

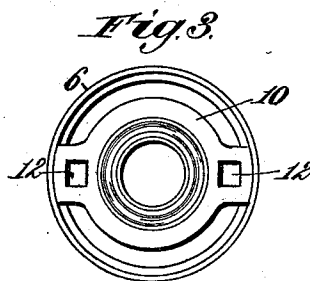
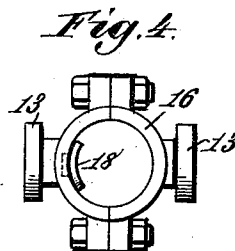
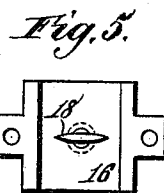
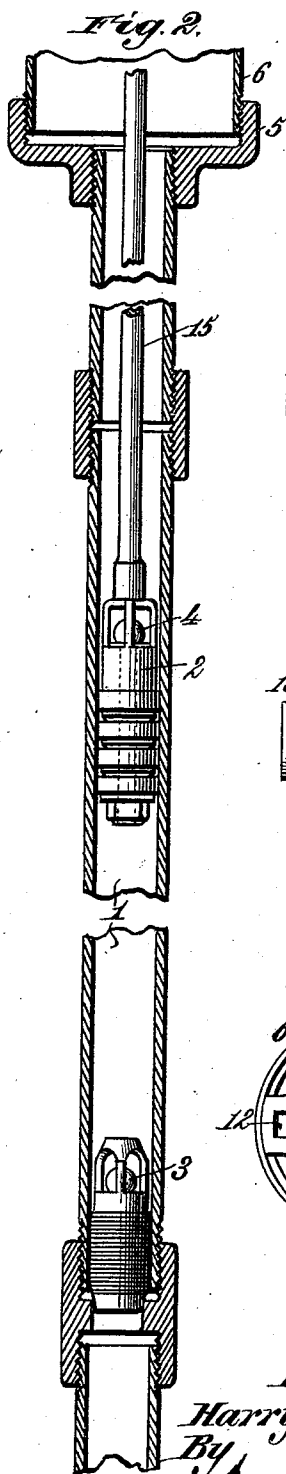
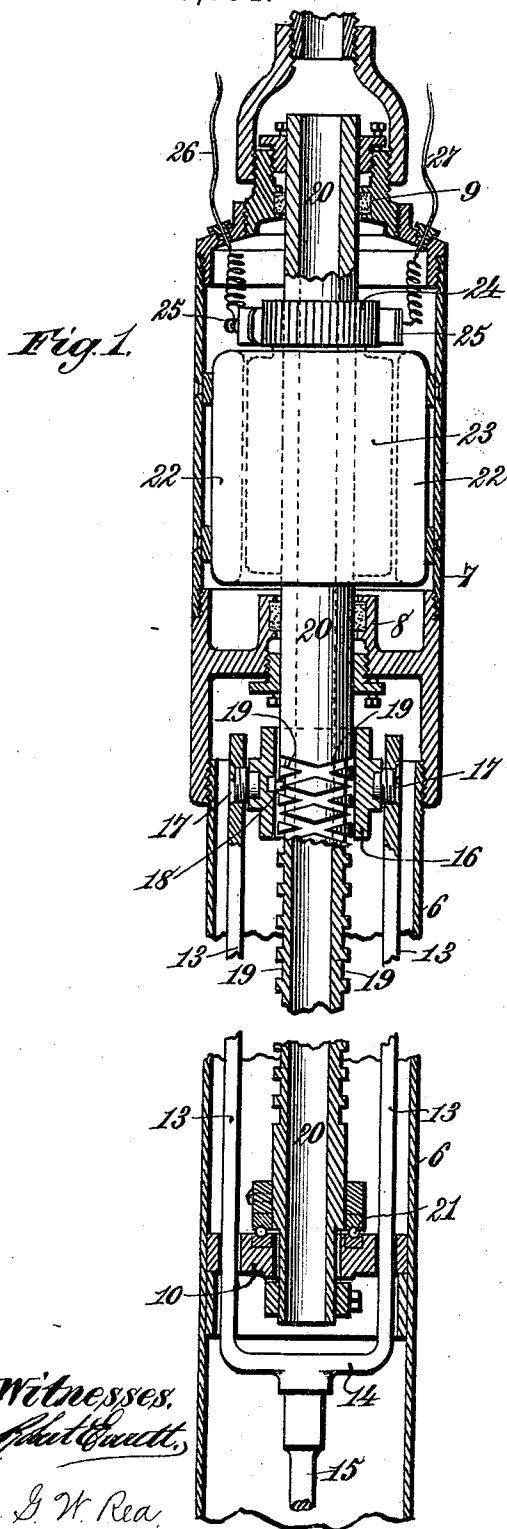
(No Model.)

H. W. PICKETT.

PUMPING MECHANISM FOR OIL WELLS, &c.

No. 529,804.

Patented Nov. 27, 1894.



