Aug. 30, 1938. N. H. ARMSTRONG 2,128,520

TUBING DRAIN

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Fig. 1.

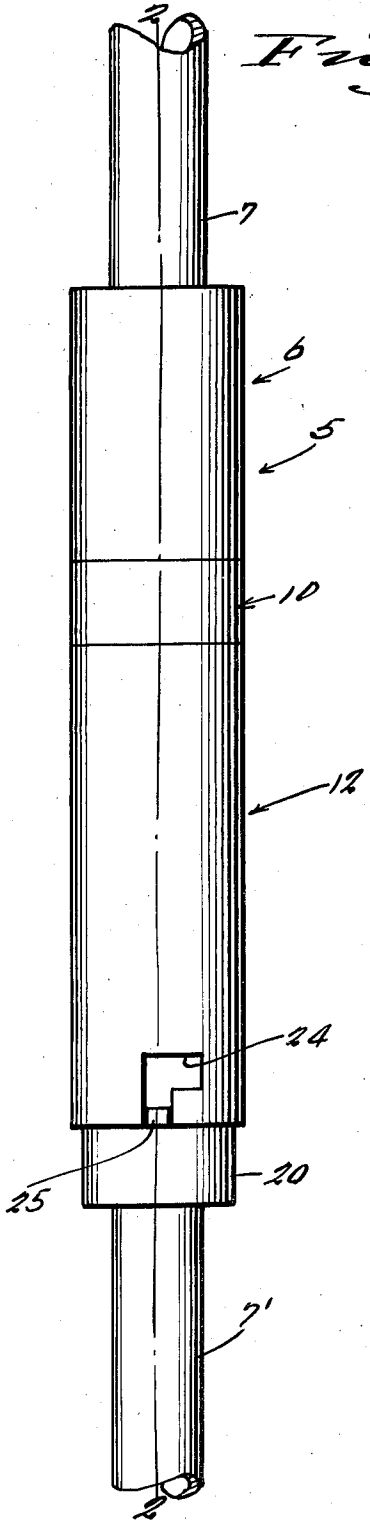


Fig. 6.

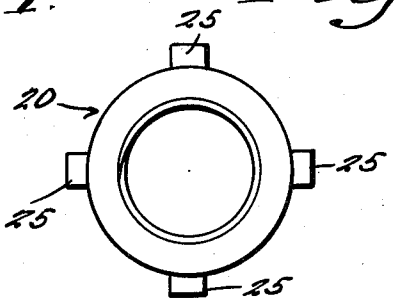


Fig. 7.

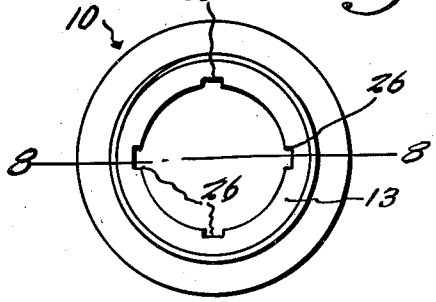
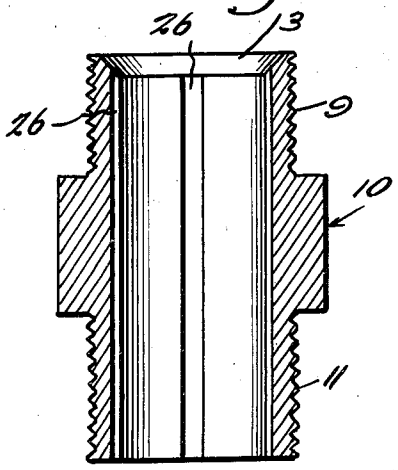


Fig. 8.



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Fig. 2.

