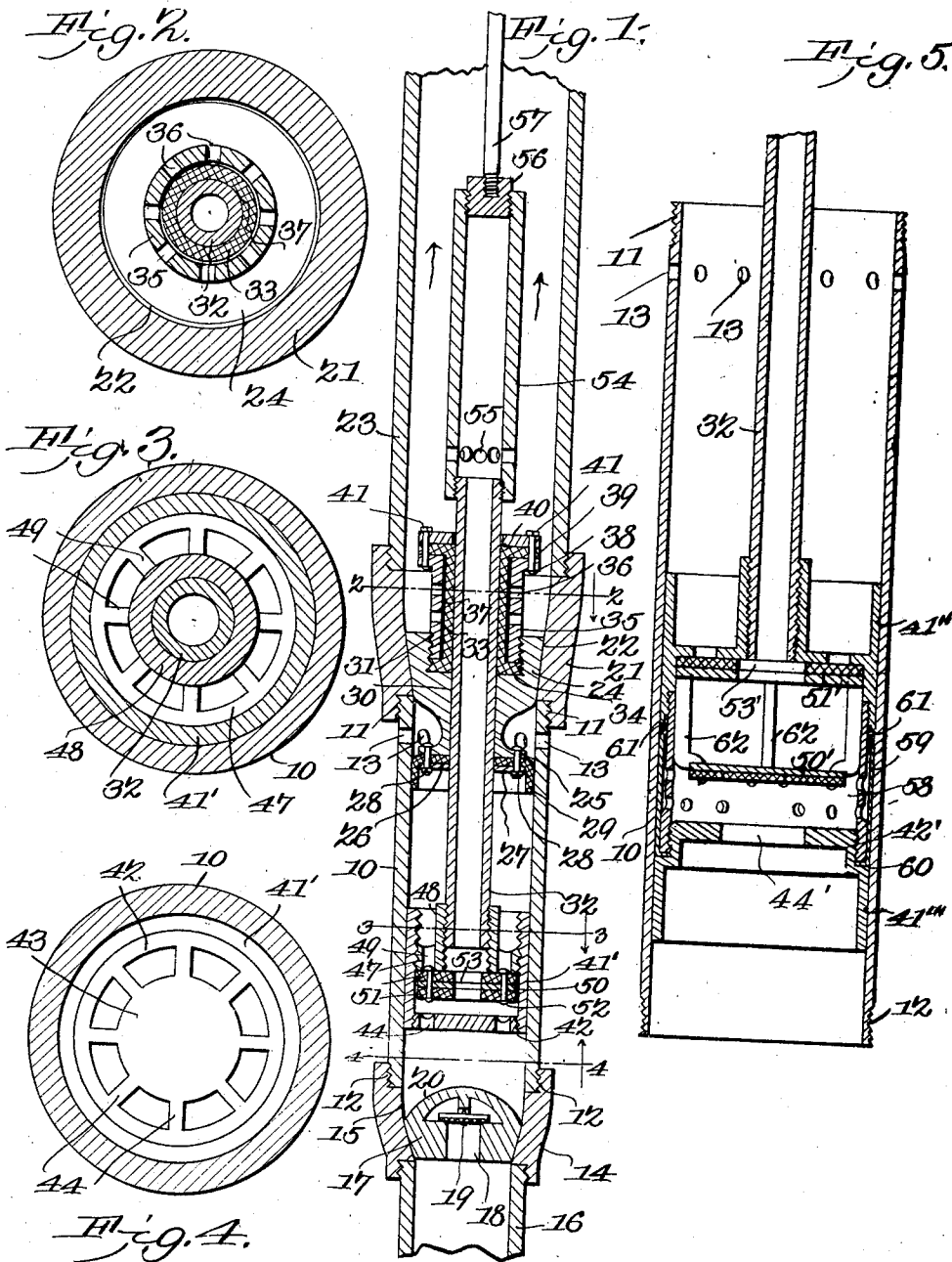


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J. FERRIES.
PUMP.

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PUMP.

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To all whom it may concern:

Be it known that I, JAMES FERRIES, a citizen of the United States, residing at Pearsall, in the county of Frio and State of Texas, have invented a new and useful Pump, of which the following is a specification.

