

(No Model.)

3 Sheets—Sheet 1.

M. L. G. WHEELER.
PUMP.

No. 601,920.

Patented Apr. 5, 1898.

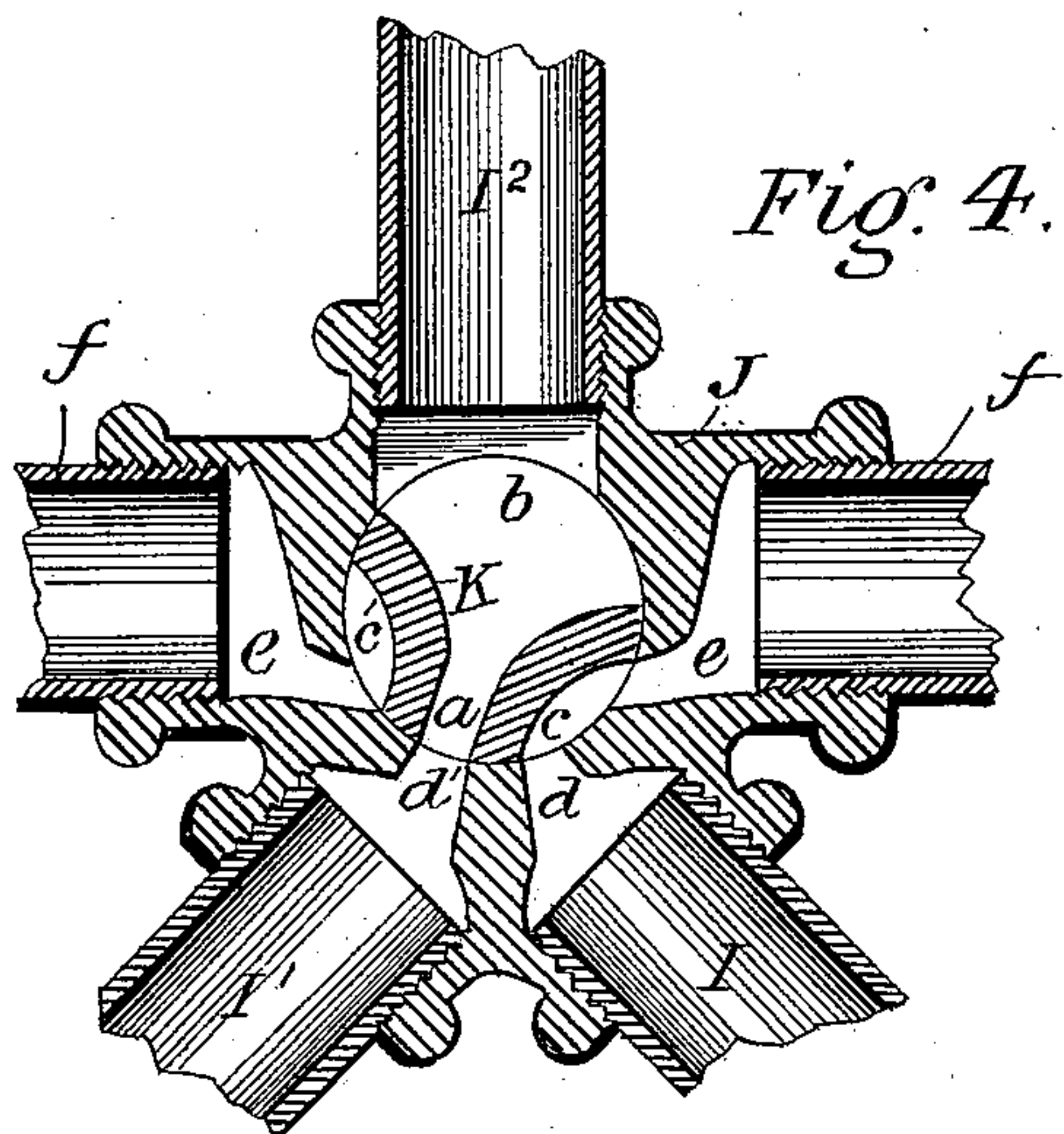


Fig. 4.

