

(No Model.)

2 Sheets—Sheet 1.

M. W. SEWALL.

MECHANISM FOR ACTUATING SHUT-OFF AND THROTTLE VALVES.

No. 430,090.

Patented June 10, 1890.

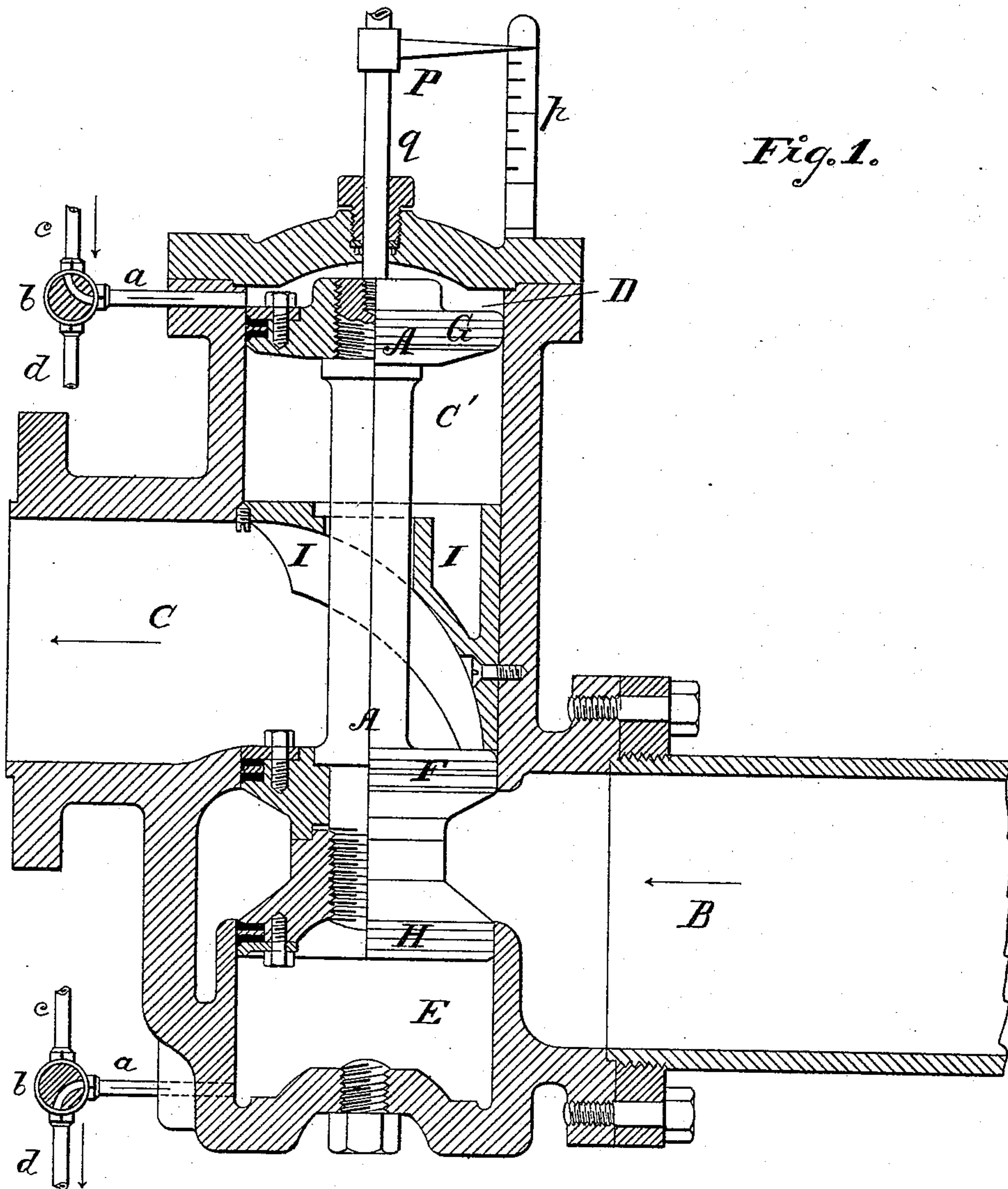


Fig. 1.

WITNESSES.

A. P. Parker

S. R. Van Campen, Jr.

INVENTOR.

Minott W. Sewall

By Chas. M. Forbes

ATTORNEY.

