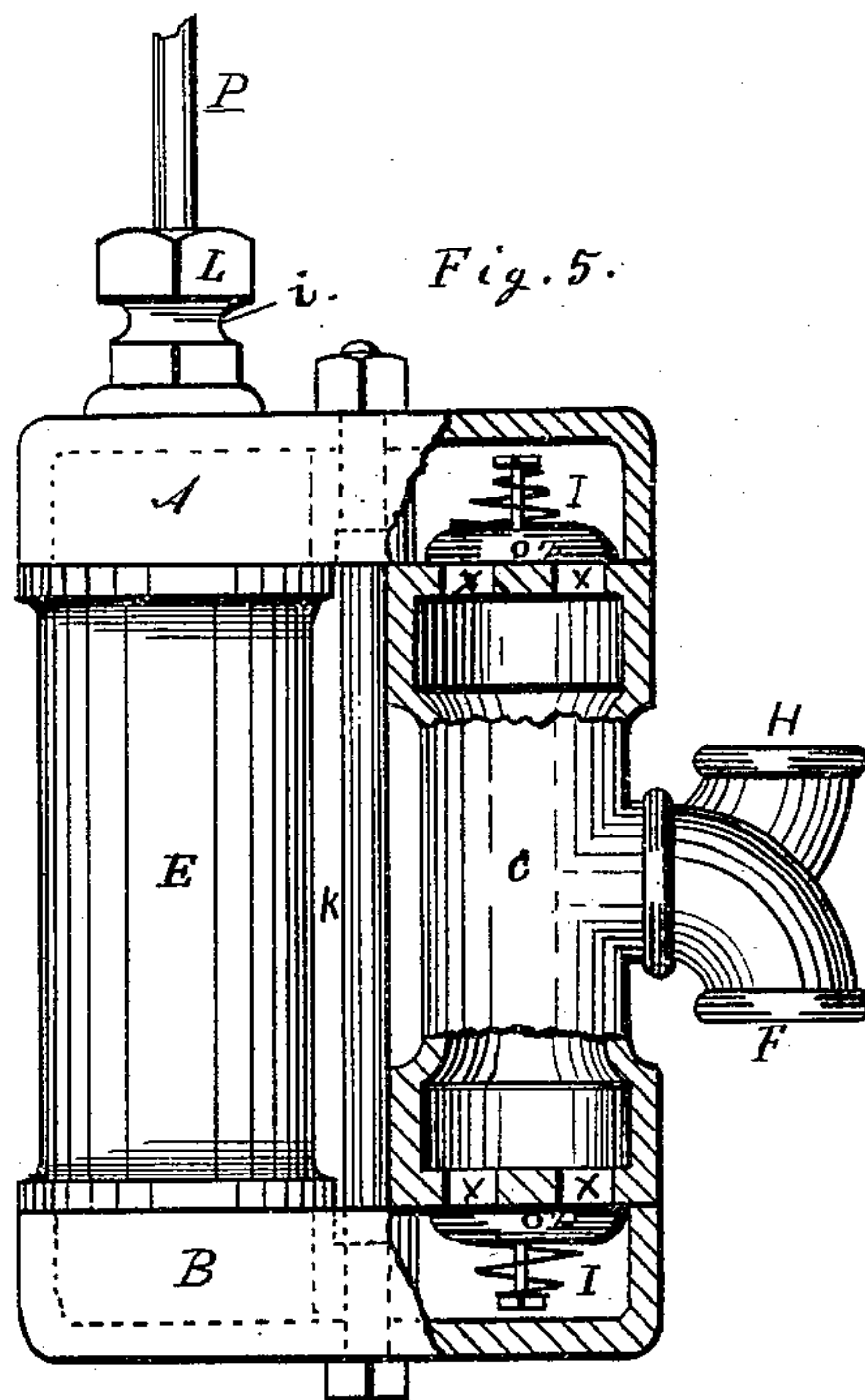
