

Aug. 17, 1943.

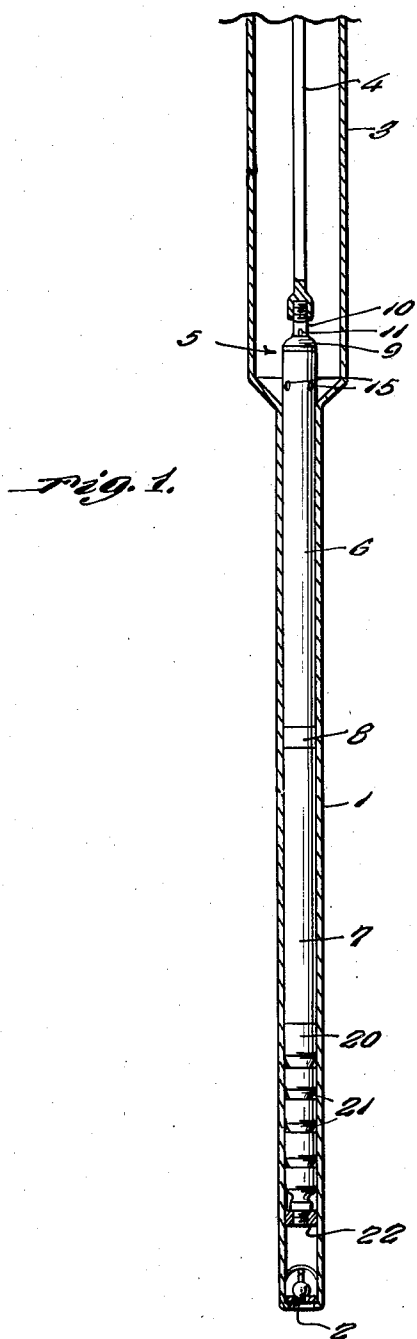
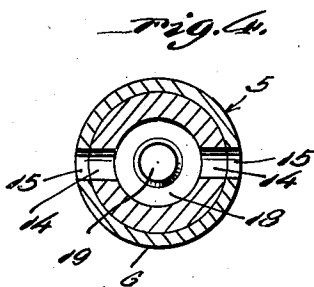
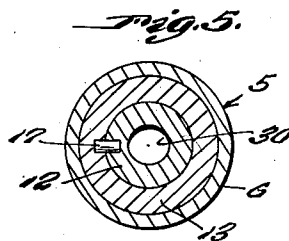
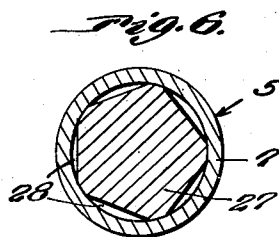
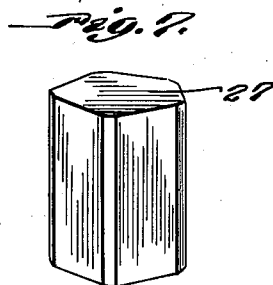
H. DE W. THOMASON