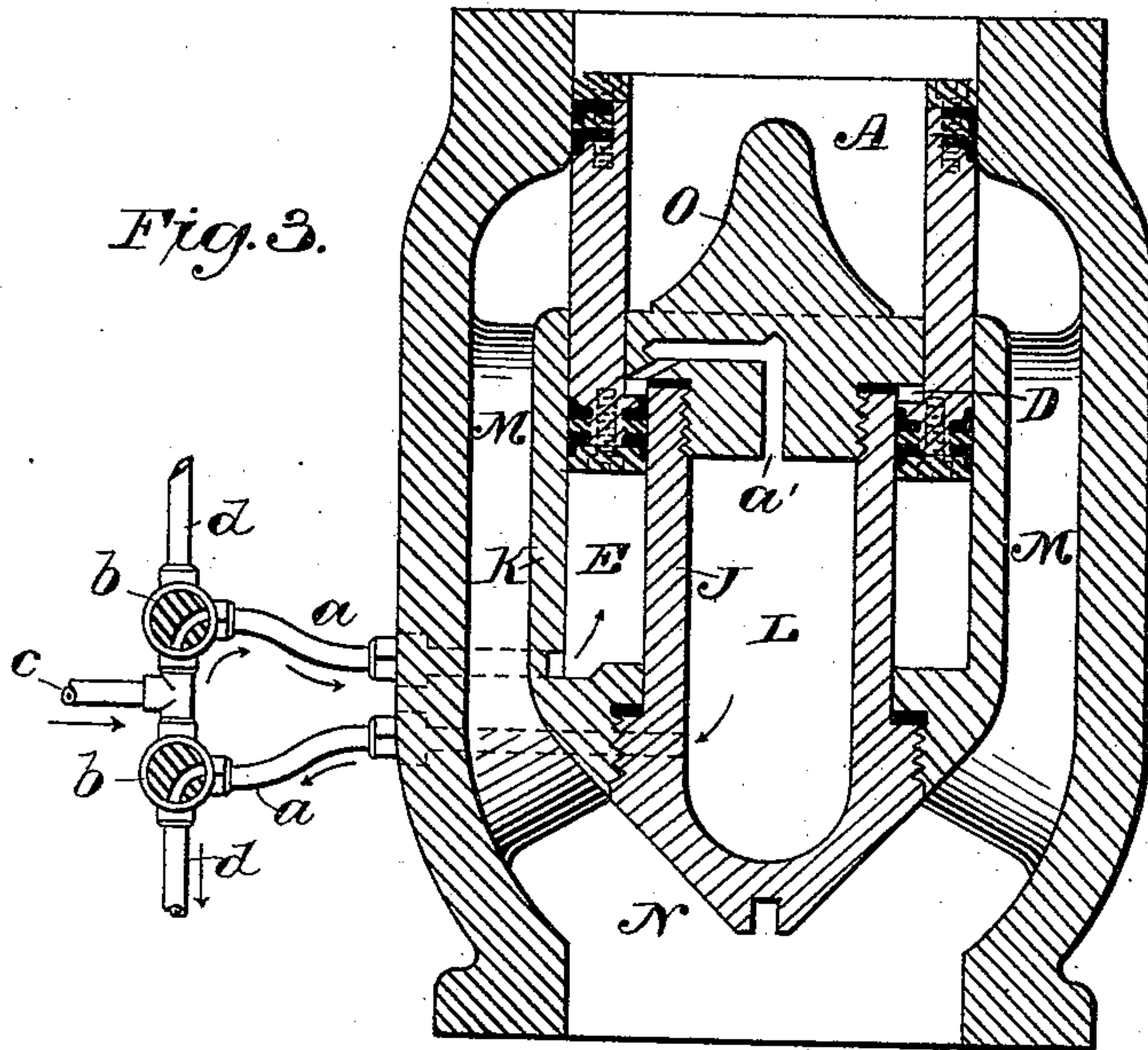
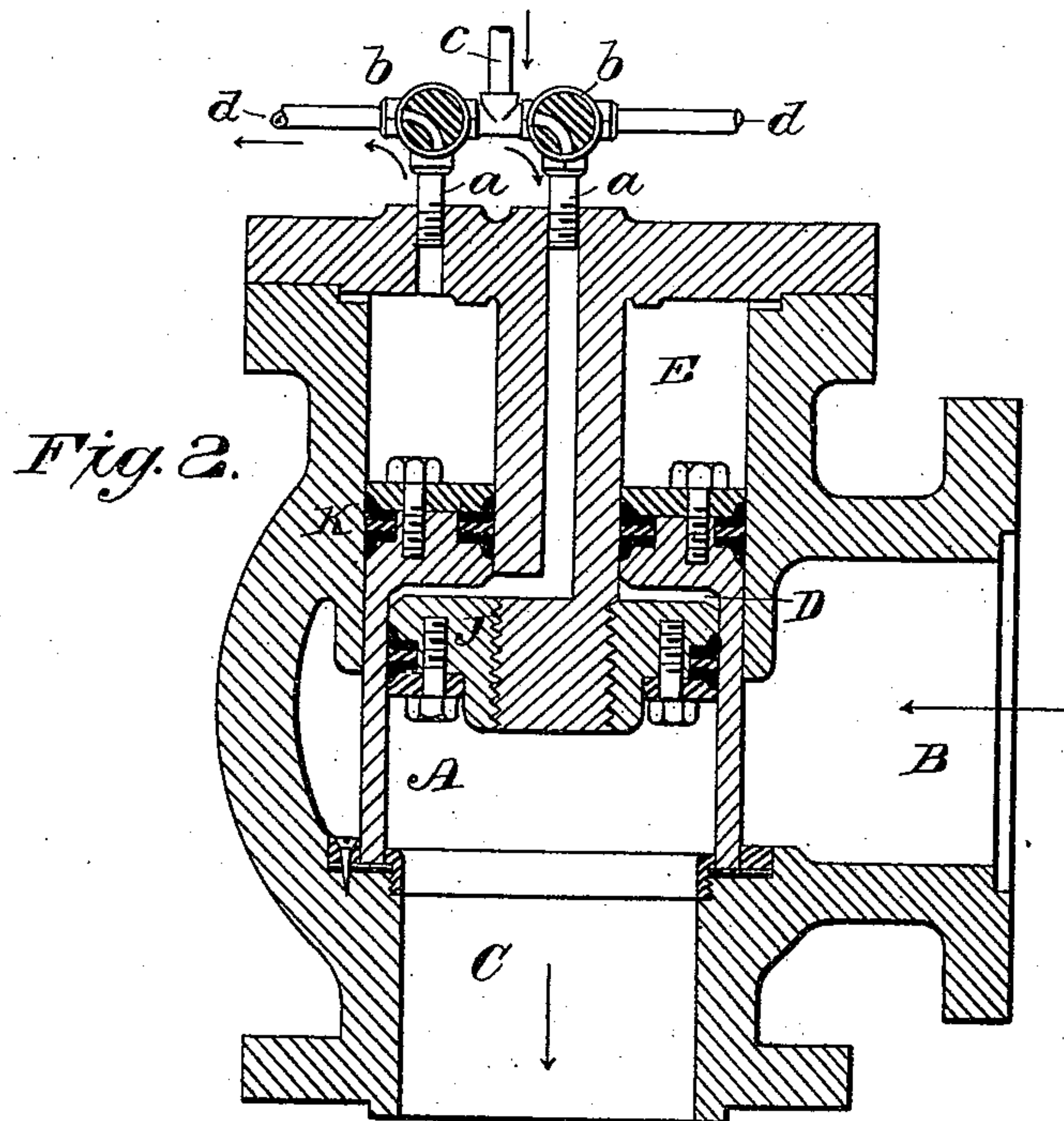
(No Model.)

