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3,005,655

WELL TUBING RETRIEVING DEVICE

Filed July 2, 1959

2 Sheets-Sheet 1

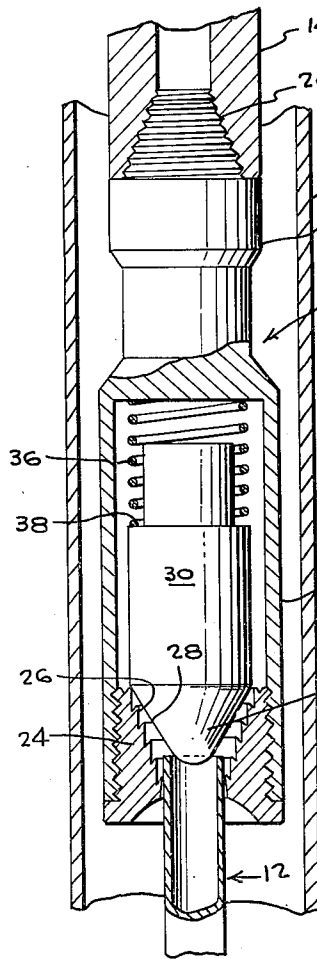
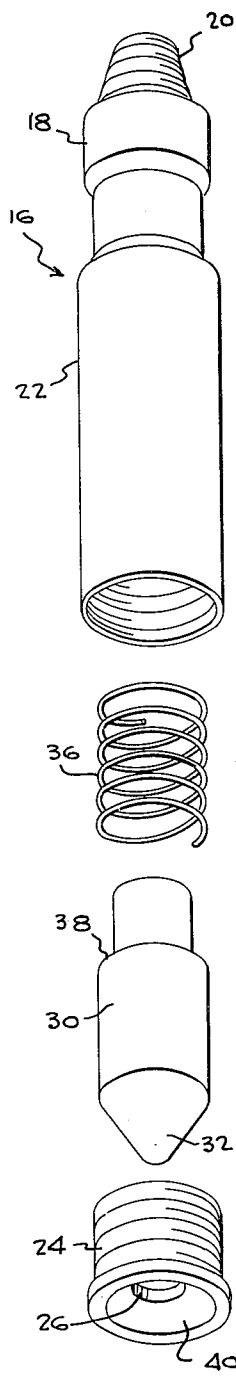