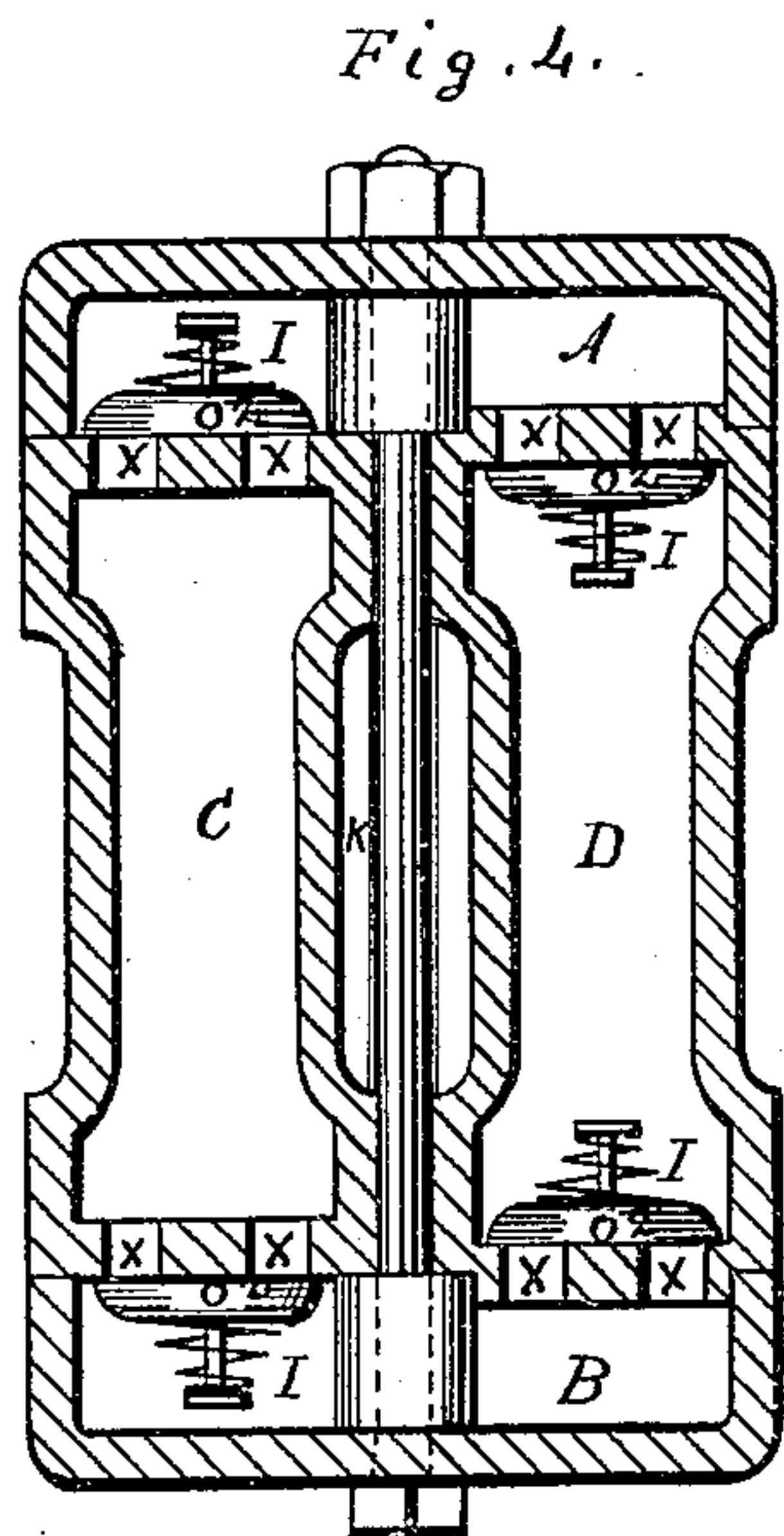
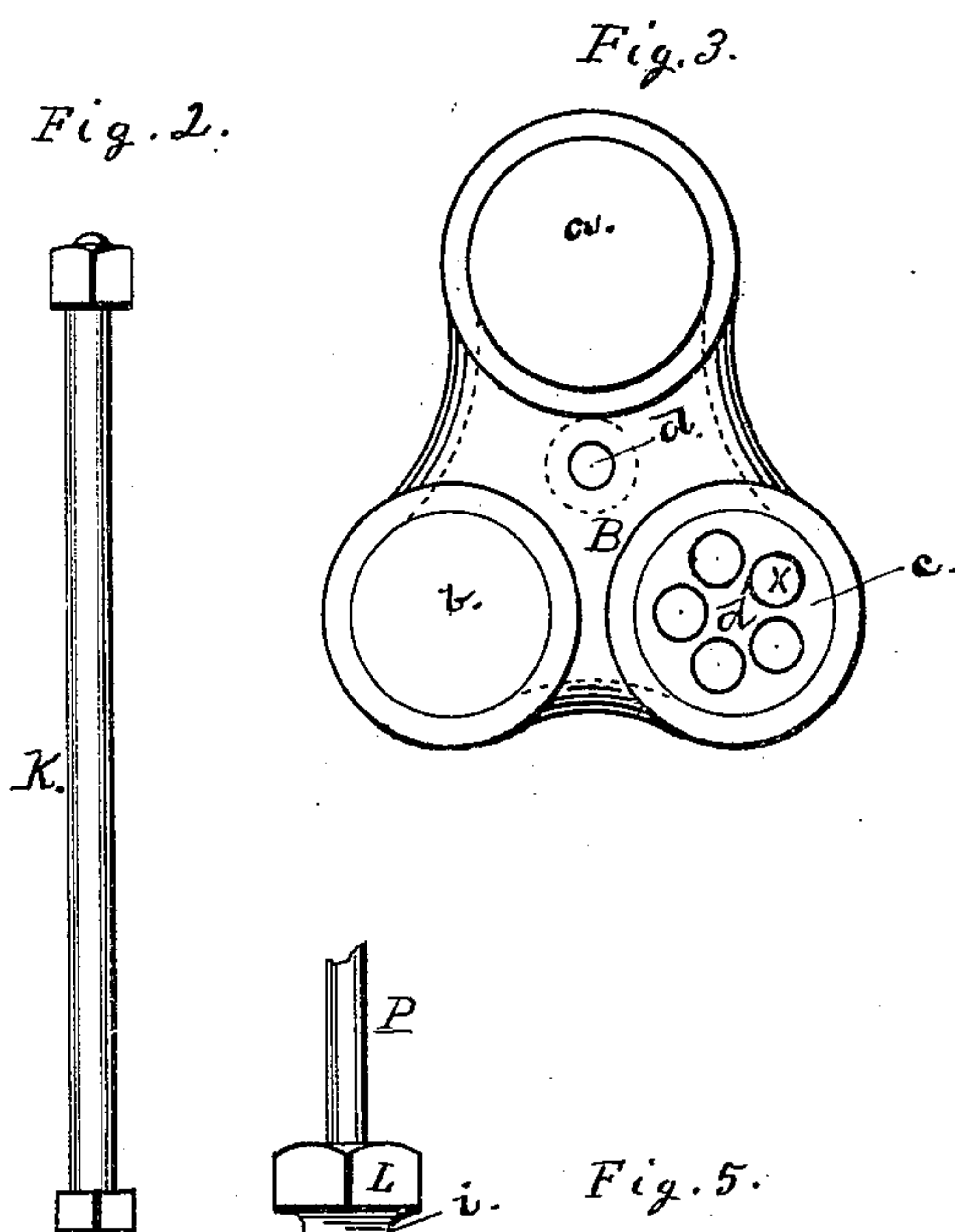
