

(No Model.)

2 Sheets—Sheet 1.

T. O. PERRY.
DOUBLE ACTING PUMP.

No. 288,108.

Patented Nov. 6, 1883.

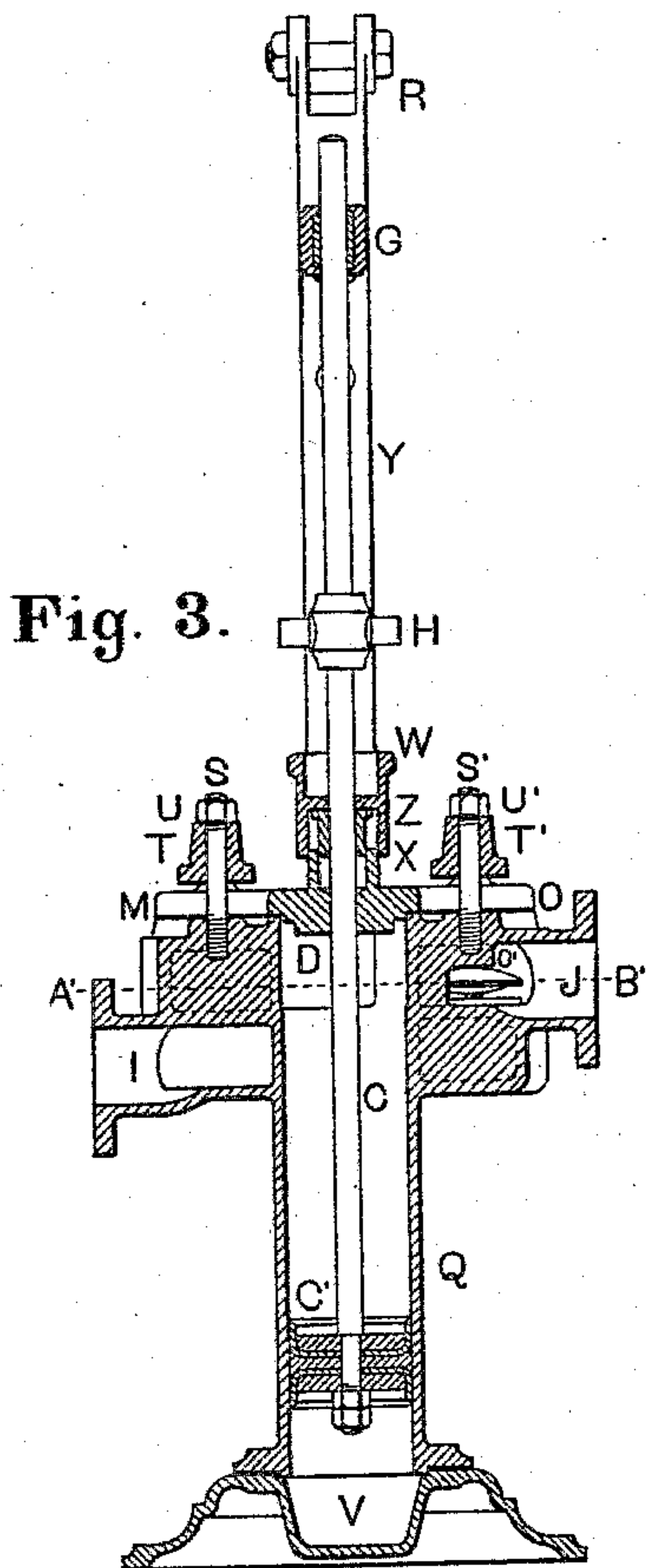


Fig. 3.

