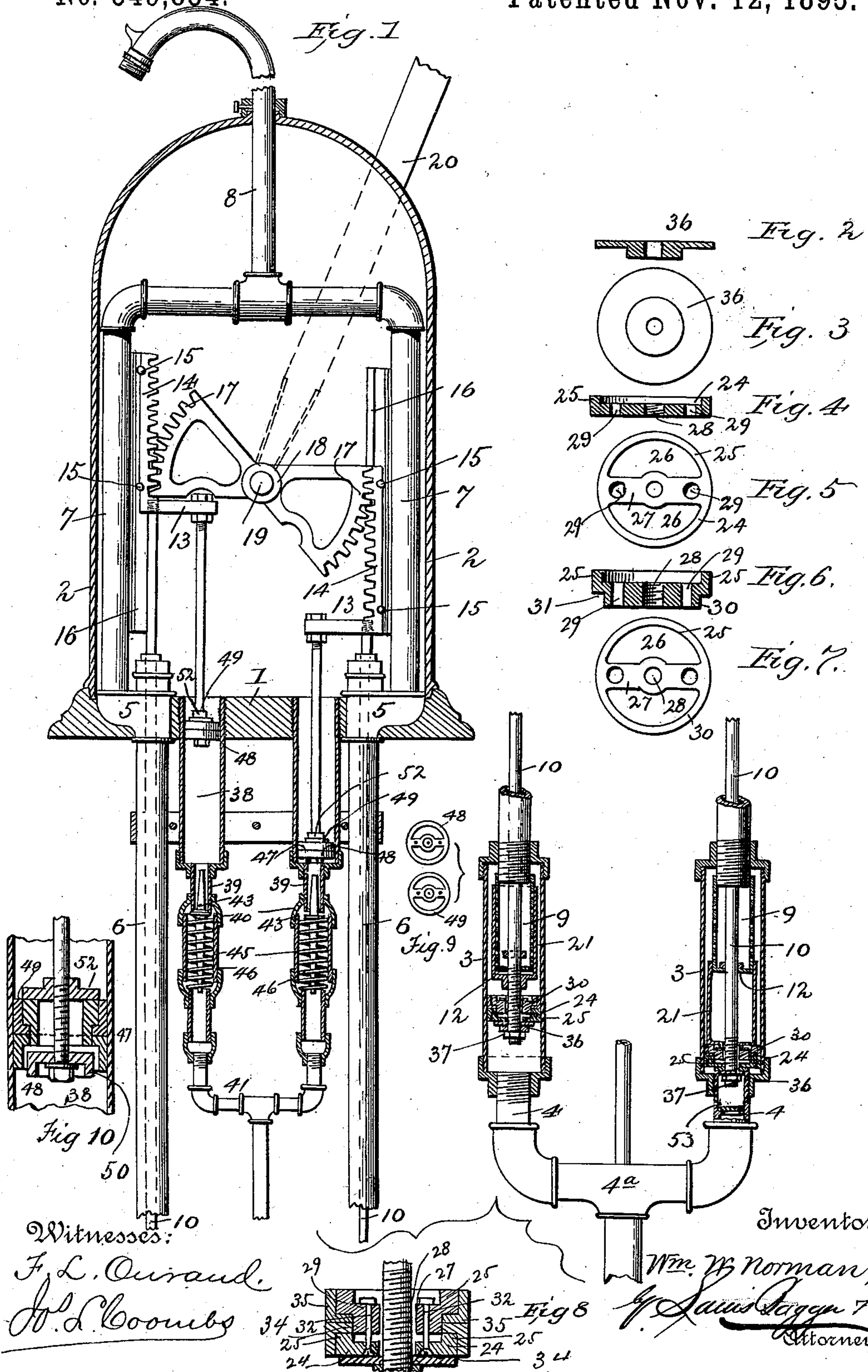


(No Model.)

W. W. NORMAN.
PUMP.

No. 549,854.

Patented Nov. 12, 1895.



UNITED STATES PATENT OFFICE.

WILLIAM W. NORMAN, OF ALLENVILLE, MISSOURI.

PUMP.

SPECIFICATION forming part of Letters Patent No. 549,854, dated November 12, 1895.

Application filed May 20, 1895. Serial No. 549,993. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. NORMAN, a citizen of the United States, and a resident of Allenville, in the county of Cape Girardeau and State of Missouri, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to double-acting force-pumps of that character or description in which two pump-barrels are employed with independently-operating pistons or valves, said barrels being connected at their lower ends with a supply-pipe and at their upper ends with an outlet-pipe, in connection with air-pumps leading to the supply-pipe for purifying the water, operated by the same means which actuate the pump-rods.

The object of the invention is to provide an improved construction of the same which shall possess superior advantages with respect to efficiency in operation.

The invention consists in the novel construction and combination of parts herein after fully described and claimed.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a pump constructed in accordance with my invention. Figs. 2, 3, 4, 5, 6, 7, and 8 are detail views showing the parts constituting the piston. Fig. 9 shows views of parts of the air-pistons. Fig. 10 is a longitudinal sectional view of one of the air-pistons.

In the said drawings, the reference-numeral 1 designates a base adapted to be placed over the mouth of a well or other place and provided with a casing 2, in which is located and concealed the mechanism for operating the water and air pumps.

The numeral 3 designates the pump-barrels, connected with the lower ends of which are pipes 4, the ends of which are bent inwardly at right angles and connected with a supply-pipe 4^a. The upper ends of the barrel are connected with couplings 5, passing

through the base, by means of pipes 6, and connected with said couplings are pipes 7, the upper ends of which are connected with an outlet-pipe 8, passing through the top casing or housing.

