

No. 649,400.

Patented May 8, 1900.

E. P. CHILSON.

PUMP.

(Application filed July 24, 1899.)

(No Model.)

2 Sheets—Sheet 1.

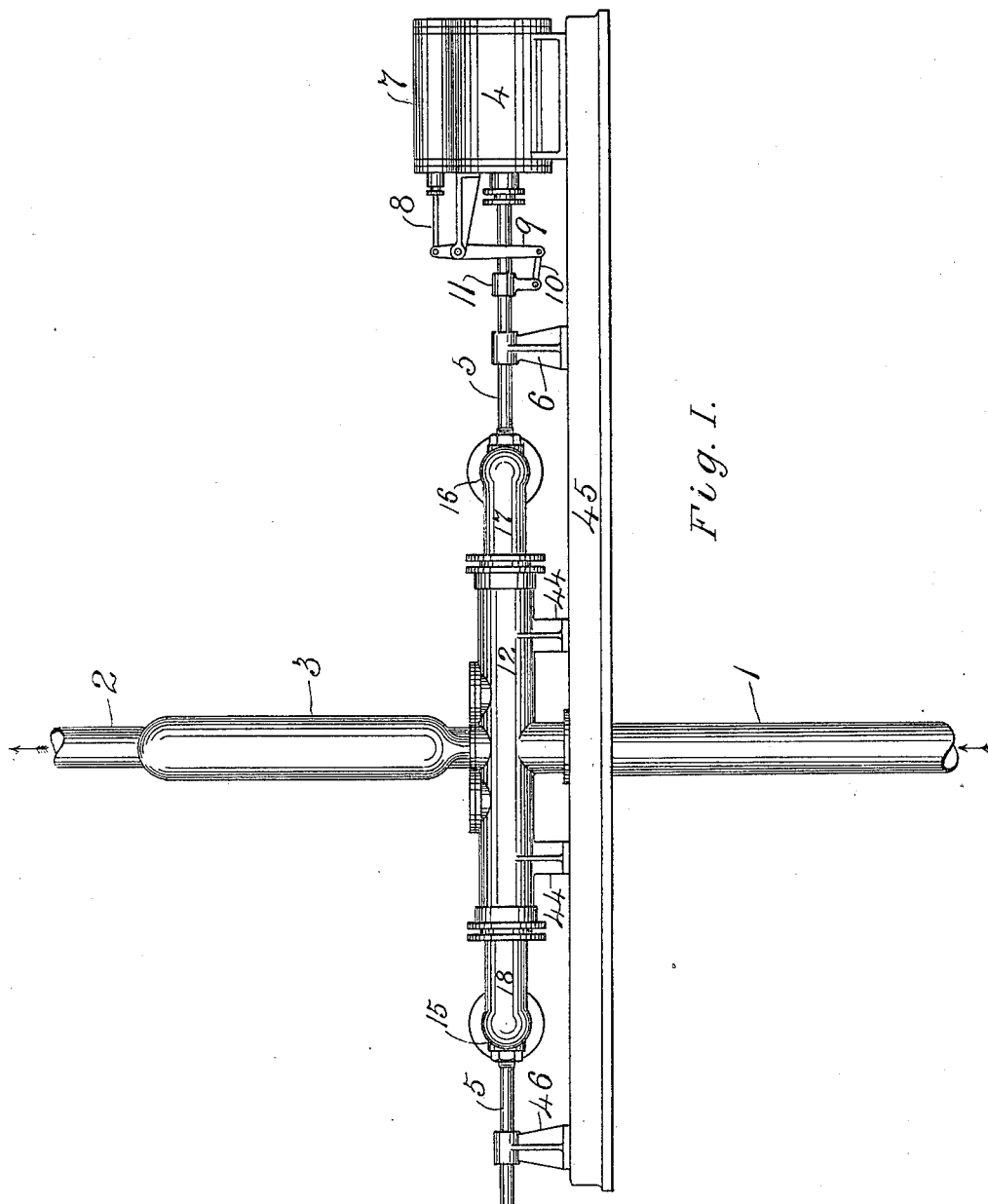


Fig. 1.