2,326,902

PUMP

Filed Nov. 26, 1941

2 Sheets-Sheet 1



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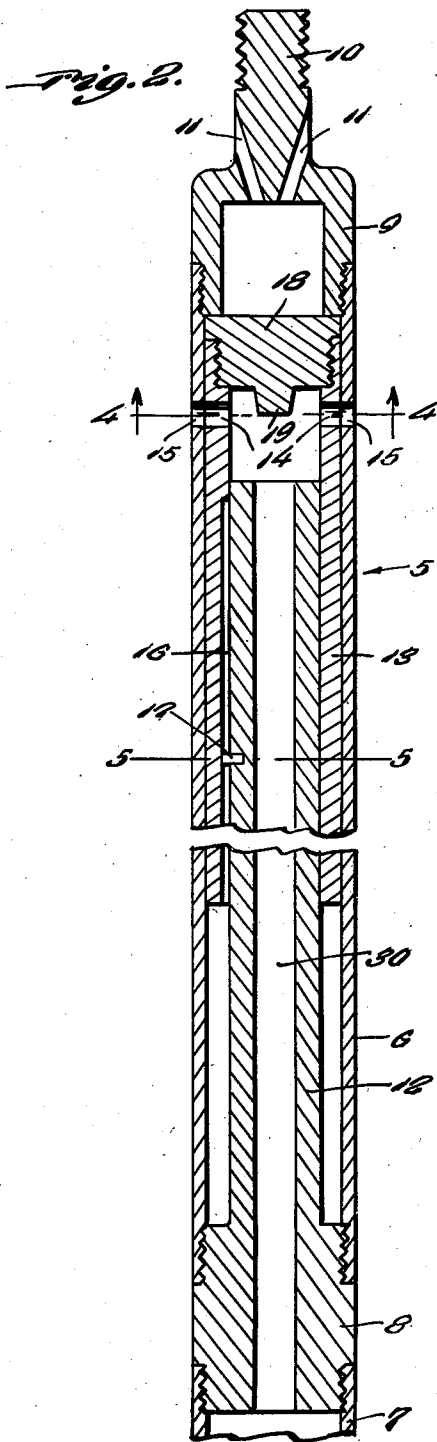
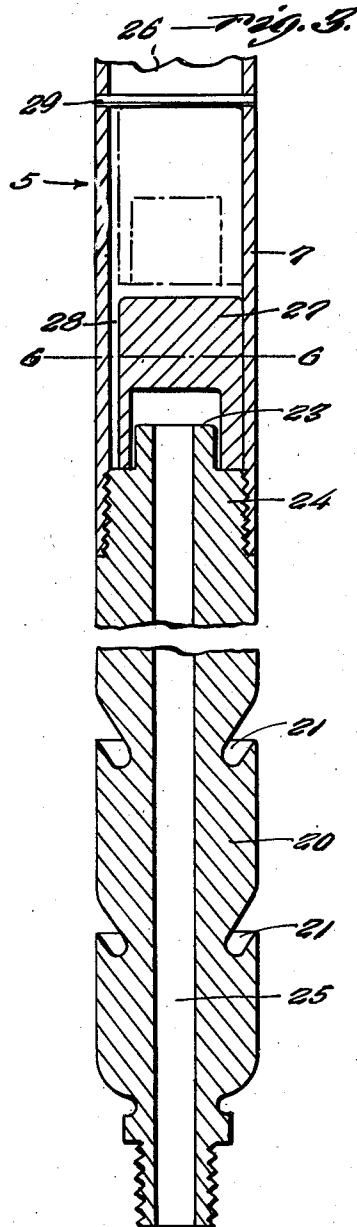
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2 Sheets-Sheet 2



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2,326,902

PUMP

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Application November 26, 1941, Serial No. 420,564

4 Claims. (Cl. 103—225)

The present invention relates to new and useful improvements in pumps, particularly for oil wells, although it will be understood, of course, that the device may be used for any other purpose for which it may be found adapted and desirable.

The primary object of the invention is to provide, in a manner as hereinafter set forth, a pump of the character described comprising a novel construction, combination and arrangement of valves for controlling the fluid.

Other objects of the invention are to provide a pump of the character set forth which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in vertical section through a barrel and a portion of a well tubing, showing a pump constructed in accordance with the present invention therein.

Figure 2 is a vertical sectional view through the upper portion of the pump.

Figure 3 is a vertical sectional view through the lower portion of the pump.

Figure 4 is a view in horizontal section, taken substantially on the line 4—4 of Figure 2.

Figure 5 is a view in horizontal section, taken substantially on the line 5—5 of Figure 2.

Figure 6 is a view in horizontal section, taken substantially on the line 6—6 of Figure 3.

Figure 7 is a detail view in perspective of the lower valve.

Referring now to the drawings in detail, it will be seen that reference numeral 1 designates a suitable pump barrel. A conventional standing valve 2 is provided in the lower end portion of the barrel 1. Rising from the barrel 1 is a tubing 3. A pump rod 4 is operable in the well tubing 3.

The embodiment of the present invention which has been illustrated comprises a piston which is designated generally by the reference numeral 5, said piston being operable in the barrel 1. The piston 5 includes elongated upper and lower cylinders 6 and 7, respectively. The cylinders 6 and 7 are joined by a connection 8

which is threaded into the adjacent end portions of said cylinders.

Threaded into the upper end portion of the cylinder 6 is a cap 9. Rising from the cap 9 is a shank 10 which is threadedly connected to the rod 4. Fluid intake ports 11, the purpose of which will be presently set forth, are provided in the upper portion of the cap 9.

