(No Model.)

H. M. WYETH.

DOUBLE ACTING PUMP.

No. 570,528. Patented Nov. 3, 1896.

Fig. 1.

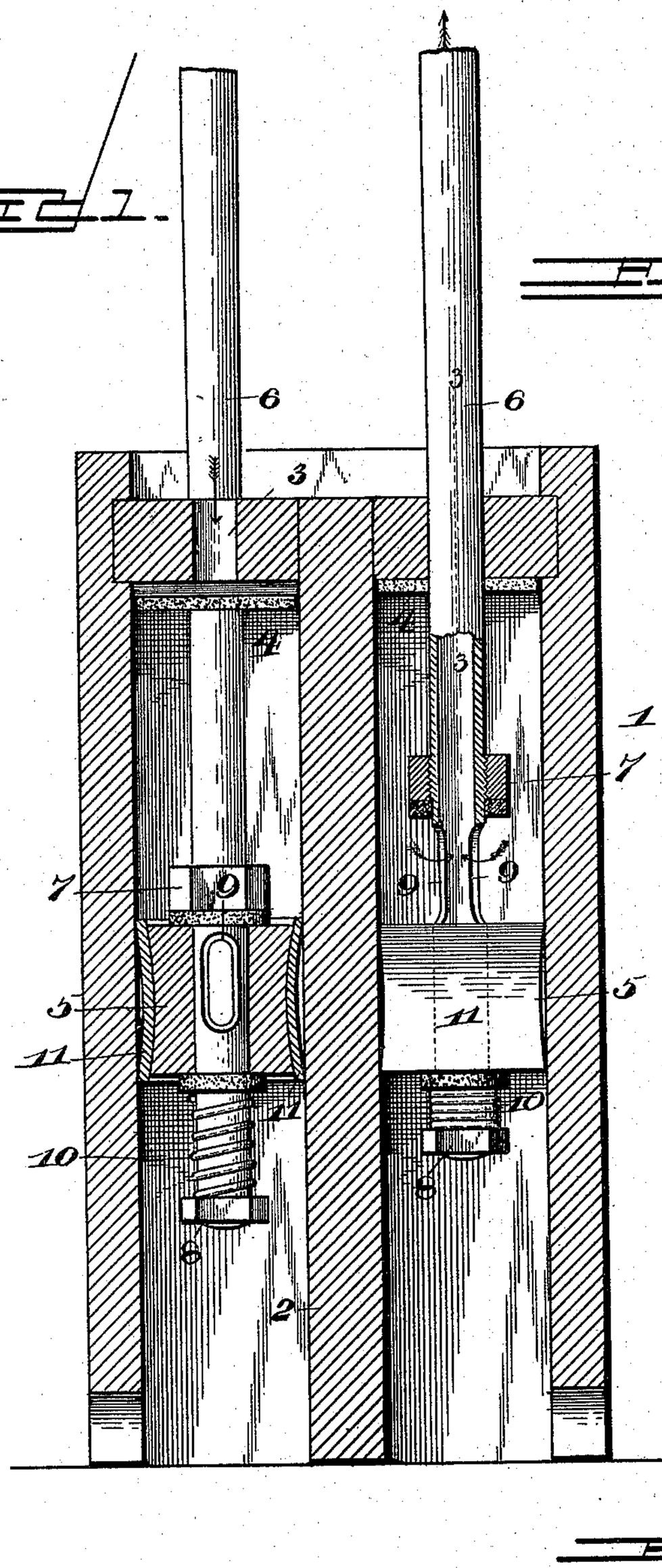

Fig. 2.

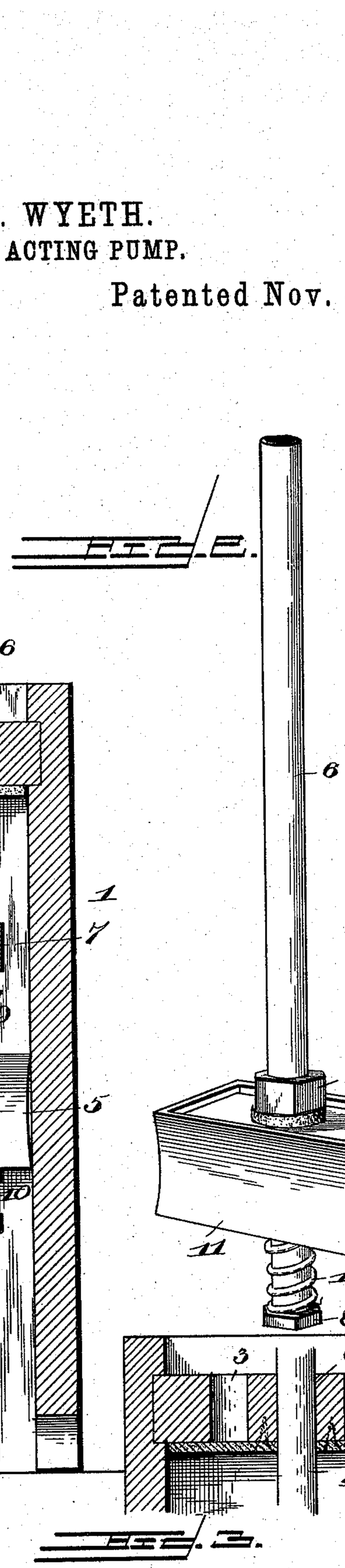

Fig. 3.