FIG-2

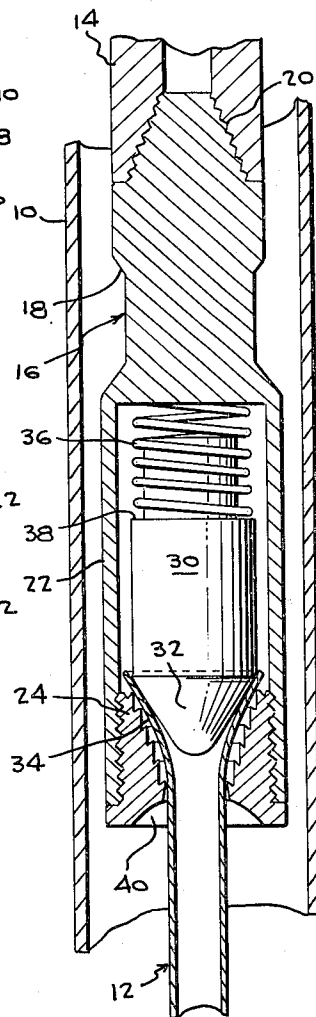


FIG-3

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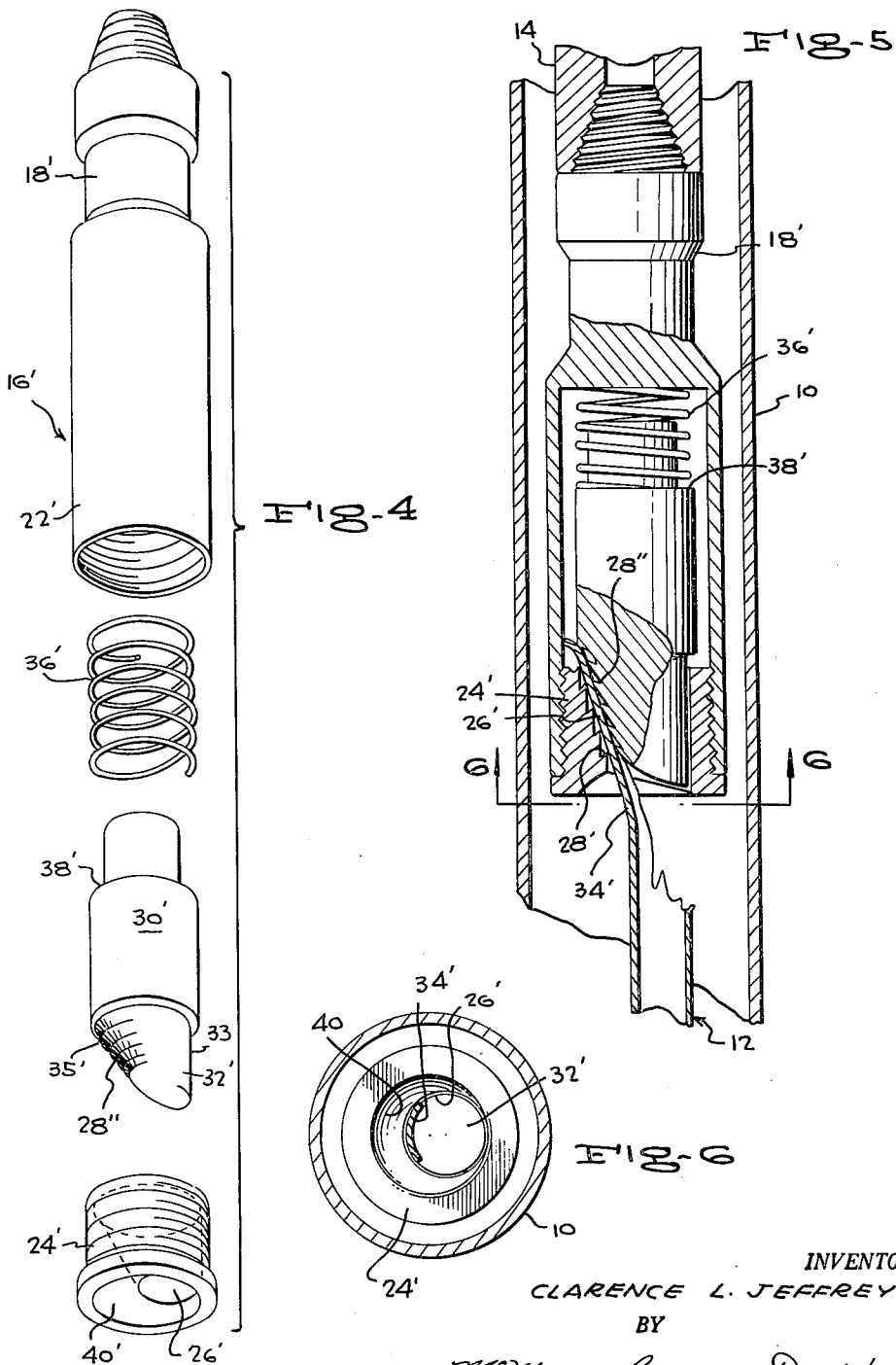
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**WELL TUBING RETRIEVING DEVICE**

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5 Claims. (Cl. 294-92)

The present invention relates to a device for retrieving well tubing from a water well or oil well.

Well tubing when lost in a well is difficult to engage by the grappling tools presently in use for the reason that such well tubing tends to collapse when gripped between the toothed slits generally employed in the grappling tool.

An object of the present invention is to provide a retrieving device for well tubing which lends itself to ready attachment to the upper end portion of a lost well tubing without crushing the tubing or causing the tubing to collapse.

Another object of the present invention is to provide a retrieving device for well tubing which is fabricated from a minimum number of components easily assembled and disassembled and requiring no special tools for disassembly or assembly.

A further object of the present invention is to provide a retrieving device for well tubing which is sturdy in construction, one simple in structure, one which lends itself to manufacture in quantity at reasonable cost, and one which is highly effective in action.

