No. 714,416. Patented Nov. 25, 1902.

A. W. WEAVER.

PUMP.

(Application filed Apr. 3, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

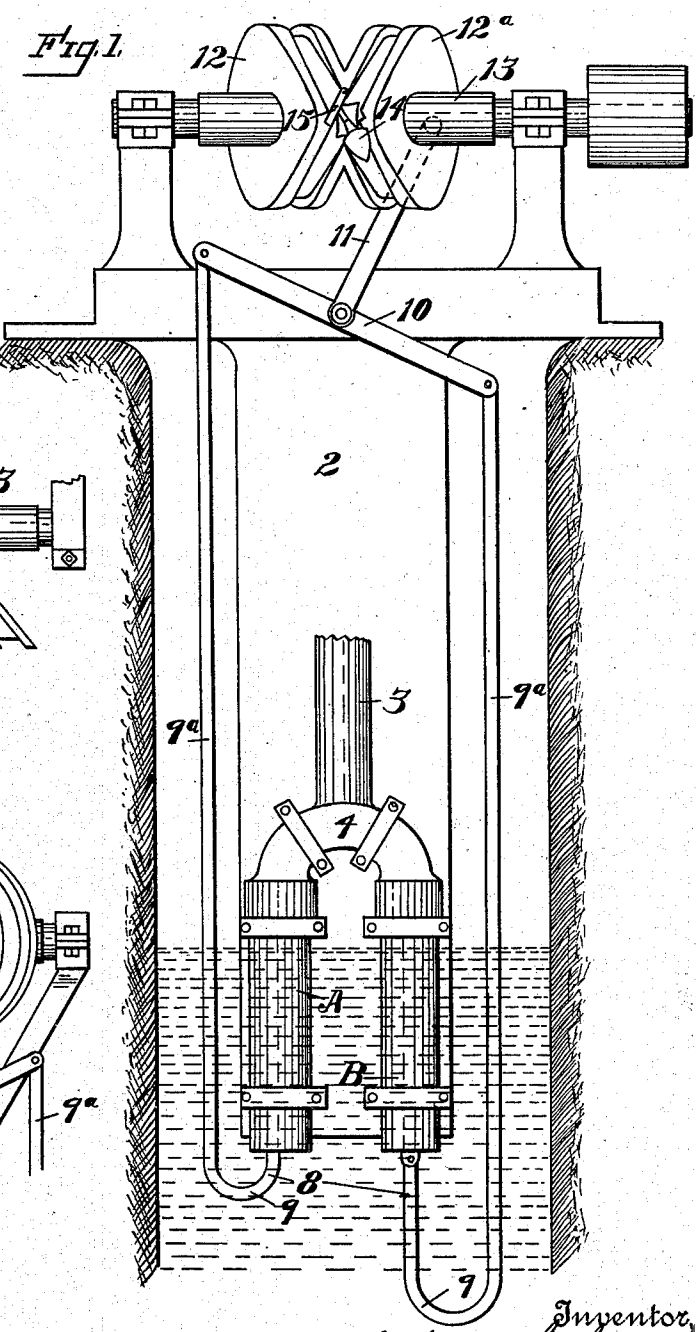



Fig. 5.

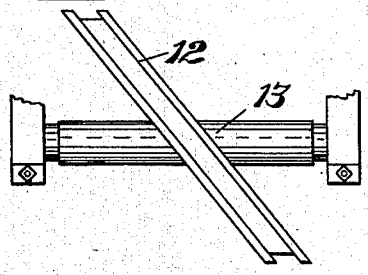
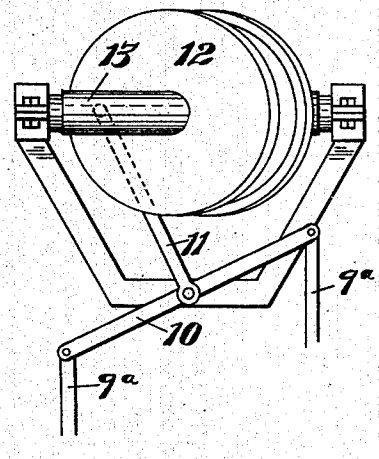



Fig. 7.