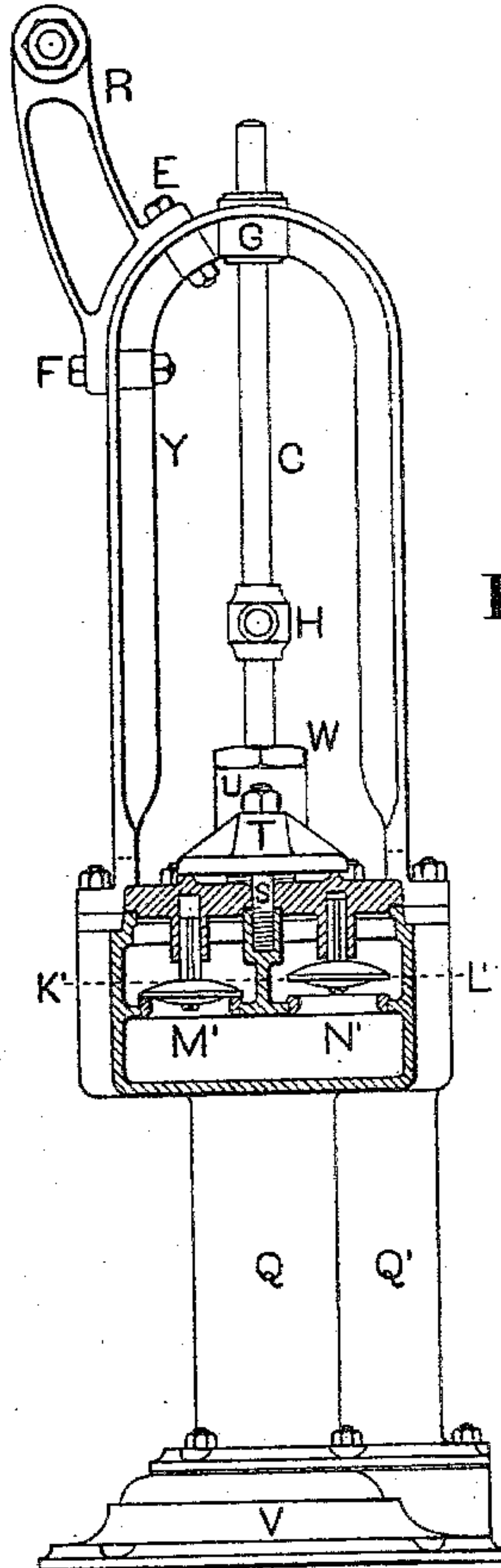


Fig. 2.

