

VALVE.

APPLICATION FILED FEB. 2, 1909.

934,131.

Patented Sept. 14, 1909.

2 SHEETS--SHEET 1.

Fig. 1,

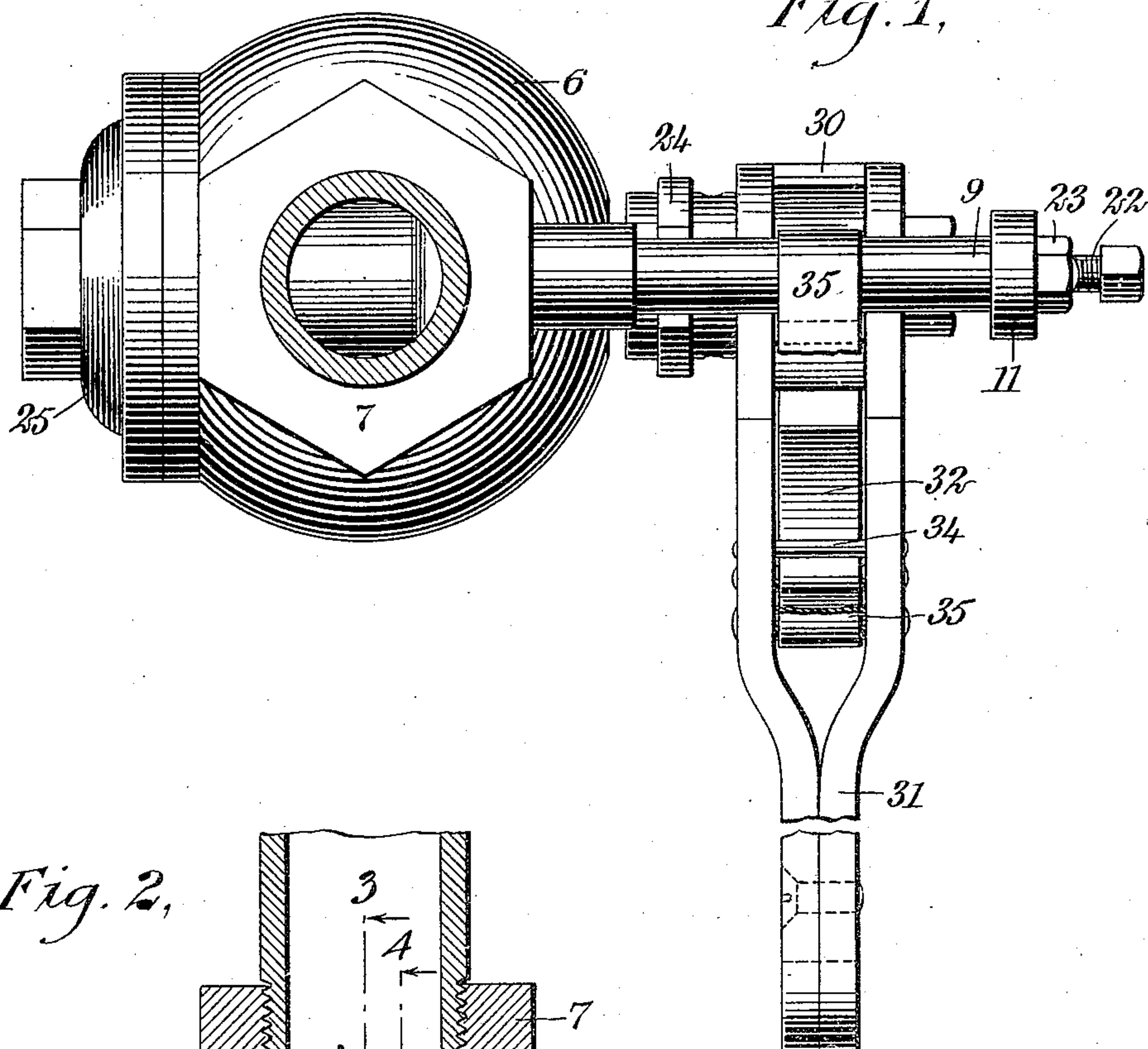
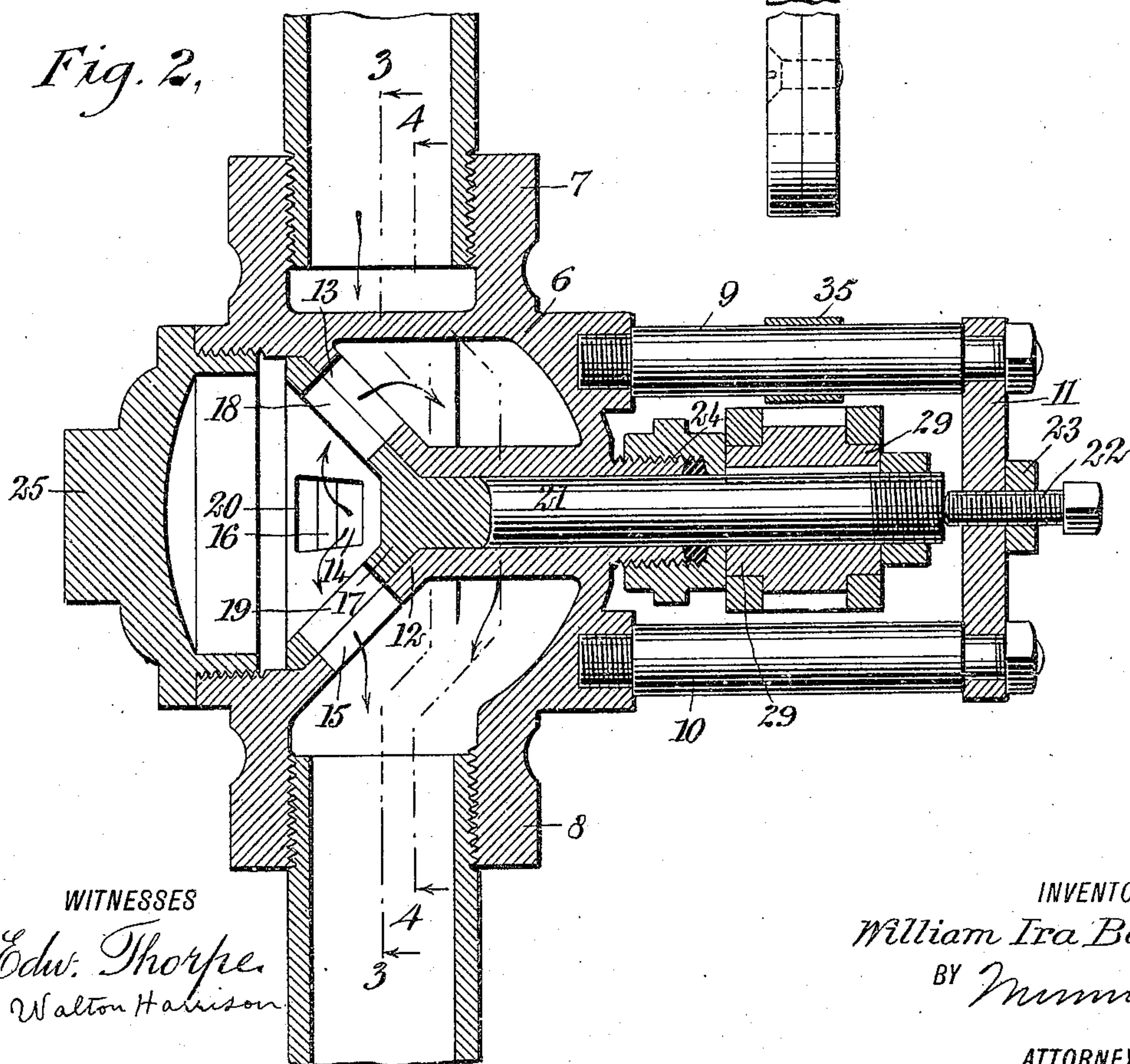


