

No. 705,670.

Patented July 29, 1902.

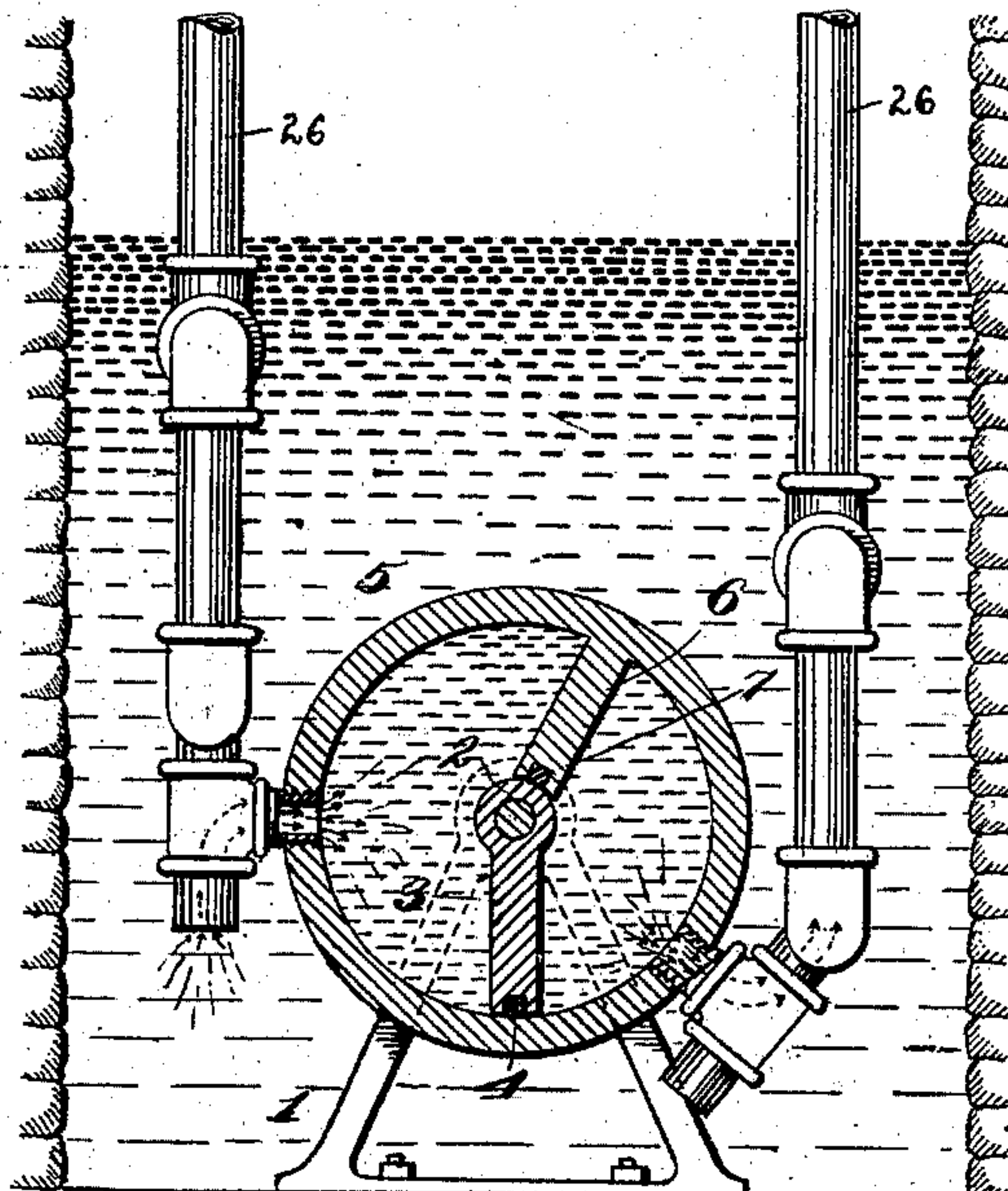
