

(No Model.)

J. W. GALLOWAY.  
FORGING AND MIXING PUMP.

No. 275,632.

Patented Apr. 10, 1883.

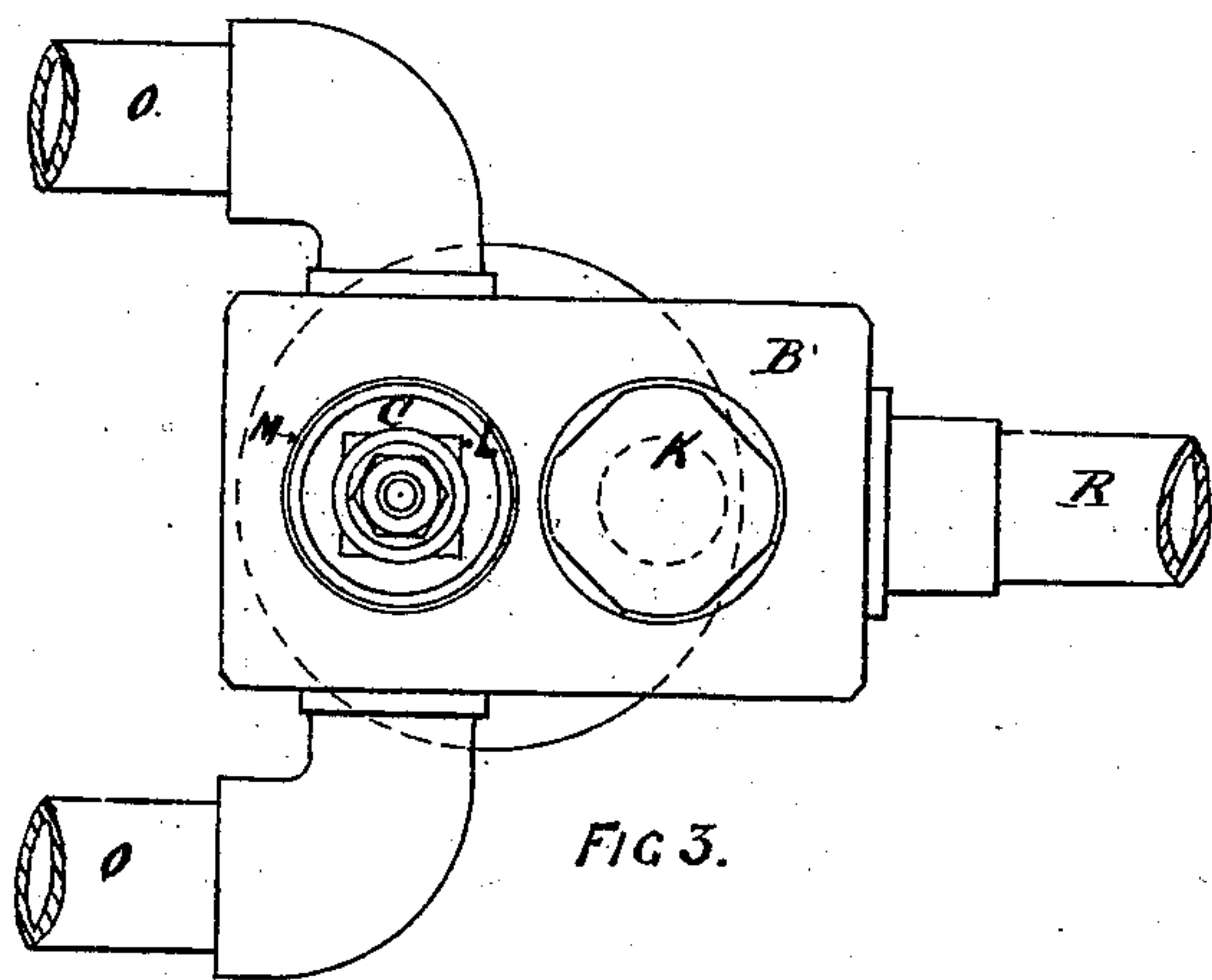


FIG 3.

