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L. J. BECHAUD

TUBING SUPPORT

Filed Jan. 12, 1924

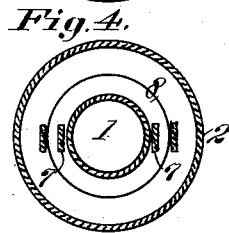
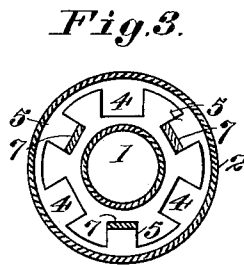
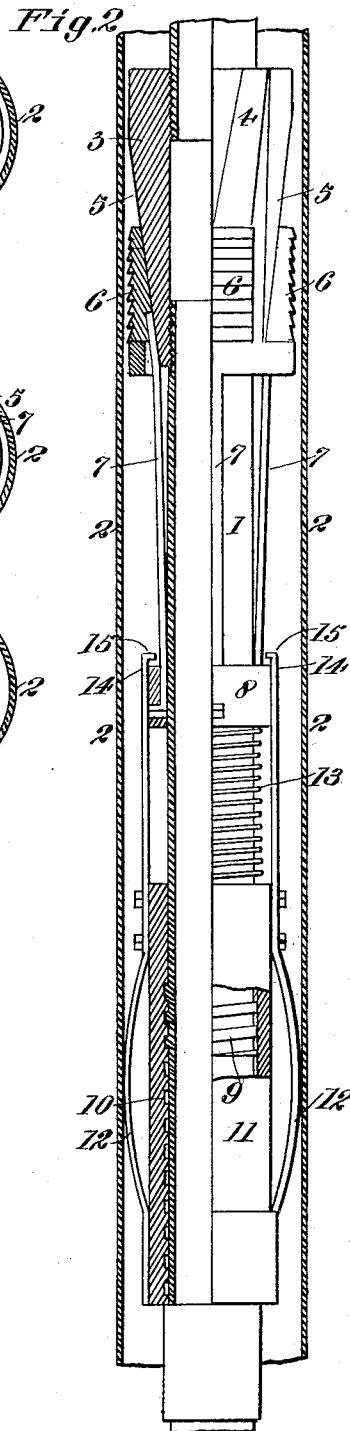
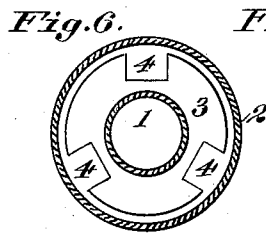
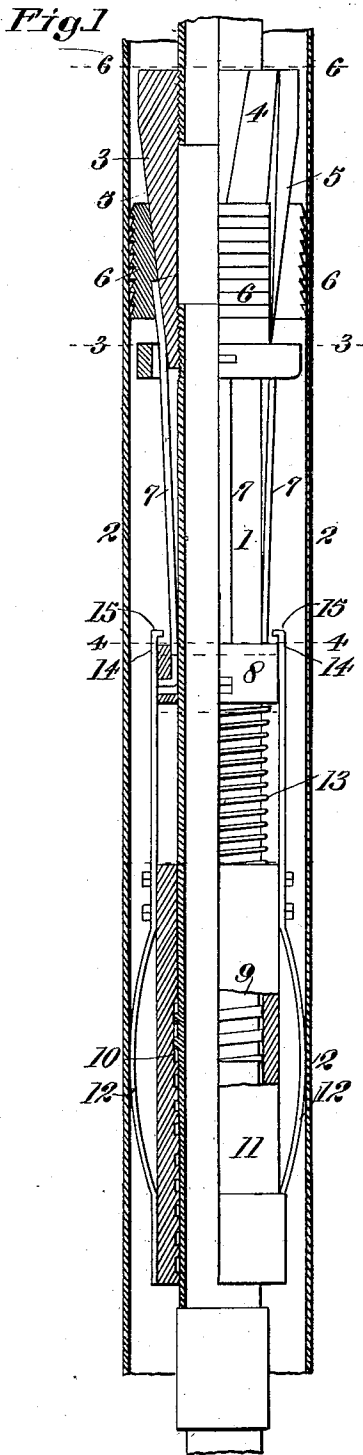
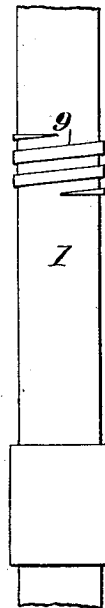


Fig. 5.



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UNITED STATES PATENT OFFICE.

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TUBING SUPPORT.

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To all whom it may concern:

Be it known that I, LESLIE J. BECHAUD, a citizen of the United States, residing at Coalinga, in the county of Fresno and State of California, have invented certain new and useful Improvements in Tubing Supports, of which the following is a specification.

It is the present practice in oil well operation to extend the tubing into the casing and to suspend the same therein from its upper end. This practice places great strain on the tubing, and the movement of the sucker rod and the friction of the pumped liquid during the pumping operation causes the tubing to move up and down with each pumping stroke, it having been ascertained that the stroke movement in a string of 2400 feet to be approximately eight inches. This tube movement causes the friction of the tube coupling members to wear through the casing, requiring frequent shutting down of the well and a replacement of the casing. In connection with this suspended tubing it is also the present practice to provide gripping devices, which, while the tube is intact are inoperative, and do not engage the casing, but which are only thrown into operation by the breaking of the string of tubing and during its downward momentum, these latter devices being known to the trade as tubing catchers. The essence of my invention lies in the employment of a gripping device which is designed for locking the tubing from movement after insertion within the casing and for locking the tubing to prevent the breaking thereof; also in the employment of a construction enabling the locking of the tubing to the casing at any point within the well, and such construction permitting the withdrawal of the tubing from the casing when the engaging devices are in locking position; in short, to provide an interlocking connection between the tubing and casing which will preclude relative movement of the members, will admit of the withdrawing of the tubing when in normally locked position, and which is capable of being thrown into locking engagement at the will of the operator.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood

that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention, reference is directed to the accompanying drawings, wherein:—

Fig. 1 is a view in elevation, partly in section, of the tubing lock and retainer in its normal operative position within the casing.