Rising from the connection 8 in spaced, concentric relation to the cylinder 6 is a tube 12. A sleeve valve 13 is slidable on the tube 12 in the cylinder 6. The upper portion of the valve 13 is provided with discharge ports 14 for registry with ports 15 in the upper portion of the cylinder 6. The valve 13 is further provided with an internal vertical groove or channel 16 which accommodates a pin 17 on the tube 12 for positively preventing rotation of said valve 13.

Threaded into the upper portion of the valve 13 is a plug 18. Depending from the plug 18 is a valve 19 which is adapted to seat in the upper end portion of the tube 12 for closing said tube.

Threaded into the lower end portion of the lower cylinder 7 is a tubular member 20 having a plurality of circumferential fluid seal grooves 21 therein. A packing 22 is provided on the lower end portion of the member 20. The member 20 terminates in an externally reduced upper end portion 23 thus providing a horizontal shoulder or seat 24.

The bore 25 of the member 20 communicates with the chamber 26 in the cylinder 7. Operable in the chamber 26 is an inverted substantially cup-shaped valve 27 which is engageable with the seat 24 over the reduction 23 for closing the chamber 26 against backflow of the fluid. The valve 27 is polygonal in horizontal section, thus providing passages 28 for the upward flow of the fluid. A bar 29 in the cylinder 7 positively limits the upward movement of the valve 27.

It is thought that the operation of the pump will be readily apparent from a consideration of the foregoing. Briefly, on the up stroke of the piston 5, the fluid is drawn past the standing valve 2 into the lower portion of the barrel 1. On the down stroke of the piston 5, this fluid which, of course, is trapped by the standing valve 2 in the barrel 1, is forced upwardly through the bore 25 of the member 20, lifting the valve 27 from the seat 24 and flowing around said valve through the passages 28 into the chamber 26 of the cylinder 7. On successive down strokes of the piston, the fluid trapped in the chamber 26 by the valve 27 is forced upwardly through the bore 25 of the tube 12 and enters the upper portion

of the valve 13. Thus, the valve 13 is raised in a manner to bring the ports 14 and 15 into registry for the escape of the fluid from the piston 5 into the tubing 3. Fluid from the tubing 3 enters the cap 9 through the passages 11 and, on the up stroke of the piston, assists in forcing the valve 13 downwardly for moving the ports 14 out of alignment with the ports 15, also for engaging the valve 19 in the upper end portion of the tube 12.

It is believed that the many advantages of a pump constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. A pump of the character described comprising a piston including upper and lower cylinders, a joint connecting said cylinders, a tube rising from the joint in the upper cylinder and spaced therefrom, a sleeve slidable on said tube, the upper cylinder having discharge ports therein, said sleeve having ports therein for registry with the first-named ports, and means for closing the upper end of the sleeve.

2. A pump of the character described comprising a piston including upper and lower cylinders, a joint connecting said cylinders, a tube rising from the joint in the upper cylinder and spaced therefrom, a sleeve slidable on said tube, the upper cylinder having discharge ports therein, said sleeve having ports therein for registry with the

first-named ports, and means for closing the upper end of the sleeve, said means including a plug threadedly mounted in the upper end portion of the sleeve, and a valve depending from said plug and engageable in the tube.

3. A pump of the character described comprising a piston including communicating upper and lower cylinders, an internal joint connecting said cylinders, a tube rising from said joint in spaced concentric relation to the upper cylinder, said upper cylinder having discharge ports therein, a sleeve slidable on the tube and having ports therein for registry with the first-named ports, a member on the upper end of the upper cylinder having fluid intake ports therein, and a valve on the upper end of the sleeve closing said upper end and engageable in the tube for valving the upper end of said tube.

4. A pump comprising connected upper and lower cylinders, the upper cylinder having discharge ports therein, a tube in the upper cylinder spaced concentrically therefrom, a fluid elevated sleeve slidable on said tube and having ports therein for registry with the first-named ports, means for securing the sleeve against rotation on the tube, a plug closing the upper end of the sleeve, a valve on said plug engageable in the tube, and a cap on the upper end of the upper cylinder engageable by the plug for arresting upward movement of the sleeve when the ports are in registry, said cap providing a chamber and having passages therein for the intake of fluid for engagement with the plug for forcing the sleeve downwardly.

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