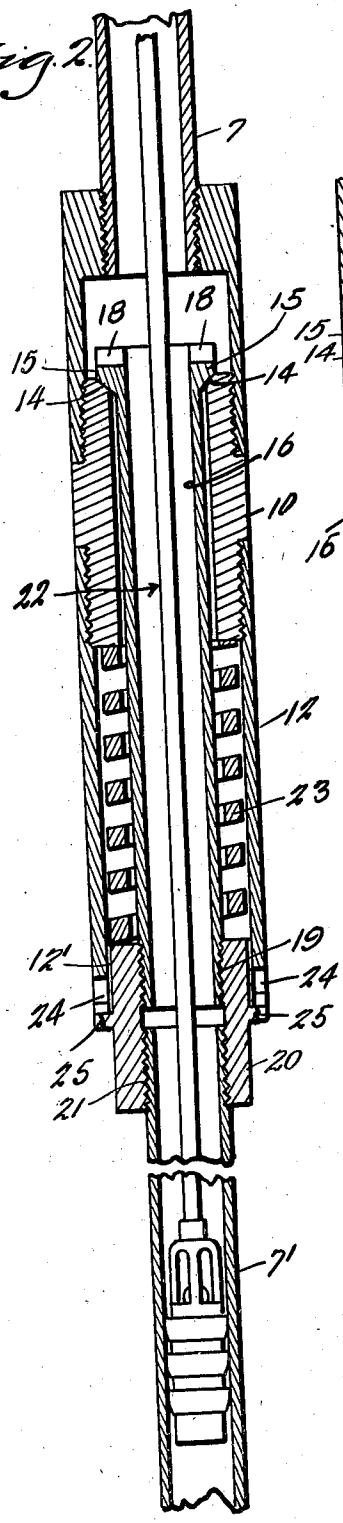


Fig. 3.

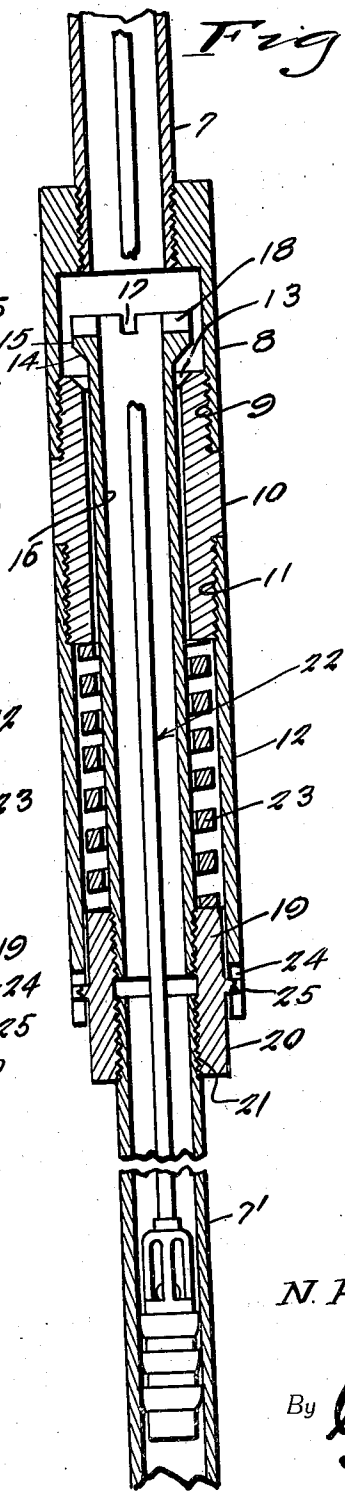


Fig. 4.

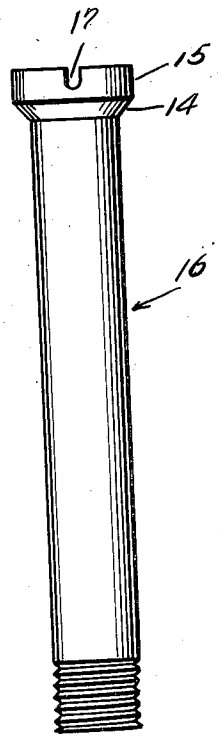
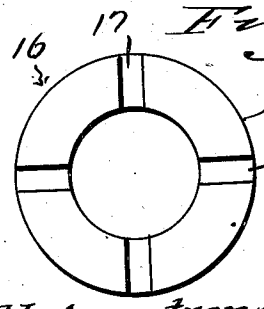


Fig. 5



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2,128,520

TUBING DRAIN

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Application April 30, 1937, Serial No. 140,056

1 Claim. (Cl. 137—34)

My invention relates generally to means for draining the fluid from tubing in an oil well before pulling the tubing out of the well, and an important object of my invention is to provide an arrangement of this character which eliminates the waste and danger of spilling oil on the wellhead and surrounding ground by causing the oil in the tubing to run back into the well as the tubing is drawn out of the well.

Another important object of my invention is to provide an arrangement of the character indicated above which may be operated with the sucker rod still in the hole.

Other important objects of my invention will be apparent from a reading of the following description taken in connection with the drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings:—

Figure 1 is a general elevational view of an embodiment of the invention.

