

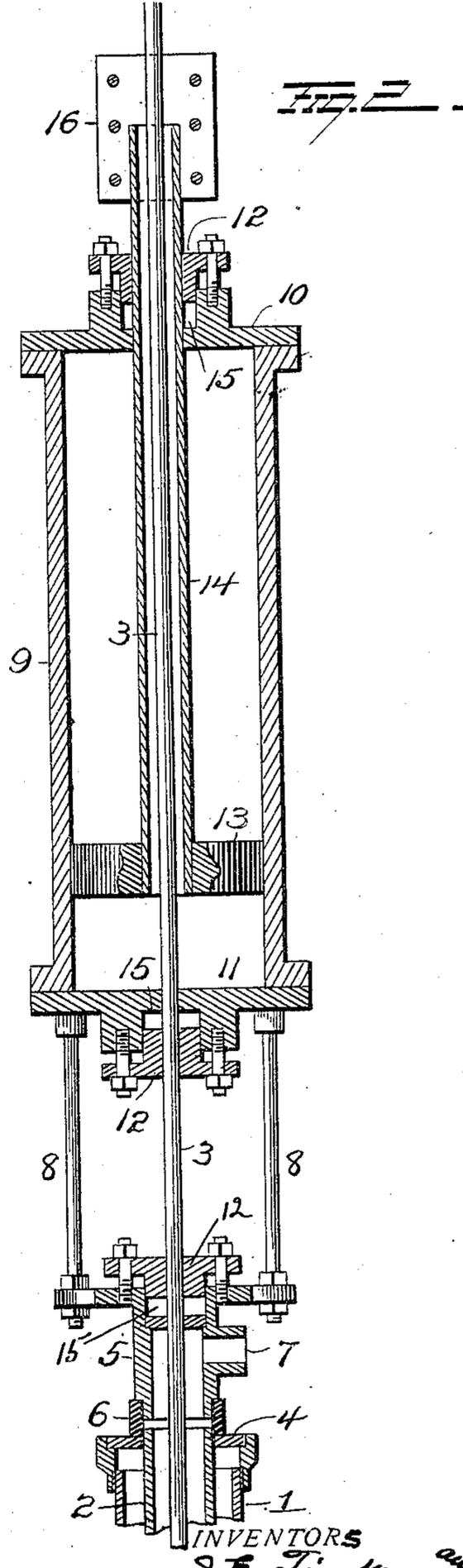
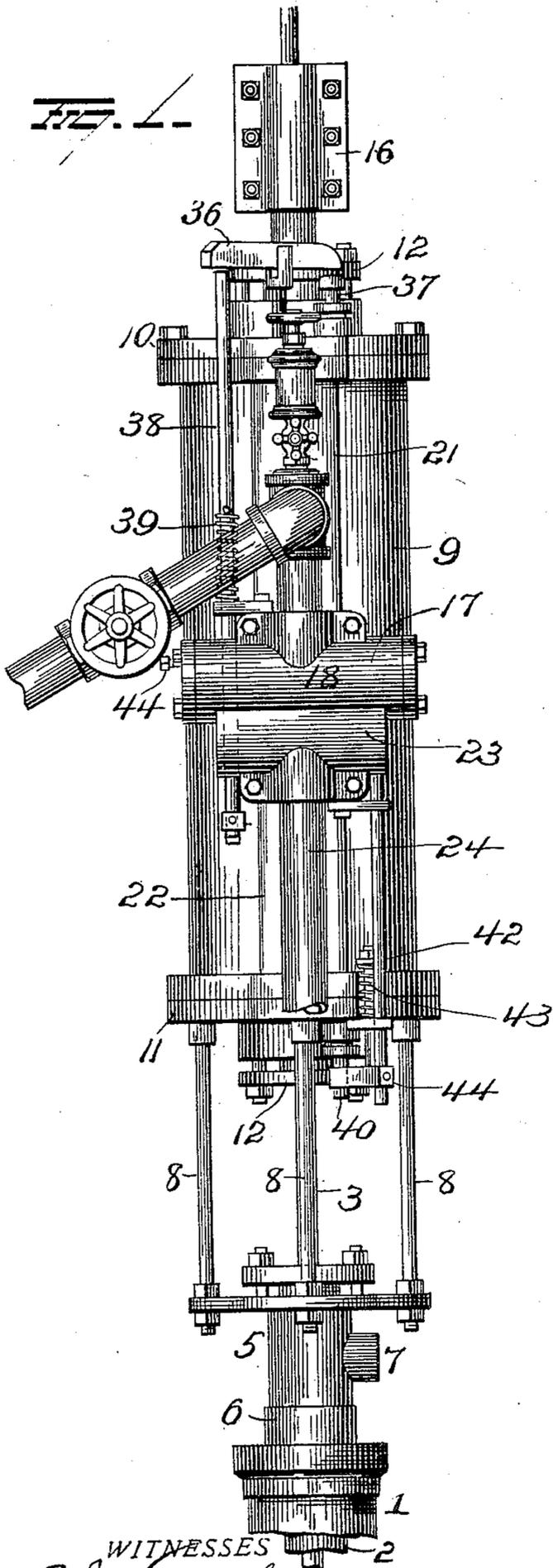
No. 840,972.