Witnesses

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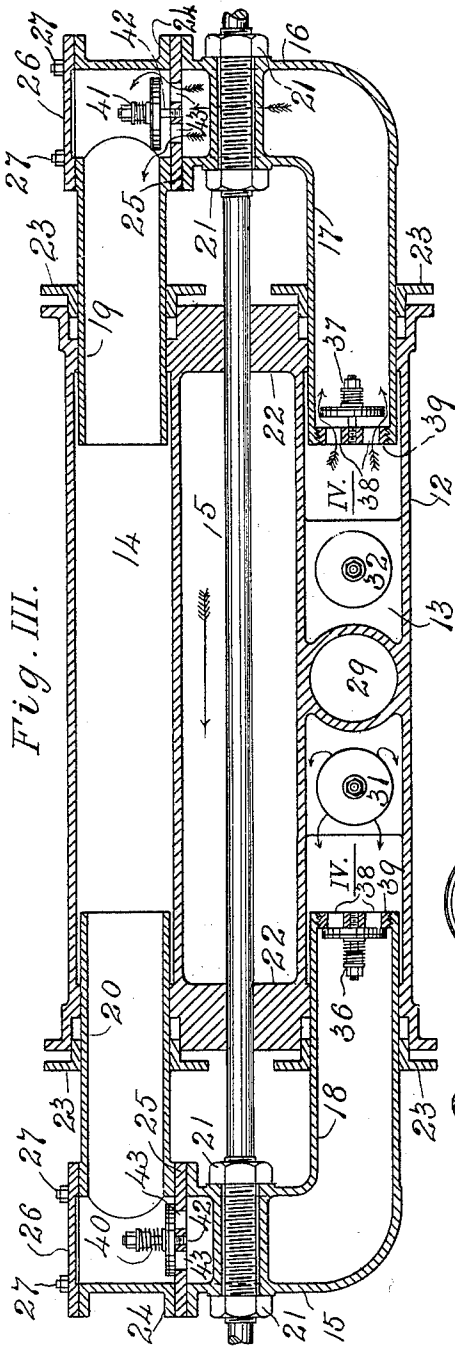


Fig. III.

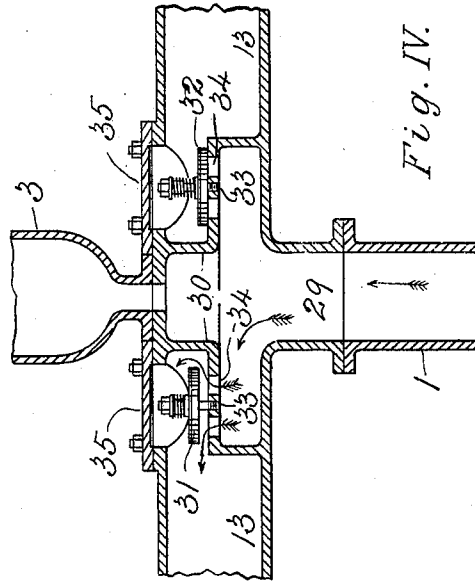


Fig. IV.

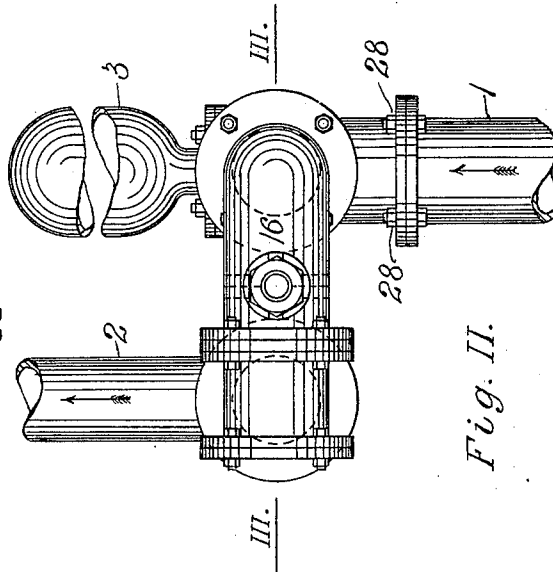


Fig. II.

Witnesses

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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 649,400, dated May 8, 1900.

Application filed July 24, 1899. Serial No. 724,929. (No model.)

To all whom it may concern:

Be it known that I, ELISHA P. CHILSON, a citizen of the United States, residing at Chino, in the county of San Bernardino and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in pumps; and my invention consists in certain features of novelty hereinafter described and claimed.

Figure I is a side elevation of my improved pump. Fig. II is an enlarged end view. Fig. III is a longitudinal section taken on line III III, Fig. II. Fig. IV is a longitudinal section taken on line IV IV, Fig. III.

Referring to the drawings, 1 represents a supply-pipe; 2, a discharge-pipe; 3, an air-chamber, and 4 a steam-cylinder having a piston working therein (not shown) for operating the pump.

5 represents a piston-rod working in a bracket 6.

7 represents the valve-chamber of a steam-cylinder, 8 a piston-rod operating in the valve-chamber 7, and 9 10 lever and link, respectively, connecting the piston-rod 8 with a bracket 11, mounted on the steam piston-rod 5.