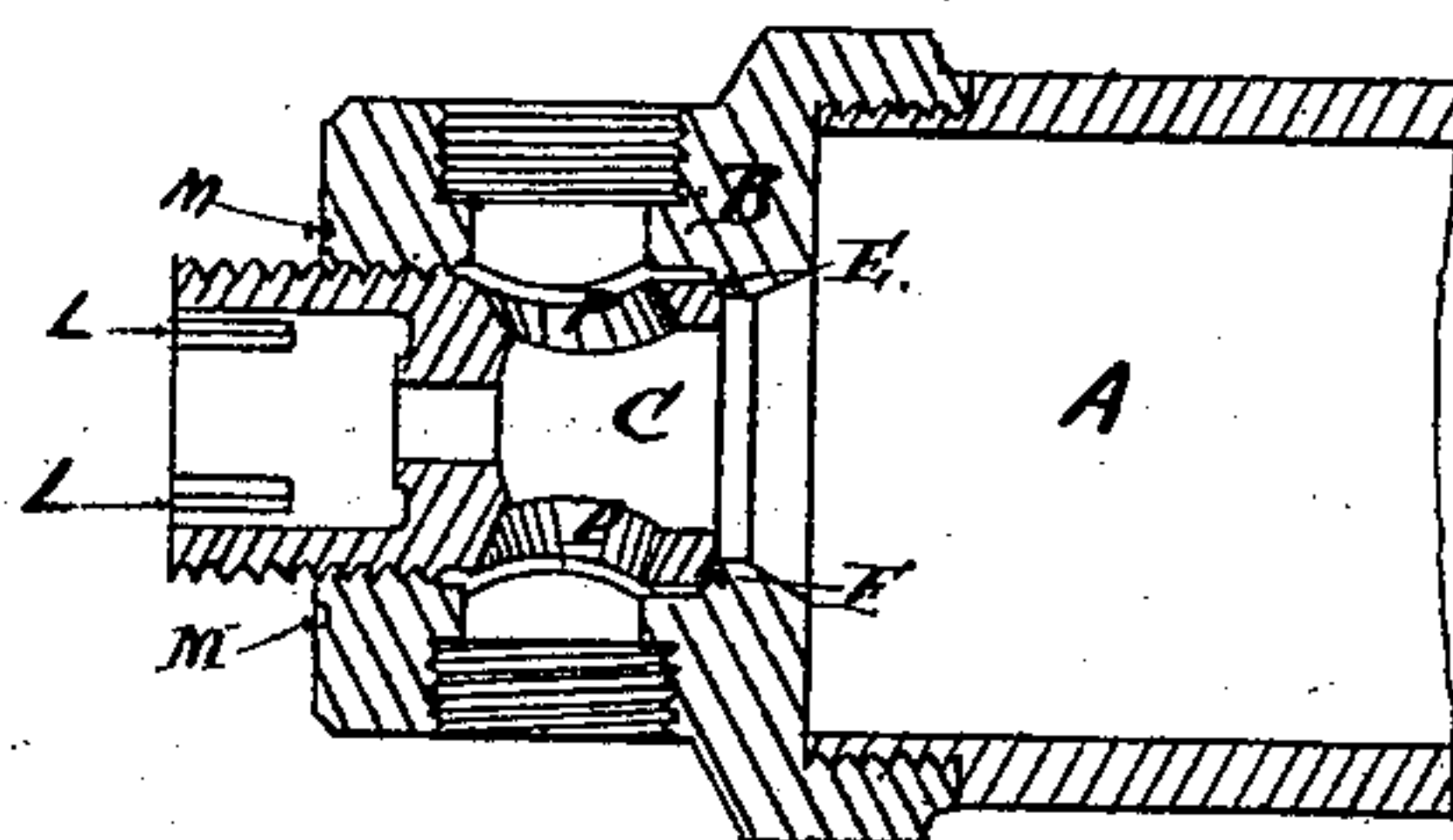


FIG 4.

