

J. A. Bailey
Water Elevator.

N^o 89,909.

Patented May 11, 1869.

Fig. 2.

Fig. 1.

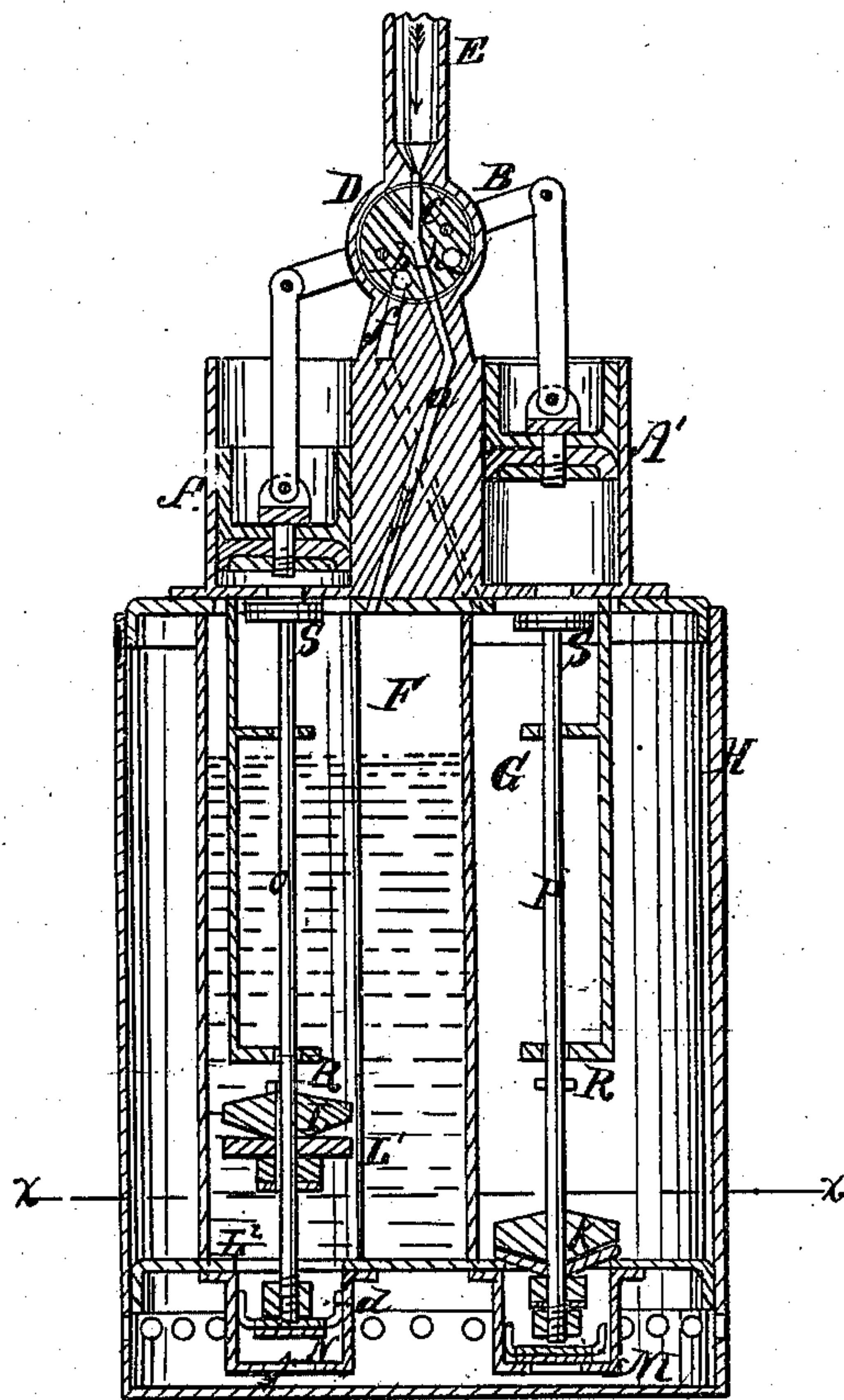
