July 1, 1924. 1,499,690

W. B. PINE ET AL

PUMPING EQUIPMENT FOR WELLS

Filed Nov. 16, 1923

Fig. 1.

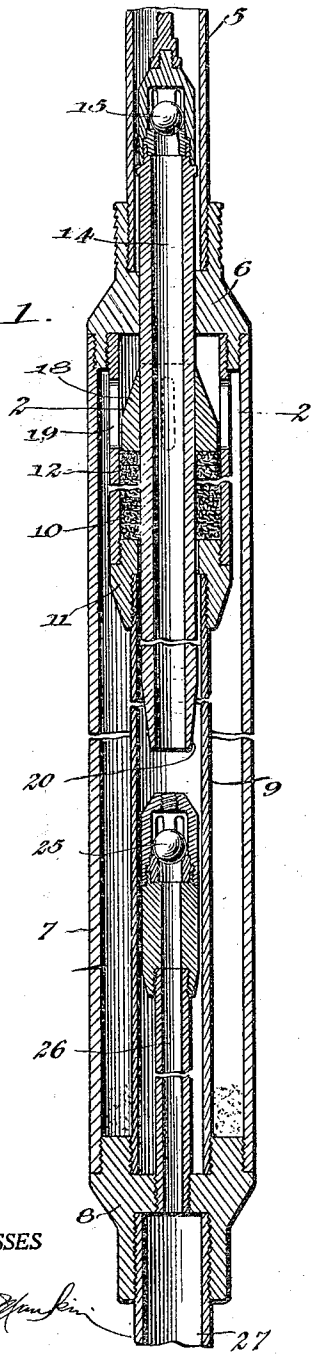


Fig. 2.

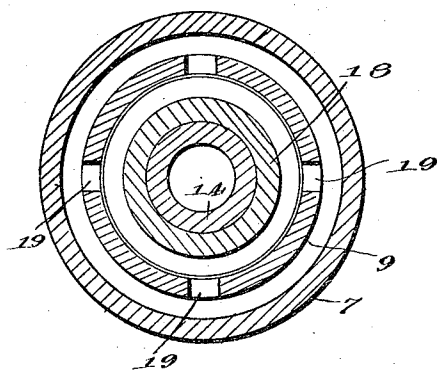
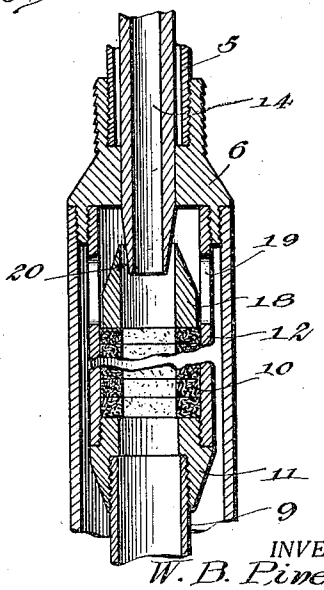


Fig. 3.



WITNESSES

INVENTOR

W. B. Pine

I. V. Martin,

BY Munn & Co.

ATTORNEYS

Patented July 1, 1924.

1,499,690

UNITED STATES PATENT OFFICE.

WILLIAM B. PINE AND IRA V. MARTIN, OF OKMULGEE, OKLAHOMA.

PUMPING EQUIPMENT FOR WELLS.

Application filed November 16, 1923. Serial No. 675,164.

To all whom it may concern:

Be it known that we, WILLIAM B. PINE and IRA V. MARTIN, citizens of the United States of America, and residents of Okmulgee, in the county of Okmulgee, State of Oklahoma, have invented certain new and useful Improvements in Pumping Equipment for Wells, of which the following is a specification.

This invention relates to pumping equipment especially adapted for use in oil wells.

Briefly stated, an important object of this invention is to provide a working barrel having reliable means to prevent floating sand from settling on the packers and rapidly wearing the same.

A further object is to provide a working barrel having novel means whereby to trap the sand upon being directed away from the packers so that it cannot again be picked up by the fluid.

A further object is to provide a pumping equipment which is simple to operate, reliable in use and one in which the necessity for frequently pulling the tubing is overcome.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing forming a part of this application and in which like numerals are employed throughout the same,

Figure 1 is a vertical sectional view through the improved pumping equipment.

Figure 2 is a horizontal sectional view taken on line 2—2 of Figure 1.

Figure 3 is a detail section illustrating the plunger about to enter the sand deflector.