Fig. 2,



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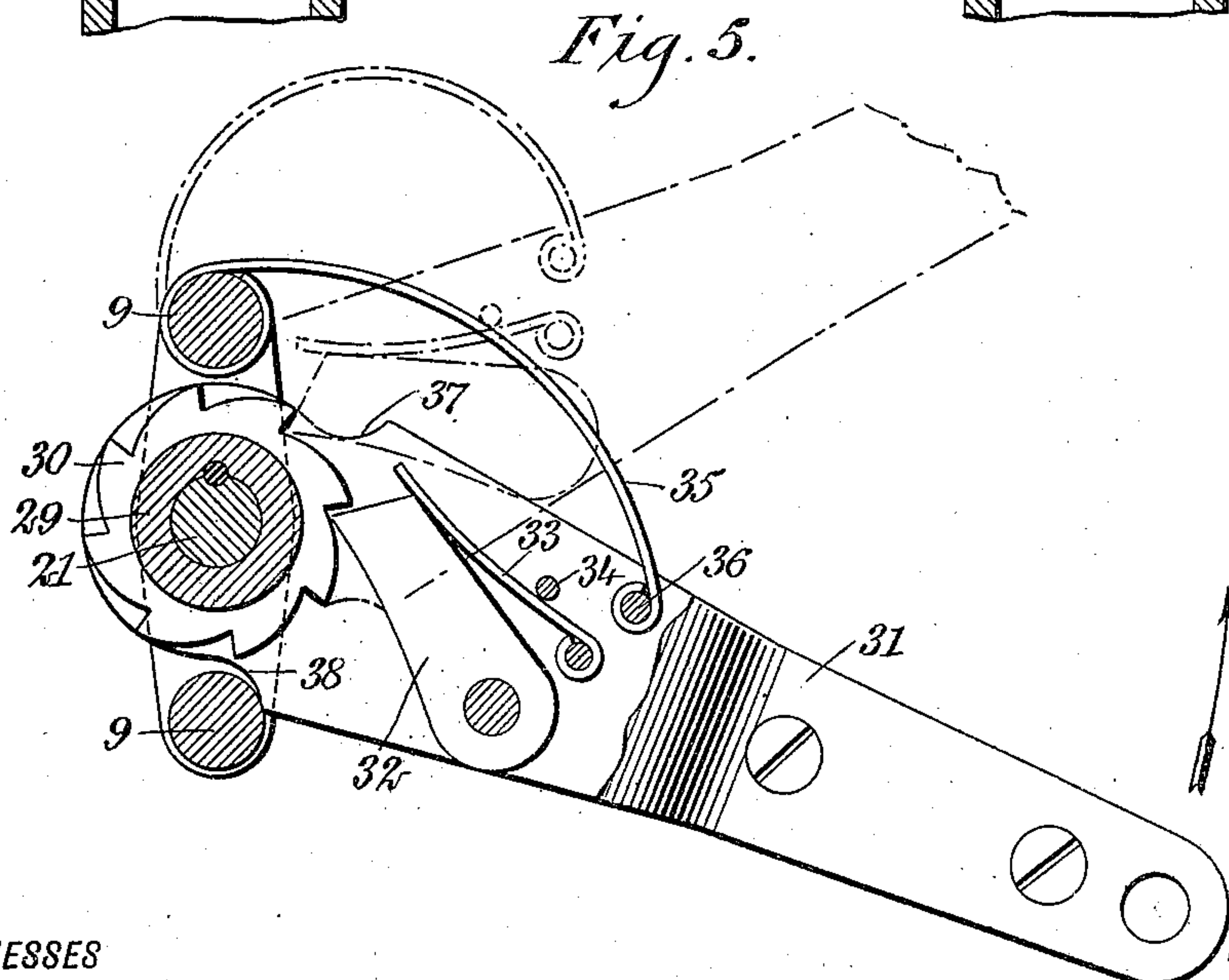
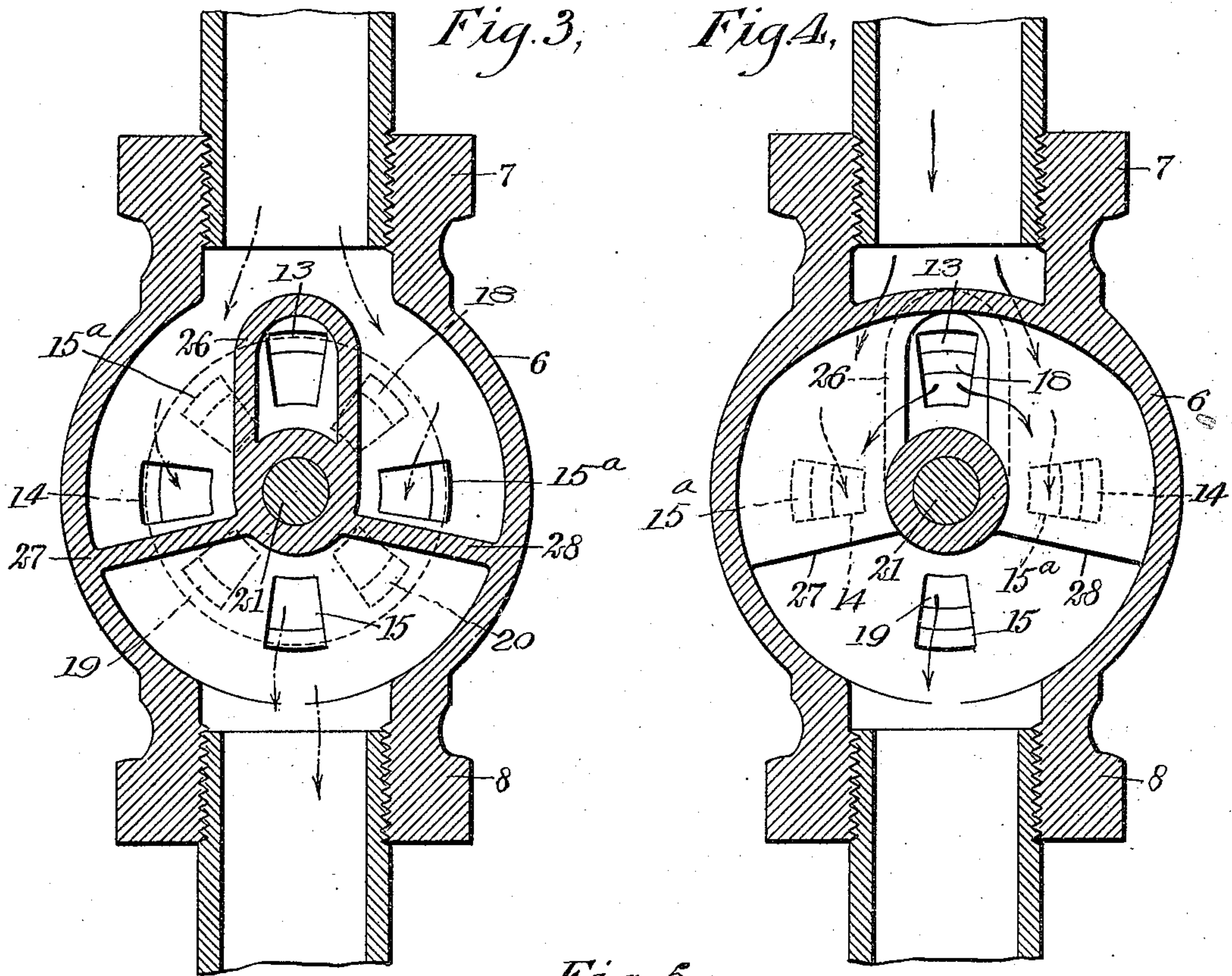
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UNITED STATES PATENT OFFICE.