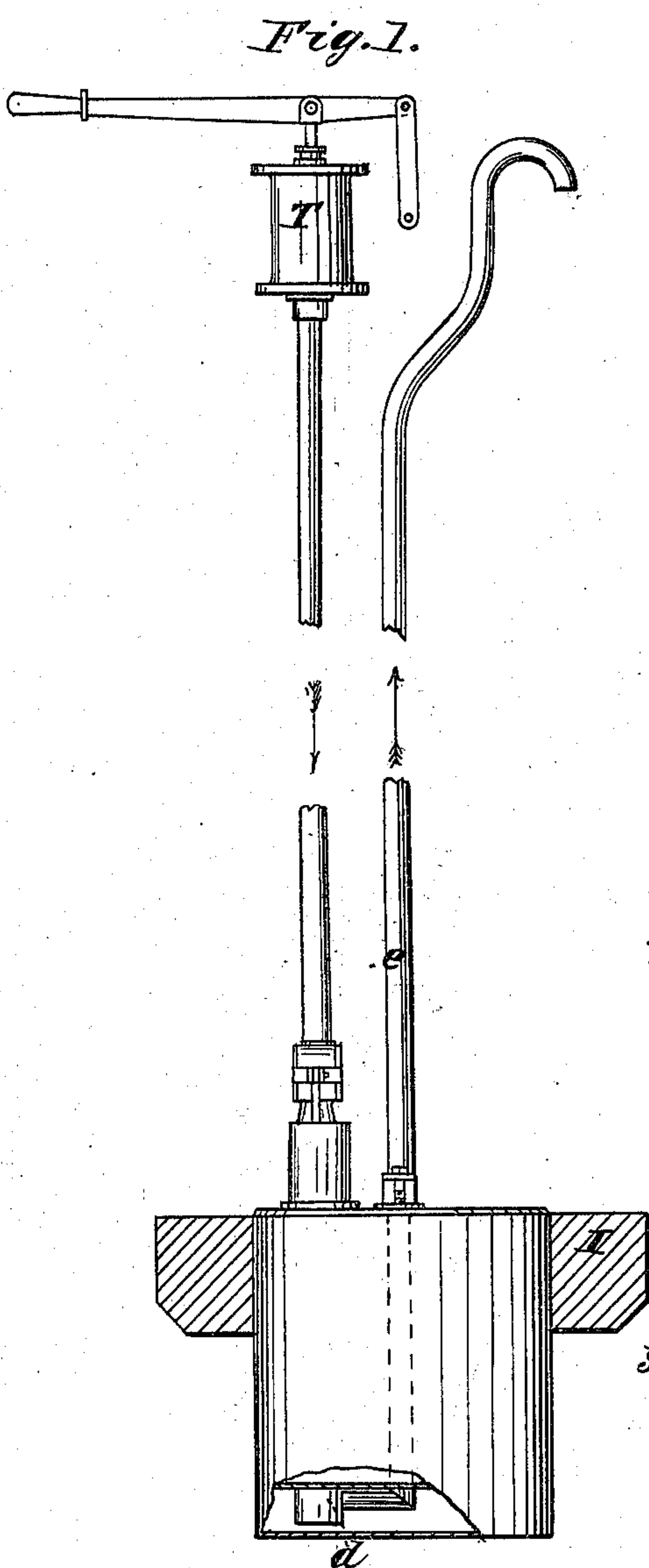
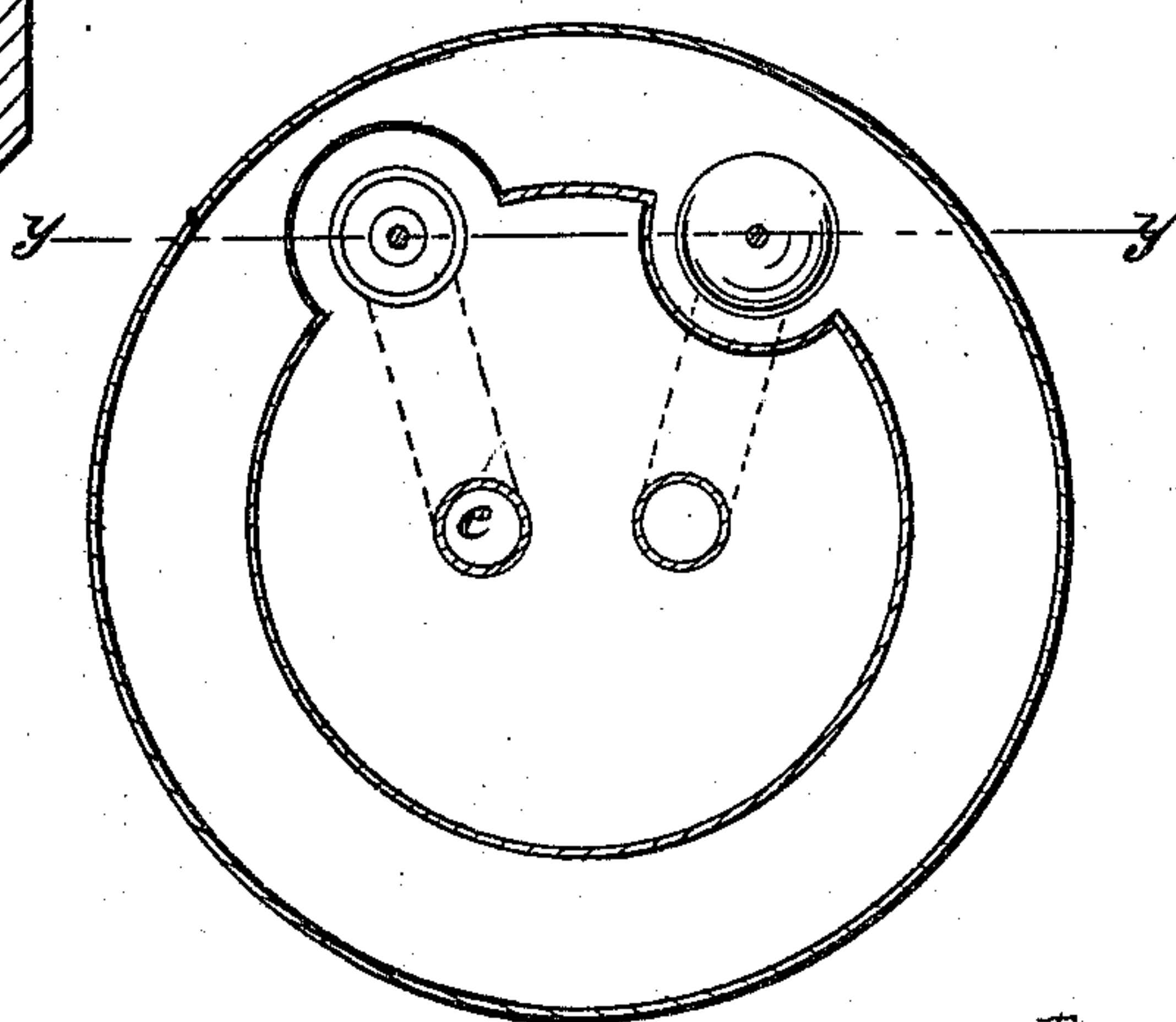