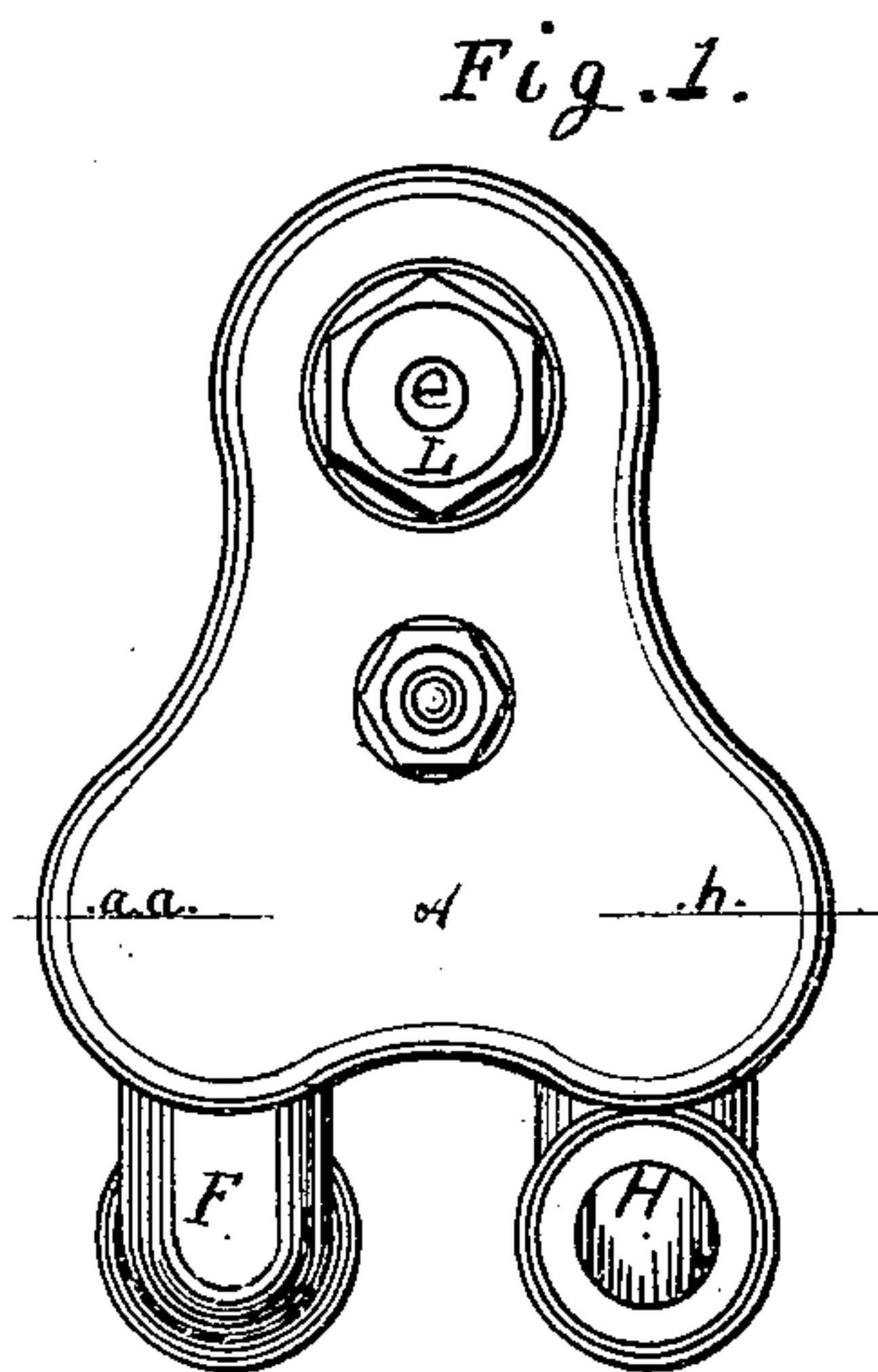