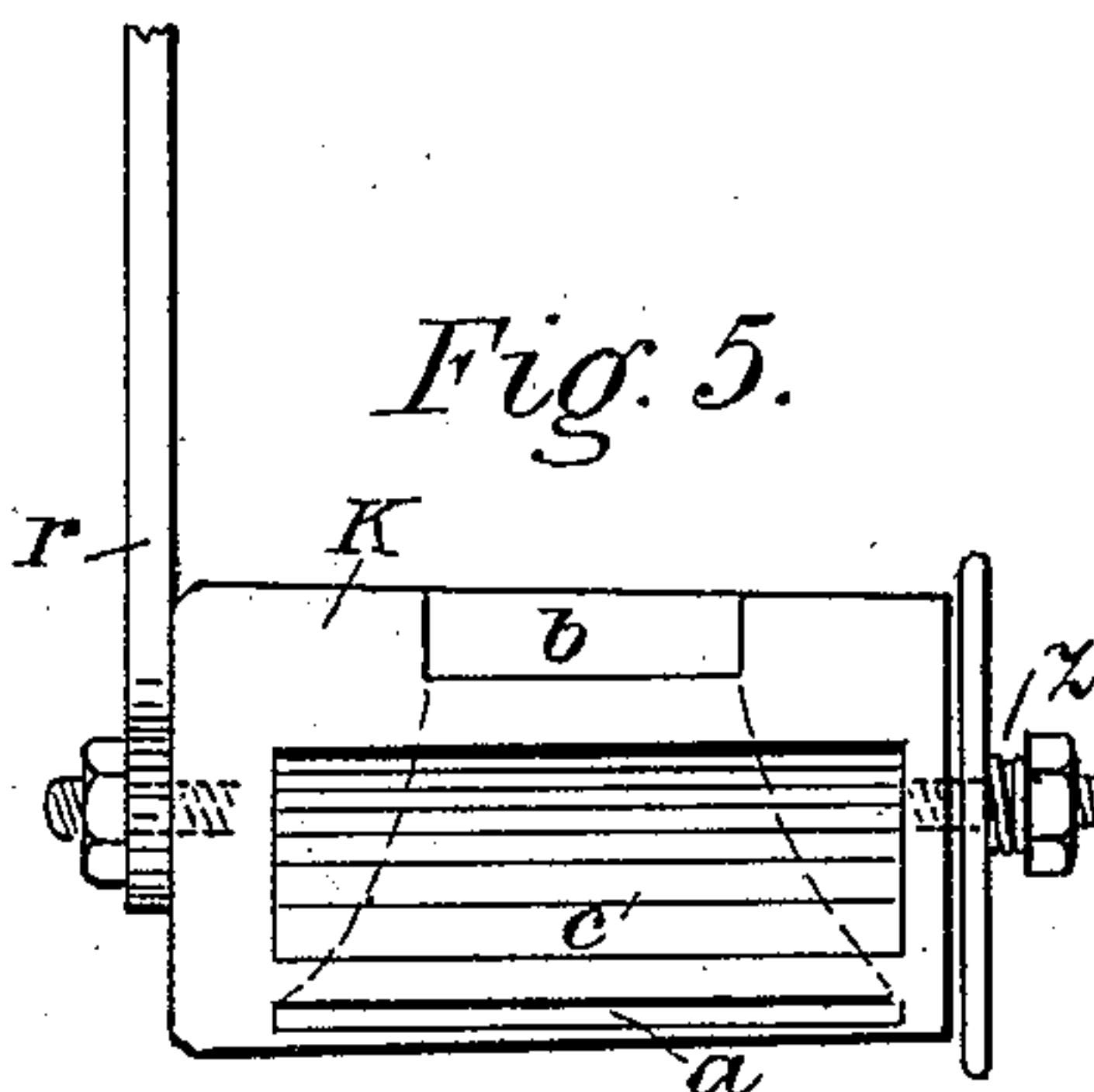


Fig. 5.

