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PATENTED JUNE 11, 1907.

F. LINTHICUM.
PUMP.

APPLICATION FILED NOV. 6, 1905.

2 SHEETS—SHEET 1.

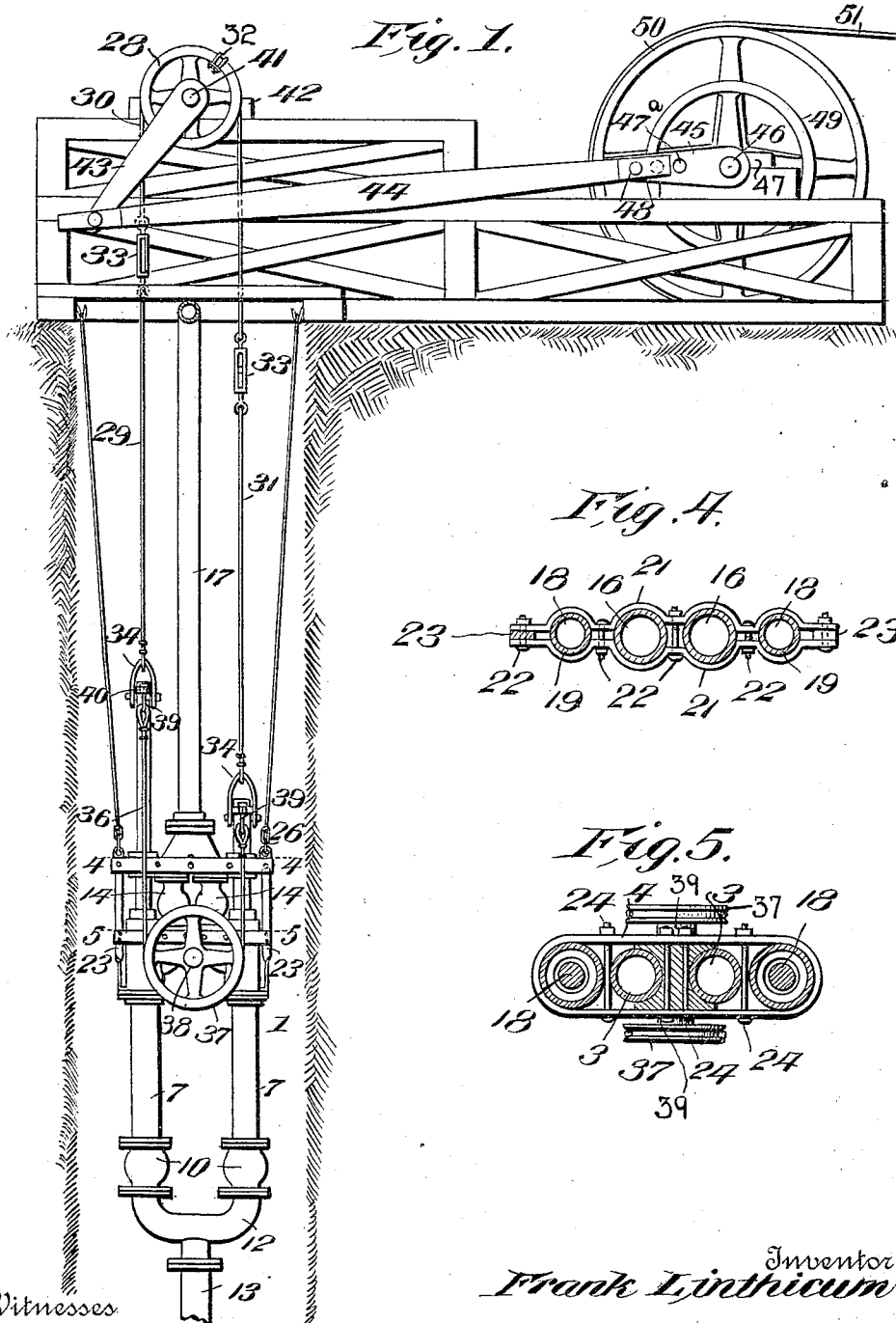


Fig. 4.