(No Model.)

H. P. MINOT.
DOUBLE ACTING FORCE PUMP.

No. 249,658.

Patented Nov. 15, 1881.



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HIRAM P. MINOT, OF COLUMBUS, OHIO.

DOUBLE-ACTING FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 249,658, dated November 15, 1881.

Application filed October 18, 1880. (No model.)

To all whom it may concern:

Be it known that I, HIRAM P. MINOT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Double-Acting Force-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same; reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention has relation to improvements in double-acting force-pumps, and has for its object to simplify the structure and combination of the parts without lessening the capacity of the device.

My invention therefore consists in a double-acting force-pump formed of a single pump-barrel with piston and head, separable inlet-valve pipe, and a separable discharge-valve pipe, with triangular-shaped top and bottom caps, the whole held together by a single screw-bolt and nut extending centrally through both caps.

My invention further consists in a double-acting force-pump formed with triangular-shaped top and bottom, having circular seats for receiving separable valve-pipes and a pump-barrel, in combination with a bolt centrally located, connecting and securing said caps together.

My invention further consists in the novel construction and arrangement of parts, as will be more fully described, and specifically claimed.

In the accompanying drawings, Figure 1 is a top view of the pump, showing the inlet and discharge pipes of the different valve-pipes. Fig. 2 is the connecting rod or bolt. Fig. 3 is a view of the lower head or cap of the pump. Fig. 4 is a sectional view of the valve-pipes, taken through the line *a a h* in Fig. 1; and Fig. 5 is a side view of the pump, partly in section, showing the internal construction of the inlet-valve pipe.