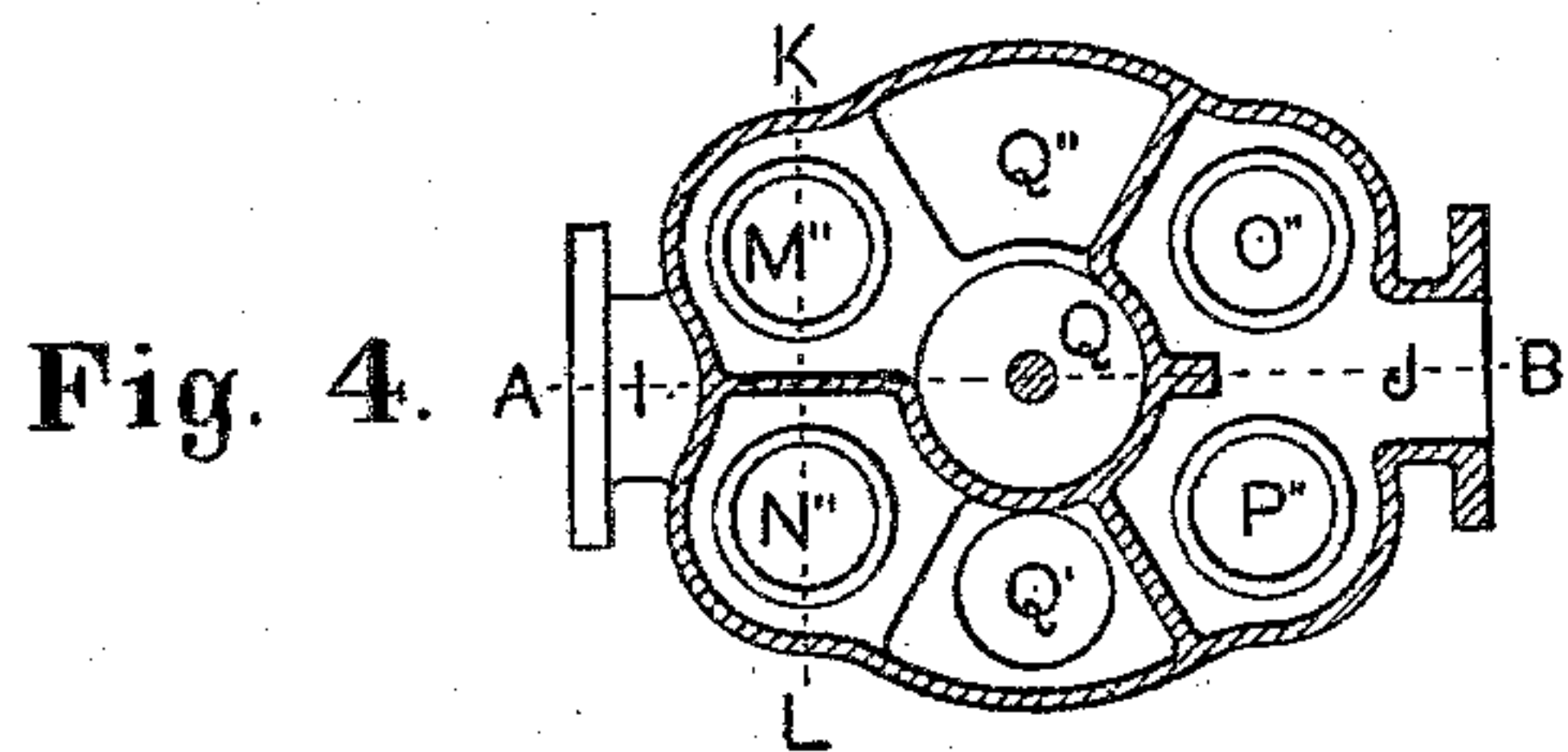


Fig. 4.

