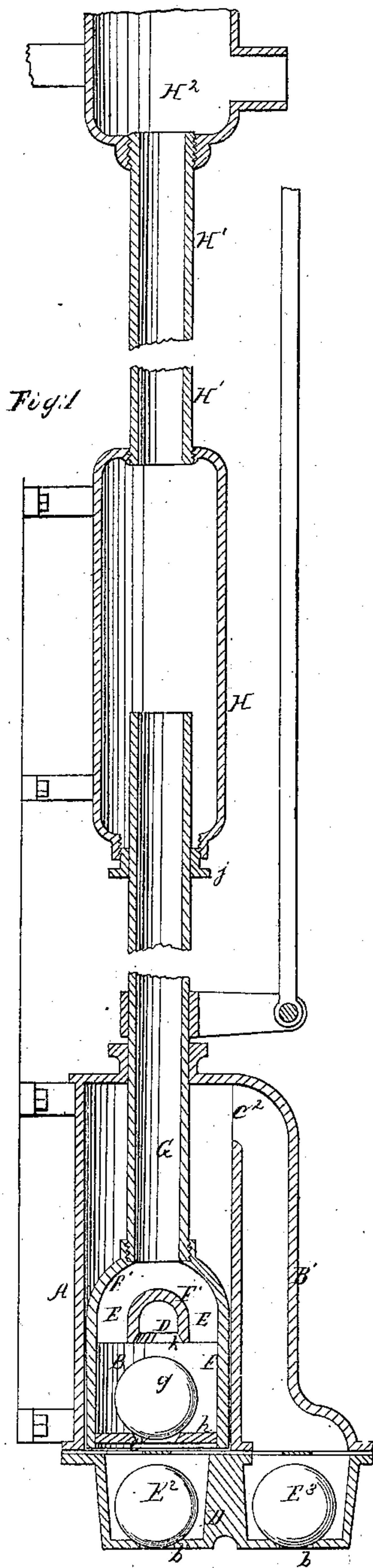