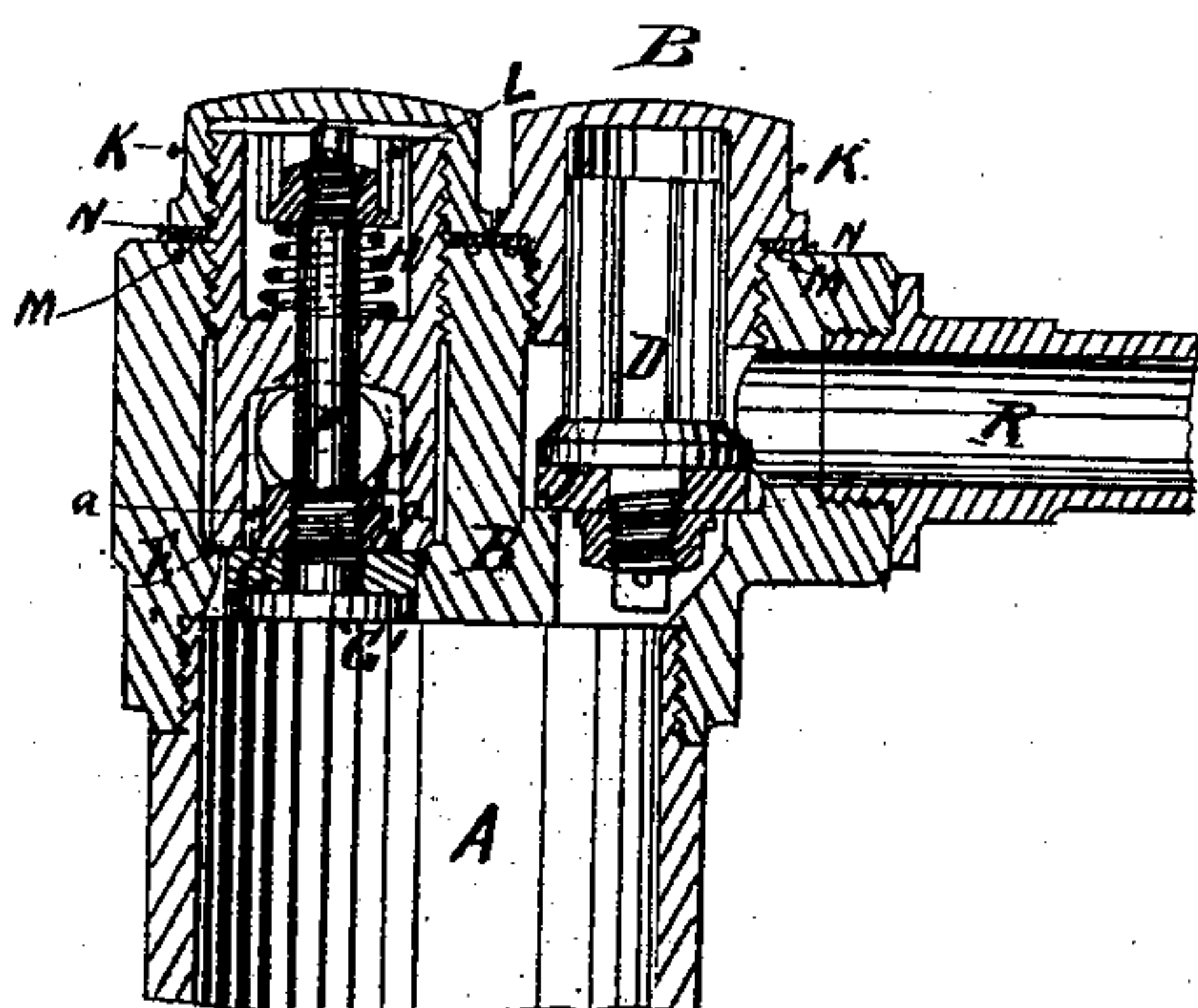


FIG 1.