Inventor

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By his Attorneys,

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Witnesses

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UNITED STATES PATENT OFFICE.

HENRY M. WYETH, OF SALT LAKE CITY, UTAH.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 570,528, dated November 3, 1896.

Application filed August 6, 1895. Serial No. 558,415. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. WYETH, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented a new and useful Double-Acting Pump, of which the following is a specification.

My invention relates to double-acting pumps of the double-piston type; and it has for its object to simplify and improve the construction of submerged cylinder-pumps, whereby the friction of the pistons in the cylinder and lost motion at the ends of the strokes are reduced to the minimum.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a vertical section of a pump constructed in accordance with my invention, the plane of the section through the right-hand cylinder embracing the axis of the piston-rod operating therein, the piston being shown in elevation in its depressed position, and the contiguous portion of the rod being broken away to show the outlet-openings, and the plane of the section in the left-hand cylinder being taken in front of the piston-rod and through one of the inlet-openings, the piston-head being shown in section in its elevated position to close the outlet-openings. Fig. 2 is a detail view in perspective of one of the piston-heads and the contiguous portion of the tubular piston-rod. Fig. 3 is a partial section on the line 3 3 of Fig. 1.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a double cylinder of cross-sectionally rectangular construction, the casing in which the cylinders are formed being provided with an intermediate partition 2, by which the cylinders are separated. The cylinders are provided at their upper ends with inlet-ports 3, having inwardly-opening flat valves 4, and operating in the cylinders are the piston-heads 5, carried by the tubular piston-rods 6. The piston-heads are mounted to slide upon the piston-rods between upper and lower stops 7 and 8, arranged thereon, said stops in the construction illustrated consisting of nuts threaded exteriorly upon the piston-rods. Formed in the sides of the piston-rods and communicating with the bores thereof are the outlet-ports 9, which are closed by the piston-heads when the latter are elevated or in contact with the upper stops and are exposed or opened when the piston-heads are depressed, as during the upstroke. Interposed between the lower stops and the piston-heads are actuating-springs 10, which normally hold the piston-heads in position to close the outlet-ports and return said piston-heads to that position when the upstroke of the piston ceases to avoid the necessity of starting the downstroke of the piston in order to close the outlet-ports. Thus during the downstroke of the piston the piston-head closes the outlet-ports, and water or other fluid is drawn into the cylinder through the inlet-openings in the top thereof, and when the piston reaches the limit of its downward stroke and the upstroke begins the piston-head is depressed by the pressure in the cylinder to expose the outlet-ports and the fluid passes out through the bore of the piston-rod. When the piston reaches the limit of its upward stroke, the outlet-ports are immediately closed by reason of the expansion of the actuating-spring.

By the use of a spring arranged as described the piston-head is elevated to close the outlet-ports 9 before the downstroke of the piston-rod commences, and hence lost motion is prevented. Without the use of a spring the pressure of liquid in the outlet-pipe would tend to counterbalance the upward pressure against the lower side of the piston-head, and hence would delay the elevation of the piston-head to its closed position, thereby materially diminishing the output of the pump by allowing the level of the water or other liquid in the outlet-pipe to sink, and hence necessitating the reëlevation of the same at the beginning of the upstroke. When the piston-rod reaches the limit of its upward movement, the outlet-ports 9 are at once closed, and hence the level of the water in the piston-rod is preserved. In this connection I employ a piston-head having a body portion, of which the side surfaces are concaved or channeled, as shown clearly in Fig. 1, and the packing 11, which is secured to

said concaved surfaces, is held out of contact with the walls of the cylinder at its center and bears against the same only at its upper and lower edges to reduce the friction of the piston-head to the minimum. The upper and lower edges of the packing, which is preferably of leather or other flexible material, are extended beyond the upper and lower surfaces of the piston-head, where they are exposed to the pressure of the fluid and thereby expanded to bear snugly in contact with the walls of the cylinder during the strokes.

From the above description it will be seen that the weight of the contents of the discharge-tubes or hollow stems is arranged, by reason of the lever, to which said stems are connected, to counterbalance, whereby the force necessary to operate the pump is only that which is sufficient to elevate the column of water discharged at each stroke, together with the friction due to the operation of the moving parts, and hence, with the exception of the element of friction, the operation of the pump is the same in elevating water from deep as from shallow wells. Obviously a pump having a stem of large diameter can be operated with less loss of power due to friction than a pump with a stem of smaller diameter.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

In a pump, the combination with a double submerged cylinder provided at its upper end with inlet-openings and controlling inwardly-opening valves, of pistons operating in the cylinder, each piston having a tubular piston-rod provided near its lower end with outlet-ports and above and below the outlet-ports with upper and lower stops, a piston-head mounted to slide upon the piston-rod between said stops and adapted when in contact with the upper stop to close said outlet-ports, and a spring interposed between the piston-head and the lower stop to normally hold the piston-head in position to close the outlet-ports and return it to said position after displacement by pressure in the cylinder, substantially as specified.

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

HENRY M. WYETH.

Witnesses:
JAMES M. SMITH,
FRANK E. HOAGLAND.