2 Sheets—Sheet 2.

M. W. SEWALL.

MECHANISM FOR ACTUATING SHUT-OFF AND THROTTLE VALVES.
No. 430,090.

Patented June 10, 1890.



WITNESSES.

H. F. Parker.

S. R. Van Campen, Jr.

INVENTOR.

Minott W. Sewall

By Chas H. Forbes

ATTORNEY.

UNITED STATES PATENT OFFICE.

MINOTT W. SEWALL, OF NEW YORK, N. Y.

MECHANISM FOR ACTUATING SHUT-OFF AND THROTTLE VALVES.

SPECIFICATION forming part of Letters Patent No. 430,090, dated June 10, 1890.

Application filed December 11, 1888. Serial No. 293,298. (No model.)

To all whom it may concern:

Be it known that I, MINOTT W. SEWALL, a citizen of the United States, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Mechanism for Actuating Shut-Off and Throttle Valves, of which the following is a specification.

This invention relates to piston-valves, annular valves, disk-valves, or other forms employed to shut off or to throttle the flow of fluid subject thereto and actuated for said purpose by the application of a pressure or of opposing pressures applied to a part of said valves exposed in an independent chamber or chambers.

The invention is especially applicable to stop-valves employed to admit or retard to a certain degree the delivery of firing-fluid from the reservoirs to the gun-barrel of a pneumatic gun, said valves remaining open at a fixed point during the gun action, while the intermission of discharge is controlled by the usual separate firing-valve employed in conjunction therewith.

The object of the invention is to obtain a positive control over the valve-movements and to facilitate the handling of valves, especially of large size, controlling a high degree of pressure or a large volume of fluid, and to enable others skilled in the art to construct a mechanism for the purpose.

I do not herein claim the method of controlling the gas-movement and regulating the same, such method being claimed in an application of even date herewith, to which the Patent Office gives the serial number 293,297.

In its use as a throttling-valve in conjunction with an automatic discharge-valve, as the firing-valve of a pneumatic gun, the herein-described throttling adjustment is employed to determine the discharge-valve-delivery capacity, thereby extending the range of adjustment applied to the latter.

In order to enable others to understand and use my said invention, I will proceed to describe the details of construction of certain forms of valves herein instanced as adapted to carry the invention into practice, explain their operation, and to subsequently point out in the appended claims the features which I claim as new.