A still further object is to provide a retrieving device for well tubing which may be used to loosen tubing in a well casing by alternately and repeatedly pulling on the tubing and driving of the tubing downwardly to dislodge from the tubing sand which may bind the tubing in the well casing.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in conjunction with the annexed drawings, in which:

FIGURE 1 is an isometric exploded view of the well tubing retrieving device according to the present invention;

FIGURE 2 is a sectional view of the device assembled and with the nose portion of the handle about to enter the upper end of a well tubing;

FIGURE 3 is a sectional view showing the handle grippingly engaging and flaring outwardly the upper end portion of the well tubing prior to retrieving the well tubing from the well casing;

FIGURE 4 is an exploded isometric view of a modified form of the retrieving device according to the present invention;

FIGURE 5 is a sectional view showing the assembly of FIGURE 4 in position gripping the broken upper end portion of a well tubing; and

FIGURE 6 is a view taken on the line 6-6 of FIGURE 5.

Referring in greater detail to the drawings in which like numerals indicate like parts throughout the several views, in FIGURES 2 and 3 the numeral 10 designates generally a well casing and the numeral 12 designates the upper end portion of a well tubing which has been dropped or lost within the casing 10. The numeral 14 designates the lower end portion of a support rod commonly in use in the well drilling and maintaining industry for attachment thereto of well drilling equipment or well tool fishing devices.

The retrieving device of the present invention is designated generally by the reference numeral 16 and comprises a head 18 having a threaded conical means 20 on its upper end for attachment to the lower end of the support rod 14, such means being of conventional construction and needing no further description.

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A tubular extension 22 projects axially from the lower end of the head 18 and has its lower end open and provided with a plug 24 within and closing the lower end of the extension 22.

The plug 24 is provided with a bore 26 extending from one end to the other end of the plug 24, the bore 26 being of a gradually increasing cross-sectional area. Gripping means in the form of a plurality of spaced serrations 28 (FIGURES 2 and 3) are provided on the plug bore 26.

An anvil 30, having a nose 32 on one end, is positioned within the extension 22 so that the nose 32 extends into the bore 26 in the plug 24. The anvil 30 is shorter than the tubular extension 22.

The anvil 30 is mounted in the tubular extension 22 for limited upward and downward movement in the extension. The tubular extension 22 upon application of a downwardly directed force causes the downward movement of the anvil 30 so that the nose 32 enters into and presses the free end portion 34 of the well tubing 12 against the serrations 28 on the bore 26 and flares the portion 34 of the well tubing 12 outwardly when the device 16 is positioned so that the tubing 12 extends into the bore 26.

Spring means is operatively connected to the anvil 30, urging the anvil 30 to the downward movement position. This spring means constitutes a coil spring 36 interposed between the shoulder 38 formed on the upper end portion of the anvil 30 and the upper end of the extension 22.

The lower end of the plug 24 is provided with an arcuate-shaped recess 40 in communication with the bore 26. The recess 40 serves as a guide for the upper end portion 34 of the well tubing 12 for directing the upper end of the tubing 12 into the bore 26 in the plug 24.

Referring to FIGURES 4 to 6, inclusive, a modified form of the device of the present invention is shown in which the plug 24' is altered so that only a portion of its bore 26' has the gripping means or spaced serrations 28'. The anvil 30' has a nose 32' which has a straight side 33 and a sloping side 35, the sloping side 35 being provided with other spaced serrations 28''.

The lower end of the plug 24' is provided with an arcuate-shaped recess 40' connected in communication with the bore 26'. The recess 40' serves to direct into the bore 26' the split upper end portion 34' of the tubing 12 when the device 16' is lowered into position over the upper end of the tubing 12.

The remaining components of the modified form of the device 16' are identical with those described previously with respect to the device 16. These components include a head 18', an extension 22', a coil spring 36' which is interposed between the upper end of the extension 22' and a shoulder 38' provided on the anvil 30'.

In both the forms of the invention above described, the plugs 24 and 24' have external threads engageable with internal threads in the lower end portions of the extensions 22 and 22'. The plugs 24 and 24' constitute slips of the type conventionally employed in grappling tools in the oil well and water well industries.

In operation, when a section of well tubing 12 has been broken or lost within the well casing 10, the device 16, 16', of the present invention is lowered into the casing 10 on the lower end of the conventional support rod 14. Upon entry of the upper end portion of the well tubing 12 into the bore 26, 26', and upon engagement with the upper end of the well tubing 12 against the nose 32, 32' of the anvil 30, 30', the anvil 30, 30' is shifted upwardly against the compression of the respective spring 36, 36' which spring 36, 36' biases the anvil 30, 30' downwardly so that the nose 32, 32' enters into the bore 26, 26' so that the nose 32, 32' bears against the upper end portion 34, 34' and bends the latter or flares the latter outwardly

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into gripping engagement with the serrations 28, 28' on the bore 26, 26' of the respective plug 24, 24'. The device 16, 16' may then be alternately and repeatedly pulled upwardly by the application of a pulling force to the support rod 14 and driven downwardly by dropping the weight of the support rod 14 on the device 16, 16' to dislodge sand which may bind the well tubing in the well casing.