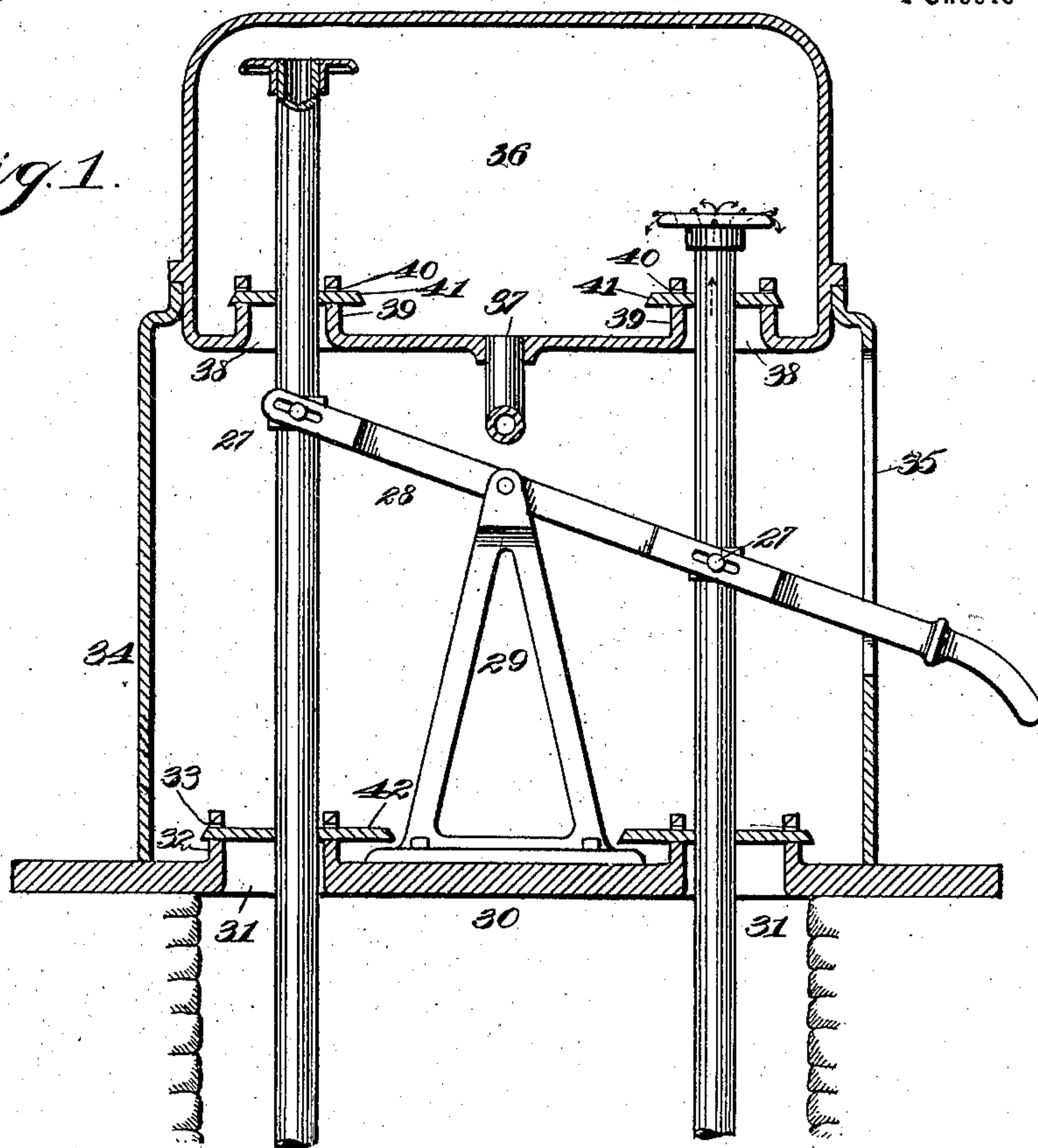
H. T. HENSON.
PUMP.

