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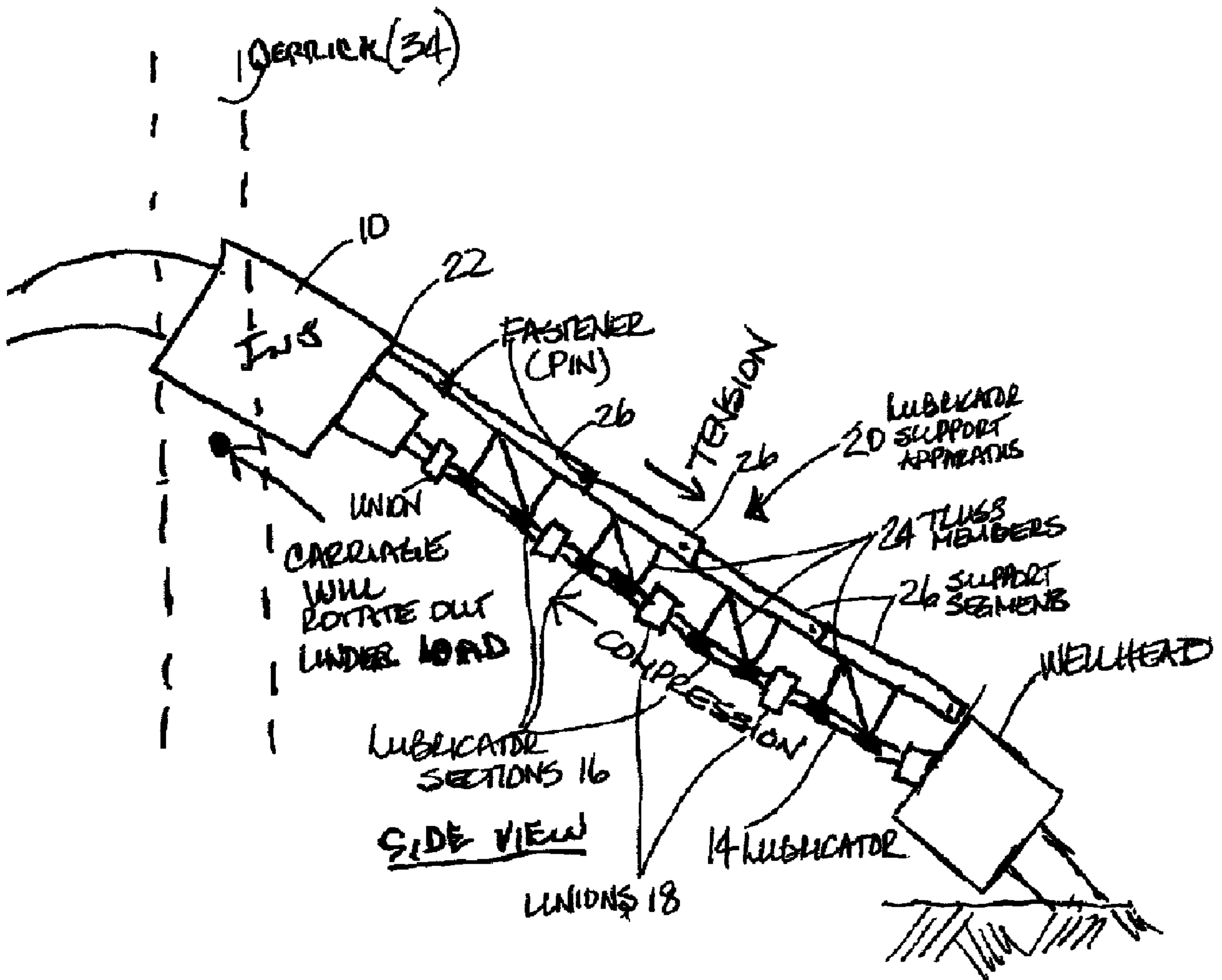
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(54) Titre : DISPOSITIF DE SUPPORT DE LUBRIFICATEUR DANS UNE OPERATION EN SERPENTIN

(54) Title: SUPPORT APPARATUS FOR A LUBRICATOR IN A COILED TUBING OPERATION



1           **"SUPPORT APPARATUS FOR A LUBRICATOR IN A COILED TUBING**  
2                                   **OPERATION"**

3  
4                                   **FIELD OF THE INVENTION**

5           The apparatus relates to the field of lubricators used in coiled  
6 tubing operations in the petroleum industry and more particularly to apparatus for  
7 supporting lubricator segments connected between a coiled tubing injector and a  
8 wellhead under loads imposed as a result of movement of the injector.

