No. 627,399. Patented June 20, 1899.

G. DONGES & H. PETESCH.

HYDRAULIC ENGINE.

(Application filed Dec. 14, 1898.)

(No Model.) 2 Sheets—Sheet 1.

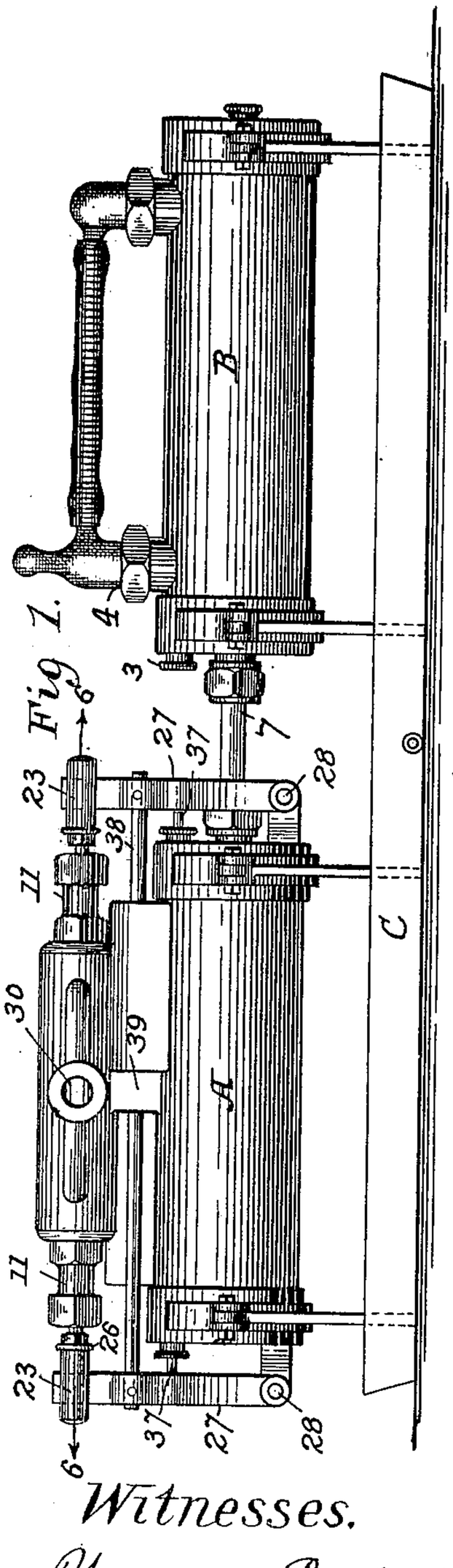

Fig 1.