In the drawing wherein for the purpose of illustration is shown a preferred embodiment of the invention the numeral 5 designates a tubing, the lower portion of which is threaded into an upper bushing 6, the said bushing forming what might be said to be the head of the working barrel.

As illustrated in Figure 1, a tubular housing 7 is threaded onto the lower portion of the bushing 6 and has connection with a lower bushing 8. An inner housing 9 consistituting the working barrel is threaded into the lower bushing 8 and supports at its upper end a hydraulic packing 10, the said packing being mounted on the upper end of an inner bushing 11 and being confined within a tubular stuffing box 12.

In carrying out the invention a plunger 14 is slidable through the packing 12 and is provided at its upper end with a caged valve 15. Of course on the upward stroke of the plunger 14 the valve 15 is seated and on the down stroke of the plunger the valve is unseated so as to allow the fluid to enter the tubing 5.

Attention is directed to the fact that an exteriorly tapered sand deflector and scraper 18 is mounted on the upper end of the packing 12 and receives the plunger 14 so that any sand on the plunger is effectively scraped from the same and directed through a plurality of vertical slots 19 in the adjacent portion of the packing box 12.

It will be seen that the lower portion of the plunger 14 is exteriorly tapered as indicated at 20 so that when the same is lowered it will freely pass through the combined sand deflector and scraper. Also, the plunger 14 is guided by the upper bushing 6 and is held in longitudinal alignment with the member 18 so that the plunger will freely enter the working barrel. By reason of this construction it is possible to remove the plunger for repair or replacement without pulling the tubing, a feature very valuable to the inventon.

The usual standing valve 25 is mounted within the inner housing 9 a suitable distance above the lower end of the housing and is supported by means of an inlet pipe 26.

In operation the plunger is reciprocated and any floating sand which settles is directed through the slots 19 into the annular sand trap defined by the inner and outer housings and the tubular stuffing box. Figure 1 illustrates that the upper end of the combined scraper and deflector tapers to a knife like edge so as to thoroughly scrape all sand from the plunger and thereby prevent the sand from settling on the packer.

The sand cannot remain within the upper portion of the packing box as the slots extend a substantial distance below the tapered portion of the sand deflector. Therefore, no pockets are formed within the packing box.

Replacement or repairs to the tubing carried elements of the invention may be con-

veniently made by pulling the tubing to the surface and the sand may also be removed from the sand trap by pulling the tubing.

It is believed to be obvious that the working barrel is supported a suitable distance above the bottom of the well by a main inlet member 28, the lower portion of which may be perforated.

Having thus described the invention, what is claimed is:—

1. A pumping equipment comprising a housing, a packing box arranged within the housing and having slots establishing communication between the interior of the box and the interior of the housing, a plunger movable through the packing box, a barrel receiving said plunger, a packing carried by the box and surrounding the plunger, and a sand deflector mounted on the packing and directing settling sand through said slots.

2. A pumping equipment comprising a housing having a sand trap, a packing box having slots establishing communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, and a barrel receiving said plunger.

3. A pumping equipment comprising a housing having a sand trap, a packing box having slots establishing communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, a barrel receiving said plunger, and a combined plunger scraper and sand deflector arranged within said box inwardly of said slots.

4. A pumping equipment comprising a housing having a sand trap, a packing box having slots establishing communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, a barrel receiving said plunger, a combined plunger scraper and sand deflector arranged within said box inwardly of said slots, and a bushing connected to said housing and receiving and guiding said plunger.

5. A pumping equipment comprising a housing having a sand trap, a packing box having slots establishing communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, a barrel receiving said plunger, a combined plunger scraper and sand deflector arranged within said box inwardly of said slots, and a standing valve arranged in said barrel, the upper portion of said scraper and deflector being tapered to a knife-like edge.

6. A pumping equipment comprising a housing having a sand trap, a packing box having slots establishing communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, a barrel receiving said plunger, and a combined plunger scraper and sand deflector arranged within said box inwardly of said slots, said scraper and deflector being exteriorly tapered for directing sand through said slots, the lower portions of said slots being located below the tapered portion of said scraper and deflector.

7. A pumping equipment comprising a housing having a sand trap, a packing box connected with the housing having slots affording communication between the interior of the box and said sand trap, a packing arranged in said box, a plunger movable through said packing, a barrel arranged within the housing, said barrel being connected with the packing box and being arranged to receive said plunger, and a combined plunger scraper and sand deflector arranged within said box above the packing and inwardly of said slots.

WILLIAM B. PINE.
IRA V. MARTIN.