

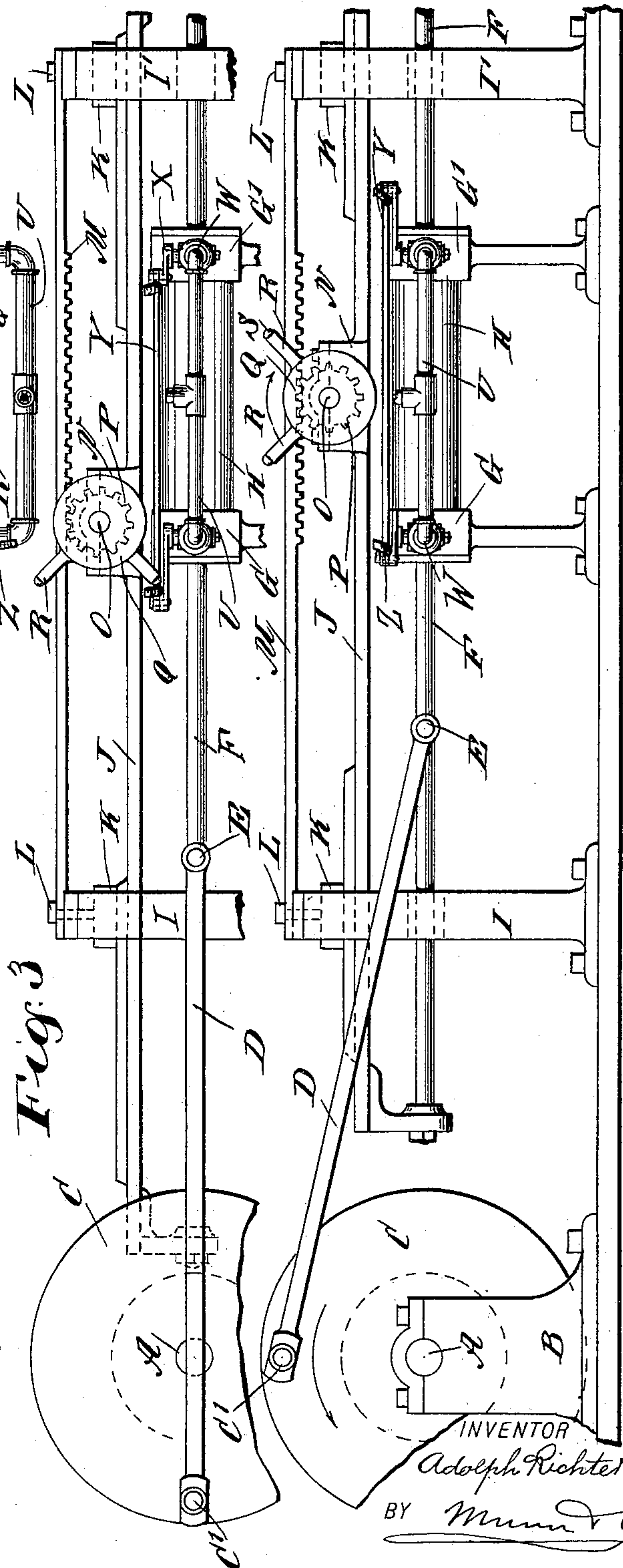
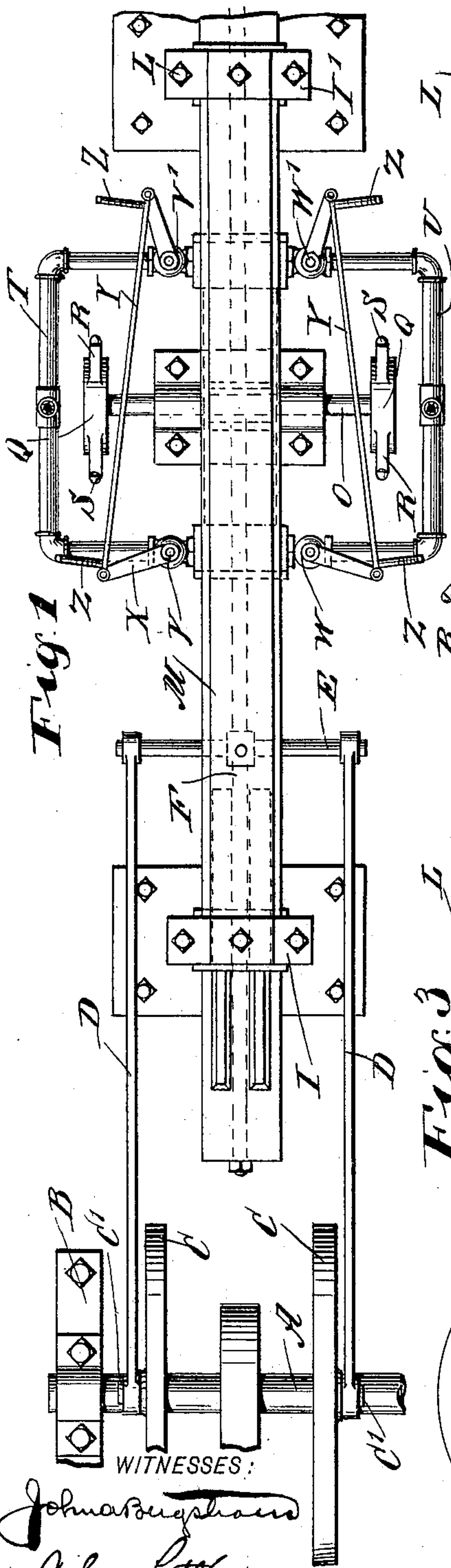
No. 618,732.

