(No Model.)

S. C. SAWYER.

PUMP.

No. 587,455. Patented Aug. 3, 1897.

FIG. 1.

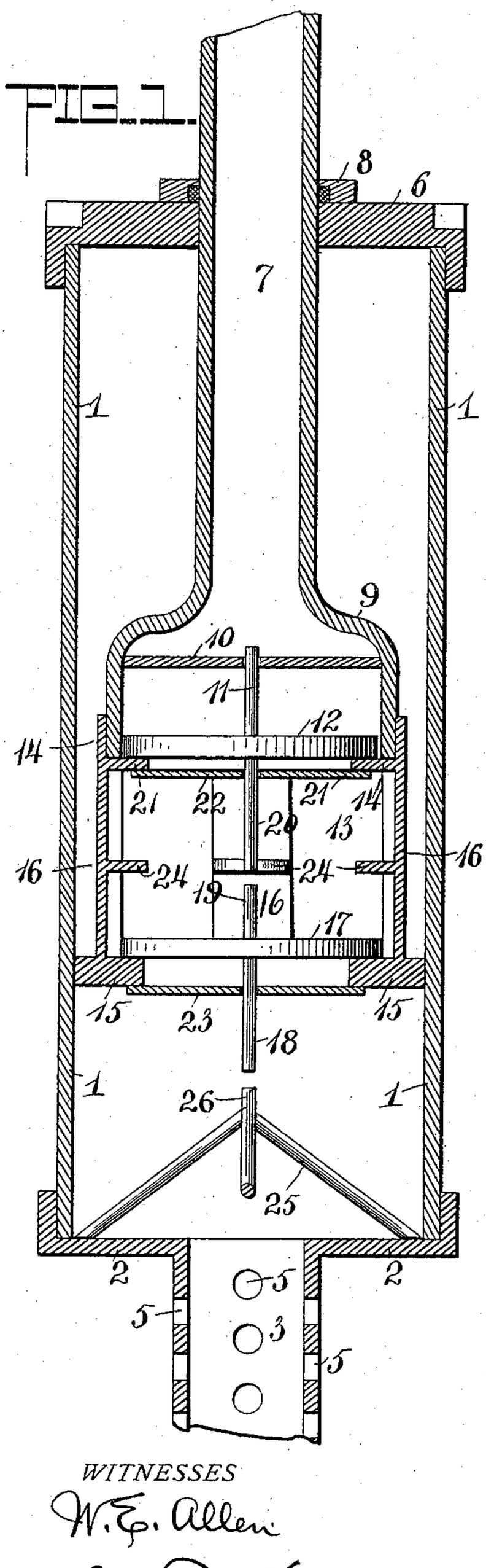
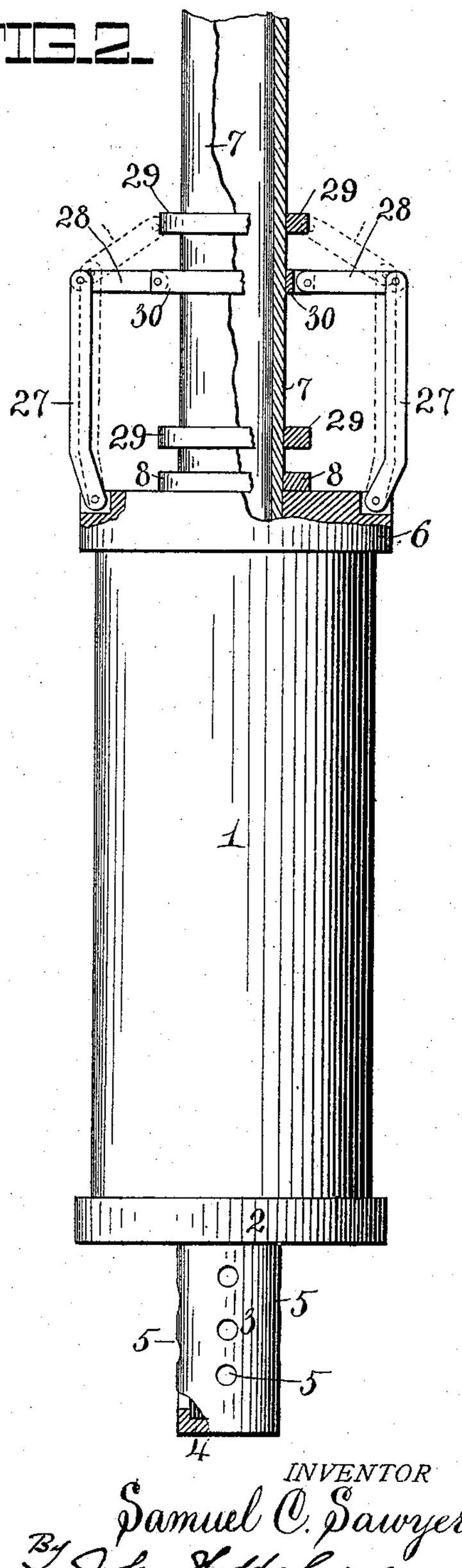