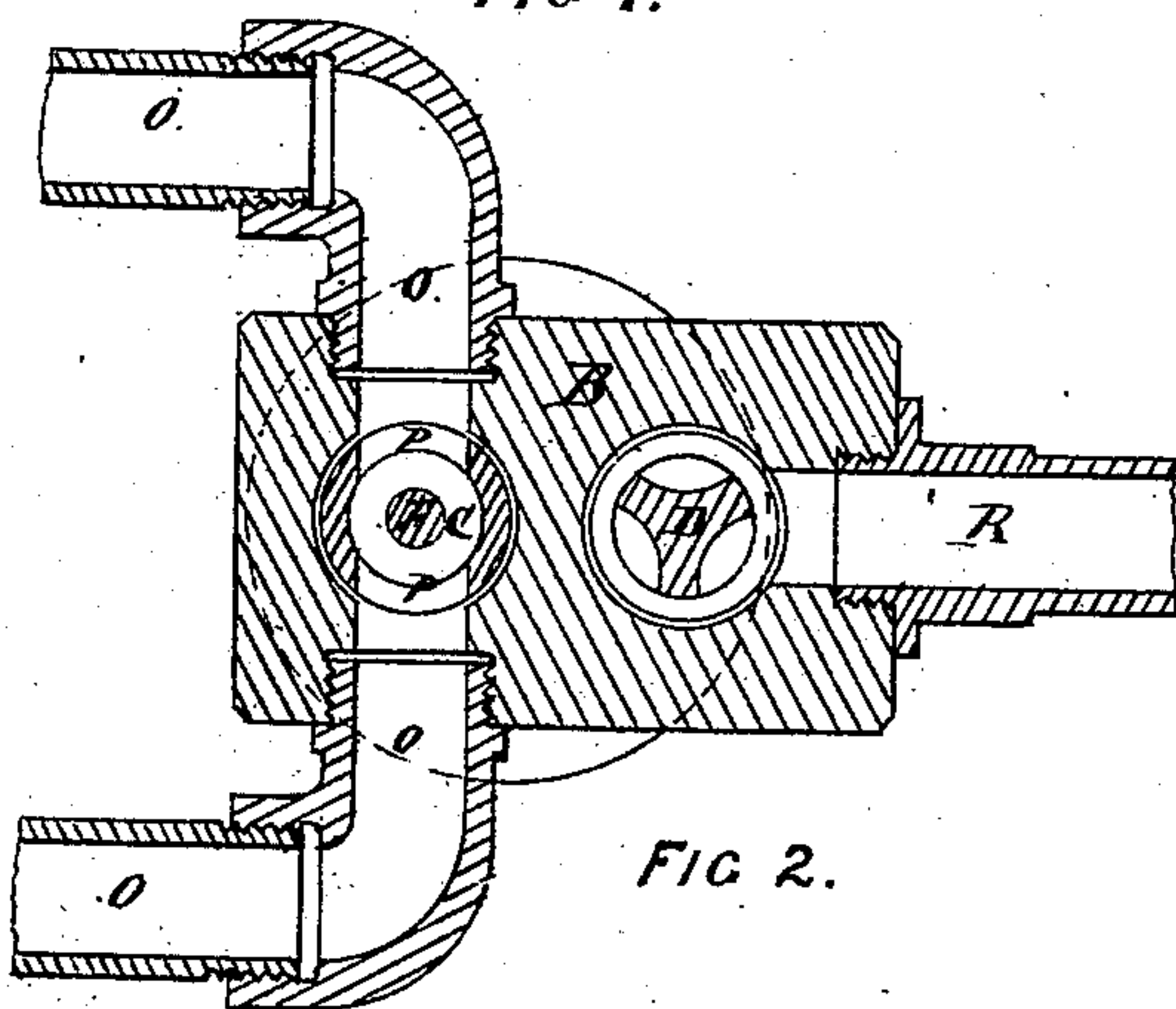


FIG 2.