Figure 2 is a transverse vertical sectional view taken through Figure 1 approximately on the line 2—2 and showing the embodiment in inoperative condition.

Figure 3 is a view similar to Figure 2, but showing the device in operated position.

Figure 4 is an elevational view of the valve.

Figure 5 is a top plan view of Figure 4.

Figure 6 is a plan view of the combination latch and tubing connection at the lower end of the device.

Figure 7 is a top plan view of the combined valve stem, valve guide and seat.

Figure 8 is a transverse sectional view taken through Figure 7 approximately on the line 8—8.

Referring in detail to the drawings, the numeral 5 generally designates the device of the invention as a whole and the numeral 6 designates the upper tubing connection and upper valve cage which screws directly onto the tubing 7 and has a depending skirt 8 which is threaded as indicated by the numeral 9 on the upper end of the combined valve stem guide and seat 10 which has a reduced threaded lower end 11 which screws into the upper end of the combined spring housing and latching device 12.

The upper end of the element 10 has the beveled seat 13 with which cooperates the beveled portion 14 on the head 15 of the valve 16 which is tubular in form. Pairs of diametrically aligned transverse slots 17 and 18, respectively, are formed in the top of the valve head 15. The lower end of the valve stem is exteriorly threaded as indicated by the numeral 19 into the upper end of the combination latch and tubing connection 20 which is interiorly threaded at its lower end as indicated by the numeral 21 to receive and make connection with the tubing 7'. The numeral 22 generally designates a sucker rod operating in the tubing 7 and showing its disposition relative to the device of the invention.

The upper section of the combination latch and tubing connection 20 is smooth and is slidably telescoped in the lower end of the housing 12 and has resting on its top the lower end of a helical spring 23 which abuts its upper end against the bottom of the valve stem guide and seat 10.

The lower end of the housing 12 has L-shaped openings 24 cut therein at circumferentially spaced points and in these openings work lugs 25 which are similarly circumferentially spaced on the connection 20 at a point intermediate the upper and lower ends thereof. The interior of the valve guide 10 is smooth and provided at circumferentially spaced points with longitudinal grooves 26 which open through the seat 13 and through the bottom of the element 10.

The device of the invention is run as a tubing connection a few feet above the working barrel (not shown). To release the fluid from the tubing, the tubing is merely set on the bottom of the well so as to cause the valve 16 to unseat from the seat so as to permit the fluid to pass down through the device and into the well itself. The member 20 has a loose fit in the lower end of the member 12 so as to leave a space 12' for the escape of the fluid from the said member 12. By making the grooves 26 in the member 10 of different sizes for different kinds of wells, the flow of fluid through said member 10, when the valve 15 is raised can be regulated to suit the individual well in which the device is placed, thereby eliminating the possibility of washing the formation when such formation is soft which might cause a bad cave-in and a costly cleaning out operation. By turning the housing 12 while the device is resting on the bottom of the well with the valve in the open position, the lugs 25 may be engaged with the lateral portions of the openings 24 and the valve thereby maintained in open position so that the tubing may be drawn out of the well with the valve in the open position. To re-run the tubing drain of the present invention the same is placed back in the hole and the housing 12 turned in the opposite direction so as to unlatch the lugs 25 from the openings 24 and permit the spring 23 to close the valve.

Although I have shown and described herein a preferred embodiment of my invention, it is to be

definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in the materials and in the structure and arrangement of the parts, within the spirit of the invention and the scope of the subjoined claim.

What is claimed is:—

A tubing drain comprising a tubular member having a valve seat at its upper end, a cylindrical upper member connected with the upper end of the tubular member, a tubing section connected with the upper end of the upper member, a tubular valve stem having an enlarged valve head for engaging the seat and said head being larger in diameter than the tubing section, a sleeve connected with the lower end of the valve seat carrying member and enclosing the valve stem, a tubular block having a sliding fit in the lower end of the sleeve and connected with the lower end of the valve stem, a spring surrounding the valve stem and located in the sleeve and bearing respectively against the lower end of the seat carrying member and the upper end of the block, means for connecting the lower part of well tubing to the lower part of the block, whereby the valve head will be moved off the seat to drain the upper well tubing when the lower tubing is caused to engage the bottom of the well, means for latching the block to the sleeve to hold the valve head off the seat, said valve head having notches therein and the seat carrying member having longitudinally extending grooves in the walls of its bore extending from the valve seat through the lower end of the seat carrying member for the passage of fluid when the valve head is off its seat.

NORVAL H. ARMSTRONG.