Witnesses,
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UNITED STATES PATENT OFFICE.

HARRY W. PICKETT, OF WARREN, PENNSYLVANIA.

PUMPING MECHANISM FOR OIL-WELLS, &c.

SPECIFICATION forming part of Letters Patent No. 529,804, dated November 27, 1894.

Application filed December 7, 1893. Serial No. 493,060. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. PICKETT, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented new and useful Improvements in Pumping Mechanism for Oil-Wells, &c., of which the following is a specification.

This invention has for its object to simplify the pump mechanism of oil wells, and to place the motor which operates the piston low down in the well-tubing, or below the surface of the earth while protecting it from moisture and contact with the wall of the well.

The invention also has for its object to provide a new and improved pumping mechanism for oil wells, wherein a vertical shaft rotating in one direction and having its axis parallel to or coincident with the axis of the well-tubing imparts a reciprocating motion to the pump piston.

To accomplish these objects my invention consists in the features of construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional side elevation vertically through a part of the well-tubing, and illustrating the mechanism for operating the pump piston. Fig. 2 is a similar view of the lower end portion of the well-tubing to show the pump piston and valves; and Figs. 3, 4, and 5 are detail views hereinafter explained.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a pump-barrel which constitutes a part of the well-tubing, and in which the piston 2 is adapted to reciprocate for the purpose of lifting the oil or other fluid. The pump-barrel and the piston are provided with valves 3 and 4 of any construction or type suitable for the conditions required, whereby the reciprocations of the piston serve to raise the oil or fluid through the well-tubing. The upper end of the pump-barrel 1 is provided with a collar 5, to which is secured a section 6 of the well-tubing, which is of greater diameter than the pump-barrel. The enlarged tubular part 6 connects at its

upper end with a casing or housing 7 having in its lower portion a stuffing-box 8, and at its upper portion a similar stuffing-box 9. The casing or housing is preferably made in sections, screw-threaded together; but, as I do not confine myself to any particular construction of casing or housing, I do not deem it necessary to more fully explain the same.

The section 6 of the well-tubing contains a block 10 rigidly secured in position in any suitable manner, and having oppositely arranged guide orifices 12, Fig. 3, through which extend the arms or members 13 of a yoke 14 which is attached to the piston-rod 15 of the piston 2. The upper extremities of the arms 13 are connected with a ring or collar 16 through the medium of screws 17, or other suitable devices. The ring or collar is composed of two sections, detachably bolted together, as shown in Fig. 4; and one of these sections is provided with a pivoted or swiveled shoe or segment 18, adapted to engage and travel in right and left hand screw-threads 19 formed in the outer surface of a vertical shaft 20 which extends through the upper and lower stuffing-boxes 8 and 9, and is supported at its lower end by the block 10 through the medium of a suitable ball-bearing 21. This ball-bearing may be of any desired construction; and, in connection with the block 10, it serves to sustain the entire weight of the rotary-shaft, and reduces the friction, so that the shaft can be easily rotated. The right and left hand screw-threads 19 intersect each other, and at the end portions they communicate in such manner that when the shoe or segment 18 reaches the extremity of one screw-thread it will automatically adjust itself and pass into the other screw-thread, whereby the rotary motion of the shaft 20 imparts a reciprocating motion to the ring or collar 16, and thus the pump-piston 2 is reciprocated. The oil or fluid is free to rise through the well-tubing about the block 10 and rotary-shaft 20, so that the yoke 14 and ball-bearing 21 will be thoroughly lubricated; but the lower stuffing-box 8 closes the upward passage of oil or fluid through the well-tubing, and consequently the oil or fluid is forced to rise through the shaft 20, which, for this purpose, is tubular and communicates at its upper end with the top portion of the well-tubing.

The upper and lower bearings, formed by the stuffing-boxes 8 and 9, sustain the rotary-shaft in a true perpendicular position and maintains its axis parallel or coincident with the axis of the well-tubing.

In the arrangement of the parts, as herein illustrated, the tubular rotary-shaft will be in line with the pump-barrel, or that portion of the well-tubing in which the piston 2 reciprocates, by which means a very compact structure is provided, and the pumping mechanism is rendered very efficient.

The tubular-shaft 20 is designed to be rotated through the medium of an electric motor composed, as here shown of field magnets 22, an armature 23, indicated by dotted lines, a commutator 24, commutator brushes 25, and electrical conductors 26 and 27.

The electric-motor is entirely housed within the casing or housing 7, and by this means the electric-motor can be located low down in the well-tubing, and at the same time be effectually protected from moisture, and from contact with the wall of the well. The field magnets are mounted upon the casing or housing 7, and the armature 23 is fixed to the rotary-shaft 20. The operation of this type of motor is obvious, and, therefore, I do not deem it necessary to enter into any detailed explanation thereof.

