Aug. 23, 1932. J. D. NIXON 1,873,782

PUMP VALVE MECHANISM

Filed Oct. 10, 1930

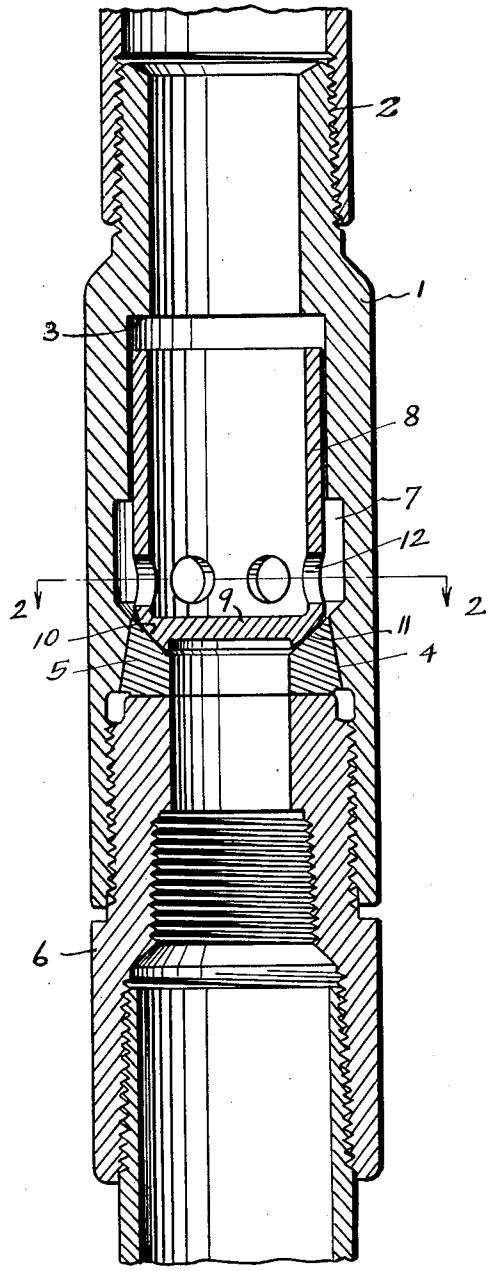


Fig. 1.

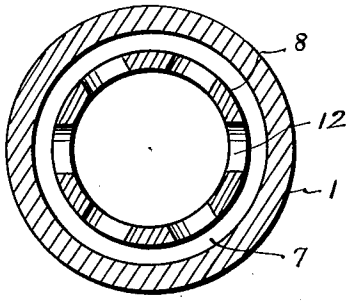


Fig. 2.

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Patented Aug. 23, 1932 1,873,782

UNITED STATES PATENT OFFICE

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PUMP VALVE MECHANISM

Application filed October 10, 1930. Serial No. 487,726.

This invention relates to new and useful improvements in a pump valve mechanism.

One object of the invention is to provide a valve mechanism specially designed for use in deep well pumps.

Another object of the invention resides in the provision, in a valve mechanism, of a novel type of valve seat and valve, the seat being of special formation and being secured in a novel manner in the valve casing and the co-operating part of the valve being shaped to at all times form a fluid tight joint with the seat, when seated thereon.

The valve mechanism described has been specially designed for use as a standing valve structure but it may be used also as the traveling valve for a pump.

With the above and other objects in view the invention has particular relation to certain novel features of construction, arrangement of parts and use, an example of which is given in this specification and illustrated in the accompanying drawing wherein:

Figure 1 shows a vertical sectional view of a standing valve structure embodying the improvements, and

Figure 2 shows a cross sectional view taken on the line 2—2 of Figure 1.

In the drawing the numeral 1 designates a tubular valve casing shown connected to the lower end of the working barrel 2 of the pump. Within this casing there is an annular, downwardly facing, inside shoulder 3 forming a stop and spaced beneath this shoulder the casing has an upwardly tapering seat 4. Within this seat there is an annular valve seat 5 whose outer side tapers upwardly to conform to the shape of and to fit closely against the casing seat 4.

The numeral 6 designates the tubular valve body whose upper end is threaded into the lower end of the casing and abuts the lower end of the valve seat 5 and holds said valve seat firmly seated against the seat 4 thus forming a fluid tight joint.

Above the valve seat 5 and spaced beneath the shoulder 3 there is an annular inside channel 7, in the casing.

There is a sleeve like valve 8 whose lower end is closed by the web 9 and is provided with an external, annular, convex face 10. The upper end of the valve seat 5 is flared upwardly forming the face 11, with which the valve face 10 co-operates, The valve 8 is extended upwardly and its upper end is open, the upper end of said valve fitting closely within the casing above the channel 7 but being spaced beneath the shoulder 3 when the valve is closed. Above the web 9 the valve has a plurality of openings 12 which communicate at all times with the channel 7. The oval or convex contour of the valve face 10 causes said face to at all times form a perfect contact all the way around with the face 11 irrespective of variations in the vertical axis of the valve relative to the vertical axis of the casing 1.

In operation of the pump upon upstroke of the traveling valve above (not shown) the valve 8 is lifted permitting the fluid beneath the standing valve to pass upwardly through the seat 5 and the channel 7 and thence through the openings 12 and on up through the working barrel. Upon downstroke of said traveling valve the valve 8 will seat against the face 11 and prevent the back flow of such fluid. The movements of the valve 8 are limited by the shoulder 3 above and the valve seat 5 beneath.

The drawing and description disclose what is now considered to be a preferred form of the invention by way of illustration only, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In a valve mechanism for pumps, a tubular valve casing having an upwardly tapering seat, an annular valve seat whose upper end has an annular, flared face and whose outside tapers to conform to the shape of and to fit closely into the casing seat, a valve body detachably secured to the lower end of said casing and whose upper end abuts the valve seat and clamps said valve seat securely in said casing seat, a sleevelike valve fitted in the casing above said seat and whose lower end is closed and provided with an annular convex face which cooperates with the flared face of the valve seat.

2. In a valve mechanism for pumps, a tu-

bular valve casing having an upwardly tapering seat, an annular valve seat whose upper end has an annular, flared face and whose outside tapers to conform to the shape of and to fit closely into the casing seat, a valve body detachably secured to the lower end of said casing and whose upper end abuts the valve seat and clamps said valve seat securely in said casing seat, a sleevelike valve fitted in the casing above said seat and whose lower end is closed and provided with an annular convex face which cooperates with the flared face of the valve seat, said casing having an annular inside channel above said seat and the valve having an opening connecting said channel with the interior of the valve.

3. In a valve mechanism for pumps, a tubular valve casing having an upwardly tapering seat, an annular valve seat whose upper end has an annular, flared face and whose outside tapers to conform to the shape of and to fit closely into the casing seat, a valve body detachably secured to the lower end of said casing and whose upper end abuts the valve seat and clamps said valve seat securely in said casing seat, a sleevelike valve fitted in the casing above said seat and whose lower end is closed and provided with an annular convex face which cooperates with the flared face of the valve seat, said casing having an annular inside channel above said seat and the valve having an opening connecting said channel with the interior of the valve, and an annular inside shoulder in the casing above said valve arranged to limit the upward movement of said valve relative to the valve seat.

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

JEDDY D. NIXON.