9  
10                                  **BACKGROUND OF THE INVENTION**

11           Conventionally, coiled tubing operations, such as wellbore  
12 stimulation and workover operations, have been performed on vertical wellbores  
13 using vertical derricks and coiled tubing injectors which are moveable vertically  
14 within the derrick. Further it is known to provide injectors carried in cradles which  
15 are movable in two planes, vertically and horizontally to better align the injector  
16 with the wellbore.

17           With the introduction of directional wellbores and particularly with  
18 slant wellbores, it is known to provide vertically actuatable coiled tubing injectors  
19 on a derrick which can be slanted in at least one vertical plane to orient the  
20 injector with the wellbore. In some cases the chassis stabilizer's of the rig are  
21 also manipulated somewhat to provide tilt in a second vertical plane.

22           Applicant is also aware of injectors which rotate and tilt relative to a  
23 trolley and to a derrick along which the trolley slides. The injector is moveable up  
24 and down the derrick using a winch mechanism and is capable of being  
25 adjusted, using hydraulic cylinders, to align with the wellbore.

1           Injectors are typically connected to the wellhead through a  
2 lubricator which is comprised of a plurality of lubricator sections which are  
3 connected by unions. Each of the risers may weigh as much as 300-400 lbs and  
4 may be rated to handle pressures in the order of about 5000 psi for stimulation  
5 or workover operations and the like. Conventional lubricators are designed to be  
6 used for vertical wellbores and thus are not designed to handle additional loads  
7 placed on them during alignment and connection to a slant wellbore.  
8 Additionally, movement of a tiltable injector in any direction would cause  
9 increased stress loads to be placed on the lubricator which may already be  
10 placed under tension as a result of the injection operations. Further, the  
11 lubricator may be caused to sag or to bind during injection operations and may  
12 not be capable of withstanding the high pressure load for which they are  
13 designed. Clearly what is required is means for supporting the lubricator during  
14 injection, either to a vertical wellbore or to a slant wellbore, particularly when  
15 injected using an injector capable of being rotated and tilted for alignment with  
16 the wellbore.

17

18                           **BRIEF DESCRIPTION OF THE DRAWINGS**

19           Figure 1 is a side view of a lubricator support apparatus according  
20 to an embodiment of the invention;

21           Figure 2 is a back view of an injector which is rotatable and tiltable  
22 relative to a derrick in which the injector is supported;

23           Figure 3 is a side view of a carrier for an injector according to Fig. 2  
24 and illustrating hydraulic cylinders or rams for movement of the injector in the  
25 carrier and relative to the derrick; and



1                   Figure 4 is a front view of the injector according to Fig. 2,  
2 illustrating the injector supported in the derrick and further illustrating hydraulic  
3 cylinders or rams for movement of the injector in the carrier and relative to the  
4 derrick.