Fig. 3.



Witnesses

A. Benneckenhoff
H. A. Morgan

Inventor.

J. A. Bailey

per Munn & Co
Attys

United States Patent Office.

JOHN A. BAILEY, OF DETROIT, MICHIGAN.

Letters Patent No. 89,909, dated May 11, 1869.

IMPROVEMENT IN PNEUMATIC PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN A. BAILEY, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and useful Improvements in Pneumatic Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in pumps, such as are actuated by the force of compressed air, and adapted more particularly for use in mining-shafts, the object of which is to dispense with the employment of connecting-rods of great length, or other connecting-mechanism, such as has been heretofore necessary to supply the power from the surface of the earth to the pumps located in deep shafts.

Also, to facilitate the location of the pumps in any part of the shaft, without reference to the conditions required when connecting-rods are used, with respect to the placing and securing the said connecting-rods

In the accompanying drawings—

Figure 1 represents an elevation of my improved pump;

Figure 2 represents a sectional elevation of the same, taken on the line *y y* of fig. 3; and

Figure 3 represents a transverse section, taken on the line *x x* of fig. 2.

Similar letters of reference indicate corresponding parts.

A and A' represent the cylinders of a double-acting valve-operating mechanism, the upper ends of which are open to the atmosphere, and the pistons are connected to the walking-beam B, the axis of which carries an oscillating valve, C, working in an enlargement, D, of an air-tube E, forming a seat for the said valve, and provided with ports for admitting air to and exhausting air from the chambers F' and G of a vessel, H, on the top of which the said mechanism is secured, and which is intended to be suspended on a float, I, to rest on the water.

The bottom of the said vessel is provided with float-valves K L, and check-valves M N.

O and P represent rods passing through the said float-valves, which are free to rise upon the said rods for a short distance, where stops R are provided to arrest their further upward movement.

The upper ends of the said rods are also provided with check-valves S, acting in conjunction with passages from the pump-cylinders to the chambers F' and G.

The air-tube may be made of flexible material, and is intended to convey air from a pump, T, at the top of the shaft, to effect the operation of the pump, which is as follows:

The valve-operating pistons being in the position represented in the drawings, the compressed air will be admitted through the induction-passage *a* to the

chamber F, which has received a supply of water, while the exhaust-passage *b* of the valve will be in communication with the chamber G, allowing the air to escape therefrom.

The pressure of the air on the water in the chamber F will cause the check-valve N to fall, and will force the water through the orifice *d* to the discharge-pipe.

When the water has been thus forced out sufficiently to allow the rubber washer L', under the float-valve, to rest on the seat L³, the continued pressure of the air will force the valve L, which is made conical for the purpose on its lower face, down, as represented at K in the chamber G, so as to withdraw the valve S, and open the passage for the air into the cylinder A, under the plunger therein, and force it upward, and the plunger in the cylinder A' downward.

While this change has been taking place, water will have been received into the chamber G, and when the change is accomplished, the valve C will have opened the passage *f* to admit the compressed air to the chamber G, to act upon the water therein, while the exhaust-passage *h* will be opened to the air in the chamber F, to exhaust it and admit the water therein.

By this arrangement an automatically-operating device is provided, which may be readily placed in any position, and operate successfully to raise the water to any desired height, without attention, except to supply the air, and requiring only a tubular connection with the air-pump, which, being made by preference of flexible material, obviates the expensive arrangements necessary when ordinary means of operating pumps are used.

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

1. The pneumatic pump, arranged as described, to effect the elevation of the water by the direct action of the compressed air on the water, and provided with its valve-mechanism D C b h f a, substantially as shown, for changing the pressure from one chamber to another, to admit of alternately filling the same, all as and for the purpose specified.

2. The valve C, as arranged to be operated by means of the compressed air, the same being admitted to act thereon after having expelled the water from the chamber F or G, through the medium of the float-valves L K, substantially as and for the purpose specified.

3. The vessel H, having the compartments F G, the valve C, provided with passages, as described, and its operating-mechanism, the float-valves L K and valves S, all arranged and combined substantially as and for the purpose specified.

The above specification of my invention signed by me, this 21st day of October, 1868.

JOHN A. BAILEY.

Witnesses:

FRANK BLOCKLEY,
ALEX. F. ROBERTS.