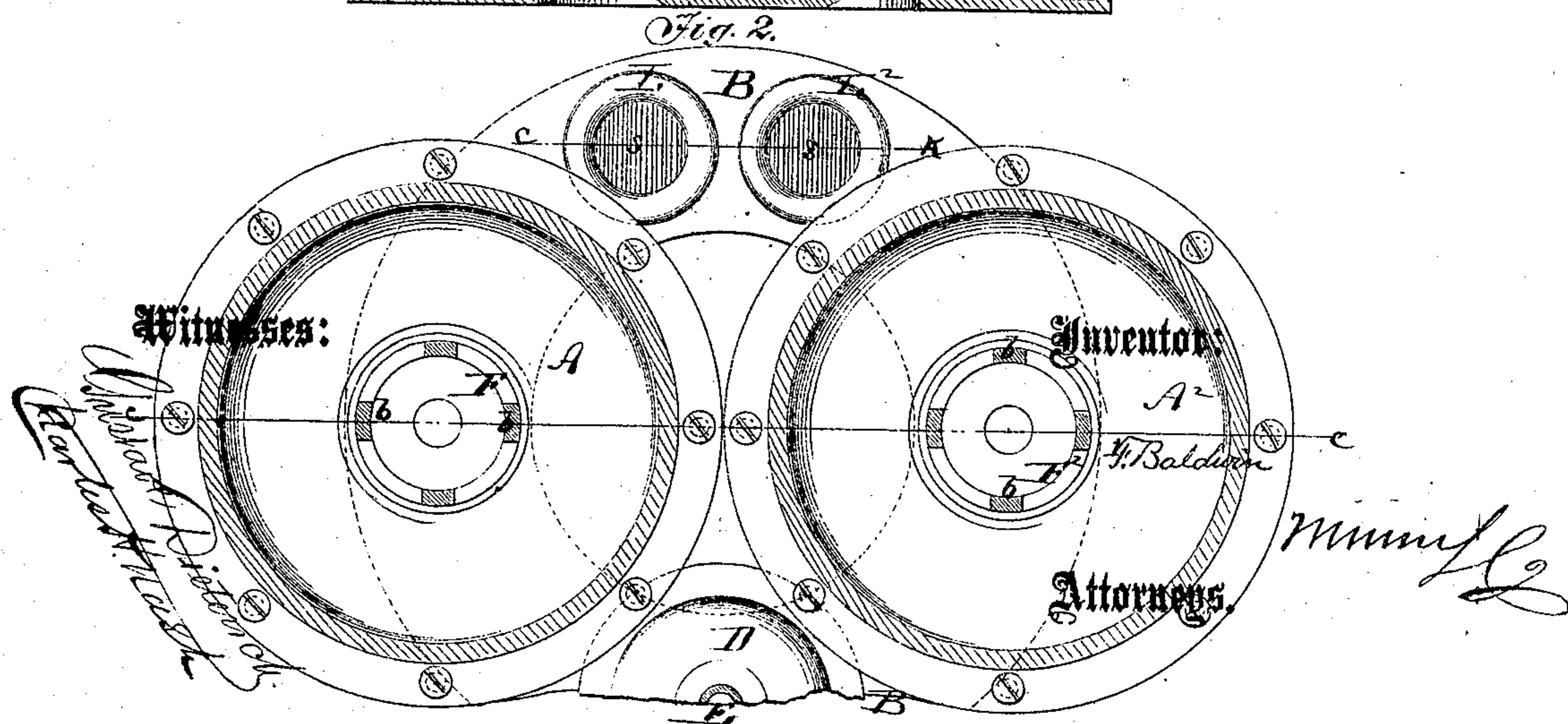