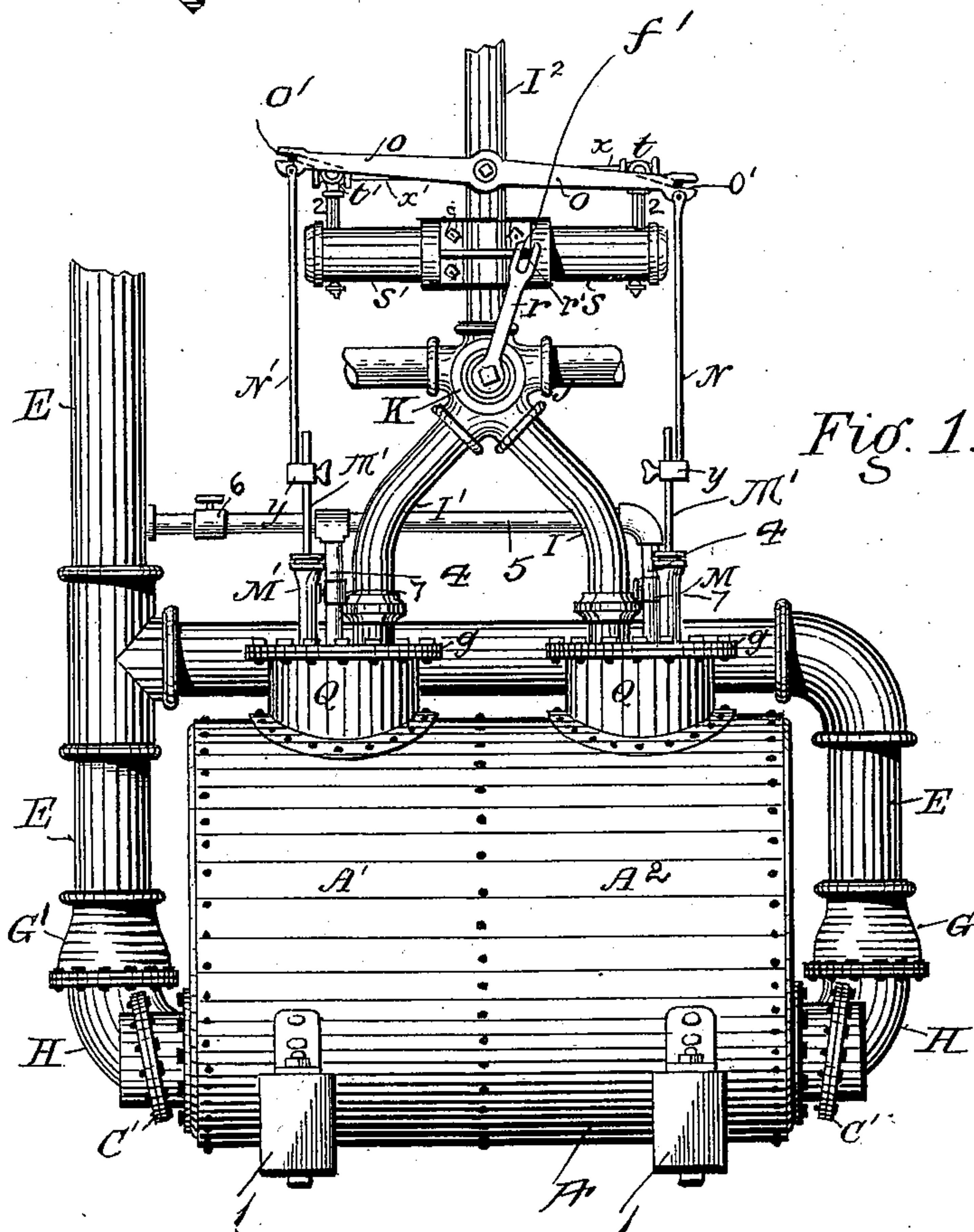


Fig. 1.

