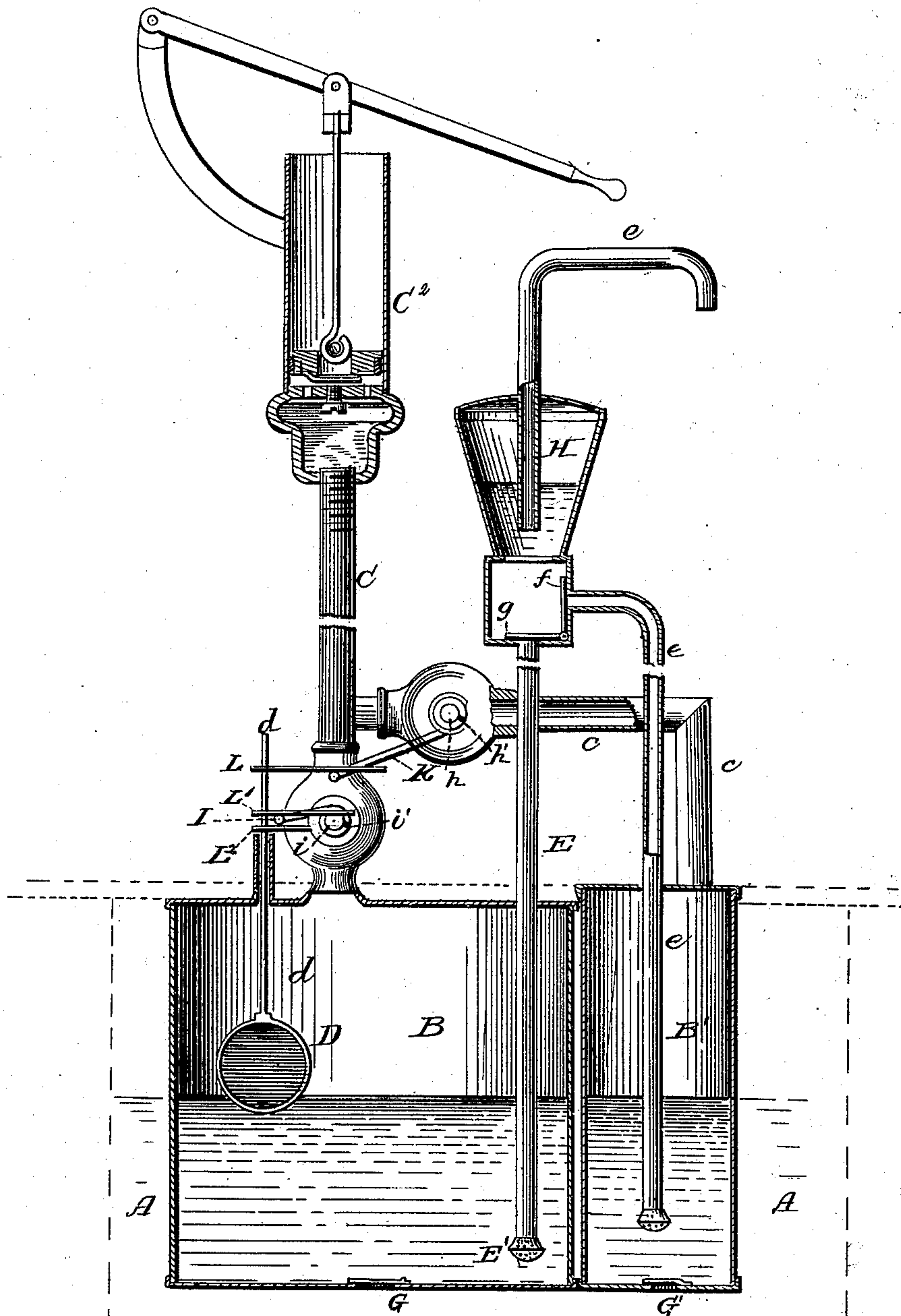


T. B. KEATING, L. W. CLARKE & W. W. GELATT
Compressed-Air Water-Elevator.

No. 223,925.

Patented Jan. 27, 1880.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS B. KEATING AND LAFE W. CLARKE, OF SHERMAN, TEXAS, AND
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COMPRESSED-AIR WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 223,925, dated January 27, 1880.

Application filed October 15, 1879.

To all whom it may concern :

Be it known that we, THOMAS B. KEATING and LAFE W. CLARKE, both of Sherman, in the county of Grayson and State of Texas, and
5 WALLACE W. GELATT, of the city of Washington, in the District of Columbia, have invented certain new and useful Improvements in Compressed-Air Water-Elevators; and we do hereby declare that the following is a full,
10 clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and which represents a sectional side elevation
15 of our apparatus.

This invention relates to compressed-air elevators for raising water from wells, cisterns, or similar reservoirs; and it consists in the improvements hereinafter fully described, and particularly pointed out in the claim.