Fig. 2 is a view similar to Fig. 1 illustrating the position of the parts during the lowering of the tubing within the casing and prior to the operation of the setting sleeve.

Fig. 3 is a transverse section on line 3—3 of Fig. 1.

Fig. 4 is a transverse section on line 4—4 of Fig. 1.

Fig. 5 is a view in detailed elevation of the threads on the tubing and forming one member of the setting screw.

Figure 6 is a transverse section on line 6—6 of Figure 1.

Referring particularly to the drawings wherein like characters of reference designate corresponding parts, 1 indicates the well tubing within the well casing 2. Carried by the tubing between adjacent sections and forming a coupling for uniting the same, is a conical body 3, provided with vertical water courses 4 therethrough, the surface of the body between the water courses affording seats 5 on which slide the engaging members 6. Extending from each engaging member 6 is a bar or rein 7, the same passing through slots 7' and united at their lower ends about the body by the controller ring or collar 8. At a point below the body 3 the tubing mounts a relatively coarse thread 9 of considerable pitch, and cooperating with the said thread is a corresponding thread 10 formed interiorly of a sleeve 11 mounted to rotate relatively to the section of tubing immediately below the body 3. The sleeve 11 on its exterior carries a plurality of outwardly bowed spring members 12 adapted to frictionally engage the interior of the casing as in the drawings. Interposed between the collar 8 and sleeve 11 and surrounding the tubing 1 is a coil spring 13, of sufficiently stiff construction to be inoperative under any condition to float the collar

8 and its associated movable devices. Certain of the spring members 12 extend above the upper end of sleeve 11 as at 14 to a point to project slightly above the collar 8 when the sleeve is in its lowered position releasing all pressure on spring 13. The upper ends of the members 14 are bent at 15 to overlie the collar 8 to preclude the upward movement of the slips 6 into engagement with the casing until such time as the sleeve 10 moves upwardly on the tubing 1.

The device being assembled as in the drawings and the parts being in the position indicated in Fig. 2, the device is operated in the following manner. The string of tubing with the locking and retaining devices mounted thereon at one or more points within its length is lowered into the casing and it will be observed from Fig. 2 that during this lowering movement the engaging members 6 are at the lower ends of the slots 5. After the tubing has been lowered into the casing to the desired point the operator imparts a rotative movement to the tubing and the engaging contact of the flat springs 12 against the interior of the casing will preclude the rotation of the sleeve 11, thus the sleeve due to its threaded connection on the tubing will act as a takeup to compress the spring 13. The compression of the spring will gradually raise the collar and its associated parts including the members 6 and cause the members to engage the inner surface of the casing and thus lock the tubing therein, against parting and against reciprocation during the pumping stroke of the sucker rod. When locked the parts assume the position as in Fig. 1 and should it be necessary or desirable to withdraw the tubing from the casing an upward pull on the tubing will cause the spring 13 to give and permit the free upward movement of the tubing, at the same time preventing a downward movement of the tubing until such time as a rotation of the tubing causes a relative downward movement of the sleeve 11 thereon to release the pressure on the spring 13.

I claim:

1. An apparatus for locking tubing within a well casing comprising gripper slips carried by the tubing, and means adapted for placing under tension for forcing and retaining said gripper slips into locking engagement with said casing, said means being operable on the axial rotation of the tubing within the casing for moving said gripper slips into locking engagement with the casing and into released position therefrom enabling the ready adjustment of the tub-

ing within the well casing after the same has been once locked therein.

2. An apparatus for locking tubing within a well casing comprising gripper slips carried by the tubing, and means associated therewith and having threaded contact with the tubing for setting the gripping members for locking engagement with the casing.

3. An apparatus for locking well tubing within a well casing comprising gripper slips carried by the tubing, and a sleeve threadably mounted on the tubing and adapted to frictionally engage with the well casing, said sleeve adapted on the axial rotation of the tubing to move longitudinally of the tubing and force said slips into gripping engagement with the casing.

4. An apparatus for locking well tubing within a well casing comprising gripper slips carried by the tubing, a sleeve threadably mounted on the tubing and adapted to frictionally engage with the well casing, said sleeve adapted on the axial rotation of the tubing to move longitudinally of the tubing and force said slips into gripping engagement with the casing, and a yielding member interposed between the slips and sleeve.

5. An apparatus for locking a member within a tubular casing comprising a part carried by the member and adapted for movement longitudinally thereof, devices actuated by the part for cooperation with the casing, and a sleeve threadably mounted on the member and adapted to frictionally engage the casing, said sleeve adapted upon the axial rotation of the member to move longitudinally of the tubing and operate said part to move said devices into cooperation with the casing.

6. In combination with gripper slips for locking the tubing within a well casing, of operating means therefor including a stem threaded on the tubing, and spring devices carried by the sleeve for yieldably engaging the casing.

7. In combination with freely movable gripper slips for locking the tubing within a well casing, of operating means therefor including a sleeve threaded on the tubing, devices carried by the sleeve for yieldably engaging the casing and a connection between slips and sleeve whereby the movement of the slips beyond a predetermined limit is controlled by the adjusted position of the sleeve on the tubing.

In testimony whereof I have signed my name to this specification.

LESLIE J. BECHAUD.