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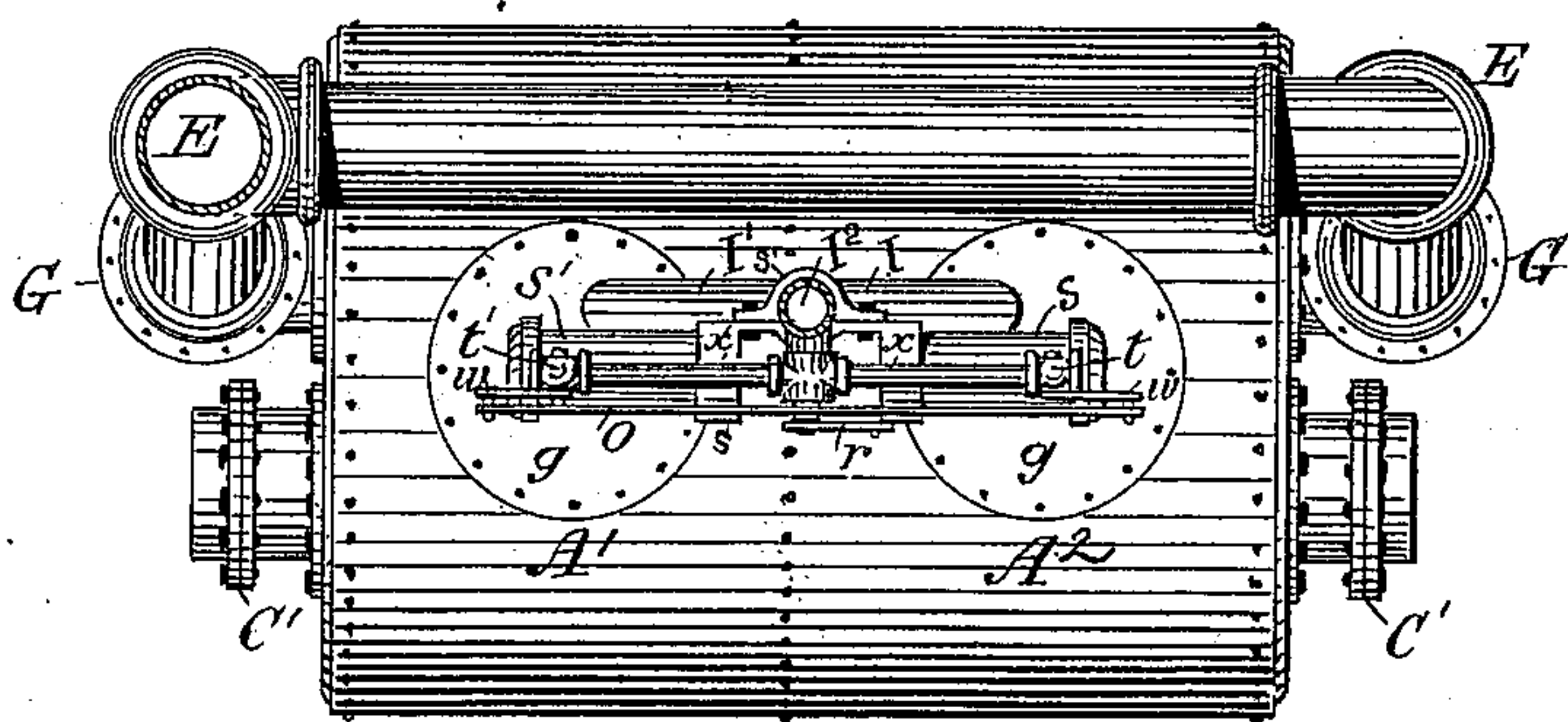
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Fig. 2.



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UNITED STATES PATENT OFFICE.

MILO LUTHER GATES WHEELER, OF NORTH YAKIMA, WASHINGTON.

PUMP.

SPECIFICATION forming part of Letters Patent No. 601,920, dated April 5, 1898.

Application filed June 1, 1897. Serial No. 638,848. (No model.)

To all whom it may concern:

Be it known that I, MILO LUTHER GATES WHEELER, of North Yakima, in the county of Yakima and State of Washington, have
5 invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertains to make and use the same.

This invention relates to improvements in lifting-pumps, and has reference to that class of pumps whereby a column of water is raised or directed to any desired point by the action
15 of compressed air or steam-pressure.

The invention consists in the novel features of construction hereinafter more particularly set forth and claimed.

In the accompanying drawings, forming a
20 part of this specification, Figure 1 is an elevation. Fig. 2 is a top plan view. Fig. 3 is a vertical sectional view of Fig. 1. Fig. 4 is a sectional detail view of the barrel-casing of the valve for controlling the admission of air
25 to the tanks. Fig. 5 is detail view of the valve. Fig. 6 is a sectional detail view of the valve-casing and valve controlling the admission of air to the cylinders. Fig. 7 is a detail view of the valve and operating-arm,
30 and Fig. 8 is a detail view of the arm for operating said valve.

