May 6, 1924. 1,493,267

W. T. KAUFFMAN

OIL PUMP

Filed Jan. 6, 1923

FIG. 1.

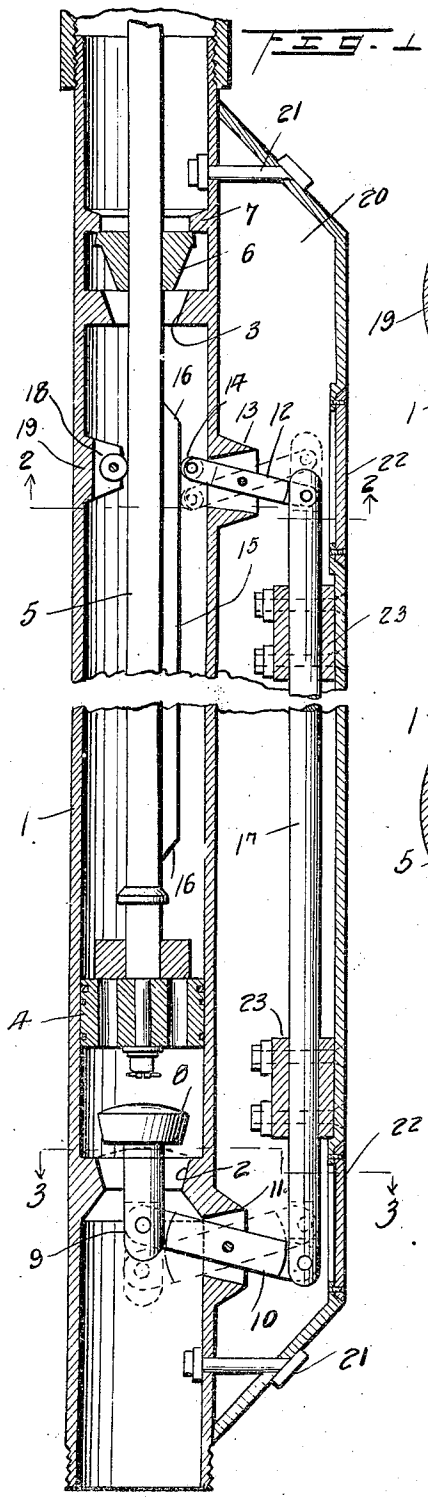


FIG. 2.

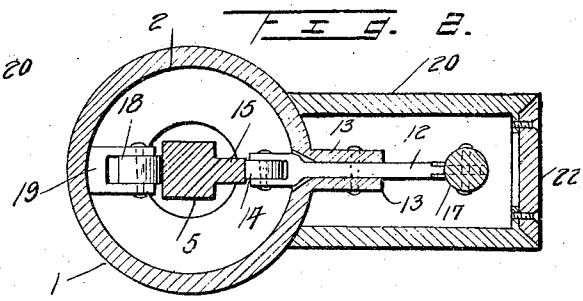
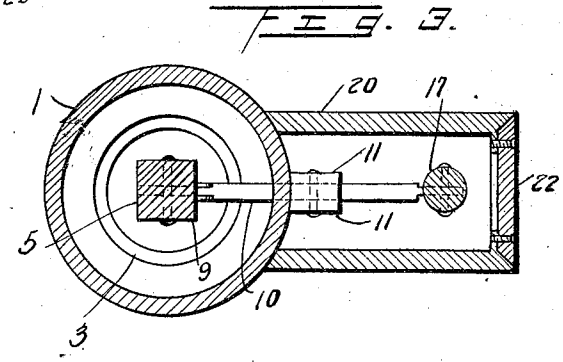


FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM T. KAUFFMAN, OF STEPHENS, ARKANSAS.

OIL PUMP.

Application filed January 6, 1923. Serial No. 611,071.

To all whom it may concern:

Be it known that I, WILLIAM T. KAUFFMAN, a citizen of the United States, residing at Stephens, in the county of Ouachita and State of Arkansas, have invented certain new and useful Improvements in Oil Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the operation of oil pumps as ordinarily constructed, difficulty has been encountered to prevent loss of oil on the down stroke of the plunger. This is due chiefly to gas pressure which prevents the seating of the valve, consequently upon down stroke of the plunger, a portion of the oil previously lifted upon the up stroke of the plunger escapes, thereby adding materially to the cost of production and materially diminishing the output.

The present invention has for its primary object the provision of a pump for use in oil wells embodying a foot valve which is positively actuated both in the opening and the closing, and which is positively held seated throughout the down stroke of the plunger against any gas pressure tending to hold the same open, thereby preventing any loss of oil upon the down stroke of the plunger.

Other objects and advantages will be apparent and suggest themselves as the nature of the invention is understood.

While the drawings illustrate an embodiment of the invention, it is to be understood that in adapting the same to meet different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings forming a part of the application:

Figure 1 is a vertical central section of an oil pump embodying the invention, the full lines showing the foot valve open and the dotted lines the position of the foot valve when seated,

Figure 2 is a horizontal section on the line 2—2 of Figure 1, looking in the direction of the arrows, and

Figure 3 is a similar section on the line 3—3 of Figure 1 looking downward, as indicated by the arrows.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 1 designates a pump barrel which is provided with valve seats 2 and 3. The plunger 4 may be of any preferred construction and is carried by the pump rod 5 upon which is loosely mounted a check valve 6 to close downwardly upon the seat 3, stops 7 being provided to limit the upward movement of the check valve upon the up stroke of the plunger.