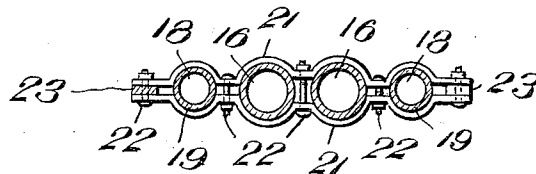
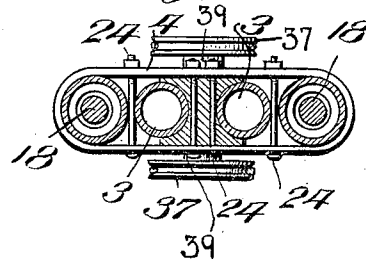


Fig. 5.



Witnesses

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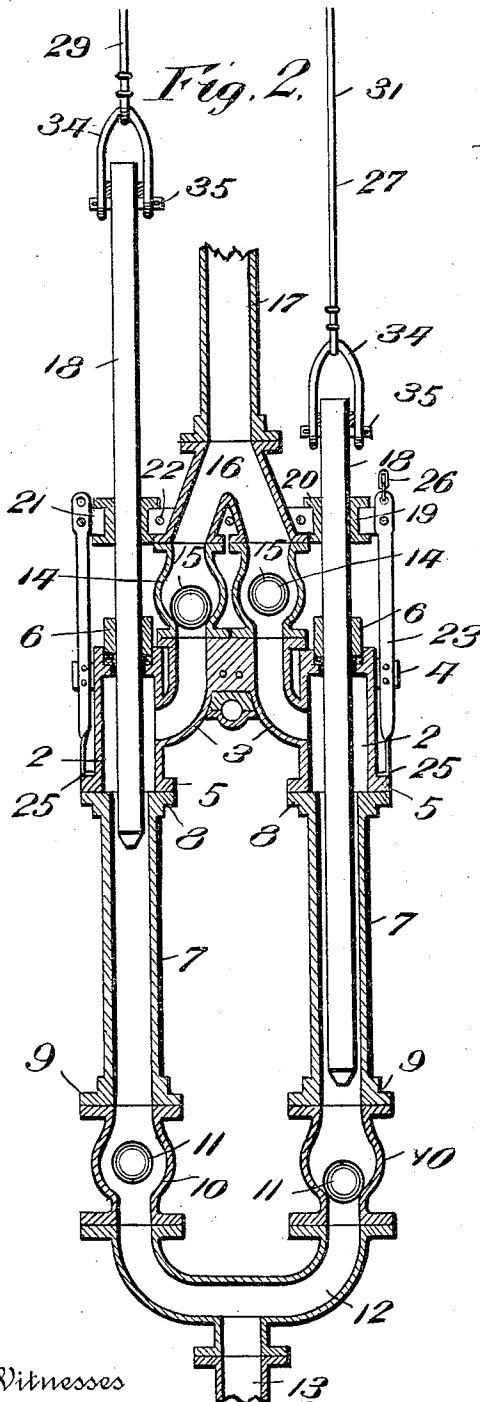
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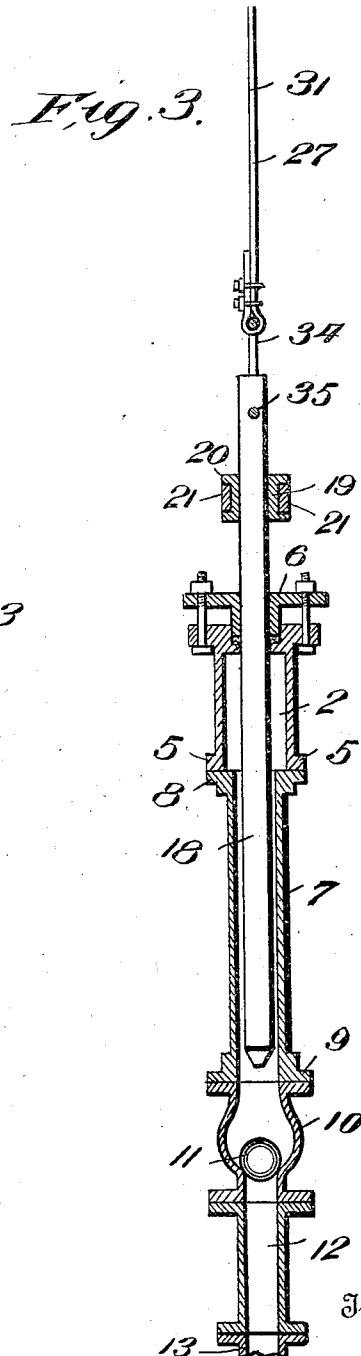
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK LINTHICUM, OF AURORA, MISSOURI.