WILLIAM IRA BELL, OF JERSEY CITY, NEW JERSEY.

VALVE.

934,131.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed February 2, 1909. Serial No. 475,569.

To all whom it may concern:

Be it known that I, WILLIAM IRA BELL, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Valve, of which the following is a full, clear, and exact description.

My invention relates to valves admitting of general use, my, more particular purpose being to produce an improved type of valve having a stationary valve seat and a valve member resting against the same, this valve member being revoluble step by step always in the same direction so as to leave the parts alternately open and closed; one movement of the valve opening all of the parts and the next successive movement of the valve closing them, the next opening them again, and the next closing them again.

My invention further comprehends the proportioning and arranging of the various parts so that whenever step by step movement of the revoluble valve member takes place, the opening or the closure, as the case may be, of the valve is rendered positive. That is to say, if the parts are open at all they are wide open, and if closed they are closed completely.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the valve complete, this view showing the reciprocating lever for turning the revoluble stem step by step; Fig. 2 is a substantially vertical central section through the valve, including its operating lever; Fig. 3 is a fragmentary section upon the line 3—3 of Fig. 2, looking in the direction of the arrows, and showing the various ports; Fig. 4 is a fragmentary section upon the line 4—4 of Fig. 2, looking in the direction of the arrows, and showing certain walls and partitions in addition to the ports; and Fig. 5 is a fragmentary section showing the operating lever and its ratchet for turning the valve stem step by step.

A casing is shown at 6 and is provided with an inlet 7 and an outlet 8. Two rods 9, 10 are mounted upon this casing and extend outwardly therefrom, being connected together by a bridge 11, the two rods and bridge together forming a cage. A web 12, integral with the casing and having gener-

ally a funnel shape, constitutes the valve seat and is provided with ports 13, 14, 15, 15^a. A revoluble valve member 17, having generally the form of a hollow cone, is provided with ports 16, 18, 19, 20, these ports being adapted to register with the ports in the valve seat.

At 21 is a valve stem which is integral with the valve member 17 and is used for turning the same. An adjusting bolt 22 engages this shaft and for this purpose extends through the bridge 11. A set nut 23 encircles the bolt 22 and by jamming against the bridge 11 locks the bolt 22 rigidly in position. A stuffing box 24 encircles the stem 21 and prevents the escape of the liquid, steam, air or gas around the valve stem. A screw cap 25 is detachably mounted upon the casing 6 and forms a closure member therefor.

