

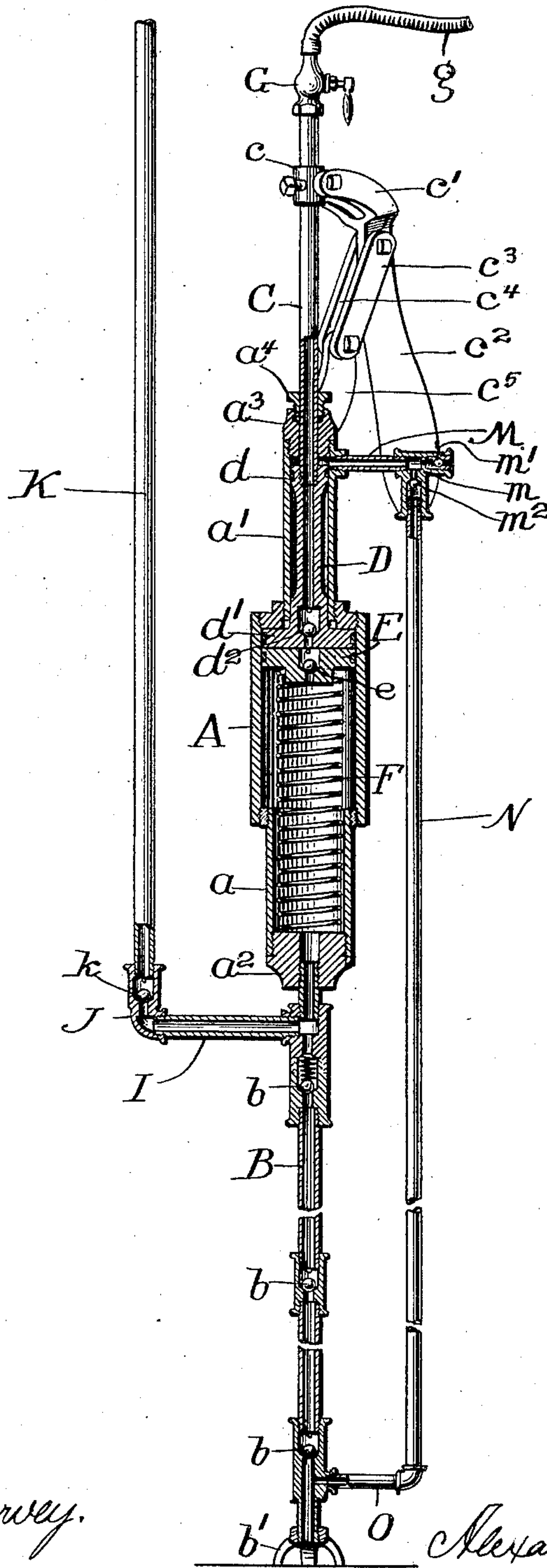
No. 699,448.

Patented May 6, 1902.

A. S. CARDELLA.
PUMP.

(Application filed Mar. 26, 1901.)

(No Model.)



Witnesses:
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S. Bliss.

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UNITED STATES PATENT OFFICE.

ALEXANDER S. CARDELLA, OF KINMUNDY, ILLINOIS, ASSIGNOR OF ONE-HALF TO WESLEY PARROTT LEASOR, OF KALAMAZOO, MICHIGAN.

PUMP.

SPECIFICATION forming part of Letters Patent No. 699,448, dated May 6, 1902.

Application filed March 26, 1901. Serial No. 52,901. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER S. CARDELLA, a citizen of the United States of America, residing at Kinmundy, in the county of Marion and State of Illinois, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to certain improvements in pumps, the purpose of which is to provide means for lowering the specific gravity of water to enable the same to be drawn by suction from a greater depth and also to provide means whereby the water may be delivered through two separate outlets, the point of delivery being determined by the opening or closing of one of said outlets.

To such end the invention consists in certain novel characteristics, which will be described and claimed below.

The drawing illustrates the invention by means of an elevation partly in axial section.