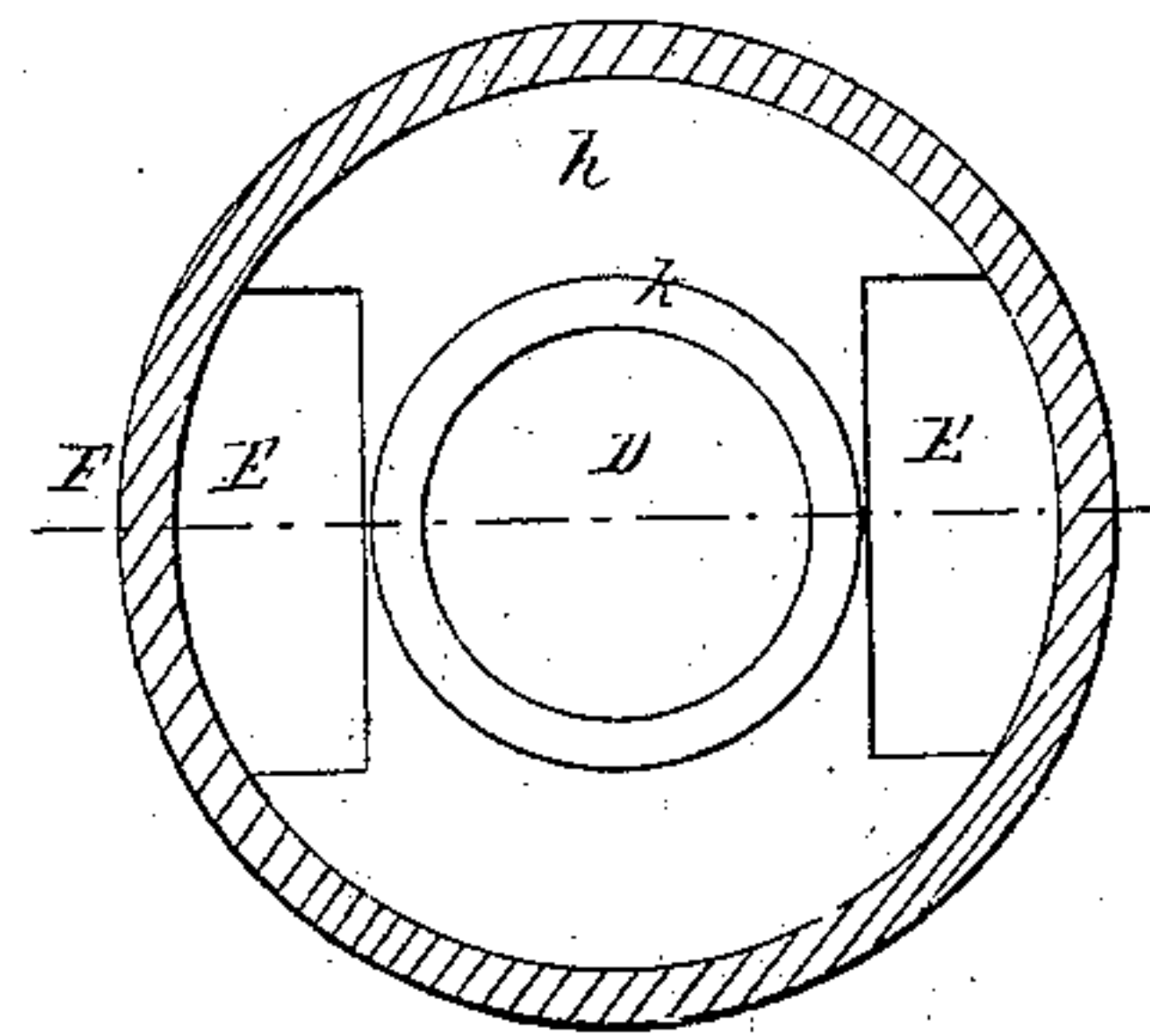
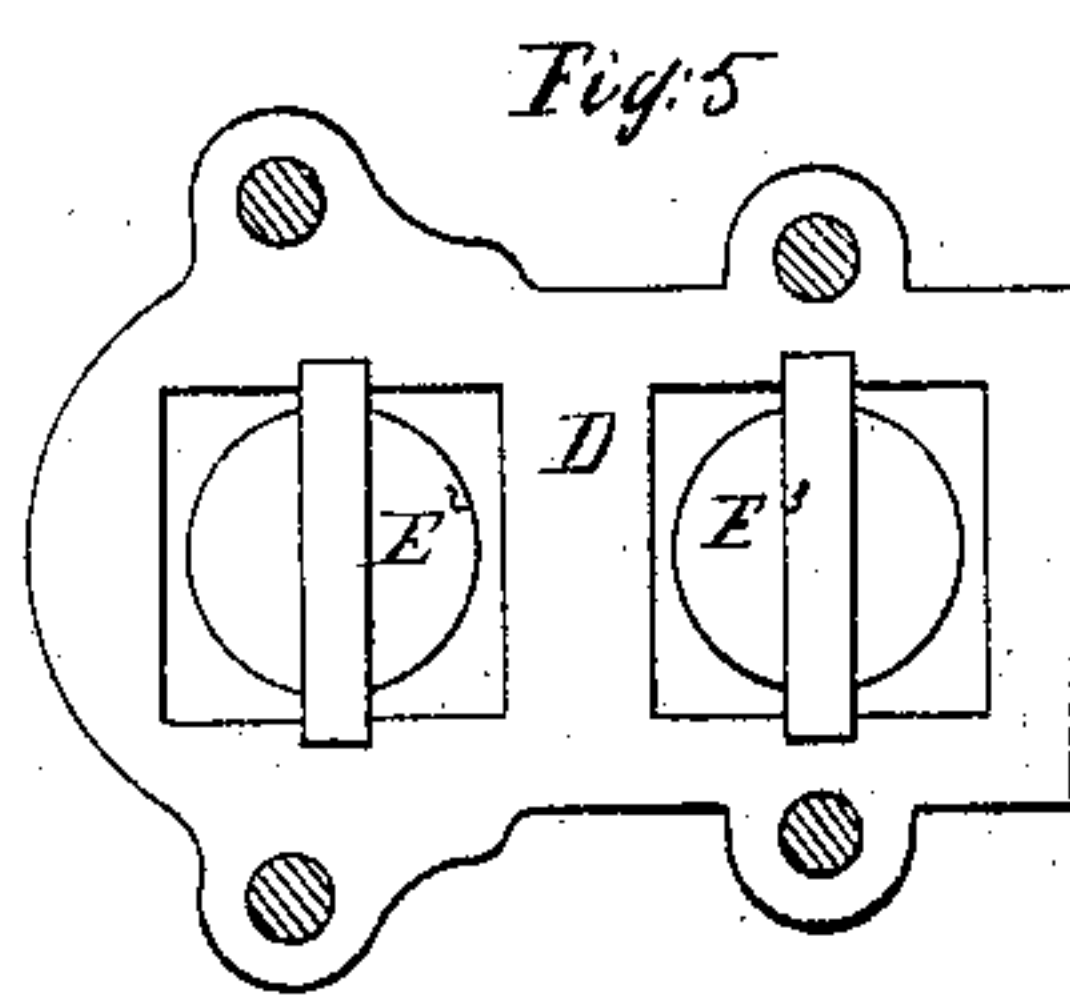