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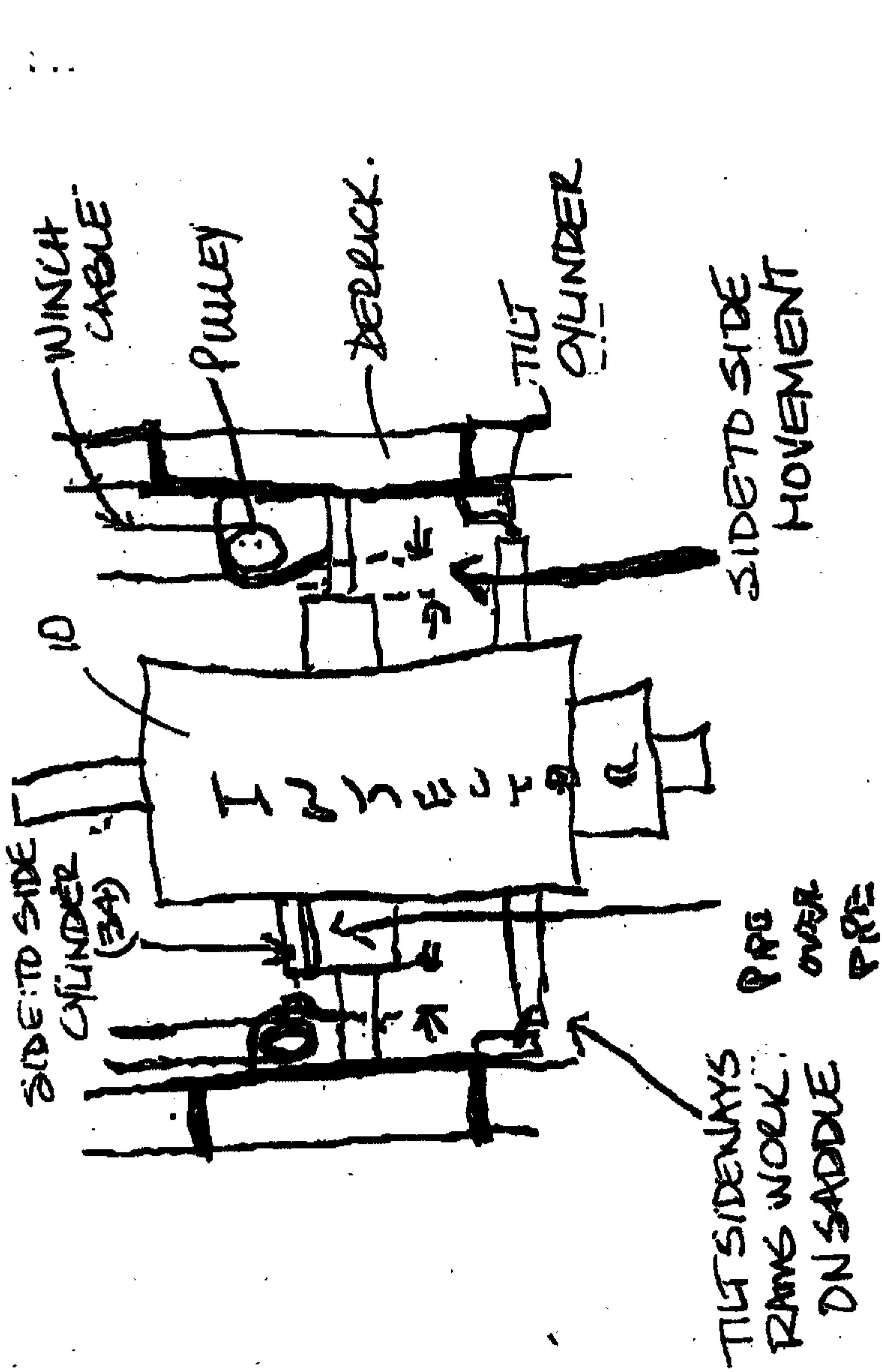
#### DESCRIPTION OF THE INVENTION

7                   As shown in Fig. 1, an injector 10 is connected to a wellhead 12  
8 through a lubricator 14. The lubricator 14 comprises a plurality of lubricator  
9 sections 16 which are connected to one another by unions 18 for forming the  
10 lubricator 14. A lubricator support apparatus 20 is connected, at a first end 22 to  
11 the injector 10. A plurality of truss members 24, are connected between at least  
12 a portion of the lubricator sections 16 and the support member for supporting the  
13 lubricator sections 16 thereon and for reducing stress loading on the lubricator  
14 14. The support member 20 is spaced substantially parallel to the lubricator 14  
15 by the truss members 24, which are fastened to both the lubricator 14 and the  
16 support member 20.

17                   In an embodiment of the invention, the lubricator support apparatus  
18 20 further comprises a plurality of support segments 26 which are fastened  
19 together using fasteners 28, such as pins, for forming the support apparatus 20.  
20 Preferably, a truss member 24 is connected between each of the lubricator  
21 sections 16 and a corresponding support segment 26. Further, use of  
22 corresponding support segments 26 and truss members 24 permit the support  
23 apparatus 20 to be readily constructed of a length required to support the  
24 lubricator 14, regardless the length of the lubricator 14.