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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

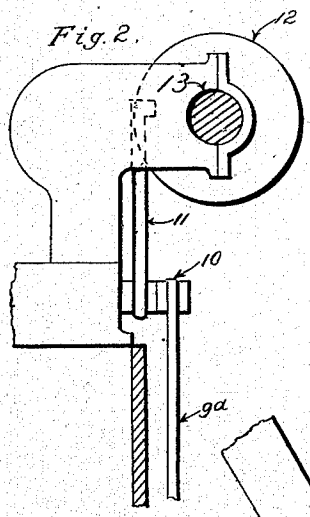



Fig. 4.

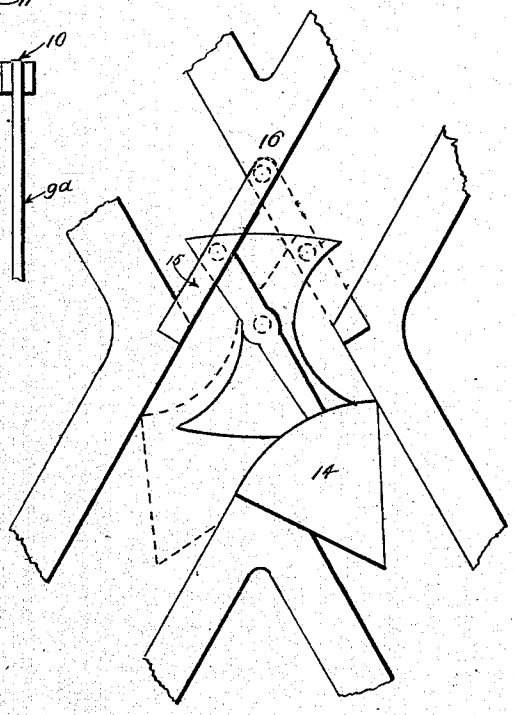



Fig. 3.

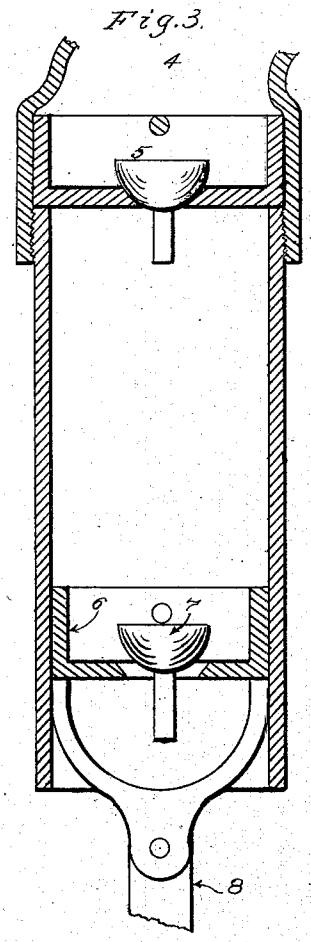
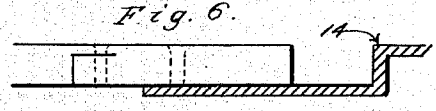



Fig. 6.




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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

ALBERT W. WEAVER, OF EL VERANO, CALIFORNIA.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 714,416, dated November 25, 1902.

Application filed April 3, 1902. Serial No. 101,277. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT W. WEAVER, a citizen of the United States, residing at El Verano, county of Sonoma, State of California, have invented an Improvement in Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel pump and means for operating the same.

It consists of the parts and the constructions and combinations of parts, which I will hereinafter describe and claim.

Figure 1 is a front elevation of my apparatus. Fig. 2 is a side elevation of the upper part. Fig. 3 is a vertical section of a pump-barrel, showing piston and valves. Fig. 4 is an enlarged view of the switch mechanism. Fig. 5 is a plan view showing a single cam. Fig. 6 is a view showing section of tongue. Fig. 7 is an elevation of Fig. 5.

The object of my invention is to provide a double-acting or double-cylinder pump and a mechanism by which the pistons are operated in the pump-barrels in opposition to each other and in inverting said pump-barrels and constructing the piston-rods so that they enter and connect with the pistons from below.