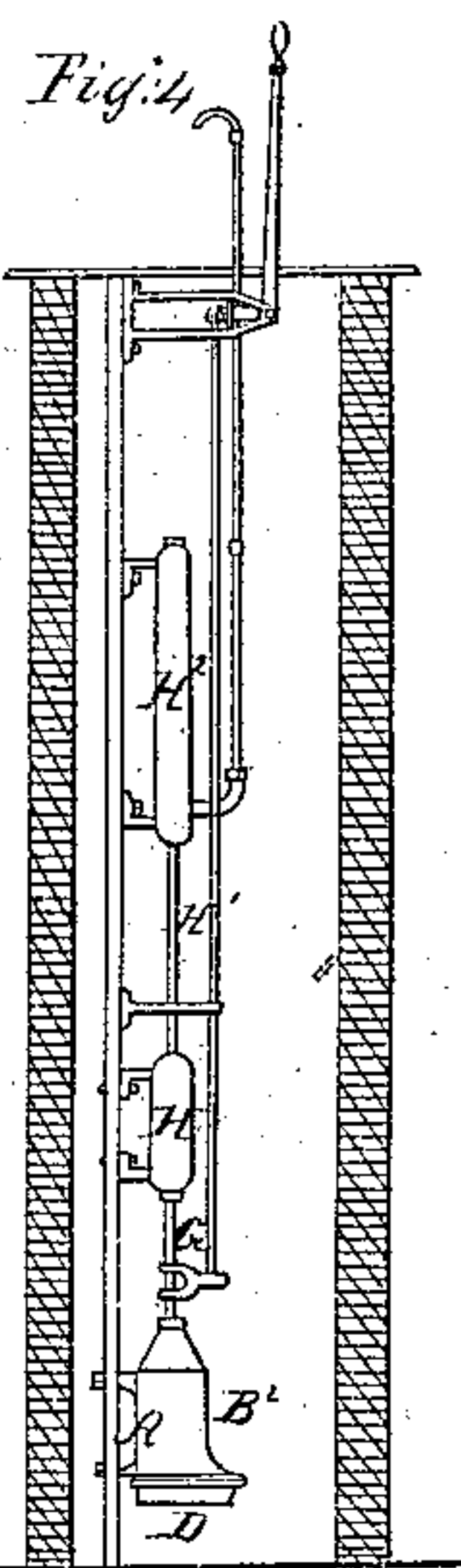