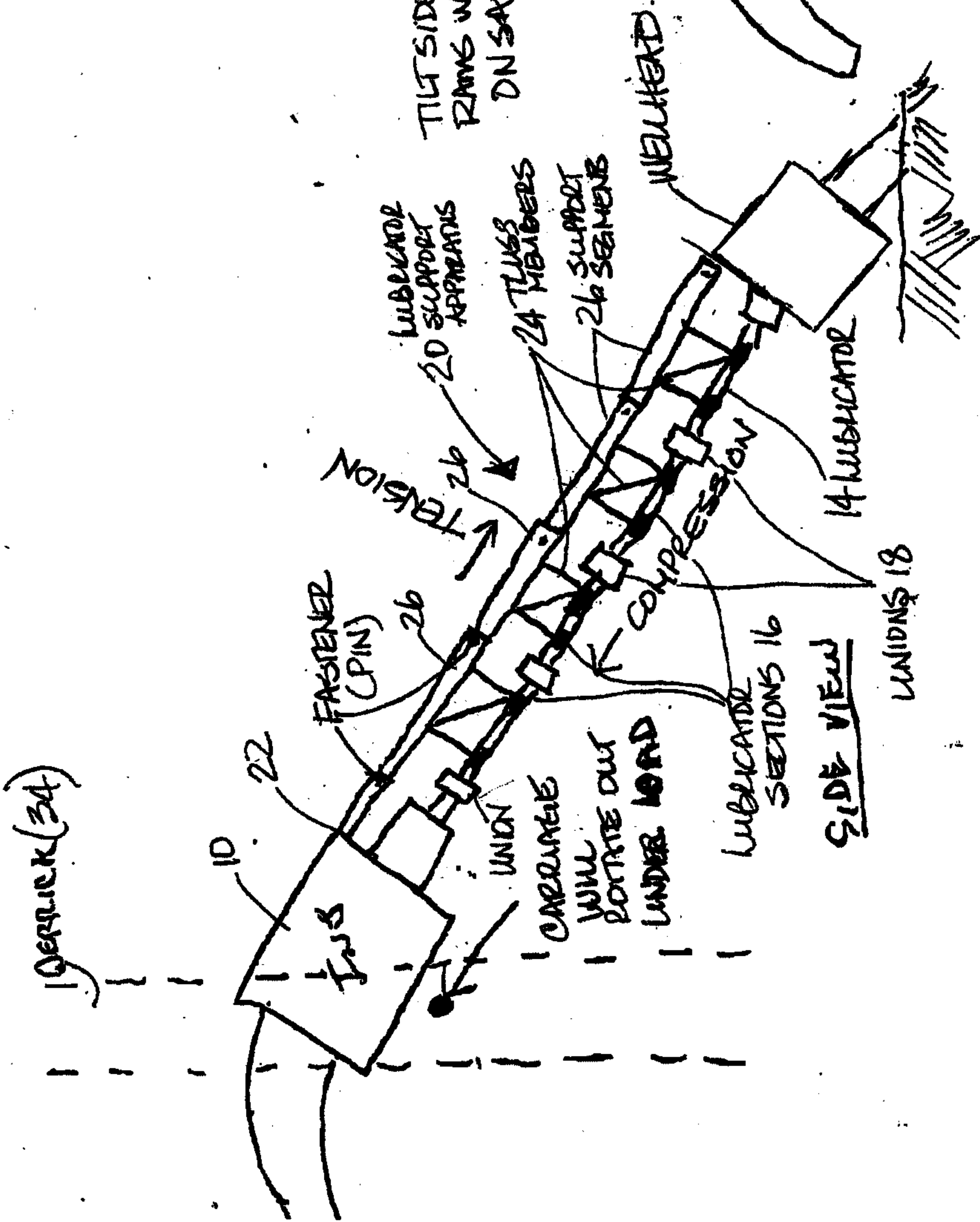
1                    Figs. 2-4 illustrate a portion of a coiled tubing rig 30 having an  
2 injector 10 carried in a saddle 32 mounted in a trolley or carriage in a derrick 34,  
3 the injector 10 being capable of being rotated and tilted relative to the derrick 34  
4 and to which the lubricator support apparatus 20 may be used. The injector 10 is  
5 rotatable and tiltable through a plurality of hydraulic rams 34 connected between  
6 the saddle 32, the injector 10 and the derrick 34.