The foot valve 8 is adapted to close downwardly on the seat 2 and has a depending stem 9 which is pivoted to the inner end of a lever 10 which passes through an opening formed in the side of the barrel 1, and which is pivoted intermediate its ends to ears 11 provided on the barrel 1 at opposite sides of the opening through which the lever 10 passes. A similar lever 12 is pivoted intermediate its ends to ears 13 and passes through an opening formed in the side of the barrel 1 and is provided at its inner end with a small wheel 14 arranged to engage a longitudinal rib 15 at one side of the pump rod 5, and having its ends inclined as indicated at 16. A rod 17, or like connection, is pivoted to the outer ends of the levers 10 and 12, and causes both of said levers to move in unison. A small wheel 18 is disposed to engage the side of the pump rod 5 opposite the wheel 14 whereby to sustain the pump rod against lateral movement due to the pressure of the wheel 14 thereagainst. The wheel 18 is mounted upon a bracket 19 projecting from the inner side of the pump barrel 1. A housing 20 encloses the levers 10 and 12 and the connection 17. The housing 20 is preferably removable and is secured to the pump barrel by means of bolts 21. Openings are provided in the outer side of the housing 20 opposite the levers 10 and 12 and are normally closed by plates 22 which, when removed, admit of access to the respective levers. Suitable guides 23 are provided within the housing 20 to direct the part 17 in its movement.

Upon the up stroke of the plunger 4, the check valve 6 is unseated and the inner end of the lever 12 is moved upwardly by the rib 15, thereby positively unseating the foot valve 8. As the plunger 4 reaches the limit of its upward movement, the rib 15 clears the wheel 14 at the inner end of the lever 12

so that the instant the plunger begins its down stroke, the weight of the column of oil above the foot valve 8 will seat the same and reverse the position of the lever 12, whose inner end will be engaged by the rib 15 and held pressed downwardly throughout the length of the down stroke of the plunger thereby holding the foot valve 8 positively seated against any pressure of gas which may otherwise tend to unseat and hold the foot valve open.

The pump rod 5 is, as clearly shown in Figures 2 and 3 of the drawing, angular in cross section. Owing to its cross sectional formation, the pump rod 5 is held by the upper portion of the barrel, which upper portion is not shown in the drawing, against rotation with respect to the barrel, and as the result the rib 15 is maintained in position for contact with the wheel 14 during the reciprocation of the pump rod.

What is claimed is:

1. In a pump of the character specified, embodying a barrel, plunger and foot valve, a lever mounted upon the barrel, a rib at one side of the plunger rod and adapted to positively move said lever in each direction, and connecting means between the lever and foot valve to positively open and close said valve and maintain the same in either position throughout the stroke of the plunger.

2. In a pump of the character specified, embodying a barrel, plunger and foot valve, upper and lower levers mounted upon the barrel, the lower lever having connection with the foot valve, means connecting the outer ends of both levers, and a rib at one side of the plunger rod to engage the inner end of the upper lever and positively move the same in each direction to open or close the foot valve and maintain the same in either position throughout the stroke of the plunger.

3. In a pump of the character specified, embodying a barrel, plunger and foot valve, similar upper and lower levers pivoted to a side of the pump barrel and passing through openings formed in a side thereof, the lower lever having connection with the foot valve, means connecting the outer ends of said levers, a rib upon a side of the plunger rod to engage the inner end of the upper lever and positively move the same in each direction, and means carried by the pump barrel to sustain the plunger rod against the lateral thrust of the upper lever.

4. In a pump of the character specified, embodying a barrel, plunger and foot valve, similar upper and lower levers pivoted to a side of the pump barrel and passing through openings formed in a side thereof, the lower lever having connection with the foot valve, means connecting the outer ends of said levers, a rib upon a side of the plunger rod to engage the inner end of the upper lever and positively move the same in each direction, and means carried by the pump barrel to sustain the plunger rod against the lateral thrust of the upper lever, and a housing at one side of the pump barrel enclosing the outer ends of the levers and the means connecting the same and having plate covered openings opposite said levers.

5. In a pump, a piston operable therein, a valve adapted to maintain the inlet of the pump closed during the discharge stroke of the piston, means to maintain said valve open through movement of the piston on its suction stroke and said means at the end of said stroke being releasable by and movable independently of the piston so that the valve may close.

6. In a pump, a piston operable therein, a valve to maintain the inlet of the pump closed during the discharge stroke of the piston, an operating means for said valve, means on the piston engageable with said operating means during a portion of the suction stroke of the piston to maintain the valve open, and said means being disengageable with the operating means before the end of the suction stroke of the piston to permit closing of the valve.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM T. KAUFFMAN.

Witnesses:
W. G. TYSON,
CLYDE WHALEY.