No. 836,775. PATENTED NOV. 27, 1906.

W. M. MYERS.

PUMPING SYSTEM.

APPLICATION FILED NOV. 29, 1905.

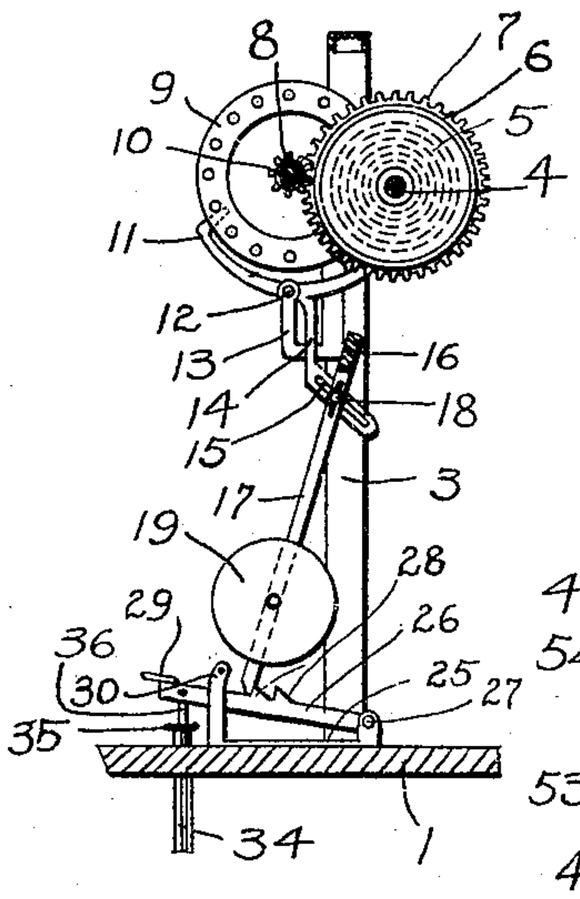

FIG. 2