Referring to the drawings, A is a casing which is divided by a transverse partition into the two compartments or tanks A' A²,
35 said casing being supported upon suitable skids 1.

Each compartment or tank is provided with a dome Q, having the tops or covers g, through which extends a tube M, which terminates a
40 short distance from the bottom of each tank, said tube serving as a guide for the vertically-moving rods M', having on their lower ends the plates P. Freely movable upon each tubular guide M is a float L', whose
45 movement is effected by the rise and fall of the water within the tank.

I² is a pipe leading from an air-compressor (not here shown) and united at its lower end to the five-way coupling J, which constitutes
50 the valve-casing for the valve K, which is movable therein. Pipes I and I' communicate with the respective tanks A² and A' at

their lower ends and at their upper ends unite with the five-way coupling at the points d d'. The two remaining openings of the
55 five-way coupling e e receive the exhaust-pipes f, which may be connected with a receiver upon the surface and to the air-compressor, the same not being here shown, so as to form a complete circuit, and thus the air
60 exhausts under a full pressure and gradually decreases to the atmospheric pressure which will serve to assist the power driving the air-compressor, thus effecting a saving in said
65 power.

S S' indicate two cylinders which are connected together by the casting s, which constitutes one member of the clamp by which the cylinders are secured to pipe I², a yoke s' encircling the pipe and being united to the
70 casting by securing-bolts. Movable within these cylinders are the pistons T, which are connected together by the piston-rod T', so that they move in unison.

2 are vertical pipes which communicate at
75 their lower ends with cylinders S S' adjacent their outer ends and at their upper ends engage one of the openings of the three-way couplings t t', while horizontal pipes x x' are also united to the three-way couplings and at
80 their upper ends communicate with pipe I². Intermediately pivoted to the coupling which unites the pipes x x' to the pipe I² is the lever O, having the rods N N' pivoted at their upper ends to its opposite ends and at their lower
85 ends secured to the coupling-sleeves y, through which the upper ends of rods M' extend, and are secured by set-screws M². The three-way couplings t and t' form valve-casings for valves V and V', which are concave,
90 as illustrated, and which are provided with concave depressions which are adapted to register with pipes 2 and x or x' or with pipes 2 and the exhaust-openings 3 in the three-way couplings. The stem of each valve projects
95 through the coupling and has secured thereto the operating-arm W, carrying at its outer end the pin W', which is adapted to engage the slot O' in the end of said lever. It will be noticed that these arms extend in opposite
100 directions from each other and that as lever O is operated the valves V and V' alternately open and close communication between the pipes 2 and x x'. Springs u are positioned

upon the valve-stems on the opposite side of the couplings between the adjusting-nuts and the outer walls of the couplings, so that the valves are held firmly at all times to their
5 seats.

The main valve K is provided with a central passage *ab* and has its opposite sides provided with the concaved depressions *cc'*. Secured at one end to the valve K is the arm *r*,
10 which is slotted at its upper end to receive the pin *r'*, carried by the piston-rod T', so that the movement of the pistons will operate said valve to cause it to establish communication alternately between the pipes I² and I' and I²
15 and I and also with the respective exhausts *e*. This valve is also provided with the spring *z* for the purpose of holding it firmly to its seat.

H H are outlet-pipes which communicate with the respective tanks A' A², and have secured thereto the valve-casings G G', in which
20 are located the valves F F'. Secured at one end to the valve-casing G' is the delivery-pipe E', while secured to the valve-casing G is the delivery-pipe E, said pipe communicating
25 with pipe E'.

C C' are the water-inlet pipes, provided with the inclined valve-seats C² C³ and the valves D D'.

4 4 are vertical pipes which communicate
30 at their lower ends with domes Q Q and at their upper ends with the horizontal pipe 5, which communicates with pipe E. The pipe 5 is provided with a stop-cock 6, while pipes 4 are provided with the valves 7.