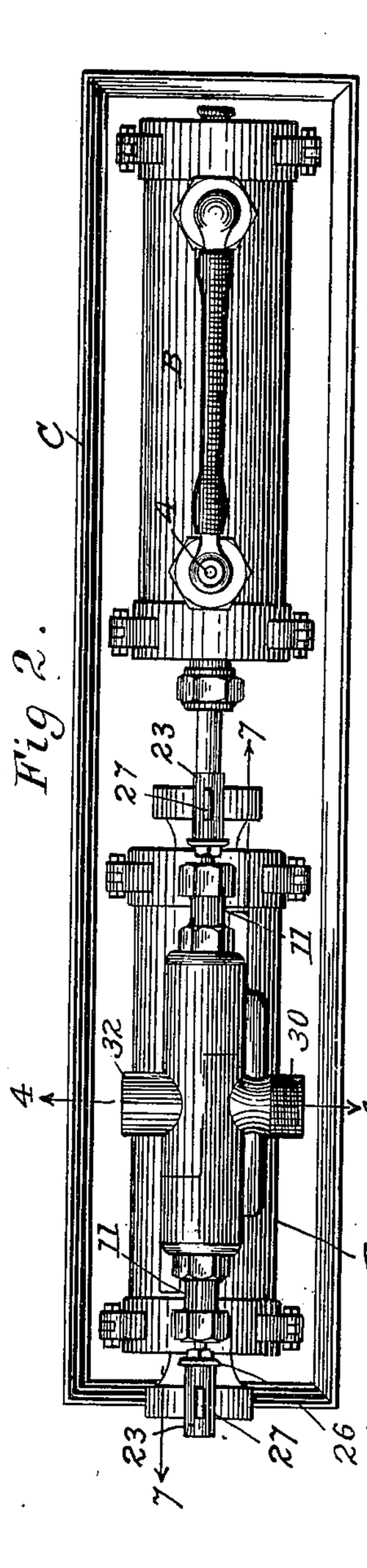

Fig 2.

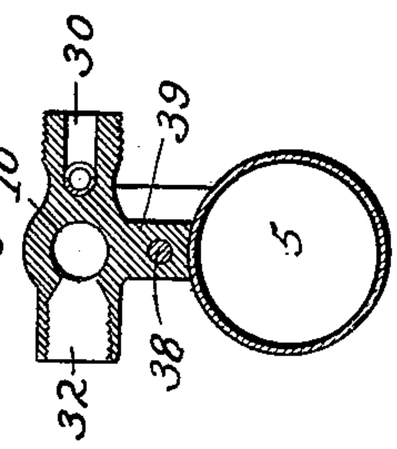

Fig 4.

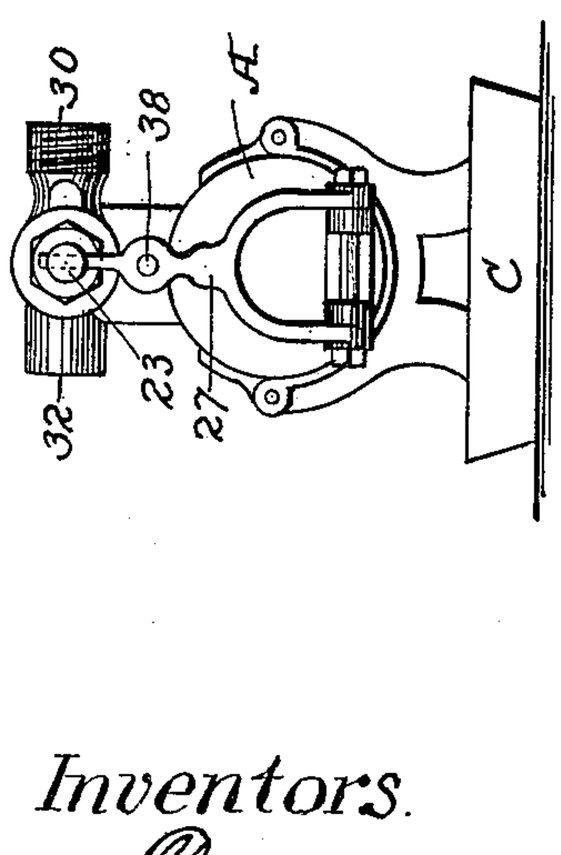

Fig 3.

Witnesses.

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HYDRAULIC ENGINE.

(Application filed Dec. 14, 1898.)

(No Model.) 2 Sheets—Sheet 2.