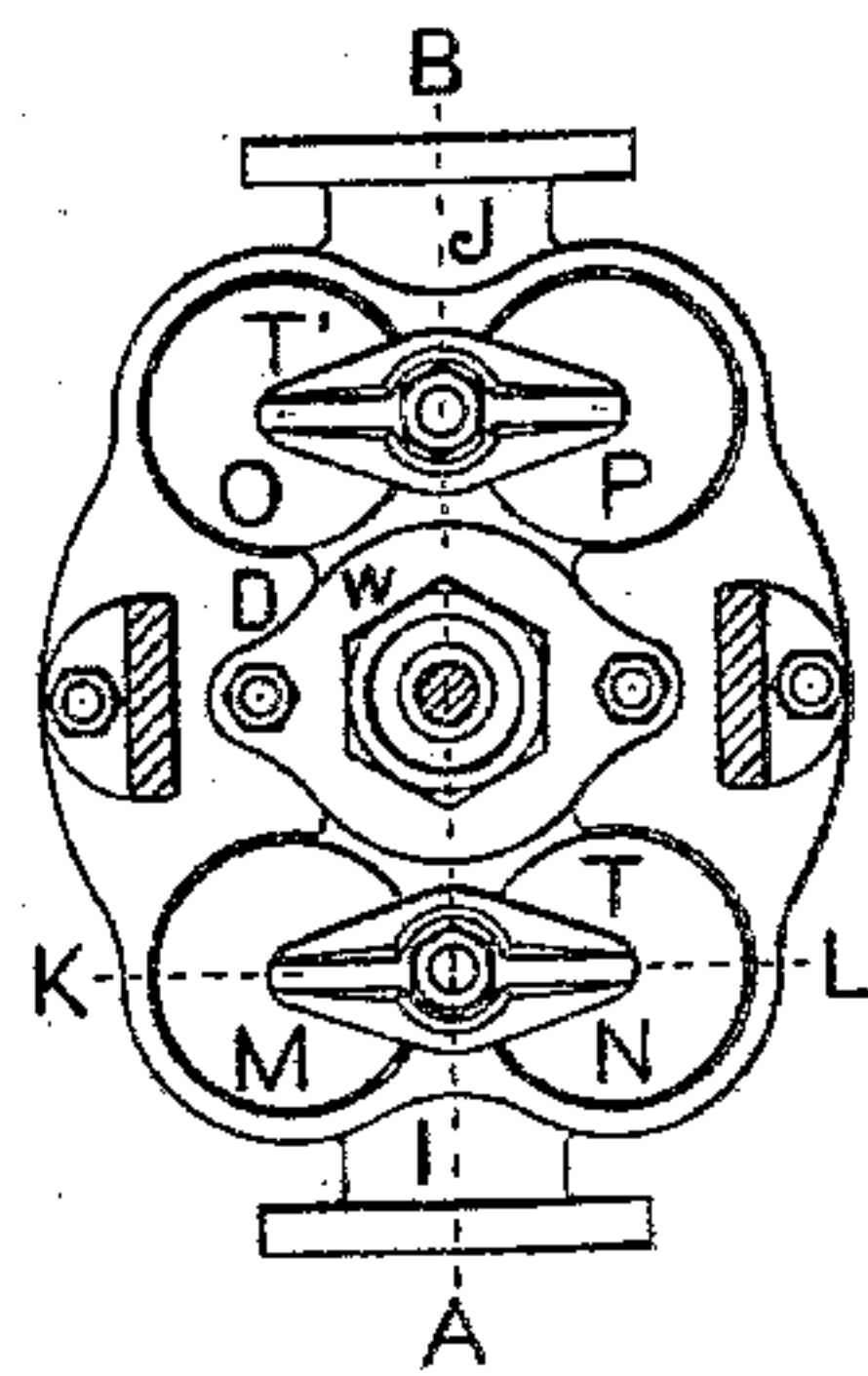


Fig. 1.

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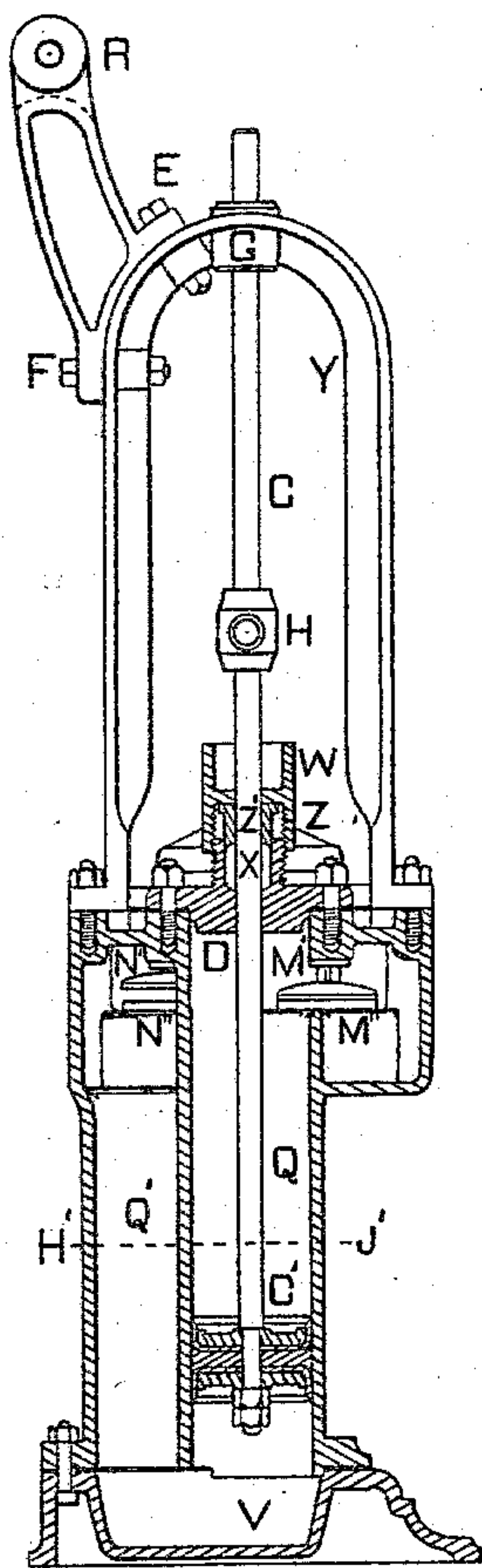


Fig. 7.