The tubing 12 is then retrieved out of the casing 10 and the plug 24, 24' is unscrewed from the extension 22 and the tubing 12 is released therefrom for disposal or re-use, if found practical.

What is claimed is:

1. A well tubing retrieving device comprising a head, means on the upper end of said head for attachment to a support rod, a tubular extension projecting axially from the lower end of said head, a plug within and closing the lower end of said extension, said plug being provided with a bore extending from one end to the other end of said plug and tapering in an inward direction, a gripping means on a portion of the wall of said plug bore, and an anvil having a nose on one end positioned within said extension so that the nose extends into said bore, said anvil being shorter than said extension and mounted for limited upward and downward movement within said extension, said tubular extension upon application of a downwardly directed force causing the downward movement of said anvil so that the nose enters into and presses the free end portion of a well tubing against said gripping means when said device is positioned so that the well tubing extends into the plug bore.

2. A well tubing retrieving device comprising a head, means on the upper end of said head for attachment to a support rod, a tubular extension projecting axially from the lower end of said head, a plug within and closing the lower end of said extension, said plug being provided with a bore extending from one end to the other end of said plug and tapering in an inward direction, a gripping means on a portion of the wall of said plug bore, an anvil having a nose on one end positioned within said extension so that the nose extends into said bore, said anvil being shorter than said extension and mounted for limited upward and downward movement within said extension, and spring means operatively connected to said anvil urging the latter to the downward movement position, said tubular extension upon application of a downwardly directed force causing the downward movement of said anvil against the action of said spring means so that the nose enters into and presses the free end portion of a well tubing against said gripping means when said device is positioned so that the well tubing extends into the plug bore.

3. A well tubing retrieving device comprising a head, means on the upper end of said head for attachment to a support rod, a tubular extension projecting axially from the lower end of said head, a plug within and closing the lower end of said extension, said plug being provided with a bore extending from one end to the other end of

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said plug and tapering in an inward direction, a gripping means embodying a plurality of spaced serrations on a portion of the wall of said plug bore, and an anvil having a nose on one end positioned within said extension so that the nose extends into said bore, said anvil being shorter than said extension and mounted for limited upward and downward movement within said extension, said tubular extension upon application of a downwardly directed force causing the downward movement of said anvil so that the nose enters into and presses the free end portion of a well tubing against the serrations of said gripping means when said device is positioned so that the well extends into the plug bore.

4. A well tubing retrieving device comprising a head, means on the upper end of said head for attachment to a support rod, a tubular extension projecting axially from the lower end of said head a plug within and closing the lower end of said extension, said plug being provided with a bore extending from one end to the other end of said plug and tapering in an inward direction, an anvil having a nose on one end positioned within said extension so that the nose extends into said bore, cooperative gripping means on a portion of the wall of said plug bore and on said anvil nose, said anvil being shorter than said extension and mounted for limited upward and downward movement within said extension, said tubular extension upon application of a downwardly directed force causing the downward movement of said anvil so that the nose enters into and presses the free end portion of a well tubing between said cooperative gripping means when said device is positioned so that the well tubing extends into the plug bore.

5. A well tubing retrieving device comprising a head, means on the upper end of said head for attachment to a support rod, a tubular extension projecting axially from the lower end of said head, a plug within and closing the lower end of said extension, said plug being provided with a bore extending from one end to the other end of said plug and tapering in an inward direction, an anvil having a nose on one end positioned within said extension so that the nose extends into said bore, cooperative gripping means embodying a plurality of spaced serrations on a portion of the wall of said plug bore and on said anvil nose, said anvil being shorter than said extension and mounted for limited upward and downward movement within said extension, said tubular extension upon application of a downwardly directed force causing the downward movement of said anvil so that the nose enters into and presses the free end portion of a well tubing between said cooperative spaced serrations on said plug bore wall and on said anvil nose when the device is positioned so that the well tubing extends into the plug bore.

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