12 represents a pump-body having a receiving-chamber 13 and a discharge-chamber 14, said chambers being open at each of their ends and having pistons 15 16 adapted to operate therein. The pistons are each provided with hollow legs 17 18, adapted to reciprocate within the respective ends of the receiving-chamber 13, and with hollow legs 19 20, adapted to reciprocate in the respective ends of the discharge-chamber 14 of the pump-body 12. The pistons 15 16 at the respective ends of the pump-body are connected by means of the steam piston-rod 5 and provided with set-nuts 21 for holding and regulating the pump-pistons.

22 represents central heads at each end of the pump-body, said heads forming a bearing for the rod 5 where it passes through the same.

23 represents packing-rings surrounding the respective legs of the pump-pistons. The

legs 17 18 are in L shape and secured to the legs 19 20 at 24 with intervening plates 25.

26 represents detachable plates near the outer ends of the legs 19 20, secured by bolts 27, by which access may be had to the interior of said legs. The receiving-pipe 1 is connected with the pump-body at 28, there being a passage 29 leading from the same into the chamber 13 of the pump-body.

30 represents a bench in the chamber 13, to which spring-closed valves 31 32 are connected by means of valve-stems 33.

34 represents apertures in the bench beneath the valves for the passage of liquid on its way to the discharge-chamber.

35 represents removable plates by which access may be had to the valves 31 32. The inner ends of the hollow legs 17 18 on the receiving side of the pump-body are provided with spring-closed valves 36 37, adapted to close from pressure within the legs and to open from pressure within the receiving-chamber outside of the legs.

38 represents apertures through the valve-seats 39, secured to the ends of the legs 17 18. Between the legs on the receiving side of the pump-body and the legs on the discharge side are spring-closed valves 40 41, having their stems 42 secured to the plates 25, there being apertures 43 through said plates for the passage of liquid. The inner ends of the legs 19 20 on the discharge side of the pump-body are open without any valve attachment. The pump-body is preferably supported by legs 44, resting upon a bed-plate 45. The piston-rod 5 at the opposite end of the pump-body from the steam-cylinder extends beyond the end of the body and reciprocates within a bracket 46, and it may, if desired, be connected at said end of the piston-rod with a power-generating device.

In operation as the pump-pistons are reciprocating with the legs thereof operating within the receiving and discharge chambers the water or other liquid, according to the position of the legs, will pass through one of the valves 31 32 and through the corresponding valve 36 or 37 in the ends of the legs 17 18, the water passing into the legs on the inward stroke, as shown in Fig. III, the valve 32 at that time being closed, suction on the oppo-

site side opening the valve 31, allowing that side of the receiving-chamber to fill preparatory to the inward stroke of the leg 18, at which time the valve 36 opens, permitting the water to pass through said valve and through the valve 40 between the legs, the opposite end of the pump-piston operating in the same manner. As the pump-piston travels inwardly the valve 41 is opened, permitting the water to pass into the leg 19, the water being forced out through the discharge-pipe 2 and at the same time creating an equal amount of pressure on the opposite leg 20, and as the two sets of legs or pistons are connected to each other by the piston-rod 5 it will be seen that the pressure of water will act upon the receding leg 20, thus assisting the inwardly-traveling leg 19, with the corresponding advantage of performing the work with less power than would otherwise be required. After the leg 20 has receded to its full limit the stroke is reversed and pressure thrown upon the opposite leg 19, which now becomes the receding leg, said pressure assisting in drawing the leg 20 toward the center of the cylinder.

There are other advantages besides doing the work with less power. The water forms an elastic cushion which greatly facilitates and smooths the operation of the pump.

I claim as my invention—

1. In a pump, the combination of a cylinder having a receiving-chamber, a discharge-chamber, pistons having legs operating in the respective chambers and a piston-rod for connecting said pistons to each other, substantially as set forth.

2. In a pump, the combination of a body

having receiving and discharge chambers, pistons having legs adapted to operate in the respective ends of said chambers, the inner ends of the legs in the receiving-chamber having valves connected therewith, substantially as set forth.

3. In a pump, the combination of a body having receiving and discharge chambers open at their ends, pistons having legs adapted to operate within each end of said receiving and discharge chambers, the inner ends of the legs in the discharge-chamber being open, and with means for automatically closing the inner ends of the legs operating in the receiving-chamber, substantially as set forth.

4. In a pump, the combination of a body having receiving and discharge chambers, pistons having legs adapted to operate at each end of the body, means for securing the legs at the respective ends to each other, and valves interposed between said legs, substantially as set forth.

5. In a pump, the combination of a body having receiving and discharge chambers, valves located in the receiving-chamber and adapted to open and close alternately, pistons having legs adapted to operate within the receiving and discharge chambers, a piston-rod for connecting said pistons, valves located at the inner ends of the legs operating in the receiving-chamber, said valves opening and closing alternately, substantially as set forth.

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Witnesses:

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