(Application filed Mar. 21, 1902.)

(No Model.)

2 Sheets—Sheet I.

Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY T. HENSON, OF ATTICA, KANSAS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 705,670, dated July 29, 1902.

Application filed March 21, 1902. Serial No. 99,336. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. HENSON, a citizen of the United States, residing at Attica, in the county of Harper and State of Kansas, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to pumps, and more especially to that class known as "double-acting force-pumps" adapted for submersion in a well, cistern, or other body of water; and my object is to produce a pump of this character having vertical discharge-pipes wherein the columns of water balance each other, so as to enable a pump submerged at a great depth to be operated by an expenditure of power no greater than a similar pump only slightly submerged and having shorter discharge-pipes.

A further object is to produce a pump of the type mentioned which is simple, strong, durable, and cheap of construction and which can be easily and expeditiously secured in or removed from position.

To these ends the invention consists in certain novel and peculiar features of construction and combinations of parts hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a vertical section of the pump embodying my invention. Fig. 2 is a vertical section taken through the valve connections at the lower end of each discharge-pipe. Fig. 3 is an enlarged cross-section of the pump-cylinder and its valved couplings.

In the said drawings, where like reference characters refer to corresponding parts, 1 designates a suitable frame or frames submerged and secured in a body of water, such as a well, as shown, and 2 a horizontal shaft secured rigidly in said frame or frames and provided with a depending arm 3, having a packing-strip 4 in its lower edge.

5 designates a cylinder concentrically surrounding shaft 2 and having its inner side engaging frictionally the packing-strip 4 and forming a water-tight joint therewith. Said shaft-arm 3 thus forms a radial partition between the shaft and the cylinder, a second

radial partition 6 being integrally formed with the cylinder and having a packing-strip 7, bearing frictionally upon and forming a water-tight joint with said shaft, the heads 8 of the cylinder being secured thereto by side bolts 9 or in any other suitable manner and journaled on the shaft near its ends, the usual stuffing-boxes (not shown) being provided to make the journal water-tight. When the cylinder is at rest, partition or piston 6 is vertically over the stationary partition or arm 3, and short pipes 10, secured in the cylinder at equal distances from the piston, are somewhat below the axis of the cylinder. Connected to pipes 10 are T-couplings 11, having depending pipes 12, provided with valve-seats 13 for sliding check-valves 14, said check-valves having grooved stems 15 and limited as to upward movement by pins 16, the arrangement being such that water can pass up through pipes 12 and after unseating valves 14 pass through their grooved stems into couplings 11, thence passing through pipes 10 into the cylinder in a manner hereinafter explained.

17 designates T-pipes, having their stems 18 secured in the upper ends of couplings 11 and provided with valve-seats 19, sliding check-valves 20 of the type previously described being arranged to unseat under pressure and permit water to pass through the cylinder up through stems 18 and in opposite directions through the heads of said stems, as hereinafter explained.

The T-shaped pipes 17 have their heads journaled in sleeves 21, rigidly connected together, as at 22, and secured upon the ends of said sleeves and forming continuations of the heads of the T-shaped pipes are stuffing-boxes 23, these boxes being connected by suitable pipe connections 24 to inverted-T couplings 25, said couplings being secured to the lower ends of and communicating with the vertical discharge-pipes 26. Pipes 26 have pin-and-slot connections, as at 27, with and are simultaneously reciprocated in opposite directions by a lever 28, which extends transversely of the cylinder and is fulcrumed upon a standard 29, mounted on a well cover or platform 30, through the openings 31 of

which said pipes extend, said openings being partially formed by annular walls 32, projecting upward from the platform and having slots 33, for a purpose which hereinafter appears.

34 designates a suitable housing mounted upon the cover or platform and incasing not only the upper portions of the pipes, but also all of the lever except its handle, the lever working through a vertical slot 35 in said housing. The upper part of the housing is in the form of a chamber 36, having a discharge-spout 37 and bottom openings 38, through which the pipes extend, said openings being partially formed by upwardly-projecting annular walls 39, having slots 40, in which reciprocate horizontally the plates 41, mounted slidably on the pipes. These plates are intended to prevent the escape of water from chamber 36 except through the proper channel—viz., the spout 37. Similar sliding plates 42 are mounted in slots 33 of walls 32, though these plates may obviously be dispensed with.