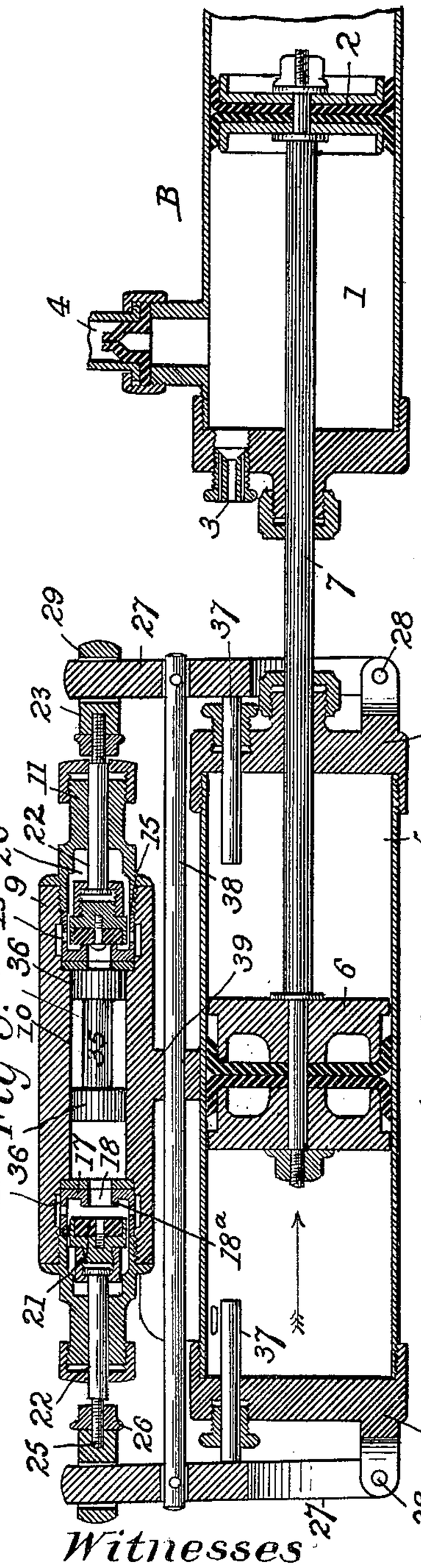

Fig 5.

Fig 6.

Fig 7.

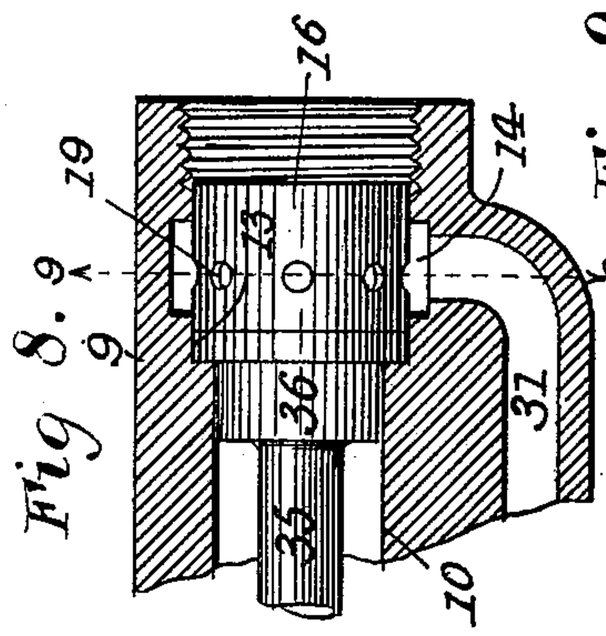

Fig 8.

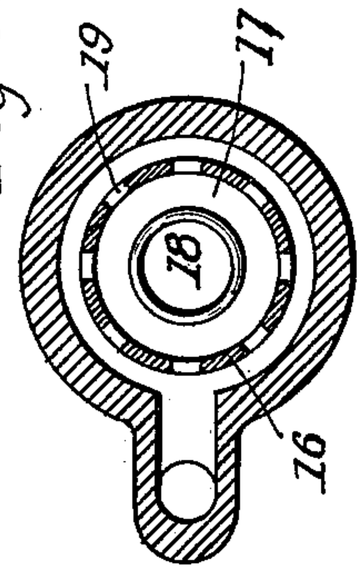

Fig 9.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE DONGES AND HENRY PETESCH, OF BALTIMORE, MARYLAND.

HYDRAULIC ENGINE.

SPECIFICATION forming part of Letters Patent No. 627,399, dated June 20, 1899.

Application filed December 14, 1898. Serial No. 699,277. (No model.)

To all whom it may concern:

Be it known that we, GEORGE DONGES and HENRY PETESCH, citizens of the United States, residing in the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in Hydraulic Engines, of which the following is a specification.

