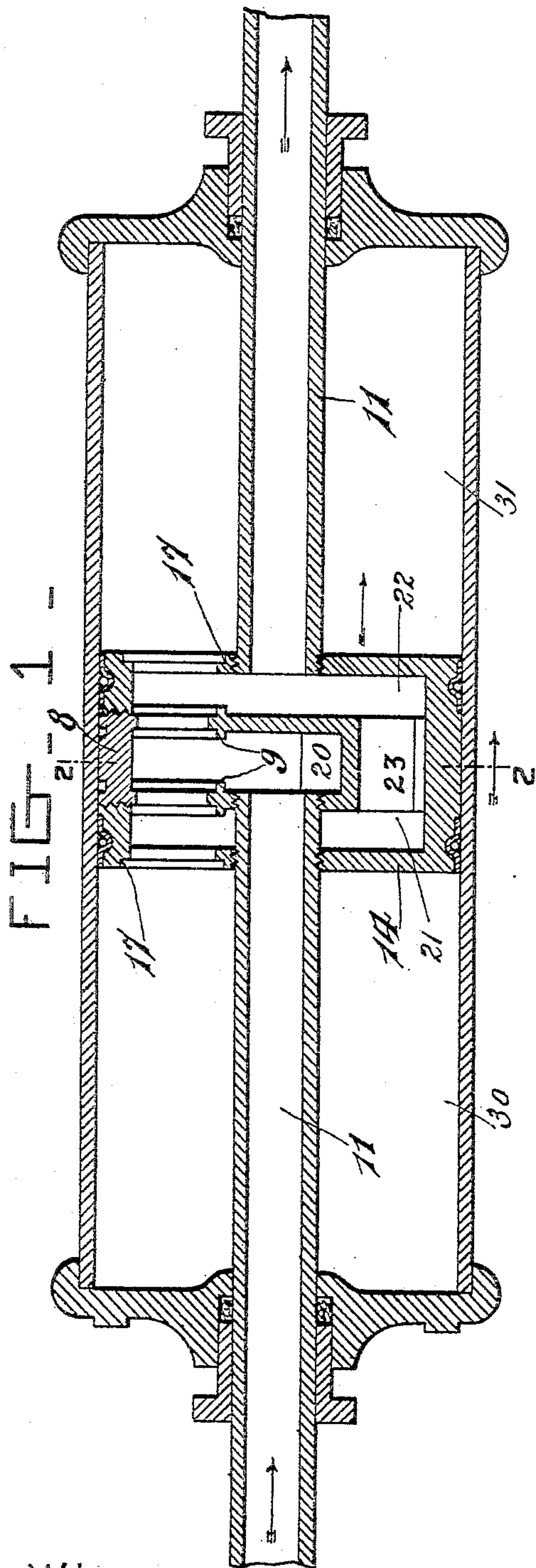


