P. A. MYERS.

PUMPING APPARATUS.

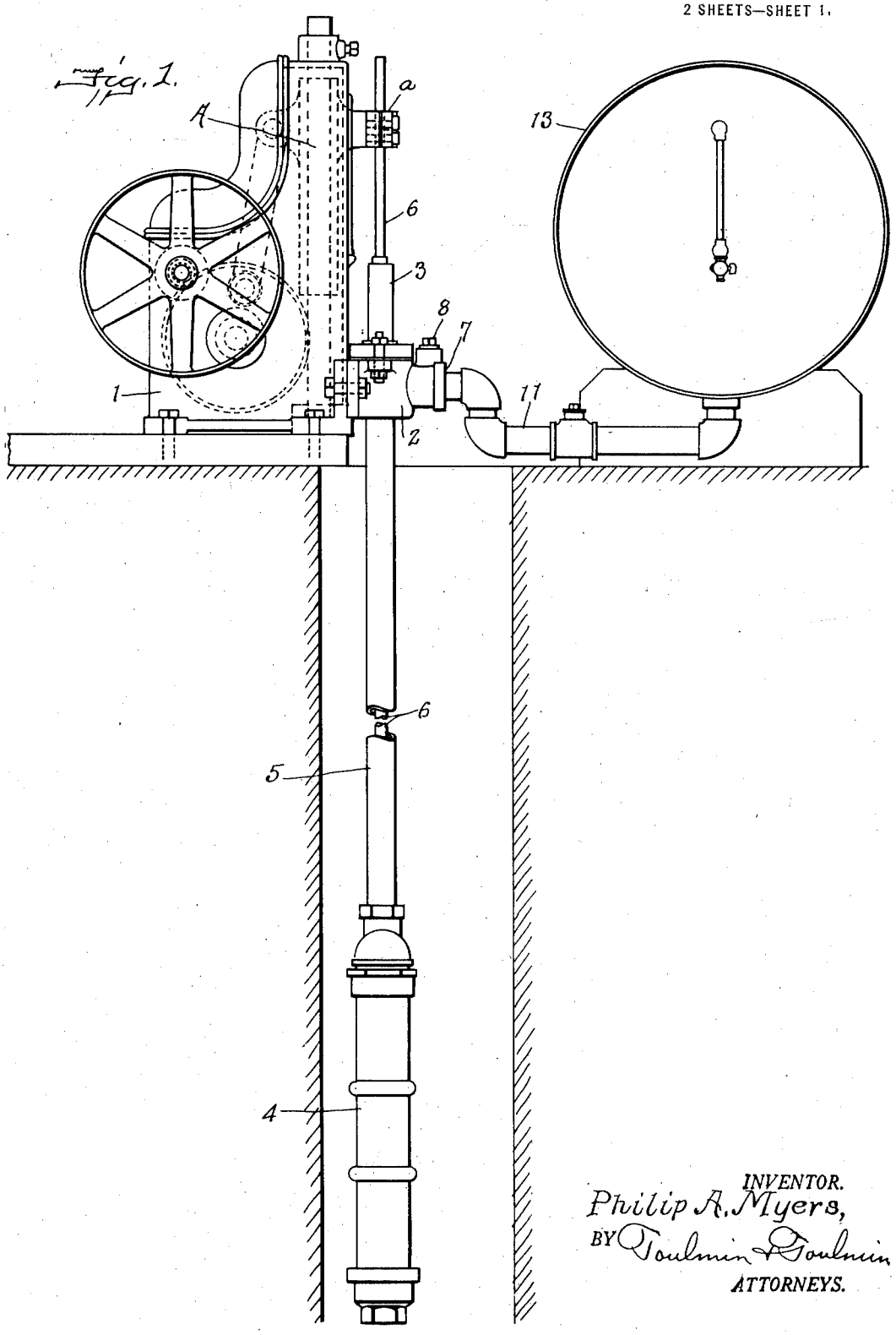
APPLICATION FILED JAN. 19, 1920.