Patented Jan. 31, 1899.

A. RICHTER.
PUMP.

(Application filed Sept. 13, 1898.)

(No Model.)



WITNESSES:

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PUMP.

SPECIFICATION forming part of Letters Patent No. 618,732, dated January 31, 1899.

Application filed September 13, 1898. Serial No. 690,844. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH RICHTER, of the city of New York, borough of Manhattan, in the county and State of New York, have
5 invented a new and Improved Pump, of which the following is a full, clear, and exact description.

My invention relates to pumps for all kinds of liquids, and has for its object to provide a
10 positive valve-action for pumps, whereby the valves will be opened and closed very quickly, so as to secure a high efficiency of the machine.

The invention will be fully described hereinafter and the features of novelty pointed
15 out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan of a pump constructed according to my invention. Fig. 2 is a side elevation thereof with the piston in its central position, and Fig. 3 is a side elevation
25 with the pump-piston at the end of its stroke.

A is the drive-shaft of the pump, journaled in suitable bearings B and provided with two crank-disks C, from the crank-pins C' of which extend the connecting-rods D, the outer
30 ends whereof are connected by a cross-bar E. To the center of the cross-bar is attached the piston-rod F of the pump, said rod being guided in the heads G G' of the pump-cylinder and in standards I I' at suitable distances
35 from the pump-cylinder. With the rod F is rigidly connected a slide J, likewise guided in the standards I I', and to compensate for wear an adjustable block K, secured by set-screws L, may be employed to engage one of
40 the faces of the slide J. The standards I I' also carry a rack-bar M, which extends centrally—that is, in the same vertical plane as the slide J. The latter above the cylinder H carries bearings N, in which is journaled a
45 transverse shaft O, provided with a pinion P, which engages with the stationary rack-bar M. At each end the shaft O is provided with a disk Q, carrying two arms R, which at their
50 free ends are provided with balls S, projecting therefrom and located within suitable sockets.

The pump-cylinder H has four ports, two

at each end, and the connection is so made that while the inlet-port at one end is open the outlet-port at the other end is also open
55 and the valves are reversed as soon as the stroke of the pump is changed.

As shown in Fig. 1, T is the suction or inlet pipe of the pump, and U the discharge or delivery pipe. Each pipe leads to one port
60 at each end of the cylinder, and the connection is controlled by inlet-valves V V' and outlet-valves W W'. These valves may be of any approved pattern. As shown, two-way cocks are employed, provided with arms
65 X, which are connected by rods Y in such a manner that when one of the connected valves is closed the other valve of the set is open. The connecting-rods Y are provided with
70 arms Z, extending in such a position as to be in the path of travel of the balls S upon the arms R, the arms Z being for this purpose bent upwardly toward their free ends.

In operation as the pump-piston reciprocates it imparts a like motion to the slide J,
75 and the pinion P, rolling upon the stationary rack-bar M, will, in addition to the reciprocating movement just referred to, receive a rotary movement about its axis O. The various parts are so proportioned and arranged
80 that as the pump-piston nears the end of its stroke one of the arms R will come in contact with one of the projections Z and will shift the valves by throwing said arm with the
85 parts connected therewith. It will be understood that this movement of the valves will take place very quickly, as the arms, on account of their double motion, move much
90 more rapidly than the slide J. The valves, therefore, will remain fully open until the end of the stroke and there will be no loss of pressure by a gradual opening of the valves at the beginning of the stroke.

Having thus described my invention, I claim as new and desire to secure by Letters
95 Patent—

1. The combination with a pump having suction and delivery valves, of a slide rigidly connected with the pump-piston, a shaft journaled upon said slide, valve-operating pro-
100 jections on said shaft, and mechanism for rotating the shaft during the reciprocating movement of the slide, substantially as shown and described.

2. The combination of a slide rigidly connected with the pump-piston, a transverse shaft journaled upon said slide and carrying a pinion, a stationary rack engaging said pinion to rotate the shaft, and valve-operating projections upon the said shaft, substantially as shown and described.

3. The combination of a pump having a suction-valve and a delivery-valve at each end, means connecting like valves at opposite ends of the cylinder so as to close the one when the other is open, a slide rigidly connected with the pump-piston, a shaft journaled upon said slide, means for turning the shaft as the slide reciprocates, and valve-operating projections upon said shaft and arranged to engage the connection between said valves, substantially as shown and described.

4. The combination of a pump-cylinder having an inlet-valve and an outlet-valve at each end, bars connecting like valves at opposite ends of the cylinder so as to keep one open when the other is closed, projections located upon said bars, a slide rigidly connected with

the pump-piston, a shaft journaled upon said slide, means for rotating the shaft as the slide reciprocates, and projections carried by said shaft and adapted to engage the projections upon the connecting-bars of the valves, substantially as shown and described.

5. The combination of a pump-cylinder having an inlet-valve and an outlet-valve at each end, bars connecting like valves at opposite ends of the cylinder so as to keep one open when the other is closed, projections located upon said bars, a slide rigidly connected with the pump-piston, a shaft journaled upon said slide, means for rotating the shaft as the slide reciprocates, and projections carried by said shaft and provided with loose projecting balls adapted to engage the projections upon the connecting-bars of the valves, substantially as shown and described.

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Witnesses:

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