This invention relates to pumps, and has for an object to provide a pump embodying new and improved features of utility, economy of motive power, and general efficiency.

A further object of the invention is to provide a pump embodying an improved form of gland or packing for the tubular piston-rod.

A further object of the invention is to provide a pump having improved means whereby the working parts may be unseated and drawn from the cylinder and discharge-pipe by the operating-rod.

A further object of the invention is to provide a pump of the double-acting class embodying an improved inflow-valve for the upper end of the cylinder.

A further object of the invention is to provide a pump having the piston-operating rod disposed within the discharge-pipe and an air-chamber carried by the rod to equalize the flow of water and to assist in seating the reciprocating parts.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made without departing from the spirit or sacrificing any of the advantages of this invention.

In the drawings, Figure 1 is a vertical sectional view of the operating parts of the improved pump. Fig. 2 is a transverse sectional view through the piston-rod gland and taken on line 2 2 of Fig. 1. Fig. 3 is a transverse sectional view through the piston and taken on line 3 3 of Fig. 1. Fig. 4 is a transverse sectional view taken on line 4 4 of Fig. 1 and showing the under side of the piston. Fig. 5 is a vertical sectional view of the pump embodying a modified form of piston.

Like characters of reference indicate corresponding parts in all of the figures of the drawings.

In its preferred embodiment the improved pump forming the subject-matter of this ap-

plication comprises a cylinder 10, screw-threaded externally at both upper and lower end, as at 11 and 12, respectively, and with a plurality of openings 13 adjacent the upper end and below the screw-threads. To the lower screw-threads of the cylinder is secured a coupling 14, having an internal tapered bore 15, with its larger end registering with the bore of the cylinder and the smaller end disposed downwardly. If found desirable, a supply-pipe 16 may be connected to the coupling to register with the smaller end of the tapered opening and extend to any approved distance below the cylinder. Within the tapered opening is disposed the block 17, having a central opening 18, forming a seat for the valve 19, retained within the cage 20. To the upper screw-threads is secured the coupling 21, having an internal tapered opening 22, with the lower and smaller end registering with the bore of the cylinder and with a discharge-pipe 23 larger than the cylinder and secured to and registering with the larger end of the coupling. Within the taper 22 is disposed the block 24, proportioned to fit the taper and having a foot portion 25 extending within the cylinder and below the inflow-openings 13. To the under surface of the foot is secured the annular ring 26, of flexible or elastic material, such as leather or rubber or the like, and retained in position by a rigid ring 27, secured as by the rivets or bolts 28 and with the periphery of the flexible ring turned down to form the flange 29 in contact with the inner surface of and constituting therewith an inflow-valve for the top of the cylinder.

The block 24 is provided with an axial bore 30, enlarged and screw-threaded at the upper end, as at 31. Through the opening 30 is disposed a tubular piston-rod 32 and about the rod is placed a sleeve 33, of flexible material, such as leather or the like, with an out-turned flange 34 disposed within the enlarged bore of the block. A rigid sleeve 35, screw-threaded at the lower end to engage the screw-threads 31, is screwed into the opening of the block and to bear upon the flange 34 and retain the flexible sleeve 33 in position surrounding the piston-rod. The rigid sleeve is provided with a plurality of openings 36, and an annular cavity 37 is defined by the rigid sleeve 35 between it and the flexible sleeve 33. The upper end of the rigid sleeve has an outturned flange 38 and the flexible

sleeve has an outturned flange 39, disposed upon the flange 38 and clamped thereon by the ring 40 and rivets or bolts 41.

Within the cylinder is disposed a piston embodying a cylindrical member 41', screw-threaded internally from each end and with a valve-seat in the lower end comprising a ring 42, having a solid center 43 with arched and spoke-like arms 44 connecting the hub and ring. Within the upper end of the cylindrical member 41' is placed the ring 47, having a hub 48 and connected by the arched and spoke-like arms 49. The hub 48 is screw-threaded internally to receive and engage the lower end of the piston 32. Between the lower ring 42 and the upper ring 47 is disposed a valve comprising, preferably, a rigid ring 50, having upon each side a ring of elastic material 51, such as leather or the like, and bound together by rivets 52 and with a central opening 53, registering into the opening in the hub 48 and the piston-rod 32. The upper end of the piston-rod 32, extending above the ring 40, is screw-threaded to engage a pipe 54, larger in diameter and with openings 55 adjacent to the top of the piston-rod and with an air-tight plug 56 closing the upper end and to which is secured the operating-rod 57.