1,385,143.

Patented July 19, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

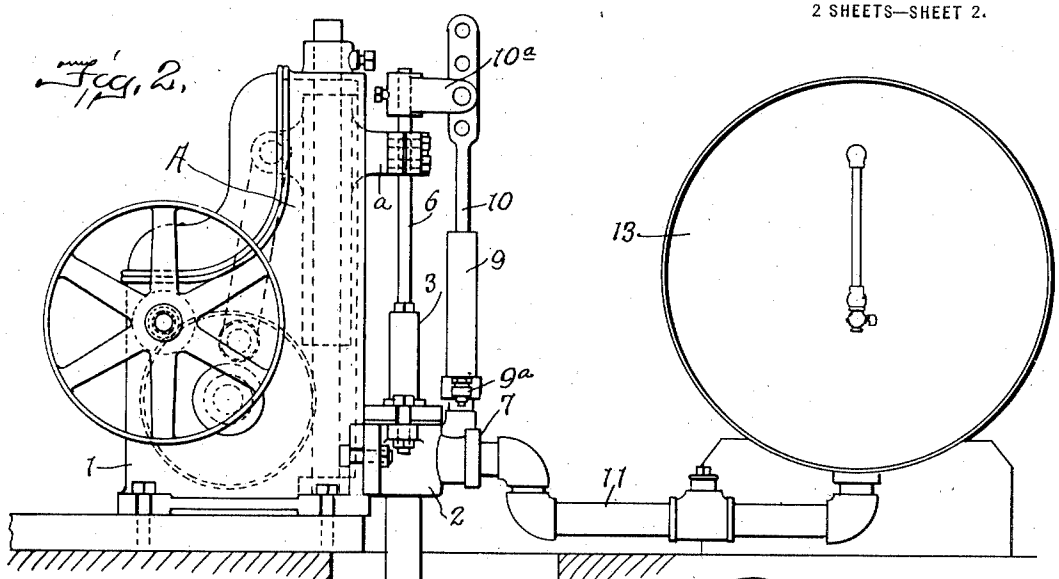
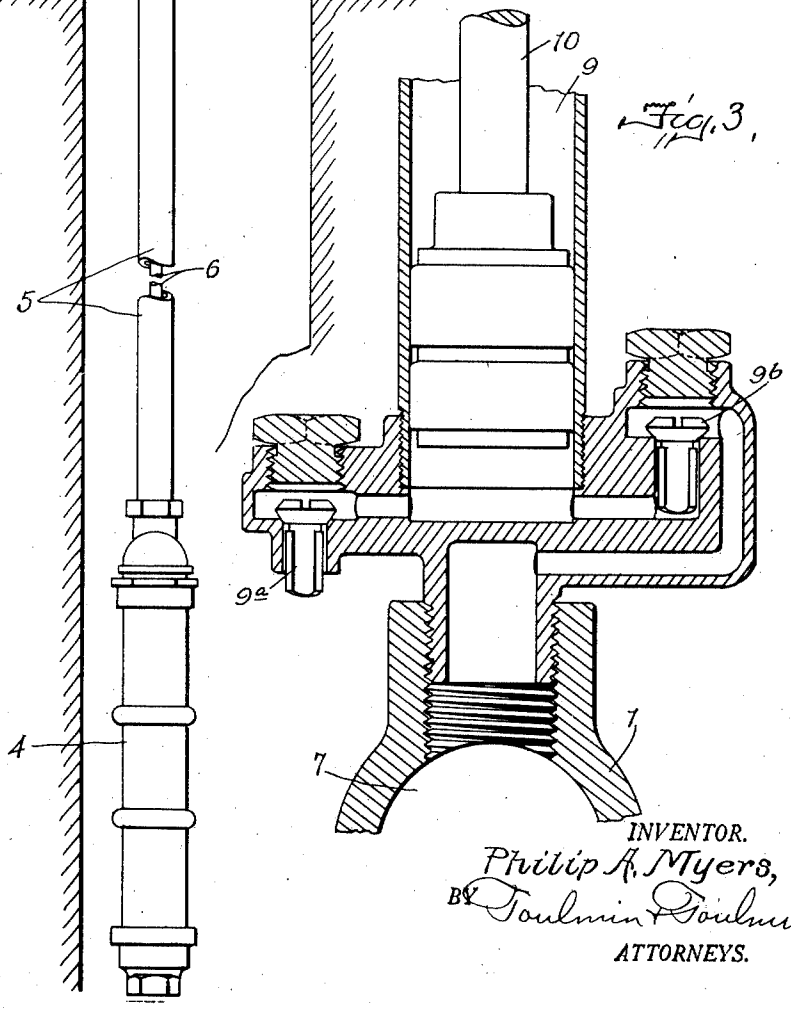