PUMP.

No. 856,271.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed November 6, 1905. Serial No. 286,134.

To all whom it may concern:

Be it known that I, FRANK LINTHICUM, a citizen of the United States, residing at Aurora, in the county of Lawrence and State of Missouri, have invented certain new and useful Improvements in Pumps; and I do 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.

This invention relates to improvements in pumps of that class designed for pumping liquids great distances in the ground or on the surface.

The object of the invention is to provide a simple, durable and comparatively inexpensive pump of this character which will be very efficient and economical in operation.

With the above and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter more fully described and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a pumping apparatus constructed in accordance with the invention; Fig. 2 is a vertical sectional view through the pump; Fig. 3 is a similar sectional view taken on a plane at right angles to that of Fig. 2; Figs. 4 and 5 are horizontal sectional views taken respectively on the planes indicated by the lines 4—4 and 5—5 in Fig. 1.

Referring to the drawings by numeral, 1 denotes a pump casing which, as clearly shown in Figs. 1 and 2, is in the form of an integral casting consisting of two cylinders 2 united by inwardly projecting branch pipes 3, but which, if desired, may be formed in two sections and united by the clamp 4 which in the present instance serves another purpose, as presently explained. Each of the pump cylinders 2 has its lower end flanged, as shown at 5, and its upper end provided with a stuffing-box or packing-gland 6 which may be of any desired form and construction. To the flanges 5 are secured depending extensions 7 of the pump cylinders 2, which extensions, as clearly shown in Fig. 2, are in the form of pipe sections having flanges 8 secured to their upper ends and bolted to the flanges 5. Similar flanges 9 are provided upon the lower ends of the extension pipes 7, and to the flanges 9 are bolted or otherwise secured valve casings 10 in which are mounted suitable check valves 11. These valves may be

of the ball type, as shown, or of any other desired form. The flanged lower end of the valve casings 10 are preferably connected to two branches of a T-coupling 12, the third branch of which may be connected to an inlet pipe 13 or may project into the liquid to be pumped. The branches 3 form the outlets for the two cylinders 2, and to their flanged upper ends are bolted or otherwise secured valve casings 14 in which are mounted check valves 15; the latter are here shown as of the ball type, but may be flap valves or valves of any other form. The upper flanged ends of the valve casings 14 are bolted or otherwise secured to a Y-coupling 16 which has connected to its top a discharge pipe 17 adapted to lead to any desired point of discharge.

Two cylindrical pistons 18 reciprocate through the packing-glands 6 and in the cylinders 2 and their extensions 7. These pistons reciprocate simultaneously in opposite directions and are guided in their vertical sliding movement by guide-sleeves 19 through which they extend. Each of these guide-sleeves is preferably formed of two half-sections which have surrounding flanges 20 at their upper and lower edges; and they are mounted between the two similar half-sections or members of a clamp 21. The latter is formed of two strips of metal which are bent and shaped, as shown in Fig. 4 of the drawings, to engage the Y-coupling 16 and the two guides 20. The two strips or members of the clamp 20—21 are secured together by bolts 22 or any other similar fastening means which clamp them upon the coupling 16. The outer ends of the clamp 21 are connected by tie-bars 23 to the ends of the clamp 4. The latter, as shown in Fig. 5 of the drawings, also consists of two strips of metal which are secured together and upon opposite sides of the pump casing by bolts 24. The tie-rods 23 extend downwardly below the clamp 4 and have their lower ends 25 secured upon the flanges 5 of the pump cylinders, as seen in Fig. 2 of the drawings. To the upper ends of the bars 23 may be connected links 26 to which cables may be attached for raising and lowering the pump out of and into a well, shaft, or the like. The pump pistons 18 are connected by a flexible element 27 which has a portion passed around and secured to an oscillatory drum, wheel or similar element 28. As shown, the flexible connecting element 27 consists of three sections 29, 30 and 31, of