PATENTED JAN. 8, 1907.

J. E. TINKER & J. CRAWFORD, JR.
APPARATUS FOR PUMPING OIL WELLS.

APPLICATION FILED DEC. 22, 1904.

2 SHEETS—SHEET 1.



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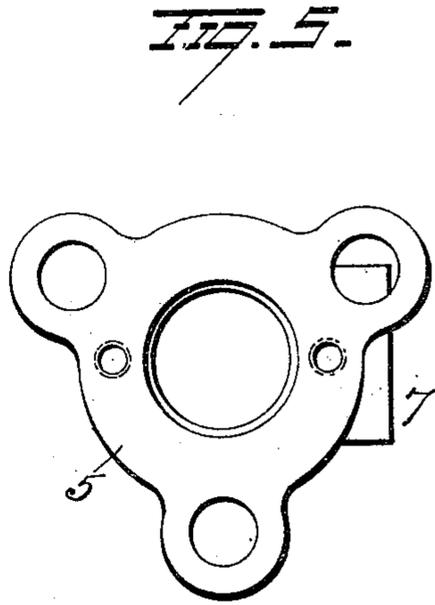
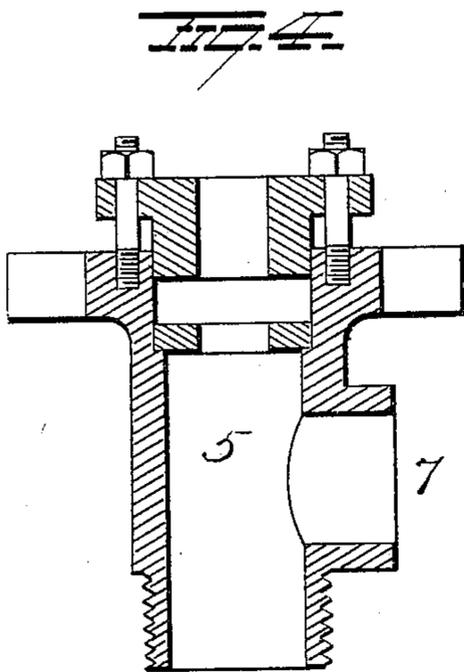
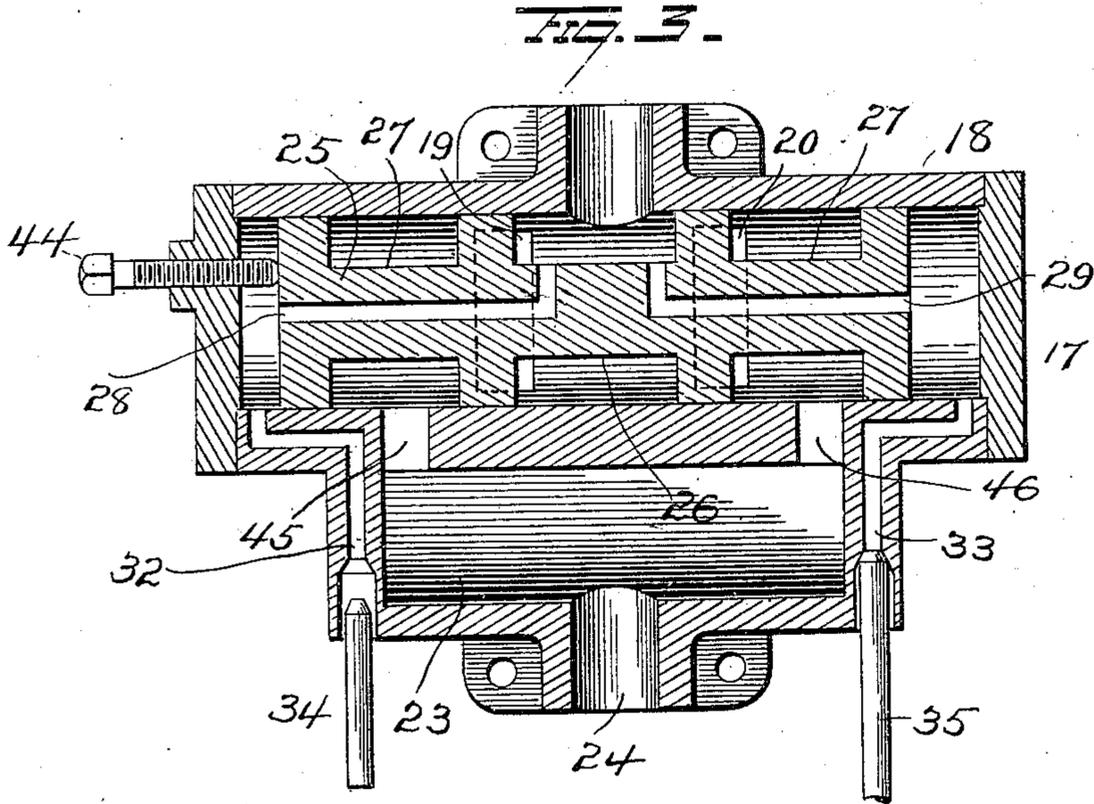
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UNITED STATES PATENT OFFICE.