7                    Further, the lubricator support apparatus 20 is also applicable in  
8 coiled tubing operations performed in vertical wellbores (not shown).



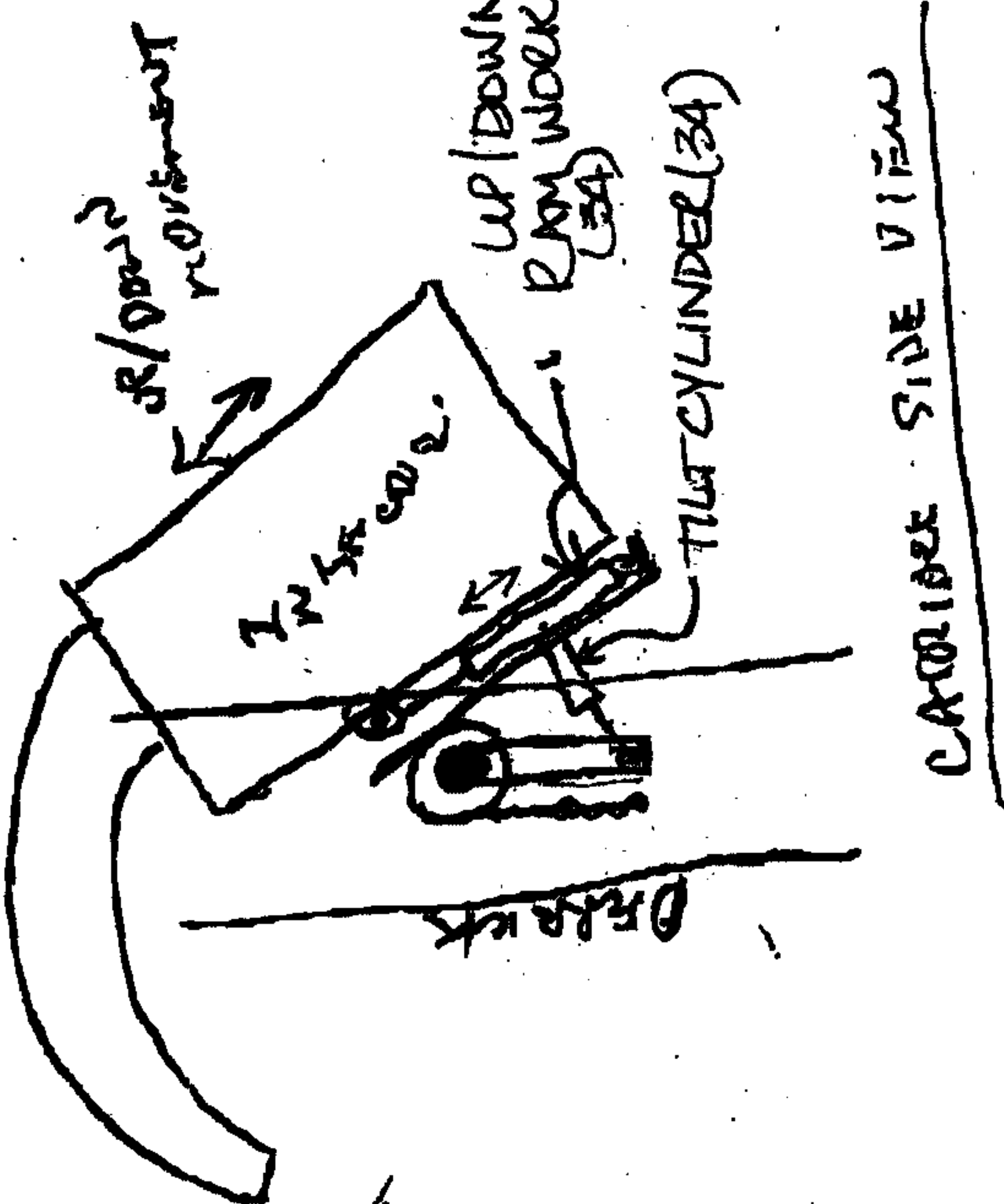
**Fig. 2**

BACK VIEW



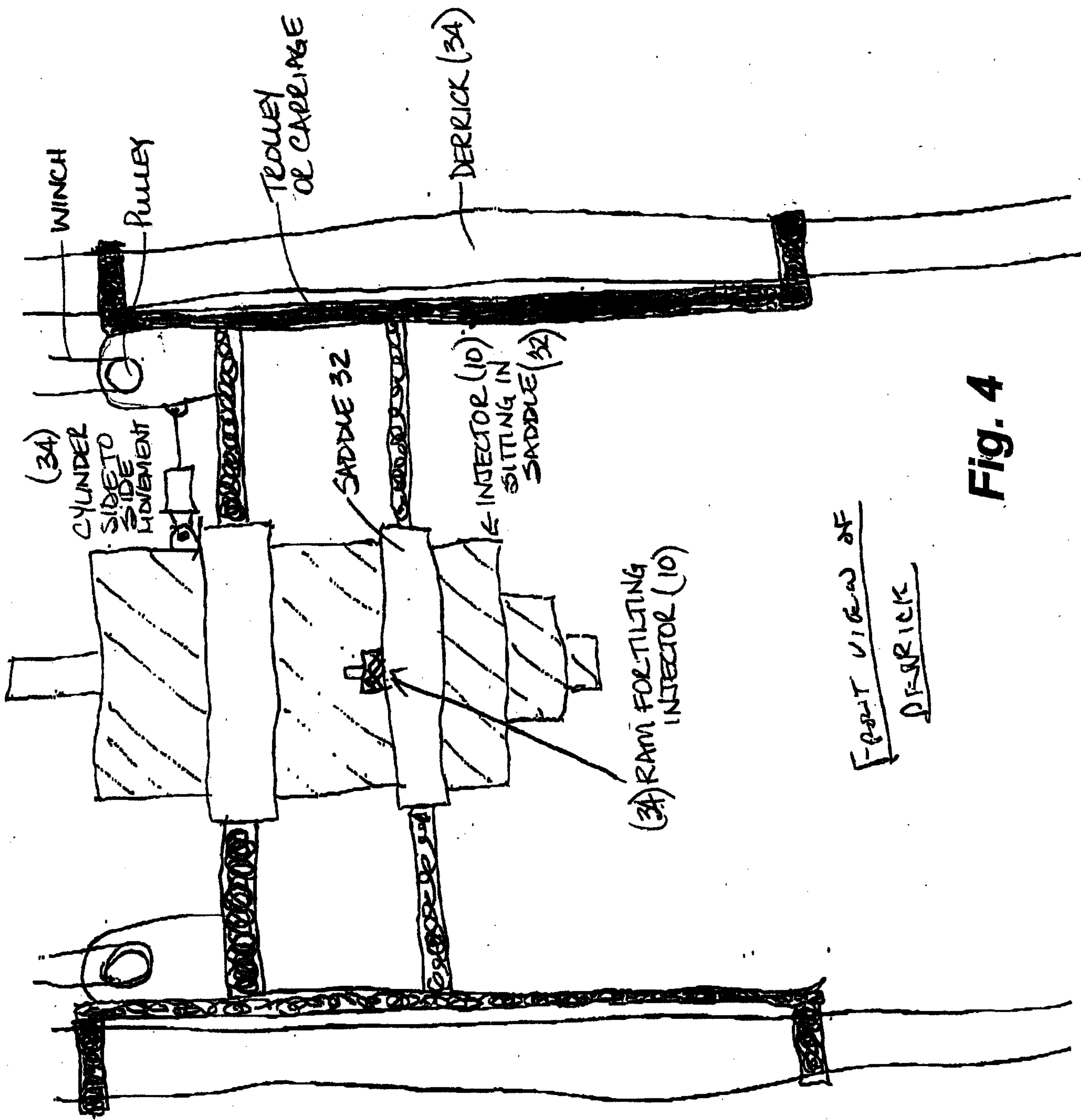
**Fig. 1**

SIDE VIEW



**Fig. 3**

CARTRIDGE SIDE VIEW



FRONT VIEW OF  
DERRICK

Fig. 4