Disposed within the casing 6 and integral therewith is a tubular web 26 and two partitions 27, 28, these parts being for the purpose of controlling the flow of liquid, steam, air or gas. A sleeve 29 is keyed upon the valve stem 21, as indicated in Fig. 5, and integral with this sleeve is a ratchet wheel 30. A lever 31, having generally a Y-shape, is journaled directly upon the sleeve 29, and partially incloses the ratchet wheel 30, as will be understood from Fig. 1. Pivotally mounted upon the lever 31 and partially inclosed thereby is a pawl 32 which engages the ratchet wheel 30. A leaf spring 33 carried by the lever 31 engages this pawl and normally tends to force it against the ratchet wheel 30. A stop pin 34 holds the leaf spring 33 in proper working relation to the pawl 32.

A spring 35 having a general arcuate form is connected at one of its ends to a pin 36 in the lever 31 and at its other end to one of the rods 9. Whenever the lever 31 is raised, as indicated by dotted lines in Fig. 5, the spring 35 is shortened a little—that is, the pin 36 is brought closer to the rod 9. This compresses the spring 35 which, by its reaction tends to force the lever 31 downward, as indicated in full lines in Fig. 5. The lever 31 is provided with shoulders 37, 38 which are adapted to lodge directly against the rods 9, 10 so as to limit the play of the lever and also to render definite the distance traveled by the lever for the purpose of producing an exact and positive movement of the valve stem and valve member carried

thereby. The number of teeth on the ratchet wheel 20 has a definite mathematical relation to the number of ports in the valve seat, and also the number of ports in the revoluble valve member. In the particular instance indicated the ratchet wheel 30 has eight teeth, the valve seat has four ports and the revoluble valve member has also four ports. My purpose is to so apportion the number of teeth on the ratchet wheel, the number of ports in the stationary valve and the number of ports in the revoluble valve member, that any given stroke of the lever 31 will completely bring the ports of the movable valve member into registry with those of the stationary valve seat, or vice versa, will carry all the ports of the revoluble valve member completely out of registry with the ports of the stationary seat.

The operation of my device is as follows: The lever 31 being moved periodically up and down upon the valve stem 21 as a center, the various ports are alternately opened and closed, the opening in all instances being thorough and the closure in each instance being complete. The operator need not concern himself about the relative position of the movable valve member or raise any question as to whether the opening of the valve or the closing of the valve be thorough. All he has to do, at least when the parts are in proper condition, is to see that the lever 31 has its simple reciprocating movement, and that this movement is complete, so that the shoulders 37, 38 are brought into proximity with the rods 9, 10, though it is not necessary that the shoulders should in every instance batter against the rods in question.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a valve, the combination of a casing having a valve seat provided with ports extending through it, a revoluble valve member provided with ports adapted to be brought into and out of registry with said ports of said valve seat, a stem connected rigidly with said valve member for the purpose of turning the same, a ratchet wheel having a sleeve, said sleeve being connected rigidly with said stem, a lever journaled upon said sleeve, and a pawl pivotally mounted upon said lever and adapted to engage said ratchet wheel.

2. The combination of a casing provided with a valve seat, a revoluble valve disposed adjacent to said seat, a stem for turning said valve, said stem extending from said casing, rods mounted upon said casing and disposed upon opposite sides of said stem, a bridge mounted upon said rods, means controllable at will for adjusting said stem relatively to said casing for the purpose of adjusting the fit of said valve relatively to said seat, a sleeve having a ratchet wheel integral with it, said sleeve being mounted rigidly upon said stem, a lever journaled upon said sleeve, and a pawl carried by said lever for the purpose of engaging said ratchet wheel.

3. In a valve, the combination of a casing provided with a valve seat, a valve member mounted within said casing and adapted to turn relatively to said seat, a stem connected with said valve member and extending from said casing for the purpose of actuating said valve member, a hand lever supported by said valve stem and movable relatively to the same, a pair of rods disposed upon opposite sides of said valve stem, a bridge connecting said rods together, a leaf spring connected with said lever and provided with a portion engaging one of said rods for the purpose of retracting said lever after a movement thereof, and means controllable by movements of said lever for turning said valve stem.

4. In a valve, the combination of a casing provided with a valve seat, a revoluble valve member mounted within said casing and movable relatively to said seat, a stem for said valve member, said stem extending from said casing, a pair of rods disposed upon opposite sides of said stem, a bridge extending from one of said rods to the other, an adjusting member mounted upon said bridge and adapted to engage the adjacent end of said stem for the purpose of adjusting said valve member relatively to said seat, and means for turning said valve stem step by step.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM IRA BELL.

Witnesses:

G. H. BLACK,
WM. C. NOBLE.