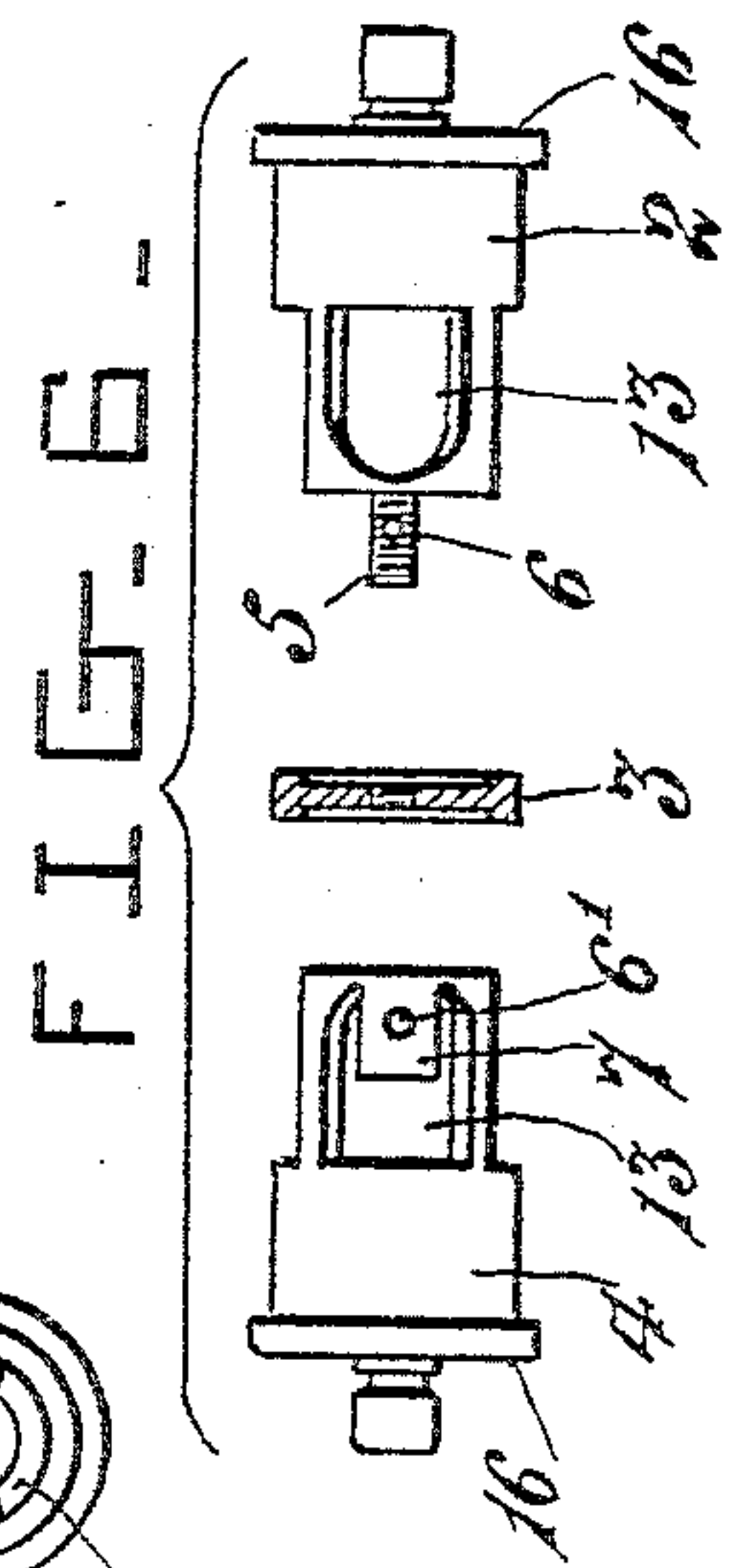
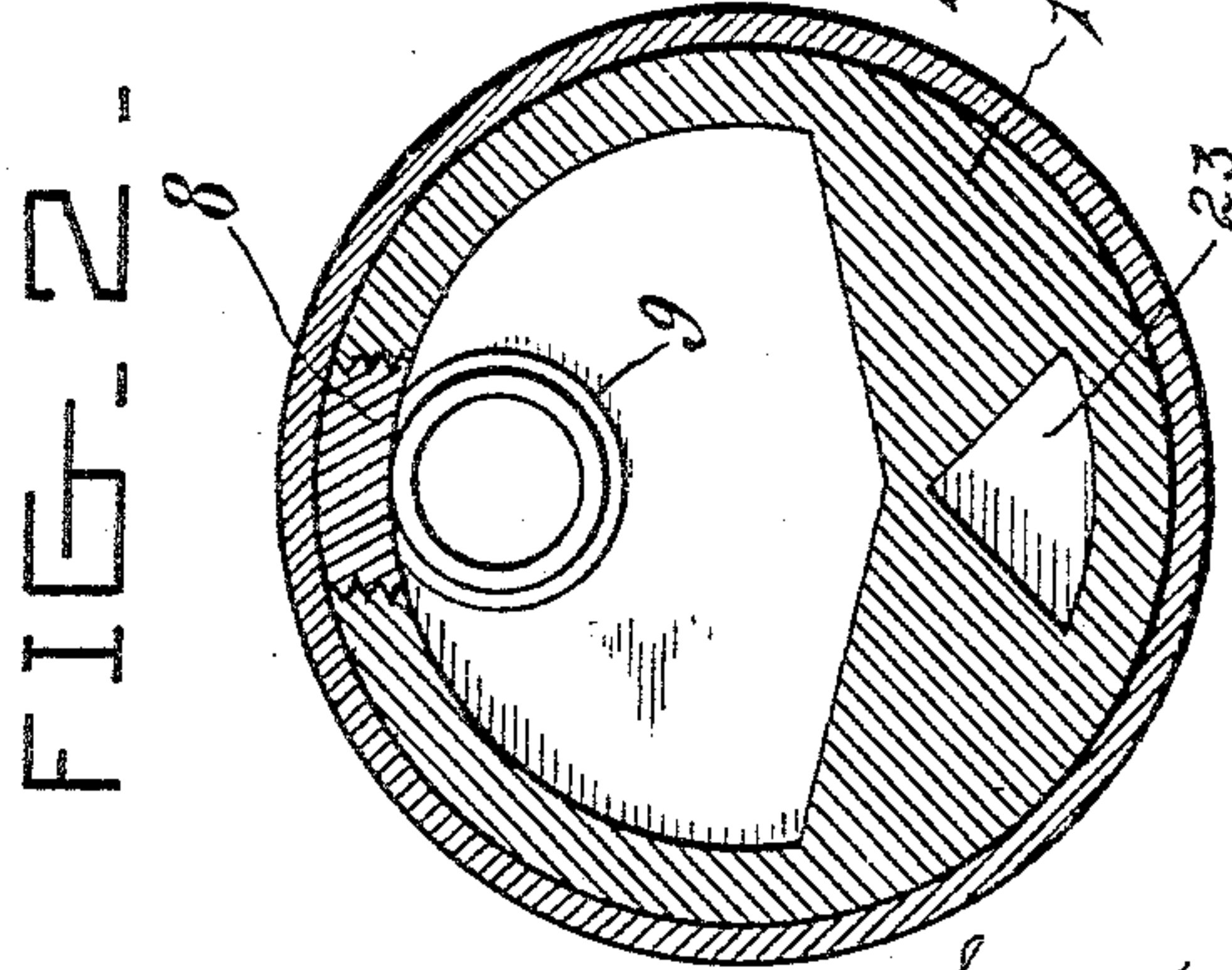