In the modification of the piston shown in Fig. 5 the cylindrical member 41' is represented by the sections 41'' and 41''', connected by a perforated sleeve 58, without which is disposed a flexible sleeve 59, of leather or like material, held at one end, as 60, by the lower end of the perforated sleeve and at the upper end by the rivets or wooden pins 61. The valve comprises the lower plate 50' and the upper plate 51', the latter being composed, preferably, of a plate of metal with a plate of elastic material, as leather, secured to its upper surface and with a central opening 53'. The lower plate 50' is composed of a metal plate with a plate of elastic material, as leather, secured to its lower surface and of a diameter smaller than the internal diameter of the perforated shell 58 and the two plates spaced and connected by the ribs 62. The lower valve-seat of the modified form has a central opening 44', proportioned to be covered and closed by the plate 50' of the valve.

In operation the downward stroke of the piston closes the valve 19, and the contained water is forced upwardly between the arms 44 and through the opening 53 into the tubular piston-rod 32, the openings between the arms 49 being closed by the valve 51, and water is drawn through the openings 13 and between the flexible flange 29 and the cylinder. At the return stroke the valve 19 is opened, and the valve 51 closes the openings between the arms 44, and the valve-flange 29 closes, the contained water being forced between the arms 49 and into the piston-rod.

The water from either stroke passes upward through the piston-rod and out through the openings 55 into the discharge-pipe 23. The water in the discharge-pipe enters the cavity 37 through the openings 36 and holds the flexible sleeve 33 in contact with the piston-rod, thus constituting a gland. The weight of the column of water in the discharge-pipe will force the water for some distance within the circular chamber defined by the tube 54, and the compressed air will to some extent equalize the flow of water, and the buoyant action of the air-chamber will help to raise the reciprocating parts, which in the case of a very deep well is a very desirable feature. The action of the modified piston shown in Fig. 5 is similar, except that water enters through the perforations of the sleeve 58 and bears against the flexible packing-sleeve 59 to hold it in contact with the inner surface of the cylinder.

Having thus described the invention, what is claimed is—

1. A pump comprising, a cylinder, a supply-pipe below and smaller than the cylinder, a coupling connecting the cylinder and supply-pipe and having an internal tapered bore, a discharge-pipe above and larger than the cylinder, a coupling connecting the discharge-pipe and cylinder and having an internal tapered bore, a tapered block carrying a valve and valve-seat disposed in the lower tapered coupling, a tapered block carrying a valve and a gland disposed in the upper tapered coupling, a piston disposed to reciprocate within the cylinder, and a piston-rod extending upward through the gland and into the discharge-pipe.

2. A pump comprising, a cylinder provided with inlet-openings adjacent the top, a discharge-pipe above and larger than the cylinder, a coupling connecting the cylinder and discharge-pipe and having an internal tapered bore, a tapered block proportioned to seat in the tapered coupling and having an axial bore, and a foot extending within the cylinder, a flexible ring secured to the foot of the block and contacting with the inner surface of the cylinder below the inlet-openings and to form a valve, a gland associated with the axial bore, a piston within the cylinder, and a tubular piston-rod extending through the gland.

3. A pump comprising, a cylinder provided with inlet-openings adjacent the top, a supply-pipe below and smaller than the cylinder, a coupling connecting the cylinder and supply-pipe and having an internal tapered bore, a tapered block disposed in the tapered bore and provided with a valve and valve-seat, a discharge-pipe above and larger than the cylinder, a coupling connecting the discharge-pipe and cylinder and having an internal tapered bore, a tapered block proportioned to seat in the upper tapered bore

and having an axial bore and a foot extending within the cylinder, a flexible ring secured to the foot of the block and contacting with the inner surface of the cylinder below the inlet-openings, a gland carried by the block in cooperative relation to the axial bore, a double-acting piston disposed within the cylinder, and a tubular piston-rod operatively connected with the piston and

mounted to reciprocate through the axial opening and gland, respectively.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES FERRIES.

Witnesses:

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S. C. ROBERTS.