cable, the section 30 being passed over the pulley or wheel 28 and secured thereto at one point by a suitable clamp 32, and having its ends connected by means of turn-
 5 buckles or similar adjusting devices 33 to the upper ends of the two cable sections 29—31. The lower ends of the latter are connected by means of yokes 34 to the upper ends of the pistons 18. These yokes 34 are of sub-
 10 stantially U-form, having eyes or loops at their ends to receive pins 35 which pass through the pistons. Instead of constructing the element 27 in this manner, it may be made up of chains, steel bands, flexibly con-
 15 nected rods, or it may be of any other suitable construction, and, if desired, spring tension devices may be included between its two ends. The pump pistons 18 are further connected by flexible cables or similar elements
 20 36 which are provided upon opposite sides of the pump casing. These cables pass around grooved pulleys or wheels 37 secured upon the outer ends of a shaft 38 which is mounted in suitable bearings 39 secured beneath
 25 and between the branches 3 of the pump casing, as shown in Fig. 2. The ends of the cables 36 are connected to the upper ends of the pistons 18 on each side of the pump, by means of eye-bolts 39 which pass through
 30 clamps 40 secured upon the upper ends of the pistons 18 above the pins 35. Each of the clamps 40 consists of two similar metal straps bolted together and upon the pistons.

In order to reciprocate the pistons 18 the
 35 wheel or pulley 28 is oscillated by securing upon its shaft 41, which is suitably mounted in bearings 42, a crank-arm 43. This arm has its outer end connected to one end of a pitman 44, which has its opposite end adjust-
 40 ably connected to a crank 45 upon a shaft 46, which is suitably mounted in bearings 47. The adjustable connection between the crank 45 and the pitman 44 is preferably effected by
 45 47^a in any one of which may be mounted the wrist-pin 48, which connects said crank and pitman. Upon the shaft 46 is mounted the fly-wheel 49 and a band-wheel or pulley 50
 50 about which a drive-belt 51 is passed. The belt 51 may be driven from a suitable motor or any suitable source of power.

The operation and advantages of the invention will be readily understood from the foregoing description taken in connection with
 55 the accompanying drawings. It will be seen that when the shaft 46 is rotated, the crank 45 will cause the pitman 44 to oscillate the crank 43 and hence oscillate the wheel or pul-

ley 28. The oscillation of the latter will cause the pump pistons 18 to be simultane- 60
 ously reciprocated in opposite directions. The upstroke of each piston will suck water into its cylinders above the check-valve 11 and its downstroke will force the water from
 65 its cylinder up through the branch 3, around the check-valve 15, and out through the discharge pipe 17.

While the preferred embodiment of my invention is shown and described, it will be under- 70
 stood that I do not wish to be limited to the precise construction herein set forth, since various changes in the form, proportion and the minor details of construction may be resorted to without departing from
 75 the principle or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters-
 Patent is:—

1. A pump having a pair of barrels, a coupling 80
 between and at the upper ends thereof, plungers operating in and extending through the upper ends of the barrels, guides for the said plungers, a clamp on the coupling and
 85 engaging and holding the plunger guides, links having their lower ends connected to the upper portions of the pump barrels and connected near their upper ends to the ends
 90 of the said clamp, and suspending means for the pump attached to the upper ends of the said links.

2. A pump having a pair of barrels, a coupling 95
 between and at the upper ends thereof and having a bearing, plungers operating in and extending through the upper ends of the barrels, guides for the said plungers, a clamp
 100 on the coupling and engaging and holding the plunger guides, a pulley having its shaft mounted in the bearing of the coupling, links having their lower ends connected to the up-
 105 per ends of the barrels and connected near their upper ends to the said clamp, suspending means for the pump attached to the upper ends of the said links, operating cables for the
 plungers attached to the upper ends thereof, a cable connecting said operating cables and
 110 engaging the lower side of the said pulley, and means to operate the said operating cables.

In testimony whereof I have hereunto set 110
 my hand in presence of two subscribing witnesses.

FRANK LINTHICUM.

Witnesses:

J. F. RAGSDALE,
 B. V. RUPPEL.