

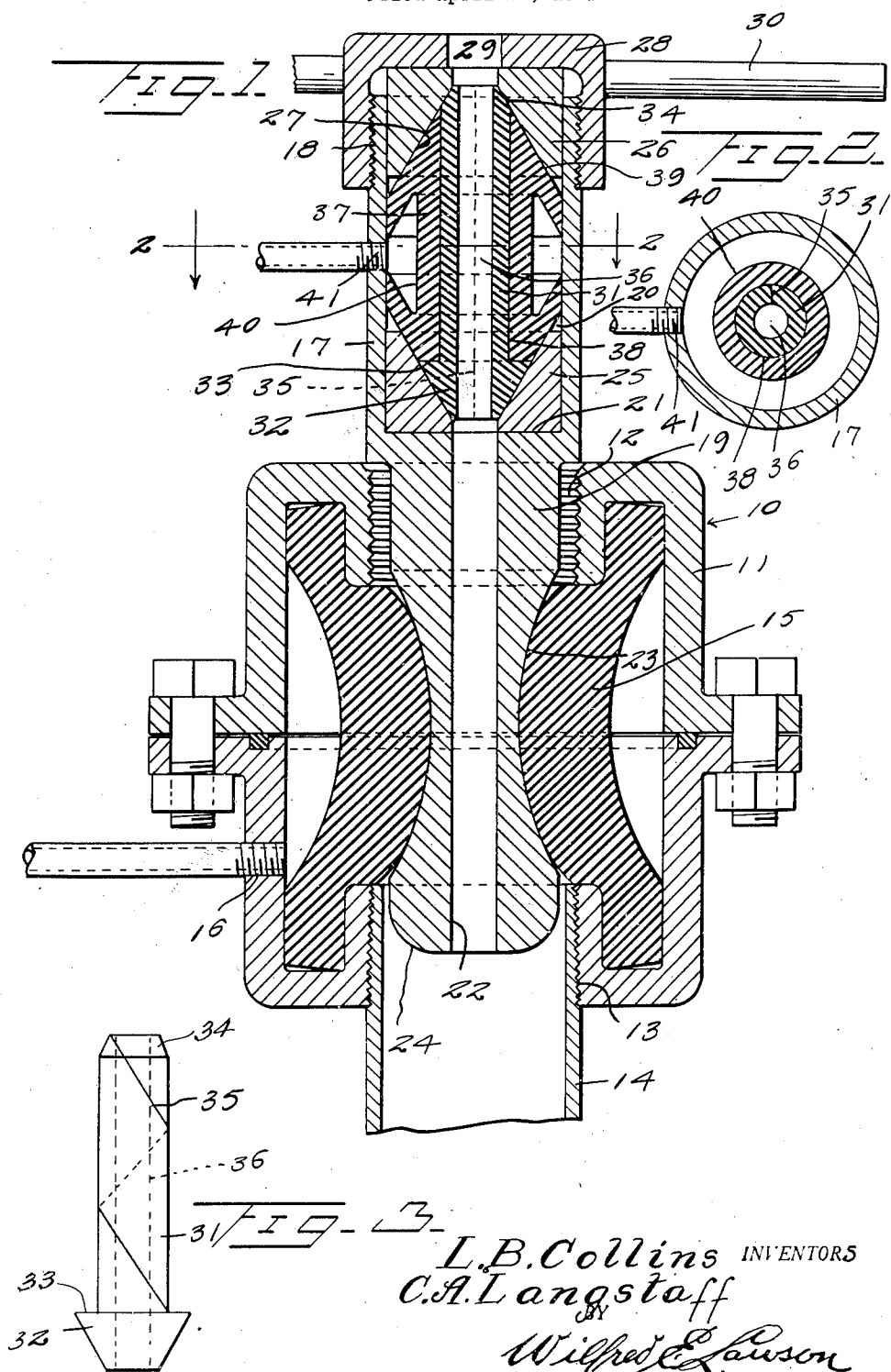
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WIRE LINE STRIPPER

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WIRE LINE STRIPPER

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This invention relates generally to well drilling and pertains particularly to improvements in strippers.