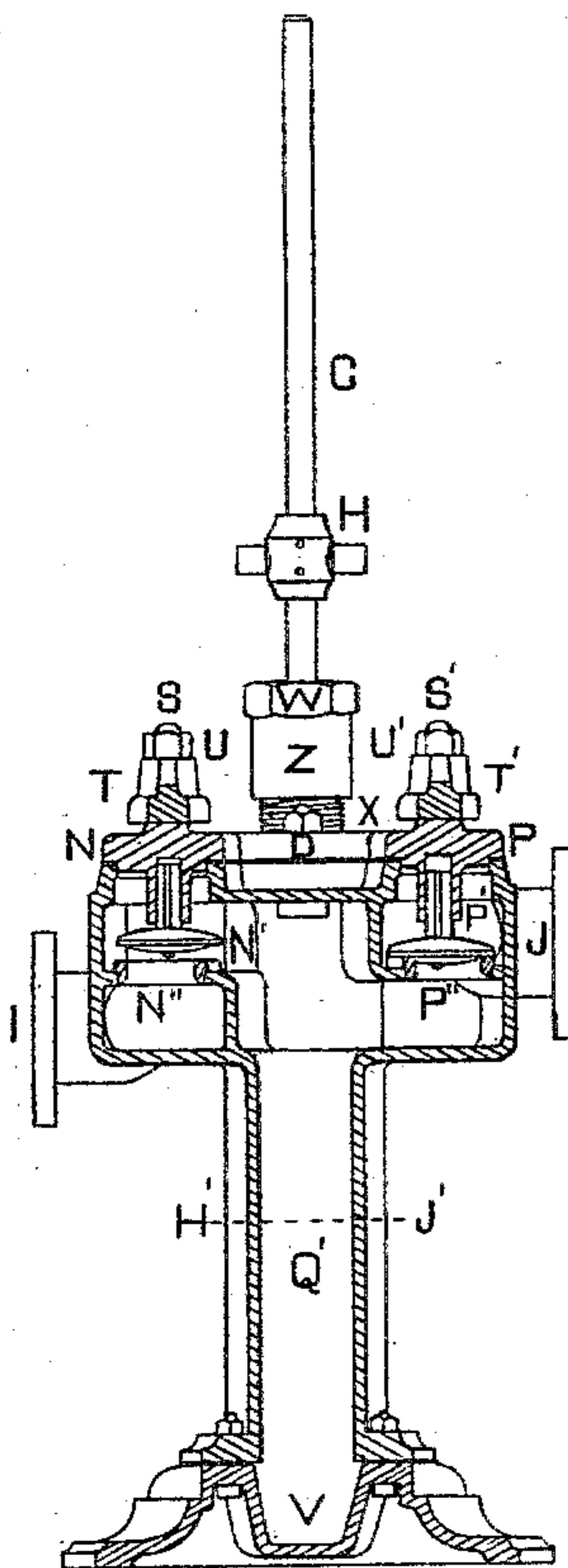


Fig. 6.