Referring to the accompanying drawings, Figure 1 is a sectional elevation illustrating the invention as applied to a piston throttle-valve; Fig. 2, a sectional elevation illustrating the invention as applied to an annular valve; and Fig. 3 a sectional elevation illustrating also an annular valve, but embodying the feature aforesaid of providing a straight-way fluid passage through the casing.

Similar letters of reference indicate parts having corresponding functions throughout the views.

A, Fig. 1, is a triple-piston automatic valve wherein the interior or central piston F composes the valve proper and the exterior ones G H are employed to balance and also to actuate the said interior piston-valve.

B is the inlet, and C the outlet, port, the functions whereof are, however, capable of reversal.

D E are the actuating-chambers, wherein the hydraulic motive power is applied to actuate the valve A in either direction, said chambers having pipe-connections *a* and cocks *b*, as three-way cocks, adapted to alternately charge or discharge through said pipe-connections by pressure-pipes *c* and exhaust-pipes *d*.

The actuating-pistons G H are packed, preferably by cup-leather packings, turned in opposite directions to resist pressures from both ways, and the piston F, provided with similar packings in its circumferential seat turned in a common direction toward the inlet-pressure. Otherwise, as in steam-controlling valves, expansive metallic packing-rings may be employed.

P is an indicator, operated over the scale *p* by the small piston-rod *q* to indicate the extent of valve-opening and enable the operator to adjust the same at any desired point.

I is a deflector, (open at *f*;) adapted to direct the current of subject-fluid and lessen its friction as far as practicable.

In Figs. 2 and 3 the annular valves A are projected or retracted to or from their seating-points, moving between the interiorly-circumferential cores J and the exteriorly-circumferential cylinders K by the alternate charge or discharge of oppositely-applied pressures in chambers E and D, respectively. The means of applying said pressures in both in-

stances corresponds with that described in reference to Fig. 1, as will be understood by an inspection of said Figs. 2 and 3. The passages *a*, which communicate to chambers D interior to the valve annulus being adapted to extend thereto through the central stationary cores J, as through the cavity L, in the instance of Fig. 3, wherein said passages are located through the webs M, as shown.

10 The cup-packings are provided, as shown, upon all the moving surfaces at the portions which separate the several chambers.

The novelty in Fig. 3 consists in supporting the entire valve structure (with its actuating-chambers) within and centrally to the outer casing by means of webs M, ranged radially between said casings in any desired number, connecting the same together preferably in a single casting. An annular passage for the subject-fluid or a series of passages is thereby formed around the valve, permitting the currents to pass in as nearly a continuous direction as attainable with this form of valve. The tapered heads N O of the interior casing assist to divide the currents flowing in either direction, as the case may be, when the valve is open.

In operation, the pistons F H, Fig. 1, are balanced when the valve is closed by the surrounding pressure in B, and when open the pressure that takes place in chambers CC' likewise balances between F and G, all the piston diameters being equal. The valve as a whole being thus interiorly balanced, is capable of being moved in either an opening or a closing direction by predominant pressure in chamber D or E, respectively, the operator observing and adjusting such movements under positive control by means of the indicator P and valves *b b*, and locking said movements when the desired adjustment is obtained by the means aforesaid of intercepting the actuating-liquid. The valves, Figs. 2 and 3, are free from pressure of the subject-fluid (in

the direction of movement) when seated, and are therefore held in said position by equal pressures in D and E, predominant on the greater area in E. When E is released, pressure in D performs the opening stroke. The pressure in E may be less in degree than the subject-fluid, but it must be sufficient upon the given excess of area to overcome the pressure of the subject-fluid (upon the seating end of the valve) for the purpose of returning the valve to its closed position. It will therefore be understood that in practice I may employ a low actuating-pressure for effecting the control of a subject-fluid under high pressure. The latter feature applies to all valves constructed and actuated under the herein-described system.

It is to be understood that I do not limit my invention to the specific forms herein cited; but I claim, broadly—

1. A valve for pneumatic cannon having a throttle or stop in the main fluid-passage from the reservoir to the gun-barrel, two pistons connected to said throttle or stop and working in chambers, separate pipe-connections leading to these fluid-chambers, whereby the pistons therein may be actuated and controlled, and an indicator connected to the main piston to show its position, all combined substantially as described.

2. In a valve for pneumatic cannon, the combination of a throttling-piston in the main passage from the reservoir to the gun-barrel, two controlling-pistons connected with said throttle and working in chambers, a separate fluid-passage to each controlling-chamber, and a deflecting-guide in the main passage by which the subject-fluid is in part guided in its course to or from the throttle.

MINOTT W. SEWALL.

Witnesses:

CHAS. W. FORBES,
JOHN A. ELLIS.