JULIEN E. TINKER AND JOSEPH CRAWFORD, JR., OF BRADFORD,
PENNSYLVANIA.

APPARATUS FOR PUMPING OIL-WELLS.

No. 840,972.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed December 22, 1904. Serial No. 237,969.

To all whom it may concern:

Be it known that we, JULIEN E. TINKER and JOSEPH CRAWFORD, Jr., residents of Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Pumping Oil-Wells; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improved pumping machinery for oil-wells, the object of the invention being to provide improved construction of pumping-head, improved valve mechanism, and improved frame and pipe construction; and the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation, illustrating our improvements. Fig. 2 is a view in longitudinal section through the pumping-head. Fig. 3 is a view in longitudinal section through the valve mechanism. Fig. 4 is an enlarged view, in vertical section, of a detail of construction; and Fig. 5 is a top plan view thereof.

1 represents the well-casing, 2 the stand-pipe, and 3 the plunger-rod. The upper end of stand-pipe 2 is secured in the casing-head 4 and to a T-coupling 5 by a ring 6, and this coupling directs the oil through a discharge-pipe 7, connected therewith. The upper end of T-coupling 5 is enlarged into general triangular shape with openings in its ends to receive rods 8, supporting the pumping-cylinder 9, and the upper and lower heads 10 and 11 of the cylinder and the upper end of T-coupling 5 are provided with packing-boxes 15 and rings 12, as shown.

In cylinder 9 a piston 13 is located and secured on a tubular piston-rod 14, surrounding plunger-rod 3 and projecting up through the packing-box 15 in the upper cylinder-head 10 and is secured to the plunger-rod 3 above head 10 by a clamp 16. On the outside of cylinder 9 my improved valve-casing 17 is secured and comprises an upper horizontal cylindrical valve-chamber 18, connected by ports 19 and 20 and ducts 21 and 22, respectively, with the upper and lower ends of cyl-

inder 9, and an exhaust-chamber 23 is located below chamber 18, is connected therewith by ports 45 and 46, and is provided with an exhaust-pipe 24.