Our invention relates to improvements in reciprocating hydraulic engines, our object being to provide a simple and compact form of motor particularly adapted to operating air-pumps for the purpose of creating pressure in beer-kegs and the like. The motor is so constructed that it is particularly adapted to be operated by water; but it will be apparent that any fluid can be used and also that the motor is not limited in its use to operating an air-pump.

A further object of the invention is to improve generally upon devices of the nature indicated.

The invention consists in the various matters hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation showing our motor coupled with an air-pump. Fig. 2 is a top plan view of the same. Fig. 3 is an end view of the motor. Fig. 4 is a sectional elevation on the line 4 4 of Fig. 2. Fig. 5 is a central longitudinal sectional elevation of the motor and a portion of the pump. Fig. 6 is a horizontal sectional view of a portion of the motor on the line 6 6 of Fig. 1. Fig. 7 is a fragmentary sectional elevation on the line 7 7 of Fig. 2. Fig. 8 is a detail, and Fig. 9 is a sectional elevation on the line 9 9 of Fig. 8.

Referring to the drawings, A represents the motor, and B a pump connected therewith and operated thereby, the motor and pump being here shown as mounted upon a pan C.

We do not care to be understood as limited to any particular form of air-pump, and it is believed that the structure will be sufficiently understood by mentioning that in said air-pump here shown 1 represents the cylinder, 2 the piston moving therein, 3 an inlet-port, and 4 an exhaust-port.

The motor comprises a cylinder 5, in which reciprocates a piston 6, suitably connected to the piston of the air-pump or other object to be driven, as by the piston-rod 7. Motion is imparted to the motor-piston by means of water or other suitable fluid, admitted first to one side of said piston and then to the other, suitable provision being made whereby as the water admitted upon one side of the piston serves to move said piston forward by its pressure the water upon the other side of the piston is exhausted. The cylinder 5 has the heads 8. Mounted upon said cylinder is a fluid-chest 9, which has therethrough a longitudinal passage 10, closed at the ends by means of the heads 11. The central portion of the passage 10 is reduced, as shown at 12, and at each end thereof is an enlarged portion 13, while on the outer side of each enlarged portion is an annular recess 14. The heads 11 project into the ends of the passage and their inner ends form shoulders 15. Between these shoulders and the shoulders formed by the enlarged portions 13 fit specially-constructed valve-casings 16, which casings are cylindrical, with a plate 17 at their inner ends, each of these plates 17 being provided with a central port 18, about which is a valve-seat 18ª. It will be seen that these casings extend across the annular recesses 14, and in their portions which lie across the recesses the casings are provided with radial openings 19. The heads 11 are suitably recessed at their inner ends, as shown at 20, and in these recesses which open into the valve-casings 16 are valves 21, these valves lying to the outer sides of the plates 17 and being adapted to control the ports 18. Valve-stems 22 connect the said valves with blocks 23, screw-threaded on their inner faces to receive the threaded ends 25 of the valve-stems. Suitable locking-nuts 26 upon the stems at their threaded portions serve to adjust the length of the valve-stems, and thus regulate the throw of the valves. Rocker-levers 27, pivoted at their lower ends at 28 to suitable portions of the cylinder-heads, extend near their upper ends through suitable slots 29 in the blocks 23, whereby the valves are reciprocated by movement of these rocker-levers.

In the fluid-chest, to one side of the chamber 12, is an inlet-port 30, centrally located, and from this port branch inlet-passages 31, said passages communicating with the annular recesses 14. Upon the side of the fluid-chest opposite the inlet-port is an exhaust-

port 32, which communicates with the chamber 12 in substantially the center thereof. Near each end of the chamber 12 and located upon opposite sides of the exhaust-port are ports 33 and 34, which communicate with the cylinder 5 at opposite ends thereof. A piston-valve D reciprocates freely in the chamber 12, said valve having a central rod 35 and heads 36, these parts being so proportioned with relation to the distance between the ports 33 and 34 that when, as shown in Fig. 6, the piston-valve D is moved to one end of its throw one of the ports lies upon one side of a head 36, while the other port is upon the opposite side thereof, and, furthermore, said head is intermediate the first-mentioned port and the exhaust-port 32. The heads 36 fit with sufficient looseness in the passage 12 to permit the water in the spaces between the outlets 33 34 and the plates 17 to pass around said heads to the exhaust-passage 32. The water in said spaces serves to cushion the valve D and prevent it from slamming against the ends of its chamber.