The present invention has for a principal object to provide a cable stripping device designed in a novel manner to be held in position by an automatic rubber valve of known construction to be readily removed to permit the complete instantaneous closing of such valve at the moment that the swab or any other tool or wire or cable line is taken out or removed from the well tube.

Another object of the invention is to provide a stripper tool which, when released from the well packer or automatic rubber valve, remains on the swab line.

Still another object of the invention is to provide a stripper designed for use in association with a known form of expansible well packer to facilitate the instantaneous closing of the packer around the swabbing tools, the stripping of the tools and the subsequent closing of the well until the main gate valve is closed.

A still further object of the invention is to provide a stripper device having a renewable rubber stripper or bushing through which the wire line or cable passes, which is of a novel construction facilitating its placement on the cable or wire line without having to draw the line and tools from the well, with novel means for maintaining an even pressure of the rubber stripper or bushing upon the cable or wire line whereby even contact of the bushing against the line is maintained and the bushing is caused to wear evenly.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawing forming a part of the specification, with the understanding, however, that minor changes and modifications may be made in the structure so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a longitudinal section through the wire line stripper of the present invention and through a packer bushing with which it is designed for use and to which it is shown applied.

Figure 2 is a transverse section taken on the line 2—2 of Figure 1.

Figure 3 is a view in side elevation of the stripper bushing per se.

The tool constituting the present invention, is designed primarily for use in connection with an expansible well packer of the character illus-

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trated in the patent to Kilmer, No. 1,930,361, issued October 10, 1933.

In the drawing the numeral 10 generally designates the Kilmer packer bushing, in association with which the device of the present invention is used. This bushing comprises a casing head 11 which is in the form of a box having the upper and lower aligned openings 12 and 13 respectively, the lower opening having secured therein the upper end of the well tube 14.

Within the head 11 is positioned the heavy rubber packing sleeve 15 which is caused to be constricted or compressed tightly about a cable, well pipe or other tool passing upwardly from the well tube through the head 11, by the introduction of suitable fluid under pressure through the opening 16 between the inner wall of the head and the tubular packing.

The device constituting the present invention comprises a relatively long steel body of circular cross section, generally designated 17, open at one end and exteriorly threaded as indicated at 18 and formed integral at its other end with the relatively long longitudinally extending stem 19, the over-all diameter of which is somewhat less than the over-all diameter of the steel body 17.

The body 17 is hollow or provided with the chamber 20 and the inner end wall 21 of this chamber, which forms an abutment for a part of the device as hereinafter described, has the central passage 22 opening therethrough, which passage passes entirely through the stem 19 as shown and provides a path for the steel well cable or rod.

Between its ends the stem 19 is cut away or of reduced outside diameter forming the encircling constricted area 23 and at the free end the corner of the stem is relatively widely rounded as indicated at 24. This rounded corner facilitates the extension of the stem through the packer sleeve 15 and when the fluid under pressure is introduced into the head 11 the packer sleeve 15 is caused to engage in the constricted area 23 and tightly grip the stem.

Within the chamber 20 there are located the brass rings 25 and 26, the opposing portions of which rings are of conical inside formation thereby providing the opposing seats 27.

The ring 25 rests upon the wall 21 while the outer ring 26 is maintained in position by the steel cap 28 which receives the outer end of the body 17 and is threadably coupled thereto in the manner shown. This cap is provided with a central opening 29 which is coaxial with the passage 22 and the cap carries the arms 30 by means of

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which it may be easily and quickly threaded into or removed from position.

The numeral 31 designates the renewable rubber stripper or flexible bushing. The lower end of this bushing is substantially conical as indicated at 32 to seat on the conical face 27 of the lower ring 25 and this conical lower portion 32 of the bushing is of an over-all diameter at its widest part, materially greater than the over-all diameter of the bushing so that there is thus formed a shoulder 33.