In the drawing, B represents the main, and B' the supplemental, tank of our apparatus, each of which has a bottom valve, (denoted by
25 G and G', respectively,) both tanks being immersed into the well or cistern A. Tank B is provided with an air-pipe, C, and discharge-pipe E, which may have any suitably-constructed outlet or nozzle, and is provided, a
30 short distance below its outlet, with an air-chamber, H. The supplemental tank B' is in like manner provided with an air-pipe, c, and discharge-pipe e, pipe c opening up into the air-pipe C of tank B, and pipe e connecting
35 with pipe E. Above the well or cistern is an air-pump, C², which may be operated by hand or by any suitable and convenient power.

f is a valve, which is arranged within a chamber or enlargement at the point where pipes e E
40 connect, and has its seat upon the mouth of pipe e, and g is a similar valve, which has its seat upon pipe E; but instead of these two valves f g a single vibrating valve may be employed, which will close alternately the mouths
45 of pipes e and E. The main air-pipe C has a stop-cock, i, which is provided with a vent-hole, i', and its branch pipe c has a similar stop-cock, h, having a vent-hole, h'. The stop-cocks i h are provided each with an arm, I K,
50 which are operated by fingers L L' L², project-

ing laterally from a vertical rod, d, which is inserted through a stuffing-box in the top of tank B in such a manner as to enable it to slide up and down easily and with a minimum of friction. At the end of rod d is a float, D, (by preference a hollow ball of galvanized sheet-iron,) which floats upon the surface of the water in tank B and controls the position of rod d. 55

The operation of this apparatus is as follows: Tanks B and B' having both been filled with
60 water through their valves G G' while the apparatus is at rest, the float D, with its connecting-rod d, will be in the top of its tank B, in which position the arms or tappets L L' L² will, on their upward passage, have opened
65 the stop-cock i, but closed the stop-cock h. Water being wanted, the air-pump C² at the top of the well is set to work, which forces air down through pipe C into tank B, thus closing
70 valves G and f, and causing the water to rise in pipe E and opening its valve g. As the water rises the air in chamber H is compressed, and presently a steady flow will commence at the spout or nozzle of the discharge-pipe. As the
75 water in tank B, from which the supply is drawn, is gradually exhausted, the float D will sink, which lowers rod d until, when the float is near the bottom, the tappets L' L will strike
80 the arms I K, respectively, and thereby shut the stop-cock i of the air-pipe C, at the same time opening its vent-hole i', and open the stop-cock h of pipe c, closing its vent-hole h'. The
85 air now passes from the pump and upper section of pipe C, through its branch pipe c, down into the supplemental tank B', the compressed air in tank B escaping through the vent i', so
90 as to enable it to fill with water again through valve G. While tank B is refilling and its float D, with rod d, gradually rising, the water in tank B' escapes through pipe e up into the upper section of pipe E and chamber H, so that
95 the flow of water continues uninterrupted and in one steady stream as long as pump C² is operated or compressed air supplied to the mouth of pipe C by any other suitable means. Meanwhile the water in tank B' is gradually exhausted, and by the time it is almost empty
100 water will have risen in tank B to such a height that the float will again be near its top, when the stop-cock h will be closed and i opened by

the arms or tappets $L' L^2$ of rod d , on its upward passage, closing the vent-hole i' , but opening h' for the escape of the compressed air from tank B' , which is thus enabled to re-
 5 fill with water through its bottom valve, G' , while an uninterrupted supply is being drawn again from the main tank B ; and so on the supply is drawn alternately from tanks B and B' in one steady stream, without spurts, so
 10 long as the demand for water exists.

It is obvious that the tanks may be located at any distance below the ground, inasmuch as the extent or height to which the column of water may be raised does not depend upon the
 15 natural atmospheric pressure, but upon an artificial air-pressure to which there is practically no limit. As soon as the apparatus has ceased working, the water in the pipes will run back into their respective tanks, so that
 20 there is no danger of freezing either of the pipes or of the tanks, which, as has been already stated, may be immersed at a sufficient depth to be out of the reach of frost.

We are aware that twin tanks operating alternately have been used before in this class of
 25 apparatus in connection with a system of air-pipes the stop-cocks of which are operated automatically by a float in one of the tanks; nor do we claim such construction and arrangement,
 30 broadly; but

What we claim as our improvement, and desire to secure by Letters Patent of the United States, is—

In a pneumatic pump or apparatus for raising water by compressed air, the combination, 35 with the twin tanks $B B'$ and their respective air-pipes $C c$ and discharge-pipes $E e$, constructed and arranged as described and provided with stop-cocks $i h$, having vents $i' h'$ and operating-arms $I K$, of the float-rod d , 40 provided with laterally-projecting parallel arms or tappets $L L' L^2$, for operating said arms $I K$ of the air stop-cocks or valves $i h$, substantially in the manner and for the purpose herein shown and set forth. 45

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of witnesses.

THOMAS B. KEATING.
 LAFE W. CLARKE.
 WALLACE W. GELATT.

Witnesses to the signatures of Keating and Clarke:

A. F. WRIGHT,
 L. W. WILLIAMS.

Witnesses to the signature of Gelatt:

GEO. F. GRAHAM,
 JOSEPH T. POWER.