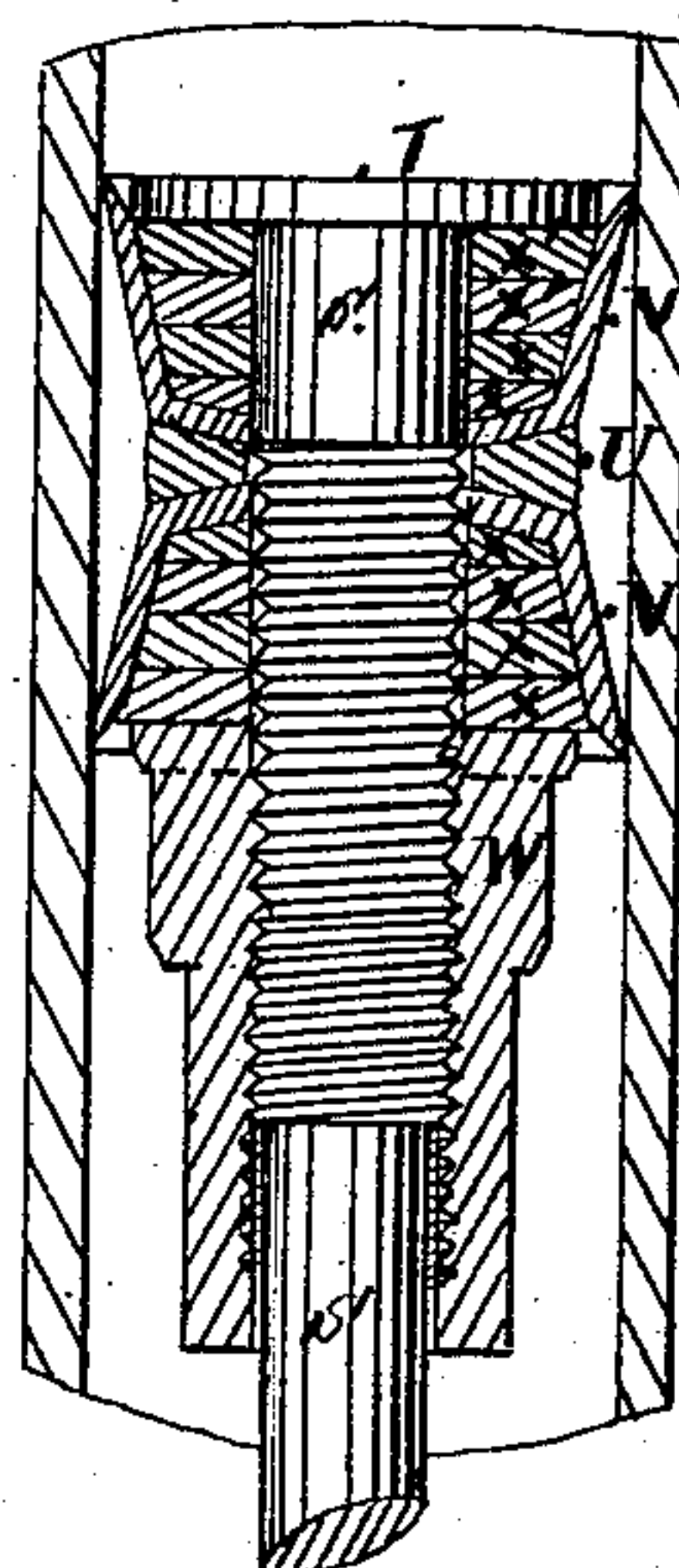


FIG 5.

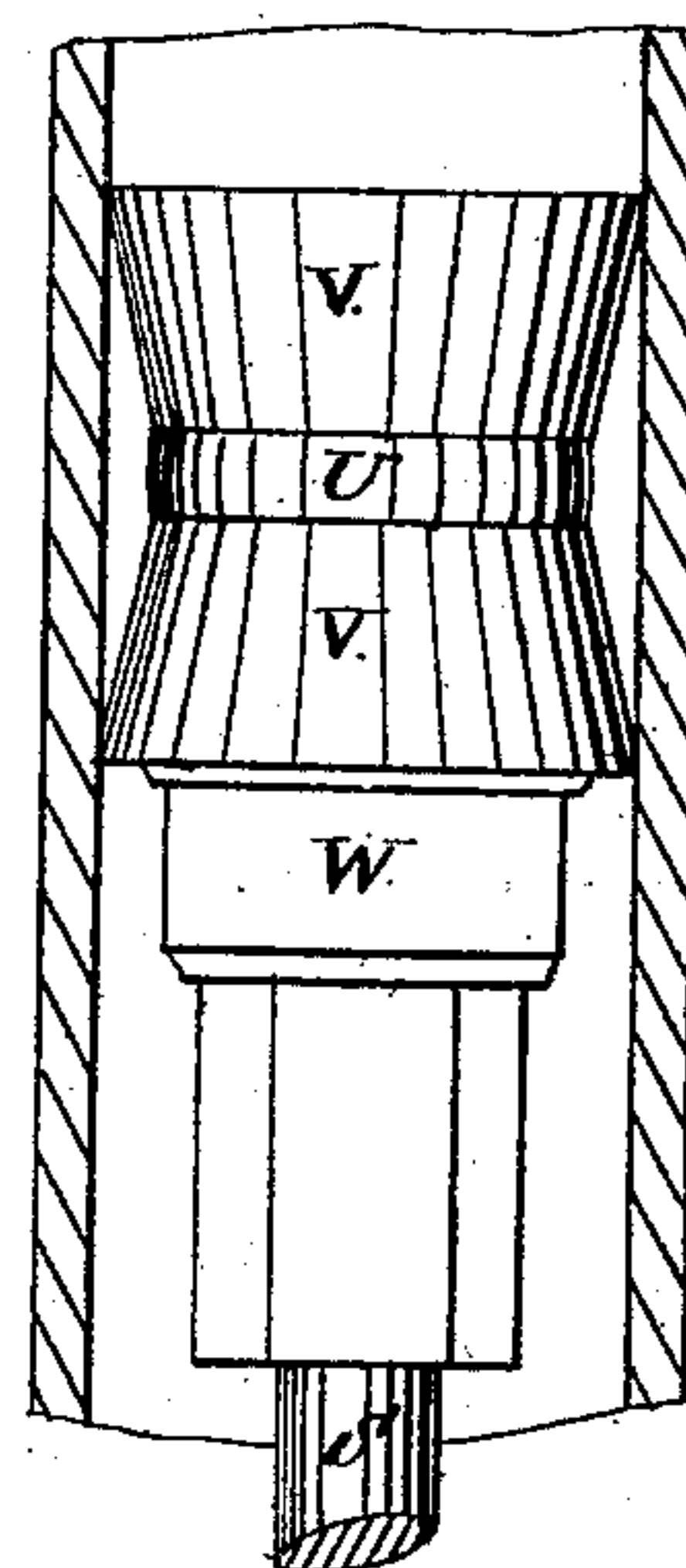


FIG 6.

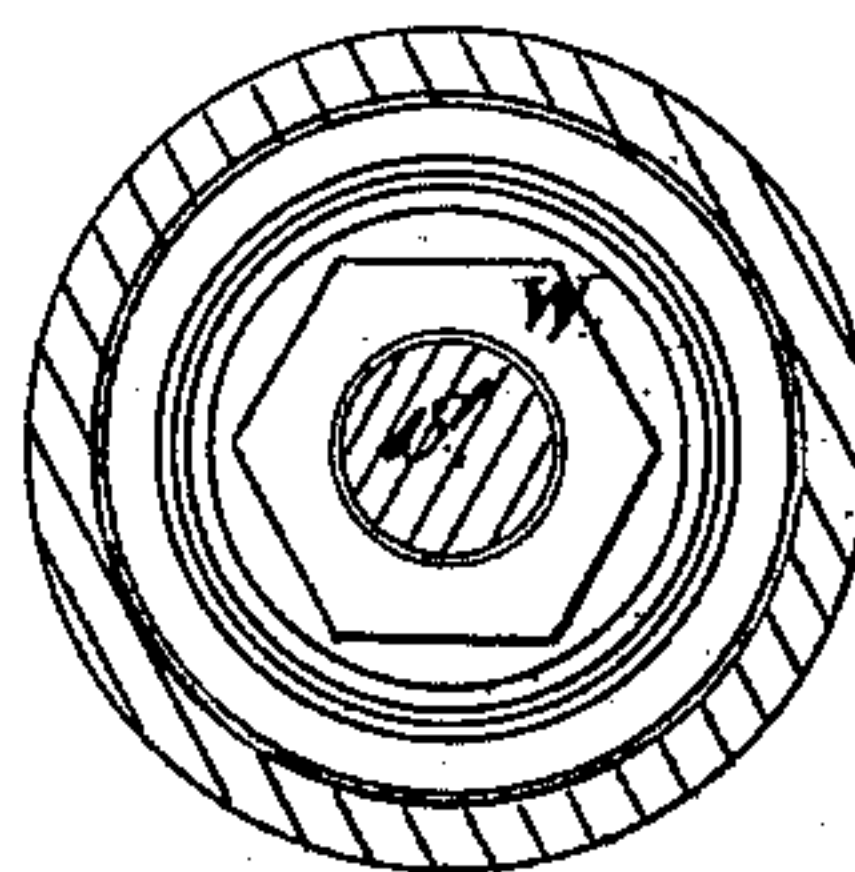


FIG 7.

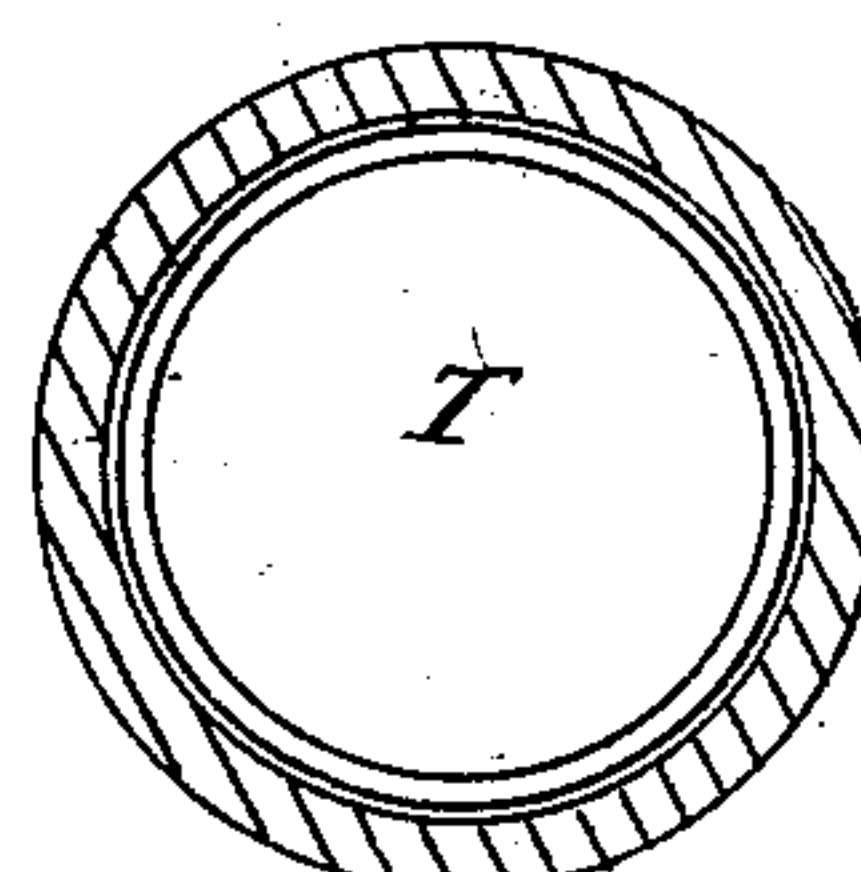


FIG 8.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES W. GALLOWAY, OF BOLTON, COUNTY OF LANCASTER, ENGLAND.

## FORCING AND MIXING PUMP.

SPECIFICATION forming part of Letters Patent No. 275,632, dated April 10, 1883.

Application filed December 8, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES WILLIAM GALLOWAY, of the firm of James Galloway, of Bolton, in the county of Lancaster, England, have invented an Improvement in Forcing or Mixing Pumps, of which the following is a specification.

This invention relates to that part of the machine used for pumping gas and water for making aerated beverages (such, for instance, as soda-water, lemonade, gingerade, &c.) called the "forcing or mixing pump;" and the invention consists, principally, in reducing the clearance in the pump-barrel, when the piston or plunger is at the top of its stroke when forcing the liquid, to a minimum.

This invention is designed to overcome a want long felt by the trade, for in all such pumps made hitherto the clearance has been too great, owing to the long passages between the pump-barrel and the valves. In such cases the clearance is charged heavily with gas, which on the return of the pump-plunger expands and partially fills the vacuum. Consequently the pump is unable to draw its full capacity. The clearance in the pump is reduced by the novel method I adopt in making the piston or plunger, which is so constructed that it traverses the full length of the barrel and completely empties it, or nearly so, thereby causing the pump to deliver its measured quantity of gas and water.

Such being the nature and object of my said invention, I will now proceed to describe in detail the manner in which the same is to be or may be performed or carried into practical effect, and in order that the same may be clearly understood I have annexed hereunto a sheet of drawings illustrative thereof, and have marked the same with figures and letters in reference corresponding with those in the following explanation thereof.

Figure 1 in the annexed drawings is a part vertical section of the forcing or mixing pump of a machine for making aerated beverages, with the arrangement of suction and delivery valves made and constructed according to my invention. Fig. 2 is a sectional plan of Fig. 1 through the valves and openings for drawing and discharging the water and gas. Fig. 3 is a plan of the top of valve-box with the cap or

cover over the suction-valve removed. Fig. 4 is a transverse section through the valve-box and suction-valve seat with the valve removed. Fig. 5 is a sectional elevation of my improved plunger for forcing or mixing pump. Fig. 6 is an outside elevation of Fig. 5. Fig. 7 is a plan of under side of plunger in Fig. 5. Fig. 8 is a plan of the top side of plunger in Fig. 5.

A is part of the pump-barrel of forcing or mixing pump. On the top is placed the valve-box B, containing the suction-valve C and the delivery-valve D. The suction-valve seat or casing is screwed into the valve-box, the bottom end being provided with a facing, which drops or sits on the lip or seating E in the bottom end of the valve-box. The spindle F is provided at the bottom with the collar G', on which the india-rubber washer G or its equivalent is secured by the nut a, the same being kept to its face when the pump is standing or forcing by the light spiral spring H. The delivery-valve D is an ordinary winged valve inverted, provided with the leather washer J, or its equivalent, such as india-rubber, &c. The valves can be easily removed by unscrewing the caps K, when the delivery-valve D can be lifted out. The suction-valve C can, by placing a square die in the slots L, cut in the internal diameter for the purpose, be unscrewed with an ordinary spanner. To make the joint under the caps K air and water tight the top side of the valve-box is provided with the grooves M, over which is placed the leather washers N. When the pump is drawing, the gas and water enters the suction-valve C through the pipes or openings O and the holes P in the suction-valve seat, when the gas and water unite immediately on entering the pump-barrel, when they are forced through the delivery-valve D and the opening R on the return-stroke of the plunger, and so on.

The pump or plunger rod S is provided at its extreme end with the collar T, which forms the end of the plunger. Midway, or thereabout, is placed the metallic washer U, concaved on both sides, the outside being provided with the conical washers V, made of leather or other suitable material. The space between the metallic washer U, the collar T, and the adjusting-nut W is provided with the elastic pack-



ing-rings X, made of india-rubber, leather, or other equivalents. In most cases I prefer to make the two top rings, X', of india-rubber, being more pliable and easily operated upon by the adjusting-nut W on the rod S, which can be tightened without removal. By this arrangement the elastic packing is operated upon by the adjusting-nut W, causing a lateral pressure on the edge of the conical washers V near the top end of the plunger, thus making it thoroughly air-tight with the least possible amount of friction, as the plunger only fits the barrel A at the two extremities. The upper end of the plunger, when at the top of its stroke, almost strikes the under side of the valve-box B and the collar G' of the suction-valve, so as to drive all the gas and water out that is possible, at the same time reducing the clearance.

Having now described the nature and object of this my said invention, together with the manner in which the same is to be or may be performed or carried into practical effect, I wish it to be understood that I claim as my invention—

1. The combination, with the pump cylinder and piston and suction-valve, of a suction-pipe, C, the seat having holes P, the gas and water pipes O O, connected therewith, the delivery-valve D, and the pipe R, whereby the union of the gas and water is effected as they enter the pump-barrel, and are forced through the delivery-valve on the return-stroke, as described.

2. The combination, with a plunger-rod, S, threaded near and having a collar at its lower end, of the midway metallic washer, U, concaved on both sides, the outer conical cup-leathers b, the nut W, and the packing-rings X, as shown, and for the purpose specified.

In witness whereof I, the said JAMES WILLIAM GALLOWAY, have hereunto set my hand and seal this 10th day of November, in the year of our Lord 1882.

JAMES WILLIAM GALLOWAY. [L. S.]

Witnesses:

JOHN HORROCKS,

EDMUND CHADWICK,

*Both of Bolton.*