FIG. 2.



WITNESSES

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PUMP.

SPECIFICATION forming part of Letters Patent No. 587,455, dated August 3, 1897.

Application filed January 20, 1897. Serial No. 619,911. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL C. SAWYER, a citizen of the United States, residing at Shibboleth, in the county of Decatur and State of Kansas, have 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 appertains to make and use the same.

This invention relates to pumps, being designed for use in wells of any depth.

The object of the invention is to provide an improved construction of plunger employing double valves and connected to the pump-rod, which is hollow and forms the conduit for the water, the arrangement being such that both the up and down strokes of the plunger may be taken advantage of for pumping the water.

A further aim of the invention is to provide means whereby the water may be drained from the pipe or hollow pump-rod preparatory to the removal of the pump mechanism from the well.

The invention also contemplates the employment of novel means for securing the pump-cylinder in place in the well and facilitating the removal thereof when required.

The invention consists in the improved device embodying certain novel features and details of construction and relative arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims.

In the accompanying drawings, Figure 1 is a sectional view through the pump-cylinder, showing the improved plunger, &c. Fig. 2 is a similar section showing the means for securing the pump-cylinder in place in the well.

Similar numerals of reference designate corresponding parts in both figures of the drawings.

Referring to the drawings, 1 designates a cylinder of any suitable diameter and height, according to the capacity of the pump, said cylinder being provided at its lower end with a head 2, having a depending tubular extension 3, closed at its bottom end 4 and provided with a longitudinal series of lateral openings 5 for the admission of water. The pump-cylinder 1 is intended to rest on the bottom of the well, and its upper end is closed by means of a head 6, having a central opening for the reciprocation of the pump-rod 7, and also provided at such point with a packing-ring or washer 8 for forming a close and water-tight joint between the cylinder and rod 7.

The pump-rod 7 is in the form of a pipe or tube and has its lower end expanded or swelled, as indicated at 9, and provided within the same with a cross-bar 10, having a central opening for the passage of an upwardly-projecting stem 11 of the upper valve 12. Screwed or otherwise connected to the lower end of the rod 7 is a plunger 13, consisting of an upper ring 14, to which the rod 7 is directly connected, and a lower ring 15, connected to the upper ring by four, more or less, bars 16, which serve to permit the ingress and egress of water at the sides of the plunger above the lower ring 15. The center of the lower ring 15 is closed by a lower valve 17, which rests upon the upper surface of the ring 15 and is provided with a depending stem 18, projecting below the plane of the plunger. The valve 17 is further provided with a central upwardly-projecting stem 19, adapted under certain conditions to contact with a centrally-depending stem 20 on the upper valve 12 for moving the latter. The upper valve 12 rests upon an annular ledge or flange 21 and closes the central opening therein. This central opening is crossed by a bar or plate 22, having a guide-opening for the stem 20 of the upper valve. The depending stem 18 of the lower valve also passes through the bar or plate 23, secured to the lower ring 15, for steadying the lower valve. The bars 16 are provided at a suitable elevation with inwardly-projecting stops 24 for limiting the upward movement of the lower valve.