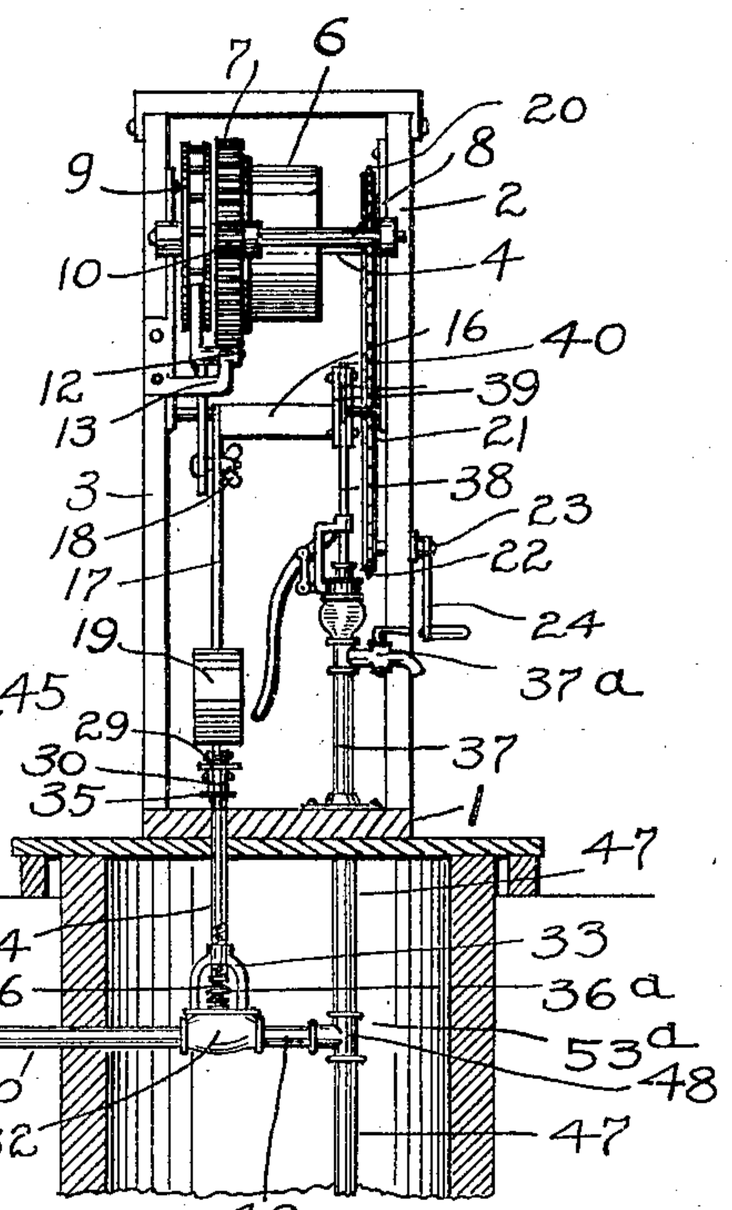

FIG. 1.

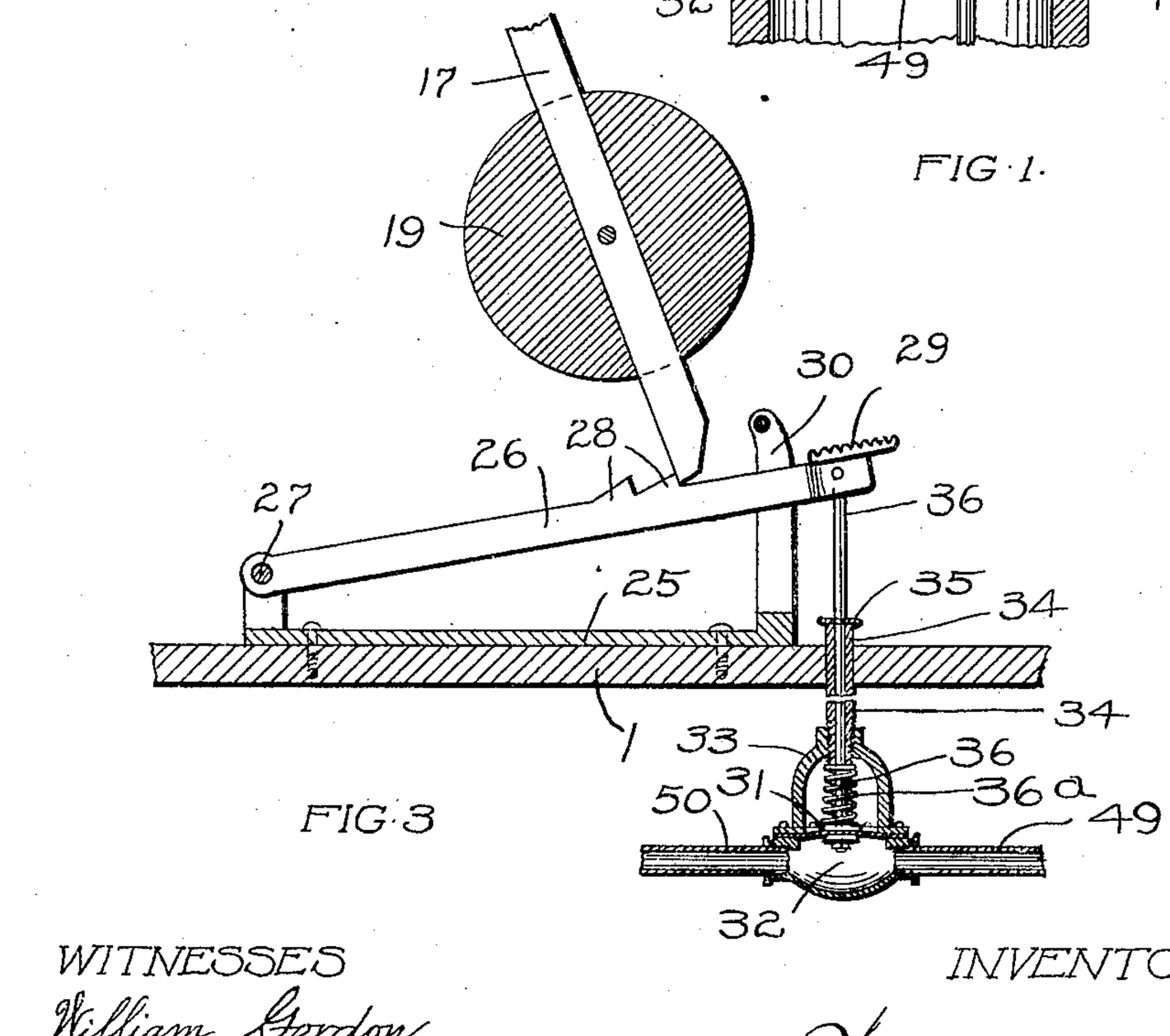

FIG. 3

WITNESSES

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PUMPING SYSTEM.