In the present case I have illustrated the apparatus as comprising two pump-barrels A and B. These pump-barrels are of any suitable or desired size and fixed to a suitable support, as the timber 2. The pump-barrels have their lower ends open and submerged within the liquid which is to be pumped. The upper ends connect with the discharge-pipe 3, as shown at 4. In the upper part of each pump-cylinder is an upwardly-opening check-valve 5. The plungers or pistons 6 each have an upwardly-opening valve, as at 7, and they may be made with a sufficiently loose fit to move easily and within the cylinders, depending upon the thin annular sheet of water between the pistons and the cylinders to form a water packing and to at the same time lubricate the pistons or reduce friction. The piston-rods 8 have a curve or offset made in them, as shown at 9, so that while the portion connecting with the piston moves vertically upward from below the curve or offset carries the rods off to each side of the cylinders, as shown at $9^a$. These exterior parts serve as connecting-rods or pitmen extending upwardly and connecting with opposite ends of a centrally-pivoted oscillating bar 10. This bar is here shown as having an arm 11 extending at right angles from its center, the end of the bar entering the groove of a cam 12, fixed upon a driving-shaft, as 13, through which power is transmitted to revolve the cam. As shown in Fig. 5, a single cam is fixed upon the shaft, and the groove of the cam has a sufficient movement from side to side to oscillate the arms 10 and 11 and produce the desired throw or stroke of the pistons within the cylinders.

When constructed with a single cam, as here shown, there will be a complete up-and-down stroke of each piston for each revolution of the cam; but where heavy work is to be done and it is desired to increase the power and reduce the speed of revolution I have shown the cam as formed with two grooves or channels crossing each other, as shown in Fig. 1. These cam-grooves may be cut in a solid cylinder, or the cams may be cast, as shown at present, in two parts 12 and $12^a$, uniting at one side, so that the grooves of one cam cross the grooves of the other, as shown. At this point of crossing I place a switch, which consists of a movable tongue 14, pivoted in the crossing of the cam-grooves and having connected with it a switch-lever 15, pivoted, as shown at 16, at the point where the cam-grooves come together. When the cam revolves, the groove or channel moving over the end of the arm 11, which engages it, will cause the arm to swing by reason of the eccentric position of the groove, and the arm will thus follow the groove until it arrives at the point where it strikes the switch-lever 15. This switch-lever lying across the path in which the end of the arm is moving will be moved out of the path of the arm and swung across, so as to lie in the groove or channel of the other cam, and at the same time the tongue 14 will be thrown into the same groove by reason of its connection with this switch-lever 15. The part 15 being thus moved across forms a temporary side to the groove or channel in which the arm 11 is moving, so that the arm continues to follow the channel in which it is until it again arrives at the switch, and as its second arrival at the switch is in the other channel from the one pursued

in its first arrival it will be manifest that it will again throw the switch and form the bar across the first channel, so that it will then follow the second channel, and it will thus take two complete revolutions of the cam to produce the complete stroke of the pump-pistons. In other words, there will be but a half-stroke of the pump-piston for each revolution of this double cam, while there would be a double stroke if only the single cam were used.

I am thus enabled to provide a simple easily-operated pump, and by suitable gearing or reduction of speed in connection with a double cam herein described I can provide a sufficient power to elevate water to a considerable height.

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

1. The combination in a pump of cylinders, pistons and piston-rods, a centrally-pivoted oscillating arm, with the ends of which said rods are connected, a shaft journaled transversely with relation to the cylinders having a cam with grooves crossing each other, an arm projecting from the one which operates the pistons, said arms being engaged by the cam-groove, and a switch located at the intersection of the cam-grooves, and alternately moved to close one or the other of the grooves to the engaging arm, said switch including a movable tongue pivoted in the crossing of the cam-grooves and a switch-lever connected with the tongue and pivoted at substantially the point where the cam-grooves come together.

2. A pump consisting of two parallel pistons, piston-rods connected therewith as shown, and means for operating said pistons consisting of double cam-grooves crossing each other and having a switch at their intersection, said switch including a movable tongue pivoted in the crossing of the cam-grooves and a switch-lever connected with the tongue and pivoted at substantially the point where the cam-grooves come together, a centrally-pivoted oscillating arm with the ends of which the piston-rods are connected, an arm extending at right angles from the first-named arm and engaging with the groove of the cam, said arm acting to throw the switch at each approach of the crossing-points of the cam-grooves whereby said grooves are alternately opened to the passage of the arm.

In witness whereof I have hereunto set my hand.

ALBERT W. WEAVER.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.