In chamber 18 reciprocating piston-valve 25 is located and is annularly recessed or grooved at its center, as shown at 26, and both sides of its center, as shown at 27, and ducts 28 and 29 extend through the valve 18 from its centrally-recessed portion 26 to its respective ends.

Ports 45 and 46 connect the ends of exhaust-chamber 23 with valve-chamber 18, and exhaust-ducts 32 and 33, respectively, are located in the ends of the casing and have valves 34 and 35, respectively. A lever 36 is fulcrumed between its ends on top of cylinder 9, and a pin 37 extends down through the upper head of the cylinder below one end of lever 36 and is struck by the piston at the extreme of its upstroke to depress the outer end of the lever 36, which is connected by a rod 38 with valve 34, and a spring 39 is located on rod 38 and is adapted to return said parts to their normal position when the piston moves away from pin 37. A pin 40, similar to pin 37, projects through the bottom head of cylinder 9 and is secured to a cross-bar 41, which latter is connected by a rod 42 with valve 35, so that said valve will be opened by the piston on its downstroke striking pin 40, and a spring 43 returns the parts to their normal positions when the piston moves away from pin 41. Steam, compressed air, gas, or other fluid is supplied to the center and top of chamber 18, and a set-screw 44 projects into the end of said chamber and may be adjusted to regulate the stroke of the valve.

The operation of our improvements is as follows: A constant supply of fluid under pressure enters the center of chamber 18 and passes through the ducts 28 and 29 to the ends of the chamber and hold the valve steady, as the pressure is equal at both ends. The live fluid passes through port 19 and duct 21 into the upper end of cylinder 9 to force down the piston, and the fluid from below the piston exhausts through duct 22 and port 20 into chamber 18 and passes around the valve and down through port 46 into exhaust-chamber 23 and out pipe 24. When the piston reaches the end of its stroke, it strikes pin 40 and presses down bar 41 and

valve 35, which permits the fluid at the right-hand end of chamber 18 to escape and the excess of pressure at the other end of the chamber to move the valve to the right, 5 which opens port 20 to the live fluid, which directs the same down through duct 22 to the bottom of cylinder 9 and causes the piston to move upward. As the piston moves away from pin 41 the spring 43 will close 10 valve 35, and the fluid-pressure will again be equalized in the ends of the chamber 18 to hold the valve stationary. On the upstroke of the piston the fluid exhausts through duct 21 and port 19, around the valve 25, through 15 port 45, into exhaust-chamber 23, and out pipe 24. When the piston reaches the extreme of its upstroke, it strikes pin 37 and through the medium of lever 36 and rod 38 opens valve 34, permitting the exhaust of the 20 fluid at the left-hand end of the chamber 18, and hence permitting the fluid at the other end of the chamber to move the valve to the left, when the operation above described is repeated. The spring 39 closes valve 34 25 when the piston moves away from pin 37 and permits the pressure to be equalized in the ends of the chamber 18 and the valve to be held stationary until the piston strikes lower pin 41.

30 A great many slight changes might be made in the general form and arrangement of the parts described without departing from our invention, and hence we would have it understood that we do not restrict ourselves

to the precise details set forth, but consider 35 ourselves at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Let- 40 ters Patent, is—

1. A cylinder, its piston - head provided with a tubular rod fitted to slide in suitable bearings in the upper cylinder-head, a pump-rod fitted to slide in suitable bearings in the 45 lower cylinder-head, the said pump-rod being extended through the piston-head and piston-rod and means for securing the two rods together exterior to the cylinder.

2. The combination in a pumping-engine, 50 of a cylinder, a T-coupling for attachment to a stand-pipe and having a fluid-outlet, a piston in said cylinder, a tubular piston-rod secured to said piston, a plunger-rod passing through the cylinder, the tubular piston-rod 55 and the T-coupling, means for securing the tubular piston-rod with the plunger-rod, and valve mechanism for controlling the operation of the piston.

In testimony whereof we have signed this 60 specification in the presence of two subscribing witnesses.

JULIEN E. TINKER.
JOSEPH CRAWFORD, JR.

Witnesses:

H. E. ALLEN,
E. R. SHERMAN.