Located in the upper part of the pump-barrels is a perforated cylinder 9, through which passes the pump-rods 10, guide-plates 12 being secured to the interior of said cylinders, having cylindrical apertures for the passage of the pump-rods. The upper ends of the pump-rods pass through the couplings 5 and are secured to inwardly-extending arms 13, secured to the lower ends of rack-bars 14, provided with antifriction-rollers 15, which work in grooves in vertical guide-bars 16, secured to the said housing or casing. Engaging with these rack-bars are toothed segments 17, secured to a hub 18 on a stud-shaft 19, journaled in the sides of the casing and provided with an operating-lever 20.

Located in the pump-barrels are cups 21, which are adapted to work or slide vertically in the cylinders 9. The upper ends of these cups are open, while the pump-rods pass through the lower ends thereof and are fixed thereto, so that as said rods are reciprocated the cups will move with them. Secured to the pump-rods below the cups are pistons 23. The pistons of both pump-barrels are identical in construction, and therefore a description of one will suffice for all.

The numeral 24 designates a lower disk formed with an upwardly-extending annular flange 25 and with openings 26, leaving a web 27, provided with an opening 28, through which the pump-rod passes, and with two bolt-holes 29. This disk is secured to the screw-threaded end of the pump-rod, and above the same is located a similar, but somewhat thicker disk 30, also formed with an annular flange 25, openings 26, web 27, with a central opening 28 and bolt-holes 29. The lower edge of the disk 30 is formed with an annular groove 31, so that when the two disks are placed on the pump-rod and connected together by the bolts 32 a space will be left between to receive the inwardly-extending flanges 34 of packing-rings 35.

Secured to the lower end of the pump-rod

is a circular valve 36 and a nut 37. This valve, when the piston is on the downstroke, will open and allow water to enter through the openings in the piston, but will close on the upstroke.

Passing through the base of the casing are two downwardly-extending air-cylinders 38, open at their upper ends, and their lower ends provided with pipes 39, connected with couplings 40, the lower ends of which are provided with branch pipes 41, connected with a vertical pipe 42, leading to the supply-pipe connected with the lower ends of the pump-barrel.

Located in the couplings 42 are valves 43, having their upper ends made conical and projecting up into the pipes 39, and provided with tapering stems 45. Coiled springs 46 encircle these stems and serve to press the valves up against the lower ends of the pipes 39, which form seats therefor.

Located in the air-cylinders are pistons 47, each consisting of a lower disk 48 and an upper disk 49. Disk 48 is formed with a downwardly-extending annular flange 50, having a web and opening similar to the pump-openings, while disk 49 is formed with a groove at its lower end to form a space for the packing-rings. It is also formed with a web and openings.

Located above the pistons, and secured to the piston-rods 51 thereof, are circular valves 52, which open on the upstroke and close on the downstroke of the pistons. The upper ends of these rods are secured to the arms 13 of the reciprocating rack-bars.

The numeral 53 designates foot-valves in the pipes 4, which may be of any ordinary construction, for preventing the water from flowing back to the well on the downstroke of the pistons.

The operation is as follows: The rack-bars are alternately reciprocated in opposite directions, causing the pump-rods and their pistons and the pistons of the air-cylinders to be correspondingly reciprocated. On the downstroke of the pump-pistons the valves on the lower sides thereof will open, allowing water to enter above the same through the openings therein. On the upstroke the valves will close and the water above the pistons will be forced into the cylinders in the pump-barrels through the perforations therein and out through the outlet-pipe. The operation will then be repeated alternately in each barrel. The cups 21, when the pump is at rest, are always full of water, or partly filled, so that in starting the pump it will require no priming.

The pistons of the pump-barrels and air-cylinders, as they are reciprocated, have a slight reciprocating movement on their rods for the purpose of opening and closing the valves.

Having thus fully described my invention, what I claim is—

1. In a double acting force pump, the combination with the pump barrels, the common supply pipe connected with the lower end thereof and the outlet pipe connected with the upper ends of the perforated cylinders located in said barrels, the pump rods and valved pistons, the cups secured to and moving with said rods and means for alternately reciprocating the rods, substantially as described.

2. In a double acting force pump, the combination with the pump barrels, the supply pipe connected with the lower ends thereof, and the outlet pipes at the upper ends, of the perforated cylinders located in said barrels, the alternately reciprocating pump rods and valved pistons, the cups secured to and moving with said rods, the air cylinders connected at their lower ends with couplings provided with spring actuated valves, the pipes connecting said couplings with the said supply pipe, the alternately operating valved pistons located in said air cylinders, the rods connected therewith, substantially as described.

3. In a double acting force pump, the combination with the pump barrel, perforated cylinders located therein, the alternately reciprocating valved pistons, and pump rods, the cups secured to and working with said piston, the air cylinders, the spring actuated valves, the valved piston and the alternately reciprocating piston rods, of the housing or casing, the grooved guides, the rack bars provided with anti friction rollers working therein, the arms at the lower ends of said bars to which the pump rods and the piston rods of the air cylinders are connected, and the segments and lever for actuating said rack bars, substantially as described.

4. The combination with a force pump of the character described, of the pump barrel, the pump rod, the lower disk through which said pump rod passes, having an annular flange and a web with openings therein, the upper disk secured thereto also provided with a web and openings and formed with an annular groove, the bolts connecting said disks, the packing rings having inwardly turned flanges, and the circular valve on the lower end of the pump rod, and said disks having an up and down movement on the pump rod, substantially as described.

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

WILLIAM W. NORMAN.

Witnesses:

MARTIN FERGUSON,
FRED SCHWANER.