The opposite or upper end of the bushing 31 is merely beveled off as indicated at 34 to fit or conform with the taper of the conical seat 27 of the upper ring 26.

The bushing 31 is preferably made in one piece and is spirally split as indicated at 35 and the passage through the bushing, designated 36, is of a diameter less than the openings of the rings and adapted to substantially conform to the diameter of the cable or wire line which the bushing is designed to tightly encircle.

As will be readily apparent the bushing 31 is adapted to be applied to the cable or wire line without having to remove the device from the cable or from the engagement of its stem portion 19 in the expansible packer bushing.

Confined within the body 17 between the conical faces or surfaces 27 of the rings 25 and 26 is the annular pressure jacket which is generally designated 37. This annular jacket has the central or axial passage 38 to snugly receive the stripper bushing 31. The top and bottom surfaces of the jacket 37 are designated 39, and these surfaces are in outwardly convergent relation so that each will have a taper corresponding to the taper of the seat 27 of the adjacent ring. Thus the taper at each end of the pressure jacket and the taper of the adjacent end portion of the stripper bushing correspond so that these two portions will seat firmly in the conical seat 27 of the adjacent ring and the entire unit may be firmly secured between the rings and held in place by the threaded cap 28.

The annular pressure jacket has formed therein the annular fluid receiving chamber 40 which opens through the outer side of the jacket and is of gradually increasing width toward the inner side. Since the outer side of the pressure jacket bears against the inner wall of the body 17, it will be seen that such wall closes the outer side of the fluid chamber 40 and there is introduced into this chamber, through a suitable opening as indicated at 41, a fluid under high pressure which causes the jacket to tightly compress the bushing 31 around the cable or wire line.

The brass retainer rings 25 and 26 help to eliminate sparks from the steel cable.

By the provision of the dovetail shaped fluid chamber 40 in the pressure jacket, when the pressure is built up in the chamber there is developed sufficient force at each end against the brass retainer rings to firmly press or feed the flexible rubber bushing into the line or cable contact space. The jacket is stretched over the bushing so that it will compress the bushing firmly around the cable and feed it inwardly along the tapered surfaces 27 of the brass ring, establishing a tight contact with the cable and also causing the bushing to wear evenly throughout its length.

The device forming the present invention is designed to be used in connection with well perforators, water locating devices, surveys and like operations and it gives the users a chance to

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recover their tools if the well should go wild for a short period and push out their equipment too fast.

At the present time it is the practice to use two of the Kilmer packers or bushings but the rubber of such bushings is cut out in a very short time and causes leakage and, aside from the fact that this requires frequent replacement of the bushings, this is particularly to be avoided at the present time in view of the cost and shortage of rubber.

The wear on the bushing or stripper 31 is even throughout even after a considerable number of hours of use, because of the wedge-like action of the pressure jacket which feeds the bushing to the wire line.

It will be readily apparent from the foregoing that a device constructed in accordance with the present invention, when in use, will release automatically from the well packer when the swab tools are withdrawn and come into contact with the lower end of the stem 19 so that the bushing or packer 15 may close promptly after the passage of the swabbing tools and hold the pressure until the well control valve is closed. Consequently, it will be readily apparent that since the stem releases from the Kilmer packer all danger of the swabbing tools breaking off and falling down into the well when such tools come up against the stem, is avoided, whereas in other types of devices where such a release means is not provided, this undesirable breaking of the swabbing tools is likely to occur.

We claim:

1. The combination with a well packer of the type having a cylindrical contractible and expansible packer bushing designed to be contracted about a cable, wire line or rod, of a line stripper comprising a housing through which the line passes, a stripper body in the housing and designed to encircle and to be contracted about the line, and a tubular stem extending from the housing through the packer bushing, the stem being formed for the gripping engagement of the packer bushing thereabout and for extraction from the bushing upon the application of a predetermined force to its free end while being gripped by the bushing.