Referring to the drawing, A is a cylinder having at the lower end a reduced extension a and at the upper end a reduced extension a' . In the lower end of the extension a is a perforated plug a^2 , in the perforation of which is secured a sectional suction-pipe B, containing a series of check-valves b , arranged at various points and terminating in a foot-piece b' . In the top of the extension a' is a perforated plug a^3 , provided with a stuffing-box a^4 , in which is guided a pipe C, the lower end of which is secured to the differential piston D, the smaller upper portion of which, d , works in the reduced extension a' and the lower larger portion of which, d' , works in the larger cylinder A. The piston is perforated longitudinally and contains a check-valve d^2 . Below the piston D is a spring-actuated piston E, perforated to register with the perforation in the piston D and containing a check-valve e . A coiled spring F, under tension between the piston E and the plug a^2 , tends to press the piston E upward. On the pipe C is a collar c , to which is secured a lever c' , provided with a handle c^2 and pivoted to the upper ends of two links $c^3 c^4$, the lower ends of which are pivoted to a bracket c^5 , which is a part of the plug a^3 . The handle provides means for reciprocating

the differential piston and operating the pump, as will be hereinafter described. On the upper end of the pipe C is a stop-cock G, and a flexible pipe g is secured to said stop-cock and terminated at some desired point of delivery. A branch pipe I, opening laterally from the section-pipe B, above the upper check-valve therein, is connected, by means of an elbow J, with an upright pipe K, containing a check-valve k , closing downward. The pipe K leads to a point of delivery at a higher level than that of the pipe g . In the upper portion of the upper extension a' of the cylinder A is a branch pipe M, connected, by an elbow m , with a vertical pipe N, extending downward and connecting, by means of a horizontal pipe O, with the suction-pipe, preferably below the lower check-valve. The branch pipe M is arranged above the highest position of the smaller end of the differential piston, and the elbow m contains an inlet check-valve m' , opening into the cylinder and an upwardly-closing check-valve m^2 in the upper end of the vertical pipe.

In the operation of the pump as above described the oscillation of the piston evidently will pump water either through the pipe K or the tube g , depending upon the elevation of the delivery ends of said pipes, and if, as stated, the pipe K leads to a higher level the water will be delivered through the tube g when it is open and through the pipe K when the other outlet is closed by means of the stop-cock G. It is also apparent that the upper smaller end of the differential piston will draw in air through the inlet check-valve m' during the downward stroke and on the return stroke will force the air down through the check-valve m^2 , eventually discharging it into the water below the lower of the check-valves b . The amount of air thus discharged is not sufficient to satisfy the suction of the pump, because of the difference in the two ends of the differential piston; but it mingles with the water and reduces the specific gravity of the latter sufficiently to make it possible to lift the water by suction to a greater height than is possible without the mixture of air.

It will be seen that there is no positive connection between the differential piston and

the spring-actuated piston, and this fact gives the apparatus a certain ease of movement in case of a quick jerk. When the pistons have reached their lower limit and start to return, 5 the differential piston is able to leave the spring-actuated piston temporarily and pump air down into the column of water before the latter need necessarily start upward.

I do not limit myself to the specific devices 10 here shown, in view of the fact that great variation is possible as to their exact details of construction.

I claim as new and desire to secure by Letters Patent—

15 1. In a pump, the combination with a suitable cylinder, of a piston therein provided with suitable connections for its reciprocation and a spring-actuated piston contiguous to the first piston and provided with a spring 20 tending to press it against said first piston whereby said spring-actuated piston is moved positively in one direction by the first piston and is moved in the opposite direction by the spring; substantially as described.

2. In a pump, the combination with a suction-pipe containing a series of check-valves 25 opening upward, of a branch pipe connected therewith above the upper check-valve, said branch pipe also containing a check-valve opening upward, a cylinder connected with 30 said suction-pipe above the branch pipe, an upwardly-pressing spring in said cylinder, a spring-actuated piston pressed upward by said spring and containing a perforation provided with an upwardly-opening check-valve, 35 a positively-driven piston above the spring-actuated piston, also perforated, containing a check-valve, and suitable connections for positively reciprocating said second piston; 40 substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the county of Cook and State of Illinois, this 20th day of March, A. D. 1901.

ALEXANDER S. CARDELLA.

Witnesses:

CHAS. O. SHERVEY,
S. BLISS.