The usual valve in the bottom of the cylinder 1 is omitted, and a tripod 25 is substituted therefor, the same consisting of a series of legs which rest upon the bottom head of the cylinder and a central upwardly-projecting stem 26, which, as the plunger is lowered, comes in contact with the depending stem 18 of the lower valve and serves to lift said valve, at the same time causing the said valve, through the medium of its upwardly-projecting stem 19, to lift the upper valve by means

of its depending stem 20, thus simultaneously opening both valves and allowing the water contained in the tube or pipe 7 to drain into the well to the common water-level of the same, thus discharging the water from the pipe 7 and allowing said pipe, together with its connections and the cylinder, to be raised out of the well for the purpose of repair, &c.

In operation as the plunger descends the water lifts the lower valve and passes out through the sides of the plunger and fills the cylinder. Then in the upward movement of the plunger the lower valve seats itself by reason of the action of the water thereon, thus causing the water above the lower valve to lift the upper valve and pass into the pipe 7, so that in addition to the admission of the water to the pipe 7 in the downward movement of the plunger the water is also forced through the pipe 7 in the upward movement thereof. When it is desired to drain or empty the pipe 7, the plunger is lowered into contact with the tripod 25, when both valves will be unseated, thereby allowing the water to seek its common level in the well. The rod or pipe 7 may be actuated by means of the walking-beam or sweep connected pivotally at one end thereto and provided on the opposite side of its fulcrum with a weight of suitable size to counterbalance the weight of said rod together with the column of water contained therein, thus making the action of the pump very easy.

The upper head 6 of the cylinder has pivotally connected thereto a series of arms 27, of elbow shape, and the rod or pipe 7 has slidingly mounted thereon a collar 30, between which and the arms 27 is interposed a series of links 28, which serve, as the collar 30 is depressed, to force the arms 27 outward into engagement with the side walls of the well. The movement of the collar 30 is effected by means of fixed collars 29 on the rod or pipe 7, said collars being spaced a suitable distance apart and the upper one adapted to bear upon the collar 30 for depressing it and forcing the arms into engagement with the side walls of the well, while the lower collar 29 serves, when the rod or pipe 7 is sufficiently elevated, to come in contact with the lower side of the collar 30 and slide the same upward, thereby drawing the arms 27 inward and releasing the cylinder from its engagement in the well, thereby allowing said cylinder to be elevated with the rod or pipe 7 from the well.

The construction above described is extremely simple and effective. It enables the pump mechanism as an entirety to be lowered into the well and to be engaged and held firmly therein without making it necessary for a person to descend into the well in order to fasten the cylinder. The pump mechanism is also very simple and takes advantage of both the up and down stroke of the plunger to force water into and upward through the tubular pump-rod. By the particular arrangement of valves the column of water in the pipe 7 is maintained and always ready for use.

Having thus described the invention, what is claimed as new is—

1. In a pump, the combination with a stationary and submerged pump-cylinder, of a plunger mounted to reciprocate therein and comprising two automatic valves, a tubular pump-rod connected to said plunger, a tripod arranged in the base of the cylinder, and positive means on the valves and tripod whereby in the lowering of the plunger both of the valves may be simultaneously unseated, substantially as described.

2. In a pump, a pump-cylinder adapted to be submerged and comprising a reduced depending tubular extension forming an annular shoulder at its upper end and closed at its lower end and provided with openings for admitting water to the cylinder, in combination with a plunger reciprocating in said cylinder and connected to and in communication with a tubular pump-rod, means for reciprocating said pump-rod, independently-movable valves controlling the admission of water above the bottom of the plunger, and tripod for simultaneously unseating said valves upon the lowering of the plunger, the tripod being seated on the said annular shoulder, substantially as described.

3. In a pump, a plunger comprising upper and lower rings connected by a series of bars spaced apart to leave lateral openings in the plunger for the passage of water, valves for closing the openings in the upper and lower ends and having upwardly and downwardly extending stems adapted to coöperate, guides engaging said stems for steadying the movement of the valves, stops for limiting the upward movement of said valves, a tubular pump-rod connected to said plunger, and a tripod arranged under and adapted to contact with the stem of the lower valve, substantially as described.

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

SAMUEL C. SAWYER.

Witnesses:
WM. JONES,
H. A. GRIFFITH.