No. 836,775. Specification of Letters Patent. Patented Nov. 27, 1906.

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To all whom it may concern:

Be it known that I, WILLIAM M. MYERS, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Pumping Systems, of which the following is a specification.

My invention relates to improvements in that class of pumping systems which are designed to pump liquids, and has for its objects the provision of a pumping system by which the pumping of liquid is so automatically regulated as to maintain a predetermined amount of pumped liquid in a trough or other receptacle from which said liquid is being used either for watering live-stock or for other purposes and to so automatically start and stop all the moving parts as to avoid useless wear of said parts and waste of liquid, and to so construct and arrange the parts of a pumping system that they shall be durable and be positive in their action, and also provide means for directing the pumped liquid from the system through a faucet or other outlet.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of motor, pump, and pipe connections and a longitudinal section of well and trough cut vertically through the center. Fig. 2 is a transverse section of motor cut vertically through the center and a side elevation of the controller. Fig. 3 is a longitudinal section of the controller and of the diaphragm-regulator cut vertically through their respective centers.

My invention consists of a motor, a winding device, a controller, a diaphragm-regulator, a pumping mechanism, a trough, a float-operated valve, and suitable pipes and rod connections, and also a faucet, as hereinafter more fully specified.

The motor consists of the following parts: base 1, uprights 2 and 3, shaft 4, coil-spring 5, spring-casing 6, gear 7, shaft 8, escapement 9, pinion 10, pallet 11, shaft 12, bracket 13, depending arm 14, its slot 15, rock-shaft 16, pendulum-rod 17, thumb-screw 18, and pendulum 19, together with suitable braces, boxings, and well-known means for securing the parts in position, as shown.

The winding device consists of a sprocket-wheel 20, sprocket-chain 21, pinion 22, crank-shaft 23, and crank 24, together with suitable well-known boxings and well-known means for attachment of parts, as shown.

The controller consists of its base 25, pivotally-attached arm 26, pivot 27, ratchets 28, treadle 29, and uprights 30.

The diaphragm-regulator consists of diaphragm 31, its chamber 32, yoke 33, sleeve 34, hand-wheel 35, rod 36, and spring 36[a].

The pumping mechanism consists of the well-known and ordinarily-used force-pump 37, piston-rod 38, connecting-links 39, and rocker-arm 40, together with faucet 37[a].

The trough consists of any ordinary trough or tank 41.

The float-operated valve consists of the elbow 42, valve 43, L-shaped pivotal arm 44, pivot 45, and float 46.

The suitable pipes and connections consist of section-pipe 47, T 48, pipes 49, 50, and 52, and elbow 51.

The above-mentioned motor and pumping mechanism are placed in position (seen in Fig. 1) over well 53[a].

In the operation of my invention after the parts are placed in position as described the operator grasps the handle of crank 24 and by said crank rotates crank-shaft 23, which carries sprocket-pinion 22, which drives sprocket-chain 21, which drives sprocket-wheel 20, which drives shaft 4, which winds mainspring 5, after which my pumping mechanism is driven by the tension of spring 5, which in unwinding rotates shaft 4, which drives gear 7, which engages and drives pinion 10, which drives shaft 8, which drives escapement 9, which drives and the speed of which is controlled by escapement 11, which oscillates on shaft 12 in bracket 13 and is adjustably and pivotally secured to and drives pendulum-rod 17 by thumb-screw 18. Pendulum-rod 17 is secured at its upper extremity to and reciprocally drives rock-shaft 16, which drives rocker-arm 40, which by two connecting-links 39 drives piston-rod 38 of pump 37 and by the above-described motor and pumping mechanism pumps liquid 53 from well 53[a] through suction-pipe 47 and thence through T 48, pipe 49, diaphragm-chamber 32, pipe 50, elbow 51, pipe 52, and elbow 42 into trough 41 until the quantity of liquid 53 is sufficient to reach upward in trough 41 to point 54, upon which float 46 by buoyancy is raised to position seen in Fig. 1

and is thus rotated on pivot 45 and carries the L-shaped arm 44, upon the upper extremity of which is carried valve 43, which thus automatically closes the discharge-opening of elbow 42.

