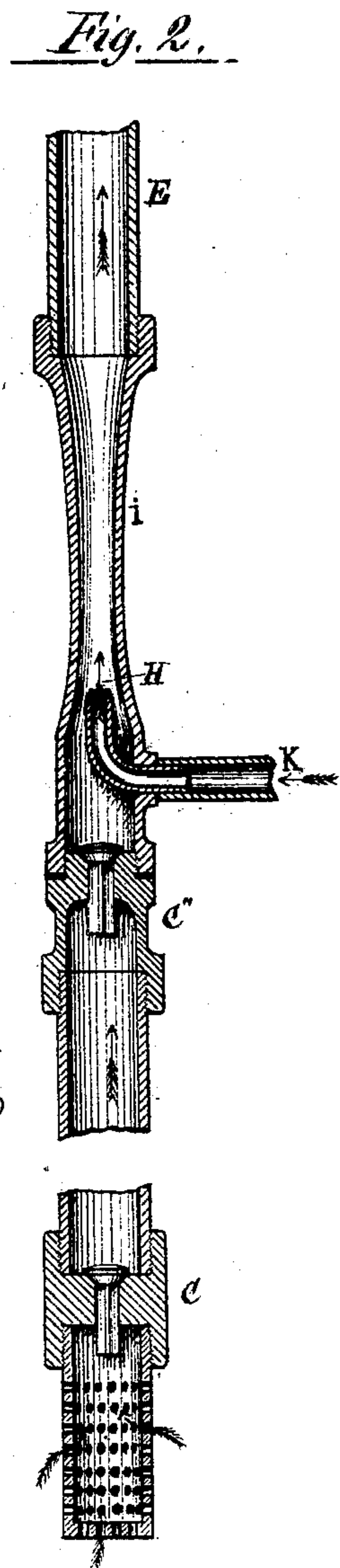
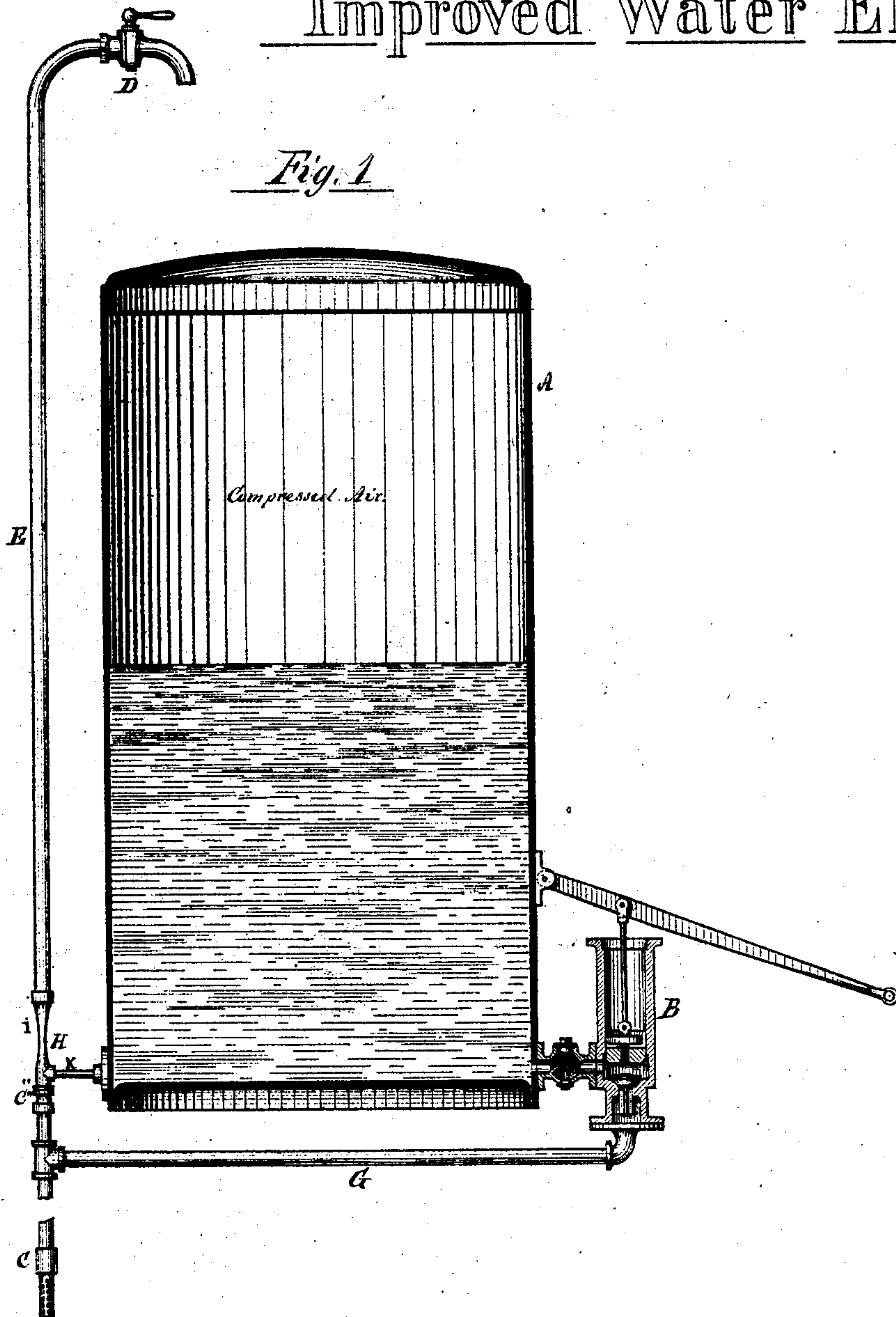