To manufacture the parts of and construct my improved force-pump, I cast the top head or cap, A, substantially of the triangular shape, as shown in Fig. 1 of the drawings. This cap is formed with the circular seats *a*, *b*, and *c*, as seen in Fig. 3 of the drawings, and has the cen-

tral bolt-hole, *d*, and piston-rod hole *e*, also one of the valve-pipe seats has the valve-seat *d'*. (See Fig. 3.) This cap also has water-ways, for the purposes hereinafter mentioned.

The bottom piece or head, B, is of identical configuration as the cap A, except that in it there is no hole for the passage of the piston-rod. The pump-barrel E, made of double, or nearly double, capacity to the inlet and discharge valve pipes, is then cast. It is cylindrical in shape. The inlet-valve pipe C and discharge-valve pipe D are then cast. They also are cylindrical and formed with the receiving or discharge orifices F and H. These different pipes are of equal length, and are cast to fit their several seats in the heads or caps, and their relative positions on the head are such that a circle drawn from the center of the bolt-hole in the cap through the center of either seat will pass through the center of all.

On the top cap or head, over the pump-barrel, is formed or suitably fixed the bushing *i*, through which the piston-rod works. The piston-head is formed of the usual construction and fits the pump-barrel, and is operated by suitable connection with the power.

The valves *o*² in the valve-pipes are of any desired form, preferably puppet-valves, as shown in the drawings, and they are disposed in pairs, those attached to the inlet-valve pipe being placed at the outer surfaces of the valve-seats and arranged within the water-ways of the heads, and those attached to the discharge-valve pipe being placed within the pipe and against the valve-seats, substantially as seen in Fig. 4 of the drawings.

The letter K represents the connecting-bolt, having the usual head and screw-threads at the ends, and is intended to pass through the center of the caps and between the cylinders of the pump-barrel and valve-pipes and secure the whole device firmly together.

The several parts, as herein described, having been made and prepared, the device is ready to be united. The lower cap or head-piece, with the valves inserted and adjusted as shown in the drawings in Fig. 4, is set ready to receive the cylinders of the pump-barrel and the inlet and discharge valve pipes, and these are set in their respective seats, which having been consummated, the upper cap, with the valves fixed and adjusted as shown in the

drawings, is set on the upright cylinders, the piston and its rod having been put in the pump-barrel. The connecting-bolt is now run in place and the nut applied and screwed up, thereby firmly binding the parts together.

It will be seen by the drawings that the valve-seats of the inlet-valve pipe form the ends of the cylinder, and that the valve-seats of the discharge-valve pipe are cast in the caps.

The operation is readily seen and understood. The induction-pipe of the inlet-valve pipe conducts the water to the interior of the cylinder, and the action of the piston causes the alternate valves to open and close, and thus maintain a constant communication with the water-ways in the caps and pump-barrel, and by the common process the water is discharged in a steady stream at the discharge-pipe. The several valve-seats have perforations to admit and discharge the water from the cylinders. In setting the parts together packing is used wherever it may be required to make a watertight joint. By making the caps of a triangular shape the equilibrium of the pump is preserved and the parts set in relation to each other at the best advantage of utility, space, and strength; and by securing the parts together by a single central bolt I attain all the strength desired to keep them firmly together.

It will be observed the pump may be repaired in any cylinder by simply releasing the central bolt and removing the special part without disturbing or affecting the other.

It will also be observed that the chambers of the valve-pipes are enlarged at the ends for

the purpose of providing for larger valves and for the ready admission and discharge of the water.

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

1. In a double-acting force-pump, the combination of a pump-barrel, the separable and independent inlet and discharge valve pipes, and the bottom and top triangular-shaped pieces, and a central connecting-bolt, substantially as described.

2. The combination, in a double-acting force-pump, of the pump-barrel, with its piston head and rod, the separable and independent inlet and discharge valve pipes, with their puppet-valves, the top and bottom triangular-shaped caps, and central connecting-bolt, substantially as described.

3. In a double-acting force-pump, a triangular-shaped cap having three cylindrical seats for the reception of a pump-barrel, and separable and independent inlet and discharge pipes and water-ways, substantially as described.

4. A double-acting force-pump consisting of the triangular-shaped top and bottom caps, with water-ways, the pump-barrel, with piston head and rod, and the separable inlet and discharge valve pipes, with puppet-valves arranged in pairs, and the central connecting-bolt, substantially as described.

HIRAM P. MINOT.

Witnesses:

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EDWARD C. SHILLING.