When discharge-opening of elbow 42 has been closed, as above described, the continued pumping of liquid 53 from well 53ª into the pipes and diaphragm-chamber 32 will cause back pressure of liquid 53 in said pipes and chamber 32, and this back pressure in chamber 32 being augmented by continued pumping of liquid 53 causes the central part of diaphragm 31 to overcome tension of spring 36ª pressing thereon and to carry upward the rod 36, which carries upward the free end of controller-arm 26, which carries ratchets 22 upward into engagement with the lower extremity of pendulum-rod 17, which causes the retention of said rod and its connected parts in the position seen in Figs. 1, 2, and 3.

From the foregoing it will readily be understood that when liquid 53 in trough 41 rises to point 54 the movement of all parts of my invention is automatically stopped, thus saving wear on the parts and waste of liquid.

When liquid 53 is used from trough 41 to a point below point 54, float 46 gravitates and rotatably carries L-shaped arm 44 on pivot 45 until valve 43 is carried by the upper extremity of arm 44 from and opens the discharge-opening of elbow 42, which releases from pipes and chamber 32 the before-described back pressure therein of liquid 53, upon which spring 36ª forces diaphragm 31 downward, which carries downward the rod 36, which carries downward the free end of controller-arm 26, which carries downward the ratchets 28 from engagement with the lower extremity of pendulum-rod 17, upon which pendulum-rod 17 and its pendulum carried thereby gravitate, thus starting the before-described motor and pumping mechanism, and these automatically-controlled operations continue until the tension of spring 5 is exhausted, after which by repetition of winding spring 5, as previously described, these operations are caused to be repeated.

By hand-wheel 35 sleeve 34 is screwed upward or downward through a threaded aperture in the upper part of yoke 33 on spring 36ª, the lower extremity of which rests upon diaphragm 31, by which such hydrostatic pressure of liquid 53 against diaphragm 31 as is caused by elevation of elbow 42 is adjustably counterbalanced.

Faucet 37ª is opened when it is desired to have liquid 53 discharged therefrom, and where faucet 37ª is at a higher elevation than elbow 42 the excessive amount of hydrostatic pressure which is caused thereby in chamber 32 against diaphragm 31 is overcome by applying pressure of the foot of the operator (not shown) upon treadle 29, which pressure lowers the free end of arm 26, guided by uprights 30, and carries ratchets 28 downward from engagement with the lower extremity of pendulum-rod 17, thus starting the motor and pumping mechanism, as previously described.

Where faucet 37ª is situated on the same level or lower than elbow 42, treadle 29 may be dispensed with, or faucet 37ª and treadle 29 may both, if desired, be dispensed with.

While I have shown and described my invention in the foregoing manner, I wish to reserve the right to so differently proportion and arrange the parts as to comply with various demands and situation as actual practice may require without departing from the spirit of my invention.

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

In a pumping system, an ordinary force-pump, a spring-driven motor for driving said pump, a driving-spring for said motor, a winding mechanism for winding the driving-spring of said motor, a controller for controlling said motor, a diaphragm-regulator for regulating the movements of said controller, a diaphragm-chamber for said regulator, a trough for reception of liquid pumped by said pump, a discharge-elbow in said trough, a float-operated valve in said trough, for automatically closing and opening said discharge-elbow, a suction-pipe for said pump and suitable pipes and connections, by which said suction-pipe is communicatively connected through said diaphragm-chamber with said elbow, in combination with a faucet on said pump, a ratcheted arm on said controller, and a treadle upon the free end of said ratcheted arm.

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

WILLIAM M. MYERS.

Witnesses:

GERTRUDE BURNHAM,

GEORGE W. HINTON.