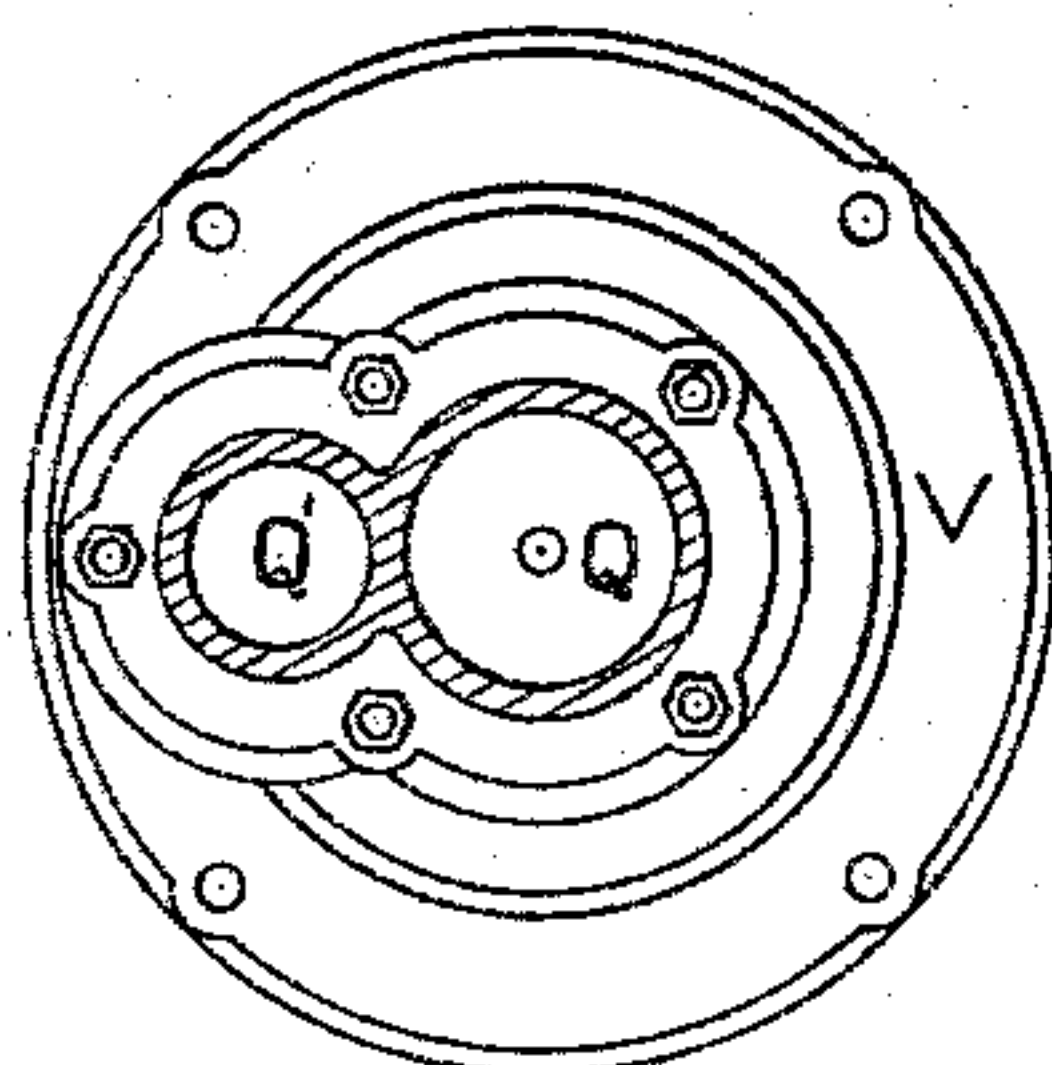


Fig. 8.

