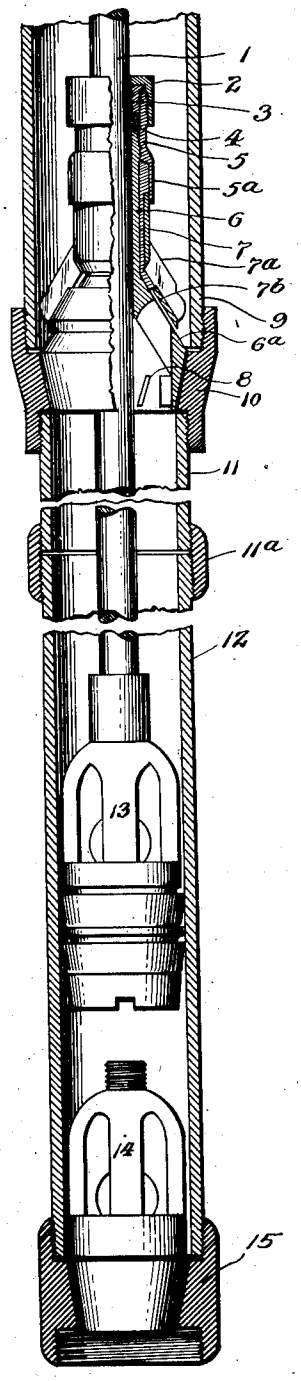
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STANDING VALVE

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Inventor.

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STANDING VALVE.

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This invention relates to pumps and more particularly to deep well pumps.

In the ordinary type of pump used in oil wells there is provided a casing or well tubing extending from the earth to a point adjacent the bottom of the well, a working barrel arranged on the bottom of the casing, a standing valve arranged at the bottom of the working barrel and a traveling valve arranged in the working barrel and connected to a pump rod extending upwardly through the casing.

Efficient operation of a well of this type depends upon complete filling of the working barrel with liquid upon each actuation of the pump rod and traveling valve. Any gas present in the working barrel when the traveling valve starts downwardly will be compressed and the traveling valve will not open. If the traveling valve fails to open and the oil from the working barrel does not pass through the traveling valve the column of oil in the well tubing descends with the valve. In deep wells, this column of oil may be five thousand feet or more in length and the stopping of this downward movement when the traveling valve reaches the bottom of its stroke causes a terrific force to be exerted on the working barrel, which frequently causes the working barrel to burst.

A further objection to the standard type of pump when gas is encountered is that the gas compressed on the downward movement of the traveling valve will expand when the valve moves upwardly and, while this expansion is taking place the standing valve at the bottom does not open and no additional oil is drawn into the working barrel.

An object of the present invention is to provide a valve arranged above the working barrel to take the weight of the column of oil off the traveling valve and to prevent sand from returning to the working barrel and clogging it.

A further object is to provide a valve on which a stuffing box may be mounted and through which the pump rod may be extended.

In the accompanying drawing I have shown one embodiment of the invention. In this showing the figure is a partial elevation and partial sectional view of the lower end of a well casing showing the working barrel, traveling valve, standing valve, and showing the valve forming the subject matter of the present invention.

Referring to the drawing the reference numeral 1 designates the pump rod which extends downwardly from the top of the well casing and is connected to the traveling valve in the usual manner. The pump rod is surrounded by a stuffing box cap 2 within which is arranged a stuffing box gland 3. The stuffing box packing 4 is arranged around the pump rod beneath the gland. A cylindrical member 5 is connected to the cap and forms a connection between the cap and the valve body. The valve body consists of a tubular body portion 6 which is received within the cylindrical member 5 and extends for an appreciable distance around the pump rod. A sand apron 5^a extends downwardly from the member 5 and is slightly spaced from the valve body 6. A conical skirt 6^a is formed on the bottom of the tubular valve member and this skirt bridges the space between the pump rod and the casing. As shown, the skirt is provided with openings to permit the passage of oil. The valve consists of a tubular member 7 surrounding the tubular valve body and extending upwardly inside the apron 5^a. The lower end of this tubular body is provided with a conical skirt 7^b which seats upon the conical portion 6^a of the valve seat when the valve is in lowered position to close the openings in the valve seat. The ring or skirt 7^b may be provided with ribs 7^a by means of which it is connected to the tubular portion 7. The valve member is received in a coupling 10 which is connected to the well tubing 9 by screw threads and is connected to similar tubing 11 arranged beneath it. The interior of the valve is provided with deflecting wings 8 which produce a whirling motion in the oil passing through the valve thus lifting the valve member with a rotary motion and regrinding its seat. The tubing 11 is connected to a coupling 11^a which in turn is connected to a working barrel 12. A traveling valve 13 is arranged in the working barrel and secured to the pump rod. At the bottom of the working barrel there is provided a standing valve 14 which is retained in position by a plug or coupling 15.

The operation of the device will be apparent from the foregoing description. On the upward movement of the pump rod the

standing valve 14 is opened by suction drawing a quantity of oil from the well into the working barrel. When the pump rod moves downwardly the oil lifts the traveling valve 13 from its seat and passes upwardly into the well tubing 9. This upward movement of the oil also lifts the valve 7 from its seat to permit the oil to pass into the well tubing. If the working barrel is not completely filled with oil on the upward movement of the pump rod the valve 7, which is stationary, prevents the column of oil in the well tubing from following the traveling valve as it moves downwardly and thus eliminates pounding. The construction of the valve 7 is such that sand is prevented from returning to the working barrel and clogging the traveling valve.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A valve for oil wells adapted to be arranged above the traveling valve comprising a tubular body through which the pump rod is adapted to pass, an outwardly extending portion formed on the bottom of said tubular body and extending to the inner wall of the well tubing, said extension being provided with openings forming a valve seat, a valve arranged over said seat, said valve comprising a tubular portion surrounding said tubular body and an outwardly extending portion adapted to close said openings when the valve is seated, a stuffing box arranged on said tubular body above said valve member, and a sand apron surrounding the upper end of the tubular portion of said valve member.

2. A valve for oil wells adapted to be arranged above the traveling valve comprising a tubular body through which the pump rod is adapted to pass, an outwardly extending portion formed on the bottom of said tubular body and extending to the inner wall of the well tubing, said extension being provided with openings and forming a valve seat, a valve arranged over said seat, said valve comprising a tubular portion surrounding said body and an outwardly extending portion adapted to close said openings when the valve is seated, packing surrounding the pump rod adjacent the upper end of said tubular body, a packing gland arranged above said packing, a cylindrical member arranged over said packing and connected to said tubular body, a bearing cap secured to said tubular member, and a depending sand apron carried by said cylindrical member and adapted to surround the upper end of the tubular portion of said valve member.

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