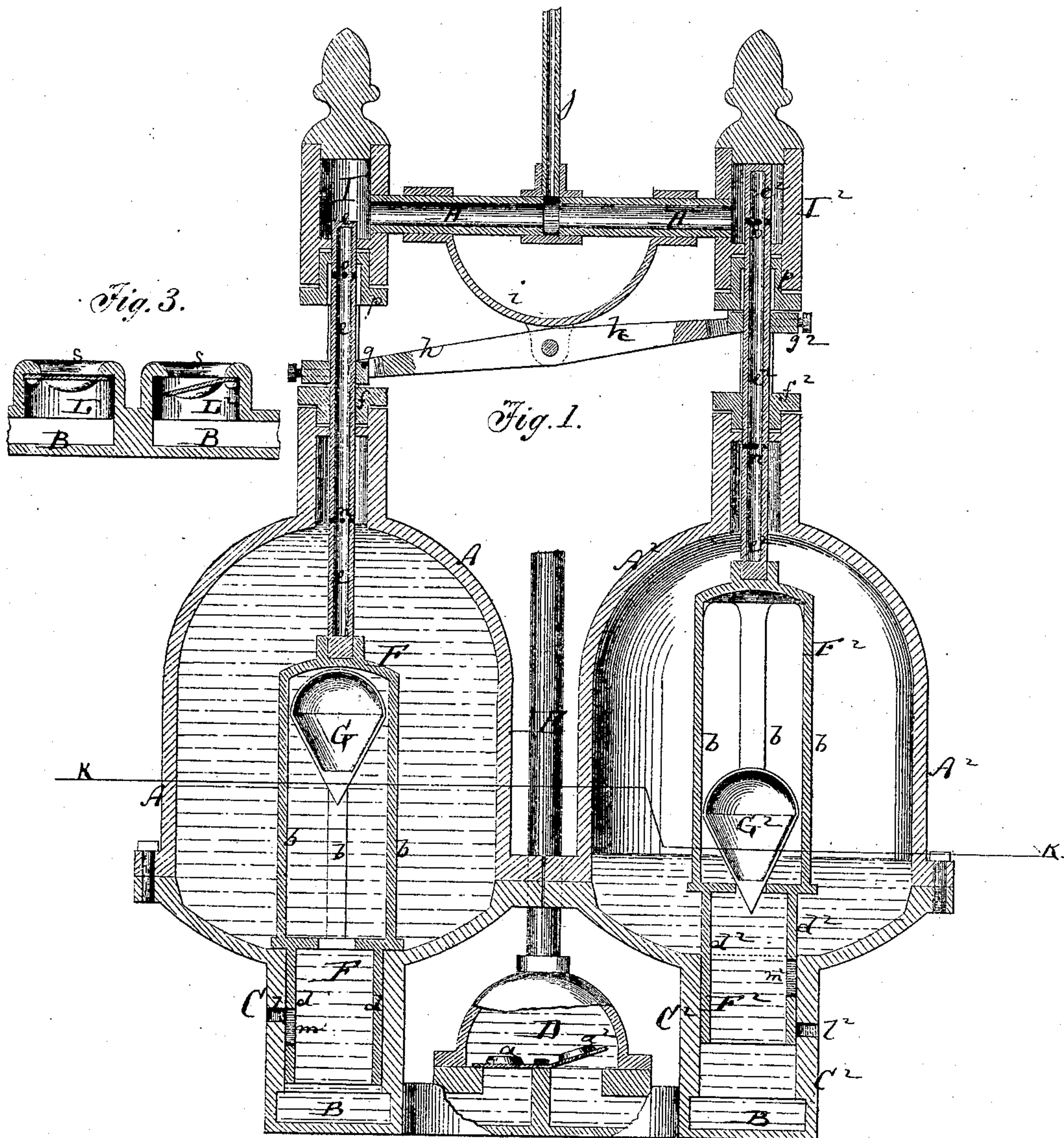