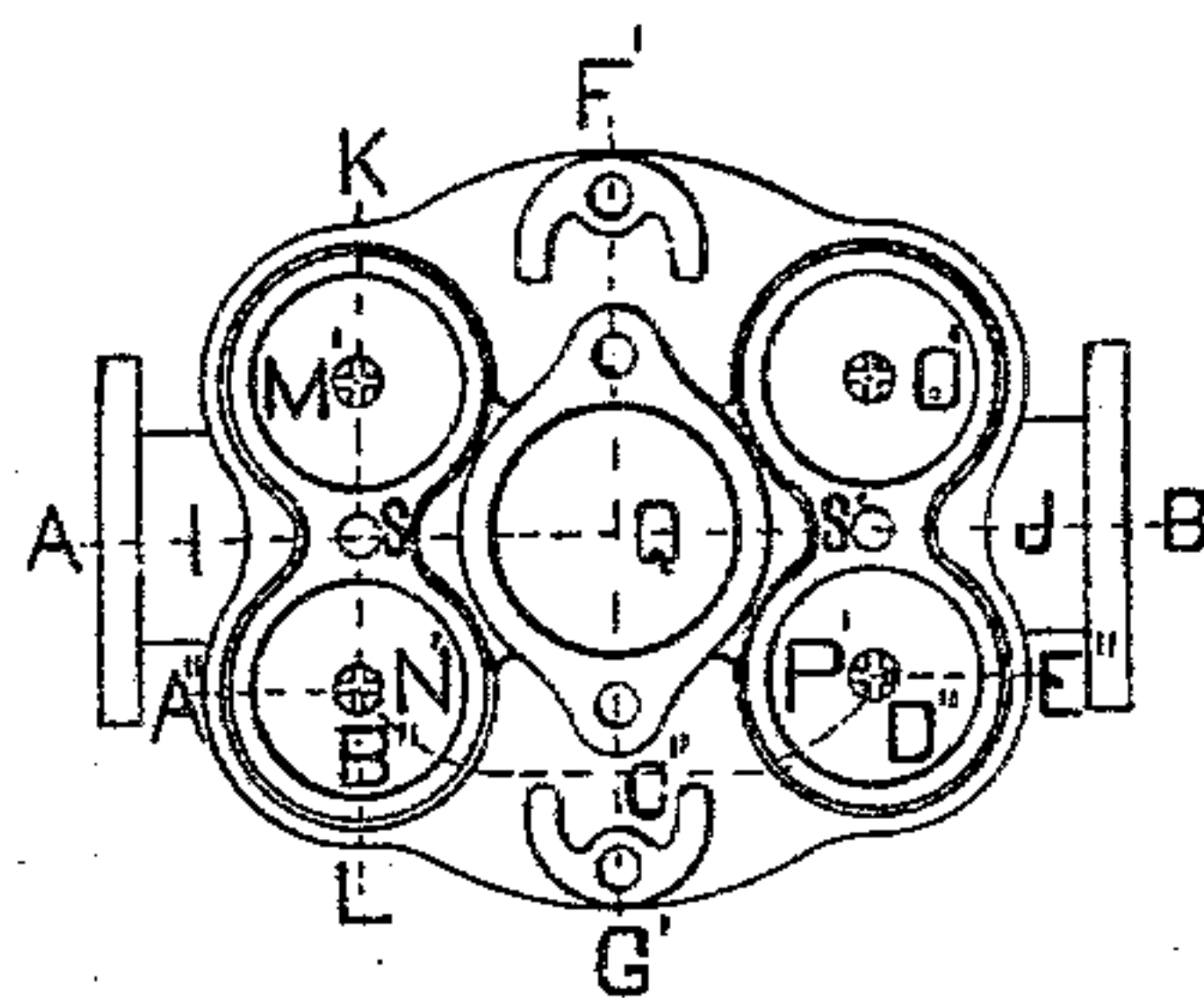


Fig. 5.

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UNITED STATES PATENT OFFICE.

THOMAS O. PERRY, OF BATAVIA, ILLINOIS, ASSIGNOR TO THE UNITED STATES WIND ENGINE AND PUMP COMPANY, OF SAME PLACE.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 288,108, dated November 6, 1883.

Application filed September 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOS. O. PERRY, of Batavia, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Double-Action Pumps, of which the following is a specification.

The invention relates to that class of double-action pumps which have a solid piston working in a single vertical cylinder, and which have all the valves arranged around the top of the cylinder.

In general construction and action this pump is not materially different from some other double-action pumps which have long been in use.

The improvements which I claim as new have for their object, chiefly, facility in construction and convenience in getting at the valves, in case cleaning or repairs become necessary.

In the drawings, Figure 1 is a plan of the top of the pump with the yoke cut off. Fig. 2 is an elevation of the pump, shown partially in section through K L. Fig. 3 is a sectional elevation through A B. Fig. 4 is a sectional plan through A' B'. Fig. 5 is a plan of the top of the pump, with the yoke, piston, cylinder-cap and its attachments, valve-covers and their clamps, all removed, so as to expose the valves and interior of cylinder. Fig. 6 is a vertical section cutting the pump through the connecting-passage and valves communicating therewith. The yoke Y and its attachments are omitted. Fig. 7 is a vertical section cutting the pump through F' G', and also showing the yoke. Fig. 8 is a sectional plan of that part of the pump below the dotted line H' J'.

Similar letters refer to similar parts throughout the several views.

Water is taken into the pump through the inlet I and discharged through the outlet J. Both inlet and outlet are provided with flanges, for convenience in connecting pipes.

The piston C' is solid, and is given a reciprocating motion in the vertical cylinder Q, the upper end of which is covered by the cylinder-cap D, secured by studs and nuts, and made water tight by packing, in the usual way.

A stuffing-box, X, is attached to the cylin-

der-cap D, through which the piston-rod C passes.

There are four valves, M' N' O' P', symmetrically arranged around the top of the cylinder Q. M' and N' are inlet-valves. O' and P' are discharge-valves. M' and O' communicate with the top of the cylinder Q, as shown in Figs. 3 and 7. N' and P' communicate with the bottom of cylinder Q through the connecting-passage Q' and the base V, which is bolted to the bottom of the cylinder Q and connecting-passage Q', and is so formed as to establish communication between them. (See Figs. 4, 6, and 7.) The four valve-seats are shown at M'' N'' O'' P''.

The valves M' N' O' P' are guided and kept in place by their stems fitting loosely into sheaths attached to the under side of the corresponding valve-covers, M N O P. The valve-covers M N O P are directly over the valves M' N' O' P', and cover openings large enough to allow the valves being put in place or taken out through the top of the pump. These covers are provided with shallow shoulders on their under sides, which fit into the openings, covered, so as to prevent lateral displacement. The valve-covers M and N are held down and made tight by a single clamp, T, whose ends are pressed against the elevated centers of each cover by means of a nut, U, and single stud S, which passes through the center of the clamp and is screwed into the top of the pump, between the two valve-covers. In the same way the valve-covers O and P are secured by means of the clamp T', nut U', and stud S'.