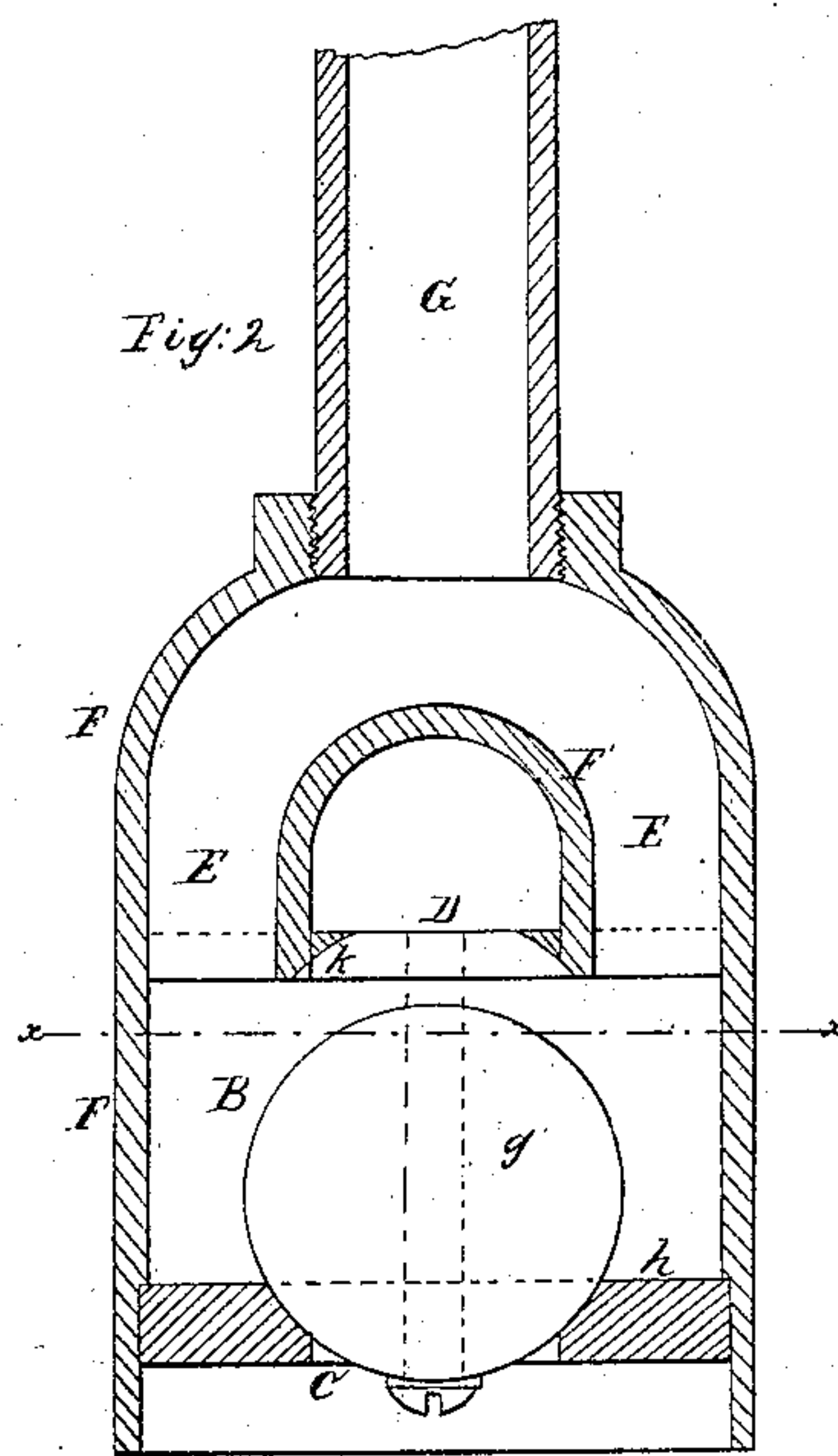
*W. S. Kelly,
Pump Lift,*