Through suitable openings in the cylinder-head 8 are plungers 37, which slide freely in their openings, these plungers being of greater length than the width of the cylinder-head, whereby they project upon each side of said head. The outer ends of the plungers are in line with the rocker-levers 27, while their inner ends project in the path of movement of the piston 6. A rod 38, slidable in a longitudinal opening in the column 39, between the cylinder and the fluid-chamber, is pivoted at its ends to the rocker-levers, whereby movement of said levers in unison is assured.

The construction of the present device being now apparent, its operation remains to be considered. The motor is suitably located (as below a counter) and connected to the air-pump, this air-pump being also properly connected to a keg or other receptacle of beer or the like. The inlet-port 30 is connected by the ordinary faucet or other suitable means with the water-main. Upon the faucet being opened water enters the inlet-port 30 and flows through the branch passages 31. Assuming that at the time the supply of water is turned on the parts are in the position indicated in Fig. 5, it will be seen that the port 18 in the valve-casing to the left of the fluid-chest is open, while the corresponding port in the opposite valve-casing is closed by the valve 21. It is therefore impossible for any water to flow from the right-hand passage 31 and the annular recess 14 upon the same side through the ports 19 in the valve-casing and thence into the chamber 12, while at the left side of the device there is a free passage through the branch passage 31, the annular recess 14, the ports 19, the port 18, and the port 33 into the cylinder 5 against the left face of the piston 6. The water being under pressure, the piston-valve D is forced to the right, thus connecting the port 34 with the exhaust-port 32, and as the water flows into the left-hand portion of the cylinder through the port 33 the piston is moved to the right, any water which may be in the cylinder 5 to the right of the piston being exhausted through the port 34 and the exhaust-port 32. As the piston reaches the end of its stroke to the right it engages the plunger-rod 37, which is in its path, and pushes the same outwardly, this movement throwing the right-hand rocker-lever 27 away from the cylinder, and thus causing the right-hand valve 21 to uncover the right-hand port 18. At the same time, the two rocker-levers being connected by means of the rod 38, the left-hand rocker-lever is rocked toward the cylinder and the left-hand port 18 consequently closed by means of its valve 21. It will now be seen that the position of the parts has become reversed and that the water will now enter to the right of the piston-valve D, thus throwing said valve to the left and connecting the port 33 with the exhaust-port 32, whereby the inflowing fluid is forced against the right-hand side of the piston 6, and thus moves said piston to the left, while the fluid upon the left-hand side of the piston is exhausted through the port 33. It will be readily seen that the continuation of the above operation produces the desired reciprocation of the piston 6 and that such reciprocation will continue until the supply of water is cut off.

The present device is a compact structure efficiently producing the desired result.

We claim—

In a hydraulic motor, the combination with a cylinder and piston, of a fluid-chest adjacent to the cylinder, a cylindrical valve-chamber in said chest, a double-headed cylindrical valve arranged to reciprocate in said chamber, a central exhaust-opening in said chamber, inlet-valve casings at the ends of said chamber, radial ports admitting fluid to said valve-casings, central ports leading from said valve-casings to said chamber, inlet-valves controlling said central ports, rocker-arms having their free ends connected to said inlet-valves and their opposite ends pivoted to suitably-fixed supports, a reciprocating rod arranged between the fluid-chest and the cylinder and pivotally connected to said rocker-arms, and rods extending through the cylinder-heads and arranged to transmit movement from the piston to said rocker-arms alternately, said fluid-chest and cylinder being connected by suitable passages the ports of which are controlled by said double-headed cylindrical valve, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE DONGES.
HENRY PETESCH.

Witnesses:
CHAS. BEGGEROW,
JOS. A. HAUK.