No. 121,533.

Patented Dec. 5, 1871

PHILIP W. MACKENZIE'S

Improved Water Elevator.



Charles W. Webb

Philip W. Mackenzie

Witnesses.

Sam. Gayre

Inventor.

UNITED STATES PATENT OFFICE.

PHILIP W. MACKENZIE, OF BLAUVELTVILLE, NEW YORK.

IMPROVEMENT IN PNEUMATIC WATER-ELEVATORS.

Specification forming part of Letters Patent No. 121,533, dated December 5, 1871; antedated November 18, 1871.

To all whom it may concern:

Be it known that I, PHILIP W. MACKENZIE, of Blauveltville, Rockland county, State of New York, have invented certain Improvements in Water-Elevators, of which the following is a specification:

My invention relates to one, two, or more perfectly air and water-tight chambers or tanks, in which the air can be compressed to any required density or pressure. The inlet and exit of the liquid are at the bottom. The air therein is trapped and confined for the elevation of water or other liquids. The liquid may be forced into the chamber by any of the known hydraulic machines. The elastic force of the air will elevate the liquid to any required height; and it consists in the combination of the compressing air-tank or tanks with a liquid jet-pipe placed centrally in a trumpet-shaped tube larger than the jet, so that when the pressure in the tanks or chambers exceeds that required for any given elevation the jet current will draw water or other liquid from a well, cistern, or other sources of supply and elevate it to any required height in proportion to the accumulated force in the tank, thereby compensating for or giving back a certain portion of the power therein contained.

Figure 1 is a sectional elevation of the tank, and showing also an ordinary pump, and perspective view of supply-pipe C C, jet-pipe K, tube I containing jet H, elevating-pipe E, and faucet D. Fig. 2 is an enlarged sectional elevation of the supply-pipes C C, jet-pipe K, and jet H, tube I, and final exit-pipe E.

A is an air and water-tight tank, which may stand on end or lie on its side, and must be perfectly air-tight. I refer to one tank. One tank may be made large enough for any amount required; but the openings in buildings will not usually admit of one large enough for the supply required. In such cases I use one, two, or more and connect them at top or bottom of the tank A. B is an ordinary pump for forcing water into the tank A to any required pressure. This supply may come from a ram or any other suitable hydraulic machine. G is a pipe to supply pump

B and tank A with water or other liquid. C C are also supply-pipes for conveying the liquid to either the pump or auxiliary tube I alternately. Separate pipes may be used, if desirable, for the pump and auxiliary, but one is the simplest and most desirable. The pipe K connects the bottom of the tank and the jet H, the jet H terminating in the center of the auxiliary tube I. The auxiliary tube I connects with the pipe E, terminating with the faucet D, or any number of them, as required, for distribution.

The water is drawn in through the pipe C and G by the pump B and forced into the bottom of the tank A. The air therein is compressed to any required degree and there held by the check-valve between the pump and the tank. Having stopped pumping, the water is subject to future use. When water is required for use the faucet D is opened, the elevation of which is supposed to be twenty-six feet, or equal to ten pounds' pressure to the square inch, and the pressure in the tank forty pounds to the square inch. The excess of thirty pounds will give a high velocity through the jet H and into and through the tube I, as indicated by the arrows, thereby drawing and forcing the liquid, as indicated by the arrows, through the pipes C and E, from the well or other source, to the point of delivery, in quantities proportioned to the difference in pressure.

It is quite evident that this arrangement compensates for or gives back a large percentage of power accumulated in the tank, also giving several gallons of fresh water from the well or other sources of supply for one drawn from the tank. The check-valve at C, Fig. 2, prevents the flow back when the pump is at work.

I claim as my invention—

The combination of the compressed-air chamber A and a supply apparatus, B, with the jet-pipe K H and suction-pipe C, all arranged for operation substantially as specified.

PHILIP W. MACKENZIE.

Witnesses:

CHAS. W. IBELL,
CHAS. T. HARRIS.