Patented Aug. 23, 1864.

N^o 43,917.



*Witnesses
C. Schaffer
Robt W. Goggin*



Inventor

*Wm. S. Kelly
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UNITED STATES PATENT OFFICE.

WILLIAM S. KELLY, OF SCHENECTADY, NEW YORK.

IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. 43,917, dated August 23, 1864.

To all whom it may concern :

Be it known that I, WILLIAM S. KELLY, of Schenectady, in the county of Schenectady and State of New York, have invented a new and useful Improvement in Double-Acting Force-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 shows a vertical section of the pump patented by me on the 25th day of February, 1862, with my present improvement applied to it. Fig. 2 is a vertical section of my present improved piston. Fig. 3 is a horizontal section of the same on an enlarged scale in the line *x x*, looking upward. Fig. 4 is a section of a well with my improved pump applied therein. Fig. 5 is a horizontal section in the line *y y*.

The invention that I have here made relates to the construction of the piston, and whereby one valve, in connection with the piston, directly answers the purpose of several valves. It also relates to an intermediate receiving-chamber between the cylinder and the air-chamber.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the drawings I have shown a pump-cylinder, A, with a side or front chamber, B', communicating with it by a top port, C². This cylinder I have also shown resting upon a base valve-chamber or box, D, which is open at top and divided into two chambers by a partition, across the center of the top of which a narrow top bar is placed. I have also shown a ball-valve, E² E³, in each chamber, these valves covering circular passages *b* in the bottom of the valve-box, but having freedom to rise when water is flowing into the chamber D. Thus far the pump is just the same as the one shown in my patent of February 25, 1862, and for further particulars thereof reference is here made to said patent.

F is a hollow cylindrical piston. Its bottom consists of a plate, *h*, with a central inlet, C, through it. Its top consists of a similar plate mounted by a hollow arch, F', with outlets E E from the piston-chamber B into a hollow piston-rod, G, as shown. Under the arch, at the top of the piston, an inlet, D, is

formed, as shown. The hollow piston-rod attaches to the top of the arch and the outlet-passages E E run directly into the hollow chamber of the piston-rod and into valve-chamber B.

Within the valve chamber B of the piston a ball-valve, *g*, is placed. This valve is small enough with respect to the depth of the chamber B to allow water to circulate in the chamber under, above, and around it during the operation of the pump. It will be noticed that the upper seat of this valve is formed in the under side of the arch F'. (See *k*, Fig. 2.)

The piston-rod extends up from the arch F' and enters a stationary water-receiving chamber, H, terminating in the same. The chamber H terminates in a reduced pipe, H', and this pipe at its upper end screws firmly into an air-chamber, H². From the air-chamber a discharge-pipe extends to any convenient and desired position, as illustrated in Fig. 4.

In order to work the piston from the top of the well, a long connecting-rod is attached to the piston-rod at a point below the stuffing-box *j* of the receiving-chamber, as illustrated.

From the foregoing description it will be evident that my improvement only embraces a new construction of piston and an intermediate receiving-chamber, the former rendering one valve in the piston of an upright pump capable of answering the purpose of two or more, and the latter obviating the necessity of using a long moving hollow piston, or enabling me to employ a short moving portion, and to make the other portion stationary.

Operation: As the piston rises, water enters the passage *b'* and fills the cylinder A. As the piston descends the valve E² of the cylinder closes, and the valve E³ of the chamber B' opens and allows water to fill the chamber B' and the space of the cylinder outside of the piston rod. Simultaneously with the inflowing of the water into the chamber B' the water which was first received into the cylinder escapes under the valve *g* and through the passages E E into the hollow piston-rod. As the piston again rises the water which is in the chamber B' and the space outside the hollow piston-rod is caused to escape under the arch F' into the chamber B above the ball-valve *g* and through the passages E E into the hollow piston-rod. Thus the operation is continuous. The discharged water

passes into the receiving-chamber H, from thence passes up the pipe into the air-chamber, and from this chamber flows into the nozzle-pipe, and finally out through the nozzle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The use of a water-receiving chamber, H, intermediate or between the piston and the discharge-pipe, when the piston is operated from a point below the receiver and the piston-rod terminates within the receiver and plays water-tight in the stuffing-box thereof, substantially as and for the purposes set forth.

2. The construction of the piston F with a

valve-chamber, B, and inlets C D above and below, and one or more outlets above the chamber and leading into the piston-rod, substantially in the manner described.

3. So constructing the chamber B with its inlet and outlet passages C, D, and E², and employing a single valve therein that the piston will enable the pump to operate, substantially in the manner set forth.

WM. S. KELLY.

Witnesses:

R. T. CAMPBELL,
E. SCHAFER.