2. The combination with a well packer of the type having a cylindrical contractible and expansible packer bushing designed to be contracted about a cable, wire line or rod, of a line stripper comprising a cylindrical housing open at one end and having an integral, relatively long tubular stem extending axially from the opposite end, the stem extending through the bushing, the exterior of the stem being constricted intermediate its ends to facilitate its being gripped by the contracted bushing, a tubular stripper in the housing coaxial with the stem for tight wiping encirclement of a shaft, wire line and the like, and means upon the open end of the housing for retaining the stripper in the housing.

3. The combination as set forth in claim 2, in which the stem at its free end is substantially rounded to facilitate the extension of the stem into the packer bushing.

4. A line stripper of the character stated, comprising a cylindrical housing open at one end and having an integral, relatively long tubular stem extending axially from the opposite end, the stem opening into the housing, the stem being of reduced outside diameter through a portion of its length and intermediate its ends, a centrally apertured cap closing the open end of the

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housing, a tubular stripper of resilient material disposed within and coaxially of the housing in line with the tubular stem and cap opening, and means within the housing and surrounding the stripper for effecting the constriction of the stripper around a cable, wire line and the like passing through the housing.

5. A line stripper of the character stated in claim 4, with means for causing the end portions of the tubular stripper to be pressed inwardly upon the operation of the stripper contracting means.

6. A well stripper device of the character stated, comprising a cylindrical housing open at one end and having an integral, relatively long tubular stem extending axially from the opposite end and opening thereinto, said stem being designed for extension through a cylindrical packer bushing of the contractible and expansible type to be gripped thereby, means within the housing forming opposed outwardly tapering conical surfaces, a tubular line stripper disposed within the housing coaxial therewith and with the tubular stem and having tapered outer end surfaces each disposed against a conical surface, an annular expansible body encircling the tubular stripper and having inclined end surfaces contacting the said opposed conical surfaces, means for effecting the contraction of said stripper encircling member by the injection of fluid under pressure into the housing, and a centrally apertured cap engaged over the open end of the housing and having the aperture thereof coaxial with the tubular stripper member.

7. A stripper device as set forth in claim 6, in which the tubular stripper member is longitudinally divided to facilitate its application to a line.

8. A line stripper device of the character stated in claim 6, in which the tubular stripper is of enlarged diameter at the end adjacent to the stem whereby there is formed an encircling shoulder, and the said stripper contracting means having bearing engagement at its inner end against said shoulder.

9. A stripper device of the character stated in claim 6, in which the said stripper contracting means has an encircling outwardly opening channel which is closed at its outer side by the encircling casing wall and into which the pressure fluid is introduced, said channel being of increasing width from the outer side to the inner side.

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10. A line stripper device, comprising a cylindrical housing open at one end having an integral, relatively long tubular stem extending axially from the opposite end and opening thereinto, the stem being exteriorly reduced in diameter throughout the major portion of its length and between points lying inwardly from its two ends to extend through and be engaged by a cylindrical packer bushing of the contractible and expansible type, a pair of ring members within the housing and axially spaced apart, the ring members having their opposing sides formed to provide outwardly tapering conical bearing surfaces, a tubular stripper member of elastic material disposed in and extending through the major portion of the length of the housing, coaxial therewith and with the stem, said stripper member being of enlarged diameter at its inner end and having both ends of tapered form to engage the conical bearing surfaces of the adjacent rings, the enlarged inner end of the stripper member forming an encircling shoulder, an annular member encircling the stripper member and bearing at one end against the shoulder, said annular member having opposite end surfaces tapered to conform to and engage against the bearing surfaces of the adjacent rings, the annular member having an encircling chamber therein opening through its outer side, the outer side of said chamber being closed by the adjacent encircling wall of the housing, means for introducing a fluid under pressure through the housing wall into said annular chamber, and a centrally apertured cap engaged upon the open end of the housing to maintain the rings, stripper member and annular member in position therein, the aperture of the cap being concentric with the stripper member.

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