

No. 860,672.

PATENTED JULY 23, 1907.

J. B. LADD.  
REVERSING VALVE.  
APPLICATION FILED MAY 26, 1905.

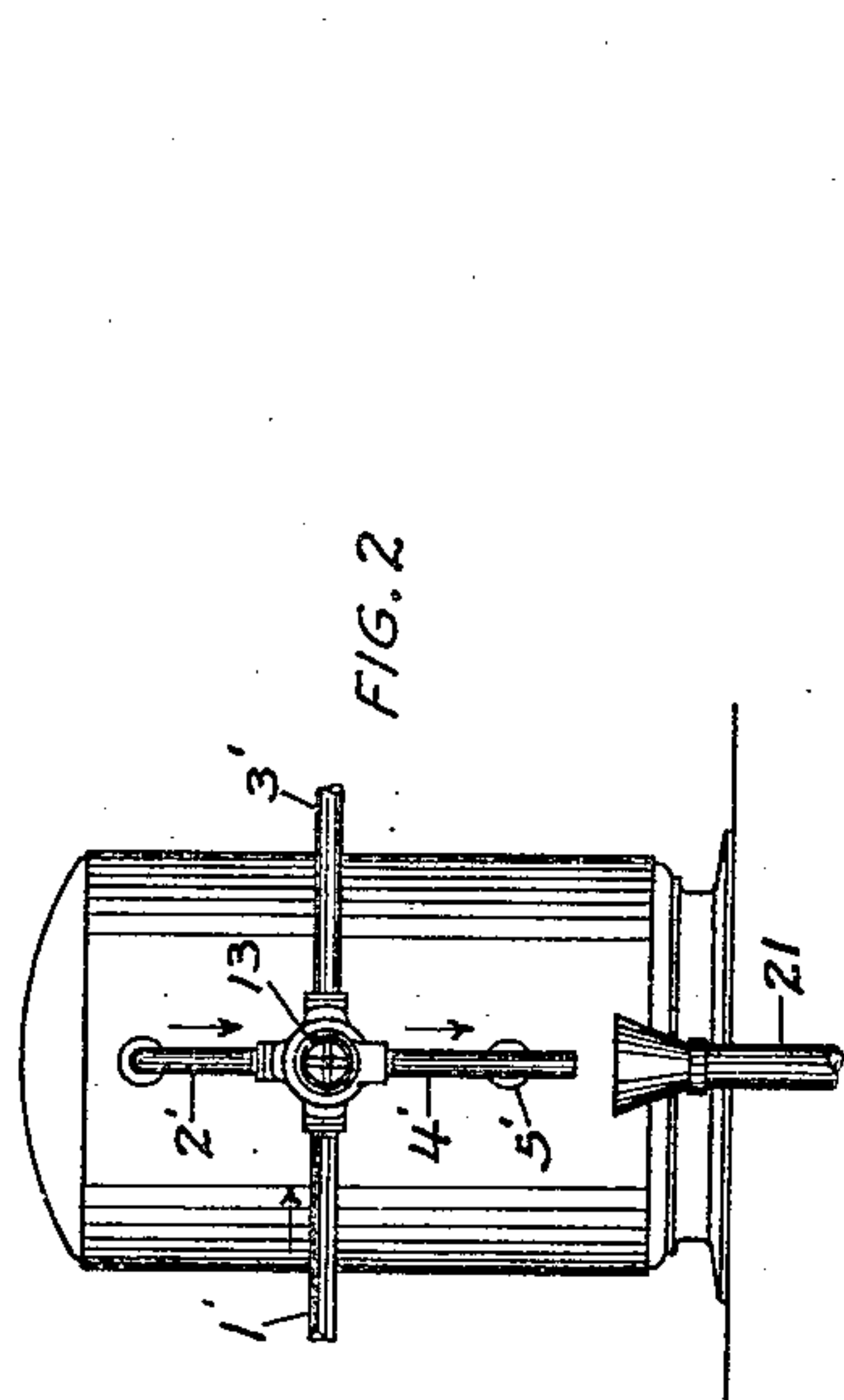


FIG. 1

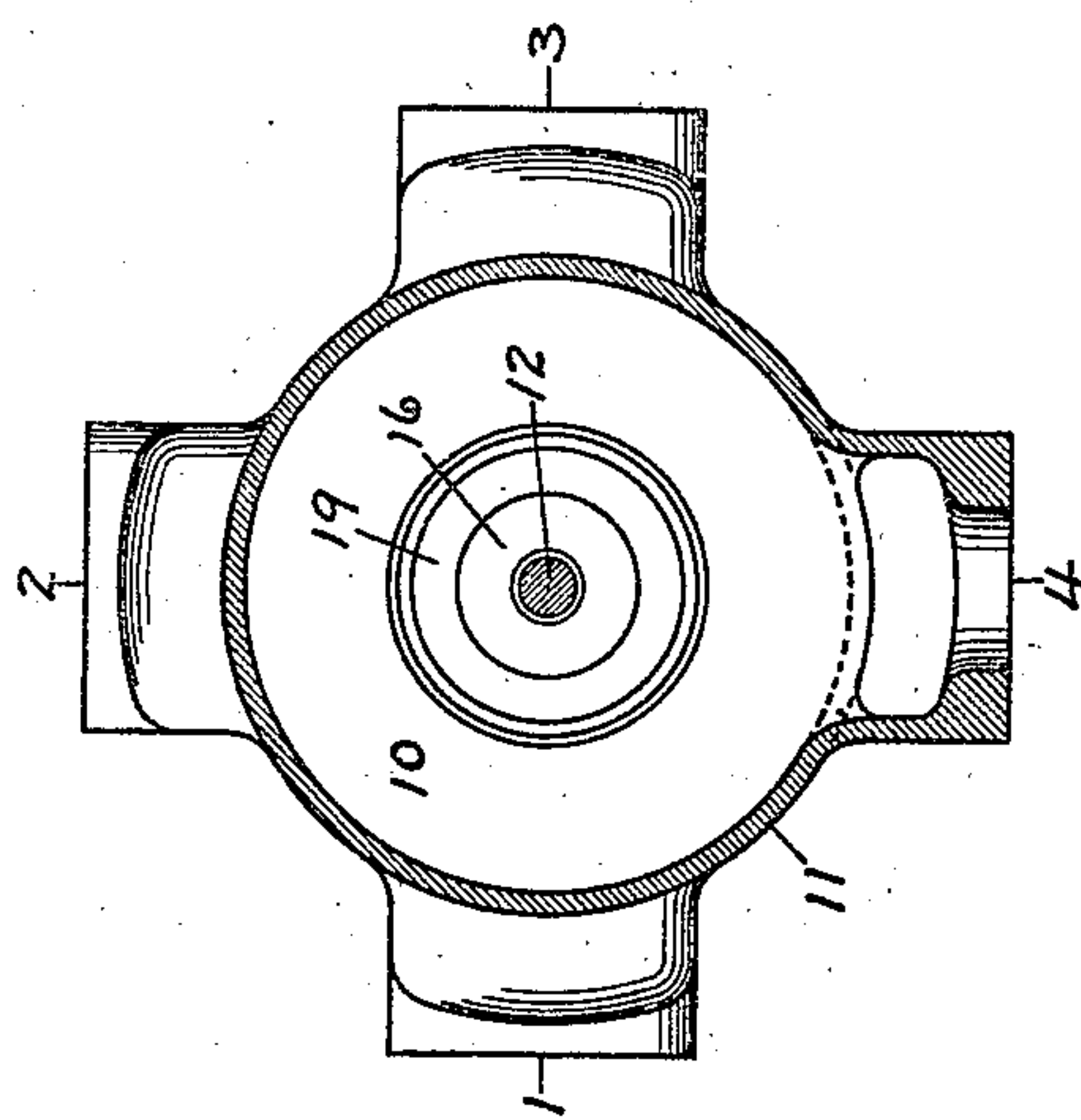


FIG. 2

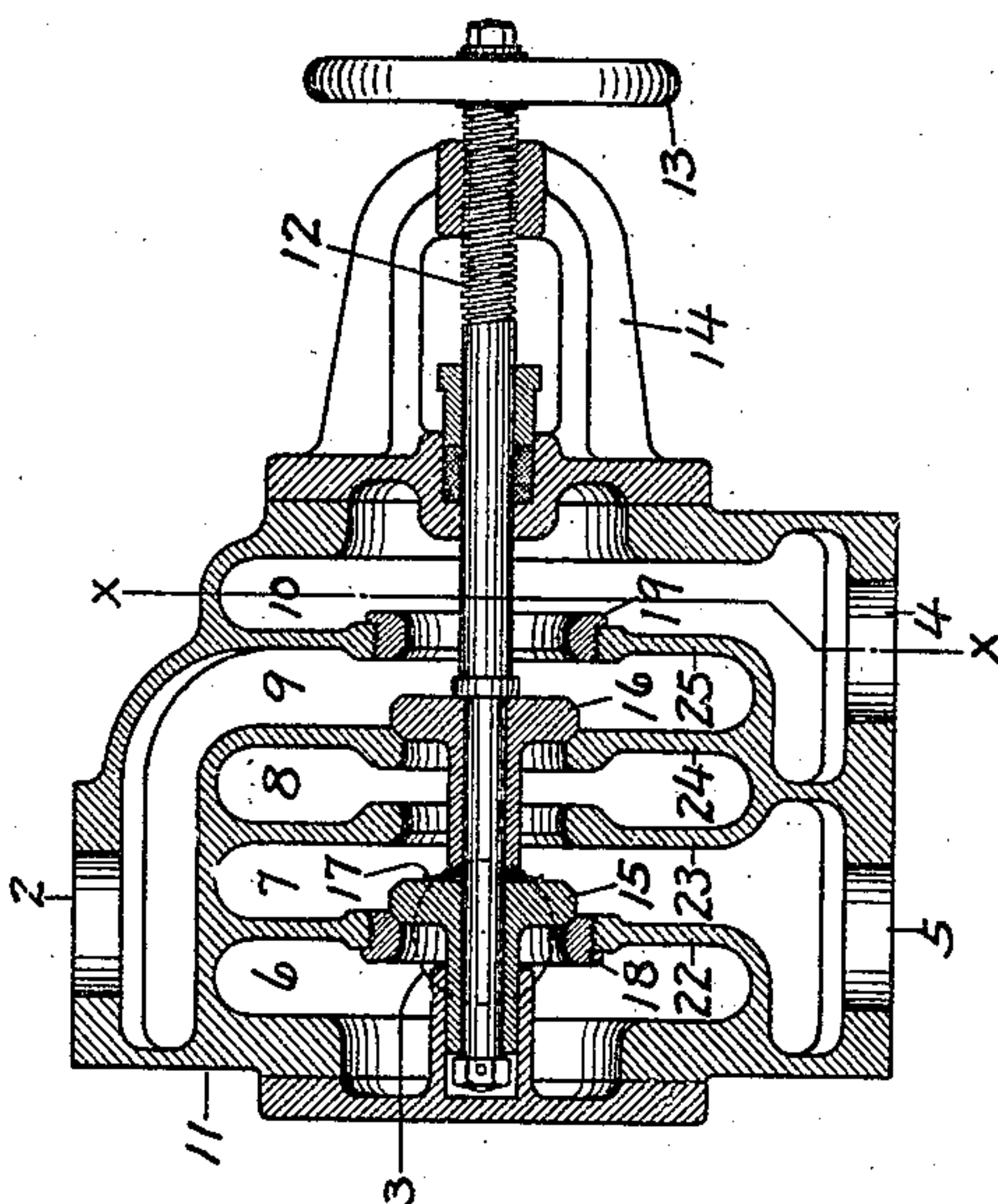


FIG. 3

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# UNITED STATES PATENT OFFICE.

JAMES B. LADD, OF WAYNE, PENNSYLVANIA.

## REVERSING-VALVE.

No. 860,672.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed May 25, 1905. Serial No. 262,126.

*To all whom it may concern:*

Be it known that I, JAMES B. LADD, a citizen of the United States, residing at Wayne, Delaware county, and State of Pennsylvania, have invented a new and useful Reversing-Valve, of which the following is a specification.

My invention relates to improvements in reversing valves such for instance as are especially useful in connection with filters.

My object is to provide efficient and simple means operated by a single stem for changing the direction of flow from a source of supply to and from the top and bottom of a filter or similar device, and at the same time opening or closing communication with other pipes, such for instance, as a waste pipe and a service pipe.

My device, being provided with five ports may be properly termed a five-way valve and practically perform the functions of five single valves.

Referring to the drawings:—Figure 1 is a side elevation of a filter provided with my improved valve. Fig. 2 is a front elevation of same. Fig. 3 is a vertical section of the valve on an enlarged scale. Fig. 4 is a vertical cross-section on line  $x-x$  of Fig. 3.

Similar numerals refer to similar parts throughout the several views.