Fig. 3.



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UNITED STATES PATENT OFFICE.

PHILIP A. MYERS, OF ASHLAND, OHIO, ASSIGNOR TO F E. MYERS AND BROTHER, OF ASHLAND, OHIO, A COPARTNERSHIP CONSISTING OF FRANCIS E. MYERS AND PHILIP A. MYERS.

PUMPING APPARATUS.

1,385,143. Specification of Letters Patent. Patented July 19, 1921.

Application filed January 19, 1920. Serial No. 352,319.

To all whom it may concern:

Be it known that I, PHILIP A. MYERS, a citizen of the United States, residing at Ashland, in the county of Ashland and State of Ohio, have invented certain new and useful Improvements in Pumping Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improved pumping apparatus and has for its particular object to provide a combined liquid pumping apparatus and pneumatic or air pressure pump whereby operation of the apparatus will act to pump the liquid and at the same time to charge and maintain the pressure in an air tank of a coöperating pneumatic system whereby the liquid will be discharged from the service pipes under air pressure, or combined air and water pressure.

Pumping apparatus of this general character is used extensively in domestic water systems for country homes, and other places where an independent water service is required, the system having all the advantages for domestic purposes afforded by the water system of a city, with the further advantage, where the water is supplied from a good well or other ample source, of having an unlimited supply at a relatively lower cost.

Domestic water systems of this character are particularly advantageous also for garden and truck farm irrigation, as with the ample supply of water usually available proper irrigation of the soil may be effected by any suitable means of distribution, practically without cost except the cost of operating the system.

It is an object of the present invention to combine an air pump or air pressure cylinder with any suitable liquid pumping mechanism in such a manner that actuation of the liquid pump will also act simultaneously to actuate the air pump, thus simplifying and cheapening both the construction and operation of the combined apparatus.

It is a further object of the invention to provide a standard form of liquid pump-head which may or may not be equipped with the air pump as may be required by the purchaser or user. Thus where the air pressure system is not installed with the liquid pump, the same may be supplied any time later if required without change in the mechanism. The liquid pump without the air pump forms the subject matter of a separate application for Letters Patent Serial No. 351,966 filed January 16, 1920.

It is also a feature of the invention to provide suitable connections between the air pump and liquid pump mechanisms whereby the air pump may be conveniently disconnected from the pump actuating mechanism, thus providing for the operation of the air pump only as required to maintain the pneumatic system at normal pressure.

In the accompanying drawings:—

Figure 1 is a side elevation of a combined power head and pump head, showing the standard construction of the pump head in which provision is made for interchangeable operation of the pump as a liquid pump only or as a combined air and liquid pump;

Fig. 2 is a side elevation of an improved pumping apparatus embodying my invention in which the combined liquid and air pump head is located above the base line of the power head;

Fig. 3 is a detail view of the air pump cylinder.

Any suitable air pressure tank may be used in connection with the air pressure pump; also any suitable power head and pump head adapted to the purposes of the invention may be used, the construction here shown being for illustrative purposes only.

As shown in the drawings the combined pumps are mounted in operative relation with a power head A having a projecting operating arm *a* to which the pump pistons are connected to be operated in unison or simultaneously thereby.