The operation of lever 28 causes the cylinder to rock upon shaft 2, which movement is necessarily accompanied by lateral as well as vertical movement of pipes 26, though it will be apparent that by locating the pivotal points of connection between said pipes and T-pipes 17, rigidly supported from the cylinder in alinement with the axis of the cylinder, and by having the lever parallel with such alinement the parallelism of the pipes is never destroyed. They thus move laterally together and while sliding through plates 41 and 42 incidentally reciprocate said plates in the slots of their respective walls. As the cylinder is rotated in one direction its arm or piston 6 moves with it, and thereby synchronously decreases the size of the piston-chamber at one side of stationary arm or partition 3 and increases the size of the opposite chamber. The result is water enters the chamber of increasing capacity and is forced out of the other chamber and into its communicating coupling 11, the lower valve 14 of which closes under this internal pressure and thus compels the water displaced from said chamber to unseat the upper valve 20 and pass up through the T-pipe, pipe connections 24, and pipe 26, escaping thence into the chamber 36 and through the discharge-spout of the latter. As this stroke of the cylinder terminates its movement is instantly reversed by the reverse movement of the lever. The contracted piston-chamber now expands and the opposite chamber contracts. As the first-named chamber expands it instantly ceases to expel water and permits that which is contained in its connected pipe 26 to close valve 20, the lower valve 14 at the same time opening to admit water into such expanding chamber. The formerly expanded and now contracted chamber at the same time expels its water through its

respective pipe 26 in the manner above explained. As all subsequent operations are repetitions of those described, it is deemed unnecessary to pursue the description any farther than to direct attention to the fact that as the pipes 26 always stand full of water they balance each other.

From the above description it will be apparent that I have produced a pump which embodies the features of advantage enumerated as desirable in the statement of invention and that the structure is susceptible of modification in some particulars without departing from the scope of the appended claims.

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

1. A pump comprising a stationary shaft having a rigid arm, a cylinder mounted to oscillate upon the shaft and incasing and having a water-tight joint with said arm, and provided with a radial partition or piston having a water-tight joint with said shaft, couplings secured to said cylinder at equal distances from said piston, valves in the lower ends of said couplings to admit water alternately to the cylinder, valves in the upper ends of said couplings to alternately permit water to unseat them and pass upward, vertical pipes communicating by a pivotal or swivel relation with said couplings above the last-named valves, and a lever suitably fulcrumed and having a pin-and-slot connection with said pipes.

2. A pump comprising a stationary shaft having a rigid arm, a cylinder mounted to oscillate upon the shaft and incasing and having a water-tight joint with said arm, and provided with a radial partition or piston having a water-tight joint with said shaft, couplings secured to said cylinder at equal distances from said piston, valves in the lower ends of said couplings to admit water alternately to the cylinder, valves in the upper ends of said couplings to alternately permit water to unseat them and pass upward, vertical pipes communicating by a pivotal or swivel relation with said couplings above the last-named valves, a lever suitably fulcrumed and having a pin-and-slot connection with said pipes, a housing for the upper portion of said pipes, provided with a water-chamber in which said pipes discharge, a discharge-spout for said chamber, and slide-plates closing the openings of the housing through which said pipes extend, and fitting slidably on said pipes.

3. In a pump, the combination of a stationary shaft having an arm, a cylinder journaled on said shaft and having a water-tight joint with said arm, and provided with an arm or piston having a water-tight joint with said shaft, couplings secured to and communicating with the cylinder and provided at their lower ends with valves which open alternately to admit water to the cylinder, and

at their upper ends with valves which alternately open to permit water to be expelled from the cylinder, a pair of vertical discharge-pipes, a pair of sleeves connected to the lower
5 ends of said discharge-pipes, T-pipes having their heads swiveled in said sleeves and their stems connected to said couplings, and a lever having a pin-and-slot connection with

said pipes 26, and fulcrumed midway between them.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY T. HENSON.

Witnesses:

JAMES A. WILLIAMS,
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