As illustrated in the drawings my device comprises a structure having five chambers and a corresponding number of ports, one port for each chamber. Port 1 is connected with the pipe 1' leading from the water supply under pressure. Port 2 is connected through pipe 2' with the top of the filter. Port 3 is connected with the service pipe 3'. Port 4 is connected with the waste pipe 4', and port 5 is connected by pipe 5' with the bottom of the filter. The connections of these ports with the chambers are as follows:—

Port 1 is connected with chamber 8, 2 with chamber 9, 3 with chamber 6, 4 with chamber 10 and 5 with chamber 7. These chambers are all adapted to communicate with each other through openings in separating partitions 22, 23, 24 and 25, said openings having a common axis and provided with valve seats to be controlled by the valve disks 15 and 16. The valve disks 15 and 16 are mounted on the common stem 12, which is threaded through the bracket 14, and operated by hand-wheel 13. It will now be readily understood that when the valves are in the position shown in Fig. 3, the water or other fluid entering through port 1 into chamber 8 is permitted to pass into chamber 7 and thence through port 5 and pipe 5' to the bottom of the filter, thence through and from the top of the filter to pipe 2' and port 2 into chamber 9, thence into chamber 10 and through port 4 and pipe 4' to waste, as indicated by the arrows in Figs. 1 and 2. When, however the positions of valve disks 15 and 16 are reversed, com-

munication is interrupted between chambers 7 and 8, and between chambers 9 and 10, while chambers 6 and 7 and chambers 8 and 9 are made to communicate with each other respectively. It will now be seen that the fluid entering chamber 8 through port 1, passes to chamber 9 and through port 2 to the top of the filter, thence through the filter to port 5, chamber 7, chamber 6 and through port 3 to service pipe 3', in the direction opposite to that indicated by the arrows shown in Figs. 1 and 2.

The valve disks 15 and 16 are loosely mounted upon the stem 12 and have a slight longitudinal play with respect thereto, said play being taken up or controlled by the spring 17 interposed between said two valve disks 15 and 16. This is a convenient method of taking up any inaccuracies in the assembling so as to insure both valve disks closing tightly against their seats.

As the water under pressure always enters chamber 8 it will be noted that the operation of the valve disk, against said pressure, that is, to close 8 either from 7 or 9, is a positive operation of the stem 12, while the spring pressure exerted upon either valve disk between chambers 6 and 7 and 9 and 10 merely coöperates with the water pressure to hold said valve against its coöperating seat.

It will also be seen by inspection of Fig. 3 that the valve seats 18 and 19 are threaded in the partitions 22 and 25 respectively, so that the same may be removed for admitting the valve disks in assembling the device. This is also a convenient construction when it is desired to use valve seats of a different metal than that from which the shell 11 is made, or when it is desirable to remove the valve seats for repairs, or to replace them when damaged. A similar construction may be provided for the valve seats in partitions 23 and 24.

What I claim is:—

1. In combination with a system comprising a main, a service pipe, a waste pipe and a receptacle, a reversing valve comprising a structure containing five chambers, each provided with a port connected as follows, one connected with the main, one with the service pipe, one with the waste pipe and two with different parts of the receptacle, valve seats positioned between said chambers and a plurality of valve disks operated by a common member for alternately coöperating with each of two oppositely disposed valve seats, the parts being so arranged that by one movement of the valve disks the flow is reversed through the receptacle and communication with the service pipe or the waste pipe respectively opened or closed as the case may be.

2. In combination with a filter, a main, a service pipe and a waste pipe, a valve for controlling the flow of water therethrough, comprising a structure having a plurality of communicating chambers positioned and connected as follows, a chamber connected with the main, an adjoining chamber connected with the top of the filter, a chamber adjoining the last mentioned chamber connected with the waste pipe, a chamber adjoining on the other side of the first mentioned chamber connected with the bottom

5 of the filter, a chamber adjoining the last mentioned chamber connected with the service pipe, a pair of disks, one operating in each chamber next to and on each side of the middle chamber, valve seats in the partitions separating adjoining chambers and means for supporting and moving the valve disks to a position establishing communication between the main and the top of the filter and between the service pipe and the bottom of the filter and to close communication with the waste pipe, or to a po-

sition opening communication between the main and the 10 bottom of the filter and between the waste pipe and the top of the filter and to close communication between the service pipe.

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Witnesses:

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