging engagement behind the slips 16 and allowing the tension springs 45 to then pull the slips inwardly to their retracted position shown in FIG. 7.

If the normal releasing procedure just described is ineffective to release the slips, a straight longitudinal pull can be taken on the tubing string C and body 10a of the tool, which will shear the pins 43 and allow the body 10a of the tool, upper expander 17 and lower sleeve 41a to move upwardly relative to the slips 16 and lower expander 42a, unwedging the upper expander from the slips and freeing them from the well casing. The released apparatus can then be removed from the well casing B.

I claim:

1. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and

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the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures; means connected to said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; and swivel means coupling said rotation resisting means to said body for longitudinal movement therewith.

2. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures; means connected to said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; tension spring means between and connected to said slips for urging said slips toward a retracted position; and swivel means coupling said rotation resisting means to said body for longitudinal movement therewith.

3. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; said lower expander structure comprising an inner portion threaded to said body and an outer portion engageable with said slips; and means releasably interconnecting said portions of said lower expander structure, whereby release of said releasable means allows non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips.

4. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures; means connected to said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; said

lower expander structure comprising an inner portion threaded to said body and an outer portion engageable with said slips; and shear means releasably interconnecting said portions of said lower expander structure, said shear means being disrupted when subjected to sufficient force imposed through said body and inner portion of said lower expander structure to allow non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips.

5. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures; means connected to said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; said lower expander structure comprising an inner portion threaded to said body and an outer portion engageable with said slips; means releasably interconnecting said portions of said lower expander structure, whereby release of said releasable means allows non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips; and tension spring means between and connected to said slips for urging said slips from expanded to retracted position.

6. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; slips between and engageable with said expander structures; means connected to said expander structures and engageable with the well conduit to resist rotation of said expander structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well conduit to prevent movement of the apparatus in both longitudinal directions; said lower expander structure comprising an inner portion threaded to said body and an outer portion engageable with said slips; shear means releasably interconnecting said portions of said lower expander structure, said shear means being disrupted when subjected to sufficient force imposed through said body and inner portion of said lower expander structure to allow non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips; and tension spring means between and connected to said slips for urging said slips toward their retracted position.

7. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand

threaded portion; a housing surrounding said expander structures; means providing a swivel connection between said body and housing; slips in said housing between and engageable with said expander structures; means slidably keying said structures to said housing; and means on said housing engageable with the well conduit to resist rotation of said housing and structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well casing.

8. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; a housing surrounding said expander structures; means providing a swivel connection between said body and housing; slips in said housing between and engageable with said expander structures; means slidably keying said structures to said housing; means on said housing engageable with the well conduit to resist rotation of said housing and structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well casing; and tension spring means between and connected to said slips to urge said slips toward retracted position.

9. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; a housing surrounding said expander structures; means providing a swivel connection between said body and housing; slips in said housing between and engageable with said expander structures; means slidably keying said structures to said housing; means on said housing engageable with the well conduit to resist rotation of said housing and structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well casing; said lower expander structure comprising inner and outer portions; and means releasably interconnecting said inner and outer portions, whereby release of said releasable means allows non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips.

10. In tubing anchor and catcher apparatus to be disposed in a conduit string: a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; a housing surrounding said expander structures; means providing a swivel connection between said body and housing; slips in said housing between and engageable with said expander structures; means slidably keying said structures to said housing; means on said housing engageable with the well conduit to resist rotation of said housing and structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well casing; said lower

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expander structure comprising inner and outer portions; and shear means releasably interconnecting said inner and outer portions of said lower expander structure, said shear means being disrupted when subjected to sufficient force imposed through said body and inner portion of said lower expander structure to allow non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips.

11. In tubing anchor and catcher apparatus to be disposed in a conduit string; a tubular body adapted to be connected to a tubing string and having a right-hand threaded portion and a left-hand threaded portion; upper and lower expander structures on said body, one of said expander structures having a right-hand threaded portion meshing with said body right-hand threaded portion and the other of said expander structures having a left-hand threaded portion meshing with said body left-hand threaded portion; a housing surrounding said expander structures; means providing a swivel connection between said body and housing; slips in said housing between and engageable with said expander structures; means slidably keying said structures to said housing; means on

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said housing engageable with the well conduit to resist rotation of said housing and structures, whereby rotation of said body threads said expander structures along said body toward each other and behind said slips to expand said slips against the well casing; said lower expander structure comprising inner and outer portions; shear means releasably interconnecting said inner and outer portions of said lower expander structure, said shear means being disrupted when subjected to sufficient force imposed through said body and inner portion of said lower expander structure to allow non-rotational upward movement of said body and upper expander structure relative to said outer portion of said lower expander structure to permit retraction of said slips; and tension spring means between and connected to said slips to urge said slips toward retracted position.

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