F. BALDWIN.
Atmospheric Water-Elevator.

No. 127,449.

Patented June 4, 1872.



UNITED STATES PATENT OFFICE.

FREDERICK BALDWIN, OF JANESVILLE, WISCONSIN, ASSIGNOR TO ALEXANDER GRAHAM, OF SAME PLACE.

IMPROVEMENT IN ATMOSPHERIC WATER-ELEVATORS.

Specification forming part of Letters Patent No. 127,449, dated June 4, 1872.

Specification describing a new and Improved Atmospheric Water-Elevator, invented by FREDERICK BALDWIN, of Janesville, in the county of Rock and State of Wisconsin.

Figure 1 represents a vertical section of my improved atmospheric elevator, the line $c c$, Fig. 2, indicating the plane of section. Fig. 2 is a horizontal section of the same on the line $k k$, Fig. 1. Fig. 3 is a detail vertical section of the same on the line $c k$, Fig. 2.

Similar letters of reference indicate corresponding parts.

The object of this invention is to obtain a self-acting water-elevator or conveyer, which is operated entirely by air-pressure derived from a reservoir of compressed air. The invention consists principally in a new combination of air and water chambers, floats, and automatic valves, all arranged to subserve the desired purpose, in the most economical and practical manner.

$A A^2$ in the drawing are two chambers or vessels, of equal size and suitable shape. They are placed close together on an annular bed, B , being held thereon by tubular supports $C C^2$. The bed B is hollow and forms two semi-circular channels, in which water can be conducted from the vessels $A A^2$ and tubes $C C^2$ to a chamber, D , and thence through valves $a a^2$ into the discharge-pipe E . Within the chambers $A A^2$ are two vertical plungers, $F F^2$, respectively, whose lower and upper ends are tubular, while their middle portions are composed of upright rods $b b$, between which the water is free to reach the lower tubes $d d^2$. These lower tubes fit snugly into the supports $C C^2$, as shown. $G G^2$ are float-valves, moving up and down with the water between the guide-rods $b b$. They serve, when lowered, to close openings in the top plates of the tubes $d d^2$, respectively. e and e^2 are the tubular upper extremities of the plunger $F F^2$, and extend upward through stuffing-boxes $f f^2$, placed in top of the vessels $A A^2$. The tubes $e e^2$ are perforated above and below the stuffing-boxes, as shown. To collars $g g^2$, that are formed at the pipes $e e^2$, are pivoted the ends of a lever, h , whose middle is pivoted to a pendent, i , of a horizontal pipe, H . The ends of the pipe H are by post, not shown, supported on the tops of the stuffing-boxes $f f^2$. Air is conveyed to

the machine through a pipe, j , to the middle of the pipe H , and thence within the latter toward chambers $I I^2$, in which the ends of H are secured, and within which the upper ends of the pipes $e e^2$ enter, as shown. The plunger can slide freely up and down in the chambers $A A^2$, together with their appendages $d d^2$ and $e e^2$. The tubes $C C^2$ have ports $l l^2$ in their sides, and the plungers $d d^2$ have corresponding but longer apertures $m m^2$. It will be seen that when a plunger, d^2 , is raised, it covers and closes the port l^2 , while it leaves it open when lowered, and thus provides an outlet for the water. The lower apertures $n n$ of the pipes $e e^2$ are always below the packing $f f^2$, but never leave the tubular upper extremities of the chambers $A A^2$. The upper apertures $o o$ of the same pipes $e e^2$ are alternately above and below the packing p of the chambers $I I^2$, as indicated. The slots $m m^2$ in the plungers $d d^2$ are longer than the ports $l l^2$, so that they will continue to leave said ports open, while the apertures o of $e e^2$ are in line with or below the packing p .

The operation is as follows: Air, being conveyed to the pipe H from a condenser or reservoir containing compressed air, enters the chambers $I I^2$, and thence that one of the pipes $e e^2$ which is elevated to have its apertures o above the packing p . The compressed air will then, through o , e , (or e^2), and n , reach the top of chamber $A A^2$, and bear upon the water therein contained, forcing it out through the plunger d or d^2 into the channels B and chamber D , and thence to the pipe E , the float being elevated in the filled chamber. When the water in the chamber is lowered so that the float will close the opening to the plunger, as at G^2 in Fig. 1, the further escape of water to the pipe E is prevented. The plunger itself then receives the air-pressure and is forced down, drawing the appendages with it. Just before the apertures o leave the chamber I or I^2 the slot m or m^2 arrives opposite port l or l^2 , and lets water escape, thus relieving the pressure under the plunger, so that the expansion of the compressed air will force the plunger the remainder of the stroke after the holes o have arrived below the chamber I or I^2 . It will be seen that the plunger could not stop on the stroke unless a cock in the pipe E was

closed, and that, therefore, the delivery is constant. By the lever *h* the plunger of one chamber is raised and brought in line of action of the air when the other plunger is forced down, as stated. The chamber *A* or *A*², from which air pressure is removed, will be refilled with water, entering the channel *B* through one of two pipes, *L* *L*², in which there are downwardly-opening valves *s* *s*, that are otherwise closed by inward pressure.

The advantages of this apparatus for throwing a constant stream of water are numerous. By connecting an air-reservoir of proper extent with a series of water-reservoirs and machines as herein described, all the machines, or any one or more of them, can be started or stopped by opening or shutting the air and water supplies.

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

1. The vessels *A* *A*², having hollow base *B* and tubular supports *C* *l* *C*² *l*², combined with hollow plungers *F* *m* and *F*² *m*², as and for the purposes described.

2. The air-supply pipe *j*, pipe *H*, chambers *I* *I*², and side-apertured pipes *e* *e*², combined with the plungers, as and for the purpose described.

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Witnesses:

E. F. BALDWIN,
S. A. HUDSON.