35 As illustrated in Fig. 3, communication is closed between the compressed-air supply and pipe I, while communication is established between the same and pipe I', thus conveying the air to tank A'. The pressure of the air
40 upon the water forces the latter upward through the outlet-pipe and delivery-pipe E. As the water lowers in the tank, float I' follows the same downward, and when the latter comes in engagement with the plate P its
45 weight will move the rods M' N' downward, causing that end of the lever O to which they are secured to be depressed, raising its opposite end. This movement of the lever through the medium of the short arm W moves the
50 valve V', so that it closes communication between the pipes 2 and *x'* and permits the air in the cylinder S' to exhaust through ports 3. At the same time valve V is moved to establish communication between the pipes 2 and
55 *x* and close the exhaust, so that air is admitted in the cylinder S and moves the piston T' toward the opposite cylinder, which, through the medium of the connection between said piston T' and the arm *r*, moves valve K to
60 close communication between the pipes I' and I² and establish it between the latter and pipe I, so that air is admitted to tank A², which has filled with water during the emptying of tank A'. It will be understood that the move-
65 ment of the lever O also moves rods M' and N and returns plate P to its normal position. By having a connection between the domes

of the tanks and pipe E a portion of the air may be admitted to the discharge-column of water, thereby lightening the water column
70 proportionately to the volume of air admitted, and thus raising the water to a much greater height with a given air-pressure from the air-compressor than obtained by forcing a solid
75 column of water in the pipe. This construction is especially desirable in discharging the water from deep mines, although for this character of work the pump may be operated in relays and greater lifting force may be obtained for each pump, and therefore requiring
80 a small number of relay-pumps.

My pump may be operated by any power suitable to operate an air-compressor and is adapted for use as a deep-mining pump as
85 well as for hydraulic mining, and it is adapted to receive water from any supply, conveying it directly to the desired point without the necessity of building expensive ditches or troughs, only to be abandoned when the claim
90 is worked out. This pump is also adapted for irrigation and may be operated by a wind-mill power, as will be understood.

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

1. In a pump of the character described, the combination of two liquid-compartments, inlets and outlets therefor, a pipe communicating with the source of pressure and with each
100 of said compartments, exhausts in communication with said pipes, a valve controlling the communication between the supply-pipe and compartments and with the exhaust, cylinders, pistons movable therein, said pistons being
105 connected to operate in unison, pipes communicating with the cylinders and the pressure-supply pipe, exhausts for said cylinders, valves controlling the communication between the pipes and the exhausts and the supply-pipe, arms secured to said valves, tubular
110 guides extending within the compartments, rods movable in said guides, an intermediately-pivoted lever to which the rods are pivoted, a connection between the respective ends of the lever and the arms of the valves, stops
115 carried by said rods at their lower ends, floats within the compartments and movable upon said tubular guide, said floats adapted to alternately engage the stops of the rods for the purpose described, and an operative connection
120 between the pistons and the main valve, substantially as described.

2. In a pump of the character described, the combination of two tanks adapted to contain the liquid to be pumped, a pipe communicating
125 with a source of pressure, pipes communicating with the supply-pipe and the tanks, exhausts for said pipe, a valve controlling the communication between said pipes and the supply-pipe and the exhausts, cylinders positioned upon said supply-pipe, pistons movable
130 in said cylinders, a piston-rod connecting said pistons, an arm secured at one end to the valve and engaging the piston-rod at

its opposite end, pipes communicating with the supply-pipe and said cylinders, exhaust-ports for said pipes, valves within said pipes for controlling the communication between
5 the same and the supply-pipe and the exhausts, tubular guides positioned within the tanks, rods movable within the guides, an intermediately-pivoted lever to the opposite ends of which the rods are connected, operative connections between said levers and the
10 cylinder-valves, floats within the tanks movable upon the tubular guide and adapted to engage the rods to operate the same, and an outlet and inlet for said tanks, substantially
15 as described.

3. In a pump, the combination of two liquid-compartments, inlets and outlets therefor, a pipe communicating with the source of pressure and with each of said compartments, exhausts in communication with said pipes, a
20 valve controlling the communication between the supply-pipe and compartments, cylinders,

pistons therein, pipes communicating with the cylinders and the pressure-supply pipe, exhausts for said cylinders, valves controlling
25 the communication between the pipes and the exhausts and the supply-pipe, arms on said valves, rods movable in said compartments, a lever to which the rods are connected, connections between the ends of the lever and
30 the arms of the valves, stops carried by said rods at their lower ends, floats within the compartments adapted to alternately engage the stops on the rods, and an operative connection between the pistons and the main
35 valve, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MILO LUTHER GATES WHEELER.

Witnesses:

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H. J. LISTY.