The arrangement of the motor, and the right and left hand screw-threaded shaft in the manner described and shown is very important, in that it produces a compact structure, enables the motor to be located in the well-tubing low down in the well in proximity to the connection of the shaft 20 with the pump piston, and renders the operating shaft available as a conduit for the oil or fluid, so that an electrically operated pumping mechanism can be produced at a comparatively low cost.

By the means described a vertical-shaft, rotating in one direction, and having its axis parallel to or coincident with the axis of the well-tubing, imparts a reciprocating motion to the pump-piston, and the motor is housed in a part of the well-tubing within the well, in which respects my invention differs from all prior pumping mechanisms of which I am aware.

By making the housing or casing 7 in sections, detachably connected by screw-threads, or otherwise, it is possible to conveniently gain access to the electric-motor whenever occasion demands.

Having thus described my invention, what I claim is—

1. The combination of a well-tubing having a motor-housing interposed between sections of the tubing to lie in the well, a reciprocating piston-rod working in a part of the tubing below the housing, a rotary tubular shaft held against lengthwise movements and provided with right and left hand intersecting screw-threads, a shoe or device engaging the screw-threaded part of the shaft, a connection between the shoe or device and the pump-piston

for reciprocating the latter by the rotation of the shaft, an electric motor arranged within said motor-housing in operative connection with the right and left hand screw-threaded shaft, a stuffing-box which cuts off communication between the motor-housing and that part of the well tubing lying below the same and through which the shaft extends, and a bearing supporting the lower end of the shaft and on which said shaft rotates, substantially as described.

2. The combination of a well-tubing having a motor-housing inserted between sections thereof to lie in the well, a reciprocating pump-piston, a piston-rod, a rotary-shaft provided with right and left intersecting screw-threads, a ring or collar encircling the said shaft and having a pivoted shoe which engages the screw-threads, a yoke having its lower end connected with the pump-piston and the upper ends of its arms attached to the said ring or collar, a guide arranged in the well-tubing and through which the yoke extends and by which it is guided, an electric-motor arranged in said motor-housing in operative connection with the right and left hand screw-threaded shaft, and a stuffing-box which cuts off communication between the motor-housing and that part of the well-tubing lying below the same and through which the shaft extends, substantially as described.

3. The combination of a well-tubing, a pump-piston, a piston-rod, a rotary tubular shaft held against lengthwise movements and provided with right and left hand intersecting screw-threads, a shoe or device for engaging the screw threads, a connection between the shoe or device and the piston-rod, a housing or casing constituting a part of the well-tubing, and an electric-motor housed in the said casing or housing in the well and in operative connection with the said tubular right and left hand screw-threaded shaft, substantially as described.

4. The combination of a well-tubing, a piston, a piston rod, a rotary tubular shaft held against lengthwise movement, provided with right and left hand screw-threads and having its axis parallel or coincident with the axis of the well-tubing, means for rotating the shaft, a shoe or device for engaging the screw-threads of the shaft, and a connection between the shoe or device and the piston-rod for reciprocating the latter by the rotation of the shaft, substantially as described.

5. The combination of a well-tubing, a casing or housing forming a part of the tubing within the well, a tubular rotary-shaft provided with right and left hand screw-threads and having its axis parallel or coincident with the axis of the well-tubing, an electric-motor housed within the said casing or housing in the well and in operative connection with the rotary-shaft, a shoe or device for engaging the screw-threads of the shaft, and a connection between the shoe or device and the piston-rod, substantially as described.

6. The combination of a well-tubing, a casing or housing forming a part of the tubing within the well and composed of detachably connected sections, a rotary-shaft provided
5 with right and left hand screw-threads and extending through the said casing or housing, an electric-motor housed in the said casing or housing and in operative connection with
10 the screw-threads of the shaft, a pump-piston, a piston-rod, and a connection between the piston-rod and the said shoe or device, substantially as described.

7. The combination of a well-tubing, a reciprocating pump-piston, a piston-rod, a rotary tubular shaft provided with an attached armature and having right and left hand intersecting screw-threads, a shoe or device for engaging the screw-threads, a connection between the shoe or device and the piston-rod,
20 and an electric-motor located in a part of the well-tubing and through which extends the rotary tubular shaft to which the armature of the motor is attached, substantially as described.
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8. The combination of a well-tubing having a motor-housing inserted between sections thereof to lie in the well, a pump-piston, a piston-rod, a block arranged in the well-tubing below said housing, a rotary tubular shaft having right and left hand screw-threads, a ball-bearing sustained by the said block and supporting the weight of the shaft and on which the latter rotates, a shoe or device engaging the screw-threads of the shaft, a connection
30 between the piston-rod and the said shoe or device, an electric-motor arranged in said motor-housing in operative connection with the tubular-shaft, and a stuffing-box cutting off communication between the motor-housing and that part of the well-tubing lying below the same and through which the shaft extends, substantially as described.
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In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.
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HARRY W. PICKETT.

Witnesses:

ALBERT H. NORRIS,
G. W. REA.