The pump head, as shown in Fig. 1, consists of a cylindrical housing 1, provided with a cylinder head 2, and having the upper cylinder 3 of the liquid pump mounted on the cylinder head. The lower cylinder 4 is supported below the ground at any suitable distance by the drop pipe or casing 5 which is secured at its upper end to the pump head housing 2, the lower cylinder 4 having suitable pipe connections extending to the water supply in the well. A piston 6 is connected to the arm *a* of the power head and extends through the cylinder 3, housing 2, casing 5 and into the cylinder 4, the piston being provided with suitable plungers in each of the cylinders 3 and 4

to effect a pumping operation, the pump head 1 being provided with suitable valves coöperating with inlet and outlet ports to cause discharge of the water through a port 7 of the head 1.

Adjacent the discharge port 7, on the upper side thereof, as here shown, is a threaded aperture normally closed with a plug 8, which, when the plug is removed, is adapted to have mounted therein an air pump cylinder 9, as shown in Fig. 2, when the air pressure system is combined with the water system. A piston 10, provided with a suitable plunger and connected to the piston 6 by an arm 10^a operates in the cylinder 9 to pump air to a combined liquid and air pressure tank 13, here shown in conventional form to illustrate the system; the water being delivered to the tank through a pipe 11 connected to the discharge port 7 of the pump head. The air pump is provided with an intake valve 9^a and an outlet valve 9^b whereby the intake and discharge of air from the cylinder is effected by the pumping action of the piston 10. Thus, when both the liquid and air pumps are in operation air and water will be simultaneously delivered to the pressure tank 13.

There is no novelty claimed relative to the construction and operation of the pressure tank here shown. The novelty of the invention consists in the combined action of the air and water pumps whereby the volume of air and air pressure in the tank may be maintained at normal by operation of the pumping apparatus. It is well known that in the operation of hydro-pneumatic systems of this character when a faucet or outlet to the pressure tank is opened the pressure of air in the tank forces the water out of the outlet, part of the air escaping with the water. Thus the air pressure in the tank will be reduced by repeated openings of the outlets, and if the pressure is not restored by some means the tank will become water-logged and the effect of the air pressure on the discharge of water from the tank will be accordingly reduced.

This difficulty is effectually overcome in the present invention by the combined action of the air and water pumps which tends to keep the air pressure in the tank normal. In certain constructions an air pressure safety valve may be used on the pressure tank to relieve the pressure at a predetermined point but for ordinary domestic uses this is not necessary.

From the foregoing detailed description and the illustrations of the drawings the construction and operation of the improved hydro-pneumatic pumping apparatus will be readily understood. It will be observed that the construction of the combined mechanisms is simple, cheap and substantial, and that the operation of the combined systems is direct and effective for the accomplishment of the purposes of the invention.

While the construction here shown is of an approved form it will be understood that suitable modifications thereof may be made without departing from the principles of construction and operation as defined and comprehended in the appended claims.

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

1. In a pumping apparatus, the combination, with a power head, including a casing in which the power mechanism is housed, of a pump head detachably connected to a vertical face of said casing, a drop pipe suspended from the lower portion of the pump head and carrying a lower cylinder, an upper cylinder mounted on the upper face of the pump head, a pipe extending from a side of the pump head other than that adjacent to the casing and opening into the pump head, a piston rod common to the upper and lower cylinders, and a connection between said piston rod and an operating arm of the power mechanism.

2. In a pumping apparatus, the combination, with a power head including a casing in which the power mechanism is housed, of a pump head detachably secured to a vertical face of said casing, a drop pipe secured to the lower part of the pump head and carrying a lower cylinder, an upper cylinder and an air cylinder carried by upper portions of the pump head, a piston rod common to the lower and upper water cylinders and another piston rod for the air pump cylinder, and connections between said piston rods and an operating arm of the power mechanism.

In testimony whereof I affix my signature.

PHILIP A. MYERS.