The cover to the stuffing-box X is a separate cylindrical piece, Z', which fits inside of the stuffing-box X, and is crowded down against the packing inside by means of a cover-follower, Z, which is screwed onto the outside of the stuffing-box X. A water-box, W, is either attached to or forms a part of the upper end of the stuffing-box follower Z.

The upper end of the piston-rod C works in a guide, G, supported by a yoke, Y, which is attached, by means of studs and nuts, to the top of the pump. The brake-fulcrum R is bolted to the yoke Y by means of the two bolts E and F.

A cross-head, H, is attached to the piston-

rod C, between the guide G and water-box W. This cross-head H may be connected by means of two links, or by one link whose lower end consists of two branches, so as to straddle the yoke Y, to a crank driven by any power—
 5 as a steam-engine—or to a vertically-reciprocating rod, as in case of wind-power, or to a hand-brake fulcrumed at R, if the pump is to be operated by hand; but, however it may be
 10 driven, if the solid piston C is given a vertically-reciprocating motion, the operation of the pump will be as follows: When the piston descends, water is drawn by suction into the top of cylinder Q, through the inlet I and
 15 valve M', filling that part of the cylinder above the piston. Then when the piston ascends the water above the piston will be discharged through the valve O' and discharge J, the valve M' closing meantime. During the as-
 20 cent of the piston water is drawn by suction into the bottom of the cylinder Q, through the inlet I, valve N', and connecting-passage Q', filling that part of the cylinder below the piston. Then when the piston descends the wa-
 25 ter below the piston will be discharged through the connecting-passage Q', valve P', and discharge J, the valve N' closing meantime. Thus water is continually taken in and discharged with both the descent and ascent of
 30 the piston. The valves O' and P' prevent water returning into the cylinder after it is once discharged, and the valves M' and N' prevent water escaping from the cylinder by the way it comes in.
 35 By simply loosening the nut U and turning the clamp T partly around and away from the elevated centers of the covers the covers M and N may be readily removed, thus enabling the valves M' and N' to be taken out and re-
 40 placed without disturbing any other parts. In the same manner the valves O' and P' may be removed and replaced by loosening the nut U' on the stud S' and turning the clamp T' partly
 45 around and away from the elevated centers of the covers O and P. The centers of the covers M N O P are sufficiently elevated, so that when the ends of the clamps are turned away from the centers the covers may be raised high
 50 enough to clear the shoulders on their under sides, after which they may be moved side-
 wise and then upward, so as to clear the clamps. Furthermore, the elevated centers insure central pressure on the covers, even though the clamps should not be turned exactly to their
 55 true position before tightening.

The water-box should not be confounded with the ordinary oil-cup, which in this case would form a conical depression immediately around the piston-rod at the bottom of the water-box, as shown in Fig. 3. The water-
 60 box W is useful only when the stuffing-box leaks sufficiently to allow air to be drawn into the cylinder, so as to interfere with the suction of the pump; but such leakage is liable to occur unless prevented by a body of water
 65 sufficiently deep contained in the water-box W.

I am aware that water-boxes used in connection with stuffing-boxes are not new in pumps of this kind; nor is the stuffing-box
 70 new constructed with stuffing-box cover Z' and cover-follower Z, as I have shown and described; but the novelty which I have introduced consists in attaching the water-box W to or in making it a part of the cover-fol-
 75 lower Z.

In some cases—as, for example, where the pump is driven by steam-power only—the brake-fulcrum is not required at all, and might be in the way. In other cases—as where a wind-
 80 mill drives the pump—the brake-fulcrum may be required occasionally, in case of calms, for pumping by hand. Furthermore, purchasers who originally intend to drive the pump by power only, and afterward find that a hand-
 85 brake is worth the additional cost, can easily be furnished with the brake-fulcrum, &c., all ready to bolt on.

Having thus fully described and explained the nature of my invention, what I claim, and desire to secure by Letters Patent, is—
 90

1. In a double-action pump having valves arranged as shown and described, the clamp T, single stud S, and nut U, in combination with the valve-covers M and N, provided with elevated centers, as and for the purpose herein
 95 shown and described.

2. In a double-action pump whose piston-rod works through a stuffing-box, X, provided with a cover, Z', and cover-follower Z, a water-
 100 box, W, attached to or forming a part of the cover-follower Z, for the purpose of holding around the piston-rod a body of water of sufficient depth to prevent air being drawn into the pump through the stuffing-box, as specified.

THOMAS O. PERRY.

Witnesses:

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