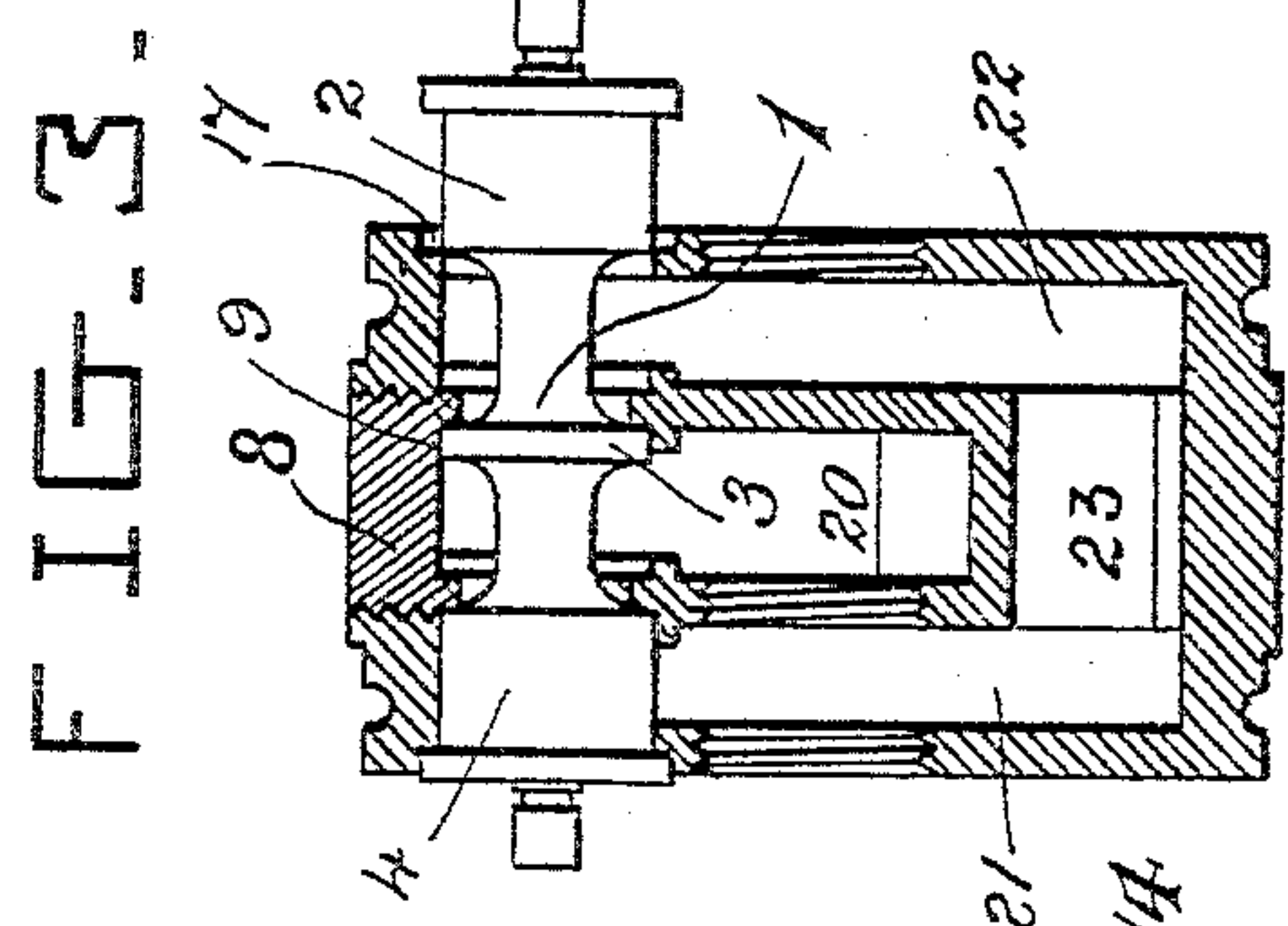
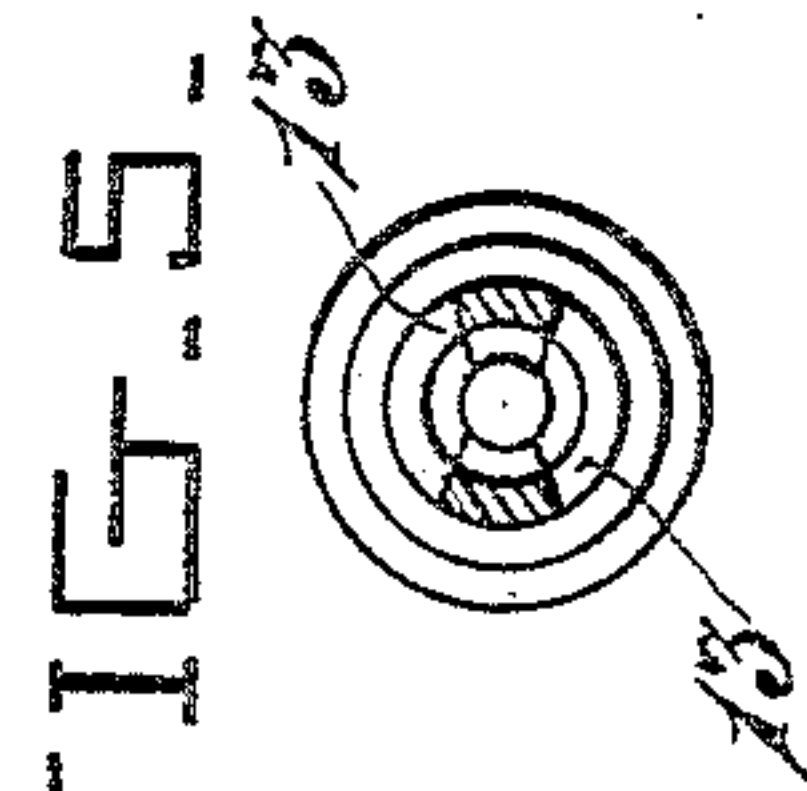
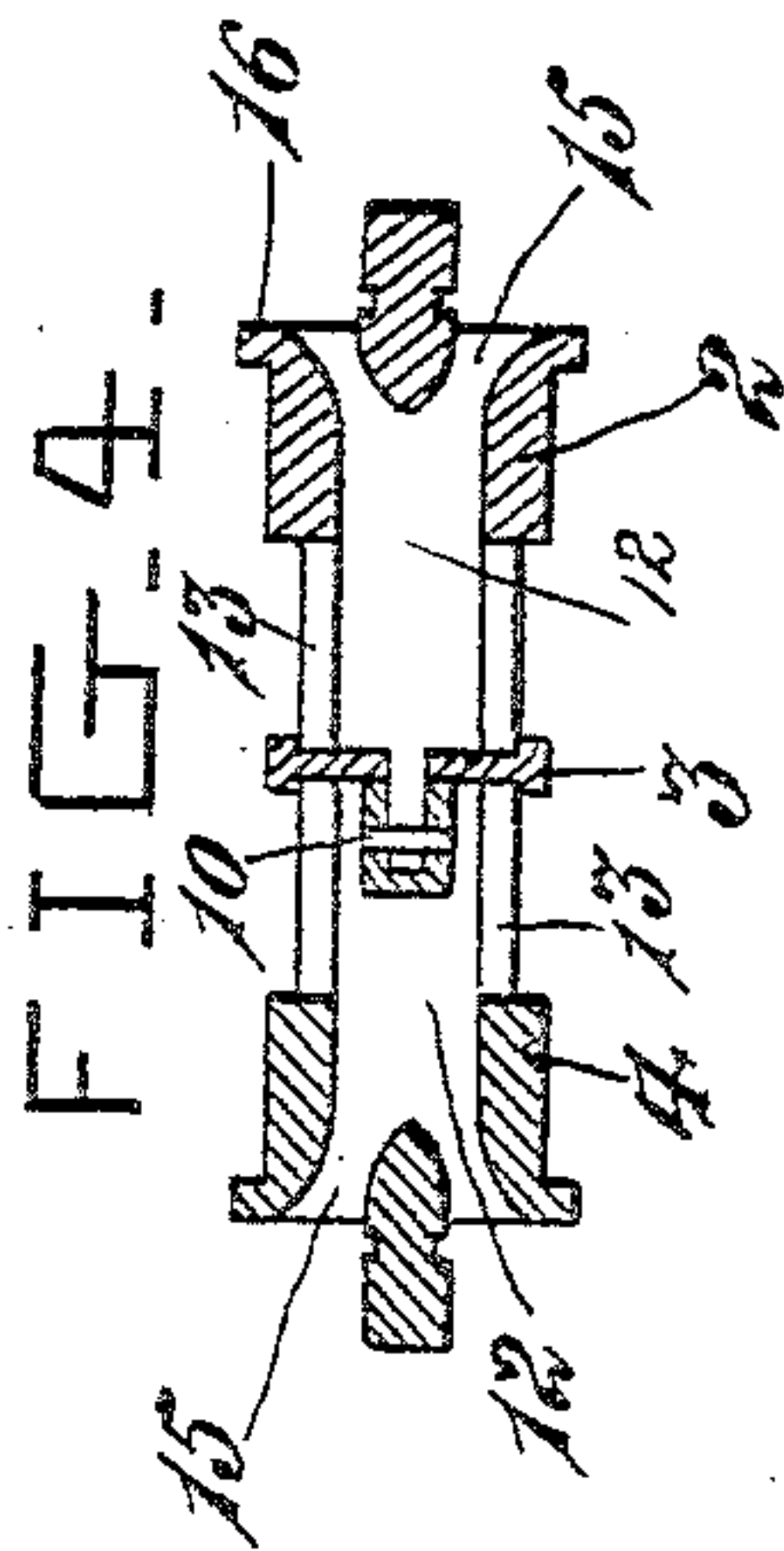
A. O. LAVOIE.
HYDRAULIC MOTOR.
APPLICATION FILED APR. 26, 1909.

943,943.

Patented Dec. 21, 1909.



Witnesses:
Emil Grimmel.
Hermann Ernst



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Attorney.

UNITED STATES PATENT OFFICE.

ALDERIC OLIVIER LAVOIE, OF MONTREAL, QUEBEC, CANADA.

HYDRAULIC MOTOR.

943,943.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed April 26, 1909. Serial No. 492,256.

To all whom it may concern:

Be it known that I, ALDERIC OLIVIER LAVOIE, residing, 72 Chestnut street, at the city and district of Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Hydraulic Motors; and I do hereby declare that the following is 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.

The invention to be hereinafter described is an improvement of my Patent No. 907,250 of December 22nd, 1908, and relates to hydraulic motors and more particularly to the reciprocating type of such motors.

Broadly speaking, it comprises a motor cylinder, a reciprocating, multi-chambered piston mounted therein, means for delivering water to and from the cylinder to the piston and flow reversing valves in said piston adapted to be automatically operated by movement of the piston.

Throughout the drawing and specification the same numerals of reference denote like parts.

In the drawings: Figure 1 is a longitudinal section through the motor; Fig. 2 is a cross section on line 2—2 of Fig. 1, looking in the direction of the arrow; Fig. 3 is a central longitudinal section of the piston showing the position of the valve shifted to the limit of its movement toward the right, as pointed out by the arrow in Fig. 1; Fig. 4 is a longitudinal section of the valve; Fig. 5 is a cross section of the same; Fig. 6 is a detail of the parts of the same.

The improvement consists in its principal part of the construction of the reciprocating valve of said hydraulic motor.

Referring to Fig. 3, the valve 1 consists of the three parts 2, 3 and 4 (best shown in Fig. 6). The part 2 at the right is provided with the thread 5, perforated at 6. The part 3 represents a shoulder or collar to be screwed on the thread 5 of the part 2, and serves to limit the movement of the valve. The part 4 at the left has its ends 7 threaded inside and is perforated at 6¹, corresponding with the perforation 6 of the part 2.

The mounting of the valve 1 in the piston is as follows: The plug 8 (shown in Fig. 3) being taken off of the piston, the shoulder 3

will be screwed on the part 2 of the valve 1. The said shoulder is adapted to enter into one of the recesses 9. The part 4 will then be screwed to the end 5 of part 2 and the whole securely fastened by means of the pin 10 as shown in Fig. 4 through the perforations 6 and 6¹. After the valve is completely mounted, the plug 8 will be screwed to the piston again which is now ready to receive the pipes 11 and may be placed in the cylinder.

The valve mounted body is divided into two duplicate working chambers 12 which are provided with the two ports 13 adapted to register alternately with the chambers 21 and 22 of the piston 14. The outer ends of the valve 1 are provided with two end ports 15 to allow free flow of the water to the valve chambers, and flanges 16 adapted to engage into the recesses 17 of the piston 14 according to the movement of the said valve from the right to the left. The water enters the middle chamber 20 of the piston through one pipe 11, and when the valve is in the position shown in Fig. 3 the water passes by the ports of valve 4 to the end portion 30 of the cylinder, and propels the piston to the right. The water in the end portion 31 of the cylinder passes through the ports of valve 2 into the chamber 22 and out by the other pipe 11. When the piston arrives at the right hand end of the cylinder the valves are reversed by contact with the cylinder cover. The water in the end portion 30 escapes by valve 4, chamber 21, by-pass 23 and chamber 22; and the water enters the end portion 31 from the chamber 20 through the ports of the valve 2 to propel the piston in the reverse direction.

It is clear that many changes may yet be made in the construction of the several parts of the invention without in any way departing from the field and scope of the present invention.

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

In a water motor, the combination, with a piston provided with three water chambers arranged side by side, an inlet pipe connected to the middle chamber, and an outlet pipe connected to one of the end chambers, said piston having also openings for the valves to slide in; of two piston valves slidable longitudinally in the said openings and con-

trolling the end chambers, one of the valves having a projection at one end and the other valve being formed with a socket in its adjacent end in which said projection is secured, and a disk secured on the said projection between the said valves and controlling the middle chamber of the piston.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALDERIC OLIVIER LAVOIE.